EMERGING ECONOMIES TRANSITION

China in the Global Economy

Agricultural Policies in China after WTO Accession

OECD

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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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FOREWORD

As China manages its integration into the World Trade Organisation, the trade aspects need to be examined in conjunction with domestic policies. To facilitate this process, policy makers need to understand the impacts of current policies on consumers and taxpayers; their trade distorting effects; and the transfer efficiency of various agricultural policy measures. They also need to understand the institutions and governance mechanisms at each level of policy implementation.

The OECD has been analysing agricultural policies in Member countries and their impacts since the mid-eighties with a view to making them more transparent and internationally comparable. The possibility of applying OECD's approach to the classification of agricultural policies through Producer Support Estimates and Consumer Support Estimates (PSE/CSE) to map the policies in China has been of interest to Chinese analysts for some time. As a first step toward this goal, the Chinese authorities and the OECD held a joint Workshop on "Agricultural Policy Adjustments in China after WTO Accession" in Beijing, on 30-31 May 2002.

The Workshop brought together OECD experts on the PSE/CSE methodology with experts on a wide variety of issues related to the transformation of Chinese agriculture. China's Minister of Agriculture**,** Mr. Qinglin Du, opened the Workshop, which included over 100 participants from China, 16 OECD Member and non-Member economies, as well as representatives of the European Commission, the FAO and the World Bank. As the present volume demonstrates, the Workshop provided a unique venue for an update of the latest policy objectives and developments in China, fresh analysis and penetrating, open discussions of the issues at stake.

The Executive Summary captures the essence of the discussions and main conclusions of the Workshop, as well as highlights from each of the papers presented in the four Workshop sessions and published in these proceedings. To orient the reader, each of the sixteen papers is preceded by an abstract. The reader will find information pertaining to economy-wide objectives and policies in China and their effects on the agricultural and rural sectors. Facts and figures, as well as expert opinions, on China's market price support and budgetary support to agriculture are provided. Finally, this volume includes several papers reflecting on the possible application and interpretation of the PSE/CSE methodology in China's case, including a comparison with the WTO's aggregate measurement of support (AMS).

These proceedings, also available in Chinese, are produced under the auspices of the Centre for Co-operation with Non-Members of the OECD as part of its programme of co-operation with China. They constitute the fifth volume on agricultural policies in the *China in the Global Economy* series. This work is published under the responsibility of the Secretary-General of the OECD.

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ACKNOWLEDGEMENTS

These proceedings bring together the papers from the Workshop on "Agricultural Policy Adjustments in China after WTO Accession", held in Beijing, on 30-31 May, 2002. For the OECD, Andrzej Kwiecinski was responsible for the design and organisation of the Workshop, with assistance from Anita Lari. Jianwen Liu prepared and organised the Workshop on behalf of the Ministry of Agriculture, China. These proceedings were edited by Wilfrid Legg, Xiande Li, Michèle Patterson, Sally Taylor and Alexandra Trzeciak-Duval. Anita Lari assembled and formatted the final publication.

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EXECUTIVE SUMMARY

Overall conclusions: *agricultural and rural areas in China have been disadvantaged by a range of economy-wide policies, but the precise effects of agricultural policies themselves remain uncertain; reform underway prior to China's WTO membership, but now speeding up; deep structural changes ongoing - comparative advantage in labour intensive sectors; OECD experience in measuring the level of support helpful.*

Objectives: As China manages its integration into the WTO, the trade aspects of this process need to be looked at in conjunction with domestic policies. The sustainability and compatibility of current policies need to be well understood by analysts and policy makers. The main objective of the joint China-OECD Workshop held on 30-31 May 2002 in Beijing was to discuss how WTO accession helps support China's long-term reform process. In particular, the discussions aimed to identify ways to make agricultural policies in China more transparent in their design and implementation and more efficient in reaching policy objectives such as raising farmers' incomes. OECD's approach to the classification of agricultural policies as applied for Producer Support Estimates and Consumer Support Estimates (PSE/CSE) was suggested as a helpful tool for mapping the policies applied in China. A better understanding of China's agricultural policy measures combined with improved availability of data should provide a good basis for the eventual association of China with the methodologies applied for OECD countries and selected transition economies in calculations of the level of support with the use of PSE/CSE.

Structure: This Executive Summary presents the main conclusions of the discussions and highlights from the papers presented in each of the four sessions of the Workshop. The Proceedings that follow are organised according to the Workshop programme, with opening statements followed by four sessions focusing on: (i) the agricultural policy framework in China; (ii) market price support policies; (iii) budgetary support policies; and (iv) measurement of agricultural support.

Main conclusions: A key message underlying several presentations and interventions was that the development of rural areas in China depends mainly on conditions and policies that affect the economy as a whole, more than on agricultural policies. Macroeconomic, labour market, education, fiscal and social policies are crucial for farmers and rural inhabitants. In particular, the importance of government support for education in rural areas was highlighted. Many participants stressed the priority of education as the main means to improve the lives of people currently depending on agriculture over the medium to longer term and to allow rural labour to compete more effectively on urban labour markets.

One of the major messages addressed by the Chinese to OECD countries was that China has made considerable concessions in joining the WTO, and it expects OECD Members to provide China with access to their markets. Technical barriers to trade and high levels of protection by OECD Member countries were cited as reasons for recent deterioration in China's agro-food trade performance.

Overall the workshop agreed that economy-wide policies in China heavily tax the agricultural sector. However, there was no firm agreement about the precise effects of agricultural policies themselves.

This is due to numerous price distortions and the lack of reliable official data, as well as institutional and systemic problems. However, as emphasised by **Brink**, much of the usefulness of measuring support lies in the process itself of arriving at the final results. The inventory of policies, the understanding, classification and description of the policy measures applied, and the careful scrutiny of the existing price, production and consumption data are as important as the estimates of the level of support as such. From this perspective, the workshop took an important step forward in understanding the policies applied in China and in identifying challenges for quantifying the impacts of these policies. It also revealed several issues that will need to be addressed before calculating the level of support as applied by the OECD. In particular, the process of analysing and discussing the institutional and governance aspects of policy making and implementation will be useful in this stage of China's agricultural policy reforms.

Highlights of papers: The opening statement by Minister of Agriculture **Du** highlights the most recent changes in China's agriculture, which seek to exploit China's comparative advantage in labour-intensive products, to improve market infrastructure throughout the agro-food chain, and to absorb excess rural labour by the development of small townships. He stresses the marked shift in policy priorities from maximising production to increasing farmers' incomes and improving product quality. **Schlögl** puts the challenges ahead within the perspective of the Doha development agenda and China's eminent role in the globalisation process. He underscores the importance and continuity of the co-operation between China and the OECD on agricultural policy issues and the shared interest in adopting transparent and efficient policies to achieve set objectives. **Ash** stresses that policy makers should have a clear view of the overall environment in which food and farming businesses operate. Policies that encourage investment in physical infrastructure, education and training, science and technology, and public health and safety are more appropriate ways to improve productivity and sustain growth than many traditional farm policy measures. He emphasises that agricultural policy reform offers significant economic benefits and that the choice of policy instruments is at the heart of reform.

In **Session I**, ***Agricultural policy framework in China: practice and methods of analysis***, **Liu** presents a historical perspective on the evolution of and motivation behind China's recent agricultural policy adjustments. He highlights the importance of WTO accession in stimulating reforms undertaken so far and in providing a firm basis for reforms that need to be implemented in the future. He notes that the main orientations of agricultural policies for the future are: restructuring of agriculture and the rural economy, improving the international competitiveness of China's agricultural products and increasing farmers' incomes. He underscores significant progress achieved in recent years in the first two areas, but observes that the growth in farmers' income has been slow since 1997.

Kwiecinski and **Li** provide evidence of labour, land tenure, education, fiscal, social and grain marketing policies which jointly discriminate against farmers and rural citizens and which, in the past, limited their choices and opportunities to improve their standards of living. The authors emphasise that agricultural policy measures alone will have a very limited impact on rural incomes if they are not integrated with a large range of other policies. Therefore, to allow farmers and rural citizens to benefit from growth, economy-wide policy reforms are needed, including: labour market reform to soften labour migration restrictions; education reform to provide the rural population with sufficient skills to compete on labour markets; fiscal policy reform combined with local administration reform to diminish the government-imposed burdens on rural households; and social policy reform to reduce the gap in access to social benefits between the rural and urban populations.

Chen observes that policy incentives, advances in applied science and technology, and favourable weather conditions contributed to grain surpluses in the second half of the 1990s. This, in turn, facilitated a shift in the focus of reforms to adjustment of agricultural production and an emphasis on

quality and efficiency over quantitative growth. Other main thrusts in dealing with the agro-rural economy include moving toward a pattern of production based on regional comparative advantage; paying greater attention to environmental issues; supporting the development of township and village enterprises; and improving labour mobility to small towns and cities.

Antón provides a methodological framework for analysing the economic impacts of agricultural policies. He highlights the results of research undertaken in OECD, which clearly indicates that not all agricultural policy measures are equally efficient in transferring income to farmers, nor do they have the same trade distorting impacts. Therefore, once a precise definition of the policy objective is set, the analysis needs to take into account both the efficiency of the different options in achieving the objective and the costs imposed on other agents, *i.e.* consumers and taxpayers, as well as on other countries through trade.

Session II explores ***market price support policies***. **Song** provides a comprehensive overview of agricultural price indices compiled by various Chinese institutions, including by the State Statistical Bureau, People's Bank of China and General Administration of Customs. In the second half of the 1990s several important policy reforms resulted in the substantial liberalisation of agricultural markets in China, including for grains, cotton, tobacco, silk, wool, meat products as well as fruits and vegetables. The author notices that in recent years considerable progress has been achieved in China in the formation of market infrastructure for agricultural commodities, including the creation of wholesale markets, market information systems, and quality standard and inspection systems.

Huang and **Rozelle** analyse implications of China's WTO accession on China's domestic agricultural markets. On the basis of survey results, they conclude that as China's regional markets are fairly integrated, price shocks at the coastal markets can gradually be transmitted into inland areas. Therefore, if WTO leads to positive or negative shocks, producers and consumers in all regions will feel the influence. However, the overall impact will be "moderate" but "not huge". There will be both gainers and losers: producers of labour intensive products will gain and those producing land intensive products will lose. The authors suggest that as regional disparities are likely to increase, policies to counter this disparity should be implemented.

De Gorter and **Liu** provide a methodological framework for the analysis of the possible impacts of tariff quota management on grain imports and domestic prices in China. These impacts will depend on a set of trade and domestic policy adjustments in such areas as domestic grain market regulations, the degree of grain export and import controls, and quota administration methods.

Lohmar discusses three main ways to increase rural incomes: increase the value of farm output, increase the share of the value of farm output that accrues to rural workers and households, and enhance rural workers' ability to earn income outside of agriculture. He suggests that the above ways of improving rural incomes can be achieved through policies that establish more secure, enforceable and tradable rights to such factors of agricultural production as land and water; that establish institutions and investment to lower transaction, particularly information, costs to farm households; and, finally, that contribute to increasing rural workers' human capital.

Budgetary support policies are examined in **Session III**. **Su** reviews the scope and effects of such policies in China, financed from both the central government and local budgets. Most of this support is allocated to agricultural production, rural infrastructure, and disadvantaged areas. The author considers that while the total amount of support is not sufficient, the allocations of available funds could be improved. Government expenditures to support investments in agriculture should increase and the priorities of such support should be clearly identified. Conditions to attract other agents to invest in agriculture, including domestic enterprises, capital markets and foreign businesses, should be created.

Moreover, support policy should ensure equal treatment for all economic entities operating in agriculture and rural areas, and a supervisory mechanism should be established to ensure proper and efficient utilisation of budgetary allocations.

Aubert and Li take up the issue of formal and informal taxes and fees paid by Chinese farmers to the state and local authorities. Altogether, these taxes and fees, called the "peasant burden", amounted to more than 10% of peasants' net income in 2000. The authors discuss the inequity and regressive character of these charges, both in terms of rural-urban and regional income disparities. For example, farmers have to pay these charges even if their average monthly net income was just 200 yuan in 2000, whereas the minimum taxable income for urban dwellers was 800 yuan per month. Easing the peasant burden cannot succeed without tax and social policy reform to allow for better repartition of tax revenues and social responsibilities between local and central governments or without local administration reform to reduce the number of local administration employees and to improve local governance.

Du, Liu and Qiu highlight the importance of state support for agricultural infrastructure. This is one of the major support measures whose budgetary allocation is rising almost every year. Investments in water management infrastructure account for about 70% of the total, which has helped to establish a basic security mechanism for controlling floods. While infrastructural investment helped to improve farmers' incomes, there is a need to reallocate available funds. So far most of the funds have been channelled into middle or large-scale infrastructure projects rather than into small-scale rural projects aiming at improving living conditions and incomes of local communities. The latter should be supported by local governments, but they lack adequate financial resources. There is also room for non state-owned entities to be involved in investments in agricultural infrastructure, including through various forms of co-investments.

He examines the main policy measures that support the provision of preferential loans to farmers, rural industries and rural investment projects in China. These measures include the creation of three major financial organisations: the Agricultural Development Bank of China, the Agricultural Bank of China, and rural credit co-operatives, all to provide loans to rural borrowers at lower interest rates than the rates charged for other borrowers. To make this possible, the Central Bank of China provides these organisations with low-interest capital to be on-lent to rural borrowers on preferential terms. Moreover, the Agricultural Development Bank of China supplies grain bureaux with capital to allow them to purchase grain at a minimum protective price fixed by the government. Despite these protective measures there is a large net outflow of capital from agriculture and rural areas to industry and, more generally, to urban areas. Moreover, as formal financial institutions do not meet the needs of mostly small-scale economic entities in rural areas, there is a rapid development of informal financing arrangements and markets. The author suggests the need for profound, market-oriented reform of agricultural credit policy, including the liberalisation of financial markets and the gradual diversification of rural financial institutions.

Session IV addresses ***measurement of agricultural support***. **Diakosavvas** explains the methodological framework for the measurement of the level of agricultural support as applied by the OECD and the WTO. He discusses and compares the two approaches, and clarifies the reasons for the differences in the results obtained. He stresses that while the WTO methodology was developed for negotiation purposes, the OECD methodology provides a more comprehensive assessment of the level and composition of agricultural support. In particular, while the Aggregate Measurement of Support (AMS) applied by the WTO was designed to impose limitations on the level of those domestic support policies deemed to be the most trade-distorting, the PSE methodology was aimed at covering all transfers associated with agricultural policies. Therefore, the estimates of support by these

methodologies are bound to differ. Thus, the interpretation and comparison of results has to be cautious and should take into account basic differences in the two concepts.

Legg analyses the evolution of agricultural policies in OECD countries on the basis of the support indicators developed within the framework of the PSE methodology and the qualitative information on the nature of these policies. He concludes that progress in agricultural policy reform has been fragile, with a wide variation across countries and commodities. For the OECD as a whole, the Total Support Estimate amounted to USD 311 billion or 1.3% of GDP in 2001 compared to an average of 2.3% in the 1986-1988 period. The set of support indicators applied by OECD is constantly reviewed and refined and data are improved to enhance their use as policy monitoring and evaluation tools.

Melyukhina presents and discusses PSE results for seven non-OECD transition countries. The calculation of the level of support for these countries raises a number of empirical issues, partly linked with the fact that they have been going through periods of sharp macroeconomic adjustments and suffer from structural and institutional deficiencies inherited from the previous centrally planned system. Therefore, the interpretation of PSE results for this group of countries should take account of their specific economic conditions. She concludes that PSE/CSE analysis helps explain the magnitude of agricultural market distortions and the cost of these distortions to consumers, taxpayers and the economy as a whole.

Tian, Zhang and Zhou discuss selected aspects of the calculation of the level of support for China, including the lack of data and policy information. Moreover, a large share of farm produce in China is self-consumed, which in the authors' opinion does not result in "real" transfers between producers and consumers. The authors apply modified OECD methodology in calculating the level of support. Their analysis indicates that China's agriculture as a whole was not supported in the past decade. Market price support policies had a major impact on the measured level of support. Some increase in the level of support in the 1990s resulted more from the removal of the discriminatory policies than from the introduction of new support measures. The authors conclude that if China is to avoid introducing agricultural support policies, OECD countries should reform their policies to diminish their level of support.

OPENING STATEMENTS

OPENING STATEMENT

By Qinglin Du
Minister
Ministry of Agriculture, China

Dear Guests, Friends, Ladies and Gentlemen:

It is through the joint efforts of the Ministry of Agriculture of China and the Organisation for Economic Co-operation and Development, that the Workshop on Agricultural Policy Adjustments in China after WTO Accession opens today in Beijing. On behalf of the Ministry of Agriculture of People's Republic of China, I would like to extend a warm welcome to the specialists and scholars from home and abroad, the delegates from relevant institutions and the news correspondents present at this workshop.

In 1999, the Ministry of Agriculture of China and the OECD held a joint workshop on the Development of China's Agro-Processing Industry and the Related Policy Issues in Beijing. Discussion results at the workshop played a positive role in promoting the development of agro-processing industry in China. Today, not long after China's accession to the WTO, we invite you to discuss relevant issues under the topic of *Agricultural Policy Adjustments in China after WTO Accession*, so as to contribute good suggestions for the agricultural development and policy adjustments in China. I am confident that, with the joint efforts of all delegates, this workshop will achieve its expected objectives and provide helpful thinking and reference for the further agricultural policy adjustments in China under the WTO framework.

China's economy continued its impressive growth rate in 2001. Despite the slow-down in the world economy, China's GDP reached 9.6 trillion yuan, with the annual growth rate continuing at over 7%. Domestic market prices remain stable, and international payments healthy. Agriculture and the rural economy continue to develop in a healthy and stable way. In particular, the market-oriented and strategic restructuring of the agriculture sector have witnessed remarkable progress, of which some of the more important aspects are that the cropping structure continues to be improved and the three-component pattern is beginning to take shape (whereby grain crops, cash crops and forage crops develop in a well-co-ordinated manner). Vegetables, fruits, horticulture and other sectors in which the country enjoys comparative advantages have been developing at a particularly rapid pace. The development of animal husbandry is accelerating, with meat, eggs and dairy output increases above last year's. There is considerable improvement in agricultural product quality. The production of high-quality rice, "special-purpose" wheat, "double-low" rapeseed, and high-oil and high-protein maize has been expanding. The production of environment-friendly food, green food and organic food is also developing at a fast pace. An agricultural production structure based on regional specification and specialised production is already in its early stages of development. The production of major agricultural produce continues to be concentrated in areas with comparative advantages. Vertical integration in agriculture has maintained a good momentum, and leading companies, specialised co-operatives and inter-media agencies play a larger role in providing guidance to farmers. The practice of contract farming is becoming a crucial link between market demand and agricultural production. Rural urbanisation is also accelerating. The development of small townships has become an important means to absorb surplus rural labour. Due to these preliminary achievements in the structural readjustment process, farmers' income improved in 2001, with per capita income reaching 2 366 yuan, representing a 4.2% increase in real terms over last year.

WTO membership will bring new opportunities to the development of agriculture and the rural economy in China. In the long run, it will help give full play to China's comparative advantage in agriculture, rationally reallocate resources and increase the overall international competitiveness of China's agriculture. It will facilitate the earlier establishment of and improvement in the agricultural product market system and the agricultural support system by the state. It will also contribute to the promotion of reforms in the agricultural sector, the rural economic system and the foreign trade system. Furthermore, it will help to improve the international environment for China's agricultural exports and attract more foreign investment, technology and management skills to encourage agricultural modernisation in China. We are fully aware that accession to the WTO also imposes great challenges to agriculture in China. Generally speaking, major land-intensive agricultural products will be greatly affected. However, due to the fact that labour-intensive products, in which the country has a comparative advantage, lack the strength to penetrate new markets, it is difficult to imagine that they will witness major developments in the near future. These factors will make it more difficult to raise farmers' income levels and to provide more employment opportunities.

Making adjustments in agricultural policy after WTO accession is a major undertaking. It is also an urgent task the Chinese government is facing. The main themes for future agricultural policy adjustments in China are as follows: restructuring agriculture and the rural economy; increasing farmers' income, and raising the international competitiveness of China's agricultural products. The goals for policy adjustment are: a shift from pursuing quantitative growth in agricultural production to pursuing quality improvements; a shift from solving the problem of inadequate food and clothing to increasing farmers' income; a shift from extensive growth methods to developments that focus on economic benefits and sustainability; and, a shift from emphasising domestic production towards more active participation, co-operation and specialisation at the international level. OECD and its Member countries have applied WTO rules to adjust domestic agricultural policy much earlier than China, and they have accumulated many successful experiences which can be of helpful reference.

Specialists attending this workshop are from domestic government departments, research institutes, colleges and universities, news agencies, OECD Member countries as well as non-member countries, EU, World Bank, UNFAO and other international organisations. Quite a number of the specialists present have devoted a lot of time on the research of China's agricultural economic policies and trade-related issues. I sincerely hope that you will feel free to voice your views, carry out in-depth discussions and make this workshop a fruitful one.

I wish this workshop complete success.

I wish all of you good health.

Thank you.

OPENING STATEMENT

By Herwig Schlögl
Deputy Secretary-General
Organisation for Economic Co-operation and Development (OECD)

Ladies and Gentlemen,

It is a great pleasure for me to open this meeting on behalf of the OECD and to thank Minister Du and the Chinese authorities for hosting our joint China-OECD Workshop here in Beijing.

Just two weeks ago at the annual meeting of the OECD Council at Ministerial level, relations between OECD Members and developing countries were at the centre of Ministers' debates more than ever before in OECD's 42 year history. During the equivalent of a one-day meeting, Ministers devoted more than half their time to discussions with Ministers from non-OECD countries. At a time of sensitive developments in international trade relations, OECD Ministers focused particularly on their commitments in relation to the Doha Development Agenda. They called for OECD Action for a Shared Development Agenda, comprising four integral elements: encouraging policy coherence for development; supporting developing countries' governance and policy capacities; improving aid effectiveness and ensuring adequate aid volume; and strengthening partnerships and accountability. The importance of agriculture for development was a central theme evoked by nearly all Ministers, OECD and non-OECD alike.

It is thus fully in line with the global development agenda that agriculture continues to be a key feature of OECD co-operation with China. The discussions that we are beginning this morning mark the fifth time that a special workshop devoted to issues in the agricultural sector is being held. Past discussions have greatly helped OECD Member countries to understand the enormous policy changes and challenges that have characterised the evolution of China's agriculture over the past twenty-five years. We believe that there have been substantial mutual benefits from these activities, including the realisation that many similar problems are shared between China and OECD countries, and therefore that we have much to learn from each other's experience. And of course these efforts also contributed in March of this year to a landmark publication: *China in the Global Economy: the Domestic Policy Challenges*.

The structure of today's agenda directly follows from this previous analytical work and on-going dialogue. We will share and discuss OECD's approach to agricultural policy analysis, so that the tools that OECD Members use to understand, evaluate, refine and reform their policies can also be considered in the context of China's policies. All countries share the common interest of identifying transparent and efficient policies to achieve their various objectives.

So, on behalf of OECD, let me welcome all the Chinese experts and policy makers, together with experts from OECD Member and non-member countries, notably Russia and Vietnam, and from the OECD Secretariat. Welcome to all of you who have joined us today to review the current agricultural policy framework in place in China. To those of you who are participating for the first time, we look forward to fresh insights that your experience and research will bring to the debate. We hope that the discussion of various methods of policy evaluation can be considered for China's analytical and policy needs.

Thank you.

OPENING STATEMENT

Agricultural policy in OECD countries

By Ken Ash
Deputy Director
Directorate for Food, Agriculture and Fisheries, OECD

Minister Du, Vice-Minister Fan, Colleagues,

Good morning. I want to share three messages with you concerning our work over the next few days: i) the role of public policies, ii) the importance of the Doha Development Agenda, and iii) the benefits of agricultural policy reform.

The accession of China to the WTO is an important milestone - for China and for global trade - and offers further evidence of a growing understanding of the economic benefits that flow from opening markets in all sectors.

Liberalisation of agricultural trade poses both challenges and opportunities. Difficult adjustments will be required, by industry and by governments. Reforms will be needed and not just those related to farm policy. Economy-wide policies will be needed to facilitate the efficient allocation of resources, including labour - and any disincentives to a more competitive system of production will need to be removed.

Which leads to my first message. While this workshop will focus on agricultural policy in China, it is essential that we also maintain sight of the bigger picture - that is, we must have a clear view of the overall environment in which food and farming businesses operate: the natural resource conditions, the way markets function, the role of economy-wide policies, as well as the effects of agricultural policies. It is within this overall environment that farm families will respond, and this must always be kept in mind by policy makers.

The WTO Ministerial Declaration (the Doha Development Agenda) outlines an ambitious agenda, including that on agriculture - substantial improvements in market access and reductions in trade-distorting domestic support, and reductions - with a view to phasing out - all forms of export subsidy. There is to be special and differential treatment for developing countries, defined so as to be operationally effective. Various non-trade concerns will be taken into account. And all is scheduled for completion over the next two and one-half years. Whatever the final modalities may be, the direction of the WTO outcome seems clear - more open markets, which means less isolation of farmers from world market conditions and greater reliance on globally competitive sources of supply.

This leads me to the second point. As markets open, the focus of policy will need to change towards that of enabling the food and agriculture sector to respond to market demands and to compete globally on the basis of comparative advantage rather than on the basis of government subsidies and protection. Policies that encourage investment in physical infrastructure, education and training, science and technology, environment, public health and safety, for example, are more appropriate ways to improve productivity and sustain growth than many traditional farm policy approaches.

Market opening, then, has important implications for the reform of agricultural policies. In OECD countries support and protection remains very high - over USD 300 billion each year, with support to producers accounting for one-third of farm receipts - and reforms have been slow and insufficient.

Much of this support continues to be provided through price and output based policies that are highly production and trade distorting – and they are also ineffective in achieving their stated domestic objectives.

Our work on PSEs/CSEs reveals much about the level and type of support provided in OECD countries, and in some non-OECD economies as well. In addition to the widely quoted quantitative results, policy monitoring and evaluation provides important qualitative information on the ways in which policies work, and provides a basis for assessing the effects of policies. This information – which you will hear much more about in the next two days – points in a very clear direction – and this is my final message: agricultural policy reform offers significant and widespread economic benefits:

- reduced costs to consumers and taxpayers;
- improved trade opportunities for competitive suppliers;
- less stress on the environment;
- more effective policies that achieve their goals more efficiently.

It is essential to understand that the choice of policy instruments is at the heart of reform. Establishing very clear and transparent policy objectives, with well-targeted instruments aimed at specific beneficiaries, would minimise international spillovers. Trade policies form the basis of multilateral negotiations, but there would be fewer trade tensions - and less to negotiate - if agricultural policies were designed in this way.

Well functioning markets, effective economy-wide policies, and transparent, well targeted agricultural policies are all ingredients in enabling a productive food and agriculture system. Our discussion over the next two days will concentrate on the latter ingredient, agricultural policies, as just one element, albeit an important one, in this mix.

SESSION 1. AGRICULTURAL POLICY FRAMEWORK IN CHINA: PRACTICE AND METHODS OF ANALYSIS

AGRICULTURAL POLICY ADJUSTMENT IN CHINA AFTER WTO ACCESSION

By Zhenwei Liu

Abstract

Entry into the World Trade Organisation (WTO) has brought unprecedented opportunities and challenges, propelling agricultural development in China into a new phase. The resultant changes and shifts in the patterns of trade in agricultural products will require Chinese agricultural policy to undergo further adjustment. The main goals will be: adjusting the structure of agricultural and rural economies, increasing farmers' incomes, and increasing the competitiveness of agricultural products on international markets. The objectives of agricultural policy are shifting from: emphasis on increasing output to increasing quality emphasis on clothing and feeding the population and increasing farmers' incomes; emphasis on extensive farming to focusing on economic benefits and sustainable development; and emphasis on domestic production to a focus on active participation in international markets.

1. Background to the new objectives of Chinese agricultural policy

Entering the WTO has propelled Chinese agricultural development into a new phase and is accelerating agricultural policy adjustments. This new phase of agricultural policy adjustments in China has the following characteristics:

- *Changes in the supply and demand relationship for agricultural products, shifting from a situation of long-term shortages to a basic balance in overall quantities and surpluses in abundant years*

In the more than 20 years since the reforms and opening up, there has been a significant increase in China's overall agricultural production capacity, with a large growth in production of the principal agricultural products. Food production capacity has increased from over 300 million tonnes in 1978 to approximately 500 million tonnes, and if each 50 million tonnes is counted as one step, we have over this period climbed four steps with an annual growth rate of 2.4%, more than one percentage point higher than the annual growth rate for the population during the same period. Currently 355 kg of food is produced on average for each Chinese person, higher than the average world level. The amounts of the main agricultural products of cotton, oil, fruit, meat, aquatic produce and vegetables all occupy first place in the world, with average per capita amounts of 4.2, 8.9, 51.2, 49.7, 34.3 and 336 kg. With the exception of fruit, the average per capita for all the other products is higher than average world levels. The average net income of farmers has risen from 134 yuan in 1978 to 2 366 yuan in 2001, and with 1978 taken as 100, the index increases in real terms to 503.8 by 2001. At the same time as the supply of agricultural products has increased greatly, the standards of living of urban and rural populations have risen significantly, while Engel's coefficients have gradually fallen. The Engel coefficients for urban and rural populations in 1984 were 58% and 59% respectively, while in 2001 these were 37.9% and 47.8% respectively. The sustainable growth in the total volume of agricultural produce has brought about historical changes in the supply and demand relationship for agricultural produce. Currently, of China's 118 agricultural products, supply has exceeded demand to various degrees in all but palm oil, and the previous "whatever is produced is sold" and "how much is produced is sold" seller's market characteristics have gradually disappeared, and buyer's market characteristics have become increasingly evident.

– *Changes in the pattern of agricultural growth, shifting from a reliance on land and labour to greater reliance on capital and technical investment*

In the period from "the Eighth Five Year Plan" to "the Ninth Five Year Plan", relatively large changes occurred in the structure of the key production factors in Chinese agriculture. The flow of technology and capital into agriculture speeded up as did the transfer of agricultural labour into non-agricultural sectors. In the "Ninth Five" year period the rate of contribution of science and technology to agriculture reached 42%, an increase of 8 percentage points over the "Eighth Five" year period. There was a fall in the percentage of labour engaged in primary industry as a proportion of the total national workforce, from 47% at the end of the "Eighth Five" period (1995) down to 45.5% at the end of the "Ninth Five" and 43.9% in 2001. Of the current 730 million national workforce, approximately 239 million are employed in urban sectors, with approximately 200 million employed in township and village enterprises (TVE) or working temporarily in cities. The investment of central finance in agriculture has increased from 57.4 billion yuan at the end of "Eighth Five" period (1995) to 108.5 billion yuan at the end of "Ninth Five" period (1999). In the 2002 budget, central government investment in agriculture is 117.9 billion yuan. These changes in the structure of the key production factors show that the reliance of agricultural development on large utilisation of natural resources and growth in the labour force is currently changing, and agricultural capital investment and the degree of intensification are gradually rising.

– *Changes in the economic operation of farms and the style of management and a strengthening of the fundamental role of market allocation of resources*

Market-oriented agricultural reforms are bringing about a change in the system of economic operation of farms from the previous planned allocation of resources to market allocation of resources within the overall macroeconomic framework. Currently, apart from a very few products, agricultural produce has already relied on the market for the adjustment of supply and demand and for pricing. The marketing rate of agricultural produce has increased, and there has been a strengthening of the fundamental role of the market in resource allocation. The market has not only provided a venue for farmers to sell their produce, but has more importantly induced farmers to adjust their production structure, investment structure and occupational structure, optimising the means of allocating resources.

– *Changes in the market competition relationship for agricultural products from sole domestic competition to both domestic and international competition*

Since the reforms and opening up, the rate of opening up of Chinese agriculture to the outside has speeded up, with world agricultural trade and competition broadening. Over this period agricultural scientific and technical exchanges and economic and trade relations have been established with the main international agricultural organisations and with over 140 countries. In 20 years, the total value of Chinese agricultural imports and exports has grown 14.7 times, introducing over 8 000 foreign capital projects and over 100 000 good-quality product varieties and materials and over 1 000 items of advanced technology. Since China entered the WTO, there has been an increase in the share of Chinese agriculture in the international trading system, with a change from mainly relying on "one market, one resource" to dependence on "two markets, two resources".

– *Adjustments in the role of agriculture and the rural economy in the national economy: the agricultural sector is not only opening up and undergoing reforms and modernisation, but it also plays an increasingly important role in stimulating domestic demand and protecting the environment*

In the new phase in which the focus is shifting from basic needs such as food and clothing to the desire for higher living standards, agricultural development needs not only to meet the basic need of the people to get enough to eat but must also meet the diversified requirement to eat well. With the expansion of the market economy and the increase in the degree of commercialisation of agriculture, the influence of the supply of agricultural produce on commodity prices becomes more and more apparent. Comrade Jiang Zemin pointed out in 1997 that "Inflation has appeared over the previous few years, and the increase in food prices is an important factor; this problem has been fairly well solved over the last few years, and abundant agricultural harvests in particular are an important cause". The Chinese rural population is very large and constitutes a huge potential consumer market. According to estimates, each 100 billion yuan of final consumption by the Chinese rural population will produce over 230 billion yuan of consumption demand for the whole national economy, bringing an intermediate injection of over 120 billion yuan to industrial sectors; each increase of one percentage point in the income of farmers will bring about a growth of 0.51 percentage points in the gross national product. Agriculture is a special production sector providing an excellent ecological environment for human existence and social reproduction, and it must make a greater contribution to protecting the ecological environment. Of course, with the development of the national economy and strategic adjustments to industrial and agricultural structure, there have been great changes in the previous dependence on extracting resources from agriculture to support national industrialisation. The share of agriculture in the gross national product will fall, but this does not signify that the fundamental role of agriculture in the national economy will be undermined.

The above-mentioned changes in agricultural development and the rural economy are the results of the continuous deepening of reform and opening up, and are an inevitable trend in the development of agriculture and the rural economy, and they are also the basis for adjustments to Chinese agricultural policy.

2. Adjustments in structural policies for agriculture and the rural economy

Facing WTO regulations and the fierce competition of the international market for agricultural products, China has to speed up structural adjustments in agriculture and the rural economy in order to be able to increase the competitiveness of agricultural produce in terms of price and quality.

China began to undertake agricultural structural adjustments in 1999. The structural adjustments were not simply an issue of increases or reductions in the quantity of agricultural products, but involved stabilisation of production, guaranteeing supply and comprehensively optimising the quality of agricultural products. These adjustments were not sealed within local boundaries, but gave full play of comparative advantage to optimise regional agricultural distribution. The adjustments did not involve simply expanding the existing production capacity, but also transformed traditional agriculture through advanced technology, strongly increasing labour productivity and land yields; they did not simply adjust the structure of agricultural production, but also adjusted the structure of the rural economy, vigorously expanding the secondary and tertiary industries and stimulating the harmonious development of the urban and rural economies. These adjustments constituted an in-depth reform in the process of agricultural development in China. They involved the comprehensive development of industrial structure, rural economic structure, science and technology in agriculture and rural economic

management levels. They laid the foundations for the long-term development of agriculture and the rural economy and also involved other sectors of the national economy.

– *Three years of agricultural structural adjustments have yielded significant results:*

One result was a further optimisation of the cropping structure. While concentrating on maintaining food production capacity, the production of high-value cash crops and feed crops has greatly expanded. In comparing 2001 with 1998, the grain producing area has been reduced by a total of 130 million *mu* (1/15 of hectare) while the area for cash and feed crops has increased by over 90 million *mu*, with the planted area of cash and feed crops now occupying as much as 30.6% of the total planted area, an increase of 3.7 percentage points. The farming sector has begun to implement a framework of co-ordinated development of grain crops, cash crops and feed crops, with the production of vegetables, fruit and flowers expanding particularly rapidly, constituting a new growth source for farmers' incomes.

The second result was the expansion of the livestock industry. All regions have profited from the full grain supply situation to speed up the expansion of the livestock and aquatic sectors. In comparing 2001 with 1998, meat output increased by 6.23 million tonnes, an increase of 10%; egg production increased by 2.695 million tonnes or 13.4%; and aquatic production increased by 4.73 million tonnes or 12.1%. In recent years, with the fall in returns of grain production, the rapid expansion of the livestock and aquatic sectors has played an important role in guaranteeing market supply and increasing the farmers' income.

The third result was a significant improvement in the quality of agricultural produce. Raising the quality of agricultural produce and expanding the production of high-quality, speciality agricultural products has been a priority for all regions. A mass of inferior varieties has been discarded, a range of good-quality and niche products has been developed, a range of prominent brand agricultural products has been cultivated. The planted area of good quality rice has now reached 250 million *mu* nation-wide, or more than half of the total area of paddy-fields. The overstock and "difficulty to sell" problems for early *Indica* rice have been partly eased or resolved; good-quality speciality wheat has reached over 90 million *mu*, accounting for 25% of the total area for wheat, constituting a preliminary turnaround in the situation in which the processing of speciality wheat over many years was mainly dependent on imports. The planted area of "two lows" rapeseed has reached 60 million *mu*, accounting for 56% of the total area for rapeseed. Speciality maize with high-oil and high-protein content has rapidly expanded, with a planted area reaching 78 million *mu*; fresh agricultural products such as poultry, aquatic produce and fruit and vegetables have also expanded rapidly. The safety and hygiene of agricultural products have been taken more and more seriously, and the expansion of safe foods, vegetarian and organic foods has been rapid.

The fourth result was the further concentration of production areas with a comparative advantage for the production of the principal agricultural products. Through the structural adjustment process, the advantages of agricultural development for each region have emerged, and key points for regional expansion and pillar industries have been established, and the trend for agriculture to adopt a regionalised layout and a specialised division of labour has become gradually more apparent. The area of paddy fields along the Yangtze has already reached 66% of that for the whole country, and the wheat area of the Huang-Huai-Hai Plain accounts for 60% of the national total, while the Northeast and the three provinces of Hebei, Shandong and Henan have a maize area accounting for 55% of that for the whole country. Oilseeds crops have also formed a preliminary production layout with rapeseed along the Yangtze, peanuts in the Huang-Huai-Hai area and soya beans in the Northeast.

The structural adjustments to agriculture in China have yielded significant results, but further efforts are still required. For the immediate future, the main focus of agricultural structural adjustment policy is the optimisation of resource allocation and the stabilisation of overall food production capacity through adjusting the layout of planting areas; raising the quality and safety levels of agricultural products and raising the international competitiveness of agricultural products through improvements in quality; speeding up the development of the agro-food processing industry; greatly increasing the value added of agricultural products; speeding up the migration of surplus rural labour and increasing farmers' incomes. In order to achieve these objectives, the Chinese Ministry of Agriculture is implementing the "Development Action Plan" in rural areas.

3. Adjustments in marketing and trade policy for agricultural products

In order to open up to trade in agricultural products, as from the 1990s, China has been speeding up reforms of grain and cotton marketing.

In 1998, the purchase price of cotton was adjusted from a government-fixed price to a government-guided price, and the supply price was determined by the market. In 1999, both the purchase price and the selling price of cotton were mainly determined by the market, and the State made no further unified regulations. Marketing channels for cotton also opened up further, enabling agencies and cotton processing factories belonging to agricultural departments, as well as state farms and authorised textile enterprises to directly purchase, process and deal in cotton. In 2001, cotton dealing further expanded, enabling authorised cotton purchasing and processing enterprises to engage in cotton dealing. Simultaneously, a cotton quality inspection structure was established to monitor compliance with the law and to establish a legal basis for maintaining order in the cotton market. This is a reform of real significance for the cotton marketing system.

Reforms to the grain marketing system have worked on the principle of proceeding step by step in an orderly way. Since 1993, the State has strengthened its control of the grain market, and a balance has been reached between supply and demand in the short term and a surplus in abundant years through strengthening administrative responsibility for grain supply and pricing procedures. In 1998, the State further explored a new approach to reforming the grain marketing system, introducing reforms mainly comprising the "four separations, one completion" (separation of government and enterprise, separation of reserves and dealing, separation of central and regional responsibility, separation of new and old accounts, and completion of a grain pricing system) and "three policies, one reform" (opening up grain purchase from farmers at protected prices; selling grain at a price higher than the purchasing price to make profits; ensuring a fund to be used by the Agricultural Development Bank only for grain purchasing; and speeding up the reforms of SOE grain enterprises). In 2000, the range of varieties and regions for grain purchases at protected prices was adjusted, and business channels were opened up, permitting and encouraging grain-using enterprises and grain-dealing enterprises to go directly to farms to purchase grain, with the approval of provincial-level Industry and Commerce Administration Offices, to open up local markets in rural areas throughout the year. In 2001, a reform of the grain marketing system was introduced under which policy is decided by provincial-level governments, and grain purchasing, markets and prices were opened up in sales areas (Zhejiang, Shanghai, Fujian, Guangdong, Hainan, Jiangsu, Beijing and Tianjin). Purchase-sales relationships were established between sales areas and the main production areas, completing a regional grain reserves system, supporting the opening up to purchasing farmers' grain surpluses at protected prices in the main production areas, and giving support in areas such as risk fund management, construction of grain warehouses, increasing the size of central grain reserves and establishing agricultural infrastructure. The conditions for agricultural production and the ecological environment have been improved,

protecting the grain production capacity of the main production areas and strengthening the ability of the state to regulate the grain market.

Since the 1990s the Chinese Government has taken the initiative in adapting to progress in the freeing of agricultural trade, actively participating in the international division of labour, and the objectives of agricultural policy have changed from being based on the domestic market and raising the level of agricultural production towards utilising the international market and raising the competitiveness of agricultural products. The changes in agricultural trade policy are: (1) Greatly reducing tariff rates on imports of agricultural produce. From 1992 to 1997, the Chinese Government took the initiative to lower the tariff rate on imported agricultural products 4 times in succession, lowering the average tariff rate on agricultural produce from 46.6% to 21.2%, of which raw materials fell to 16.5%, semi-finished products fell to 24.2%, and finished products fell to 27%. (2) Abolishing or reducing non-tariff rate barriers. Import quotas and permits for agricultural products such as soya beans have been gradually abolished and have been replaced by tariff rates (3) In accordance with WTO rules, domestic agricultural laws and regulations have been clarified, and regulations limiting the quantity of agricultural products and conditions for entering the market in the area of agricultural services and trade have been modified, strengthening the transparency of technical measures. (4) According to undertakings made on entering the WTO, unified, fair and just import and export regimes for agricultural products have been established. The "Provisional Methods of Tariff-Rate Quotas (TRQ) Management for Imports of Agricultural Produce" have been officially disseminated and implemented, indicating that regulation of foreign trade in Chinese agricultural products will abide by international rules, and transparency will improve.

Even though the reforms of the Chinese agricultural produce marketing system have made important progress, the requirements for adapting to the development of the socialist market economy and entry into the WTO will bring further deeper reforms to the grain marketing system. The objectives will be to speed up market-oriented reforms of grain marketing, with the preconditions that the requirements of food safety and a stable market supply are ensured; maintain overall grain production capacity, protect the rights and interests of farmers; ensure that state grain enterprises really do turn to the market and stimulate their transfer to a business system; and strengthen the State's oversight role under conditions of the market allocation of resources.

4. Adjustments in farmers' income

Since agriculture has entered a new phase, the focus of Chinese agricultural policy has been on the problem of farmers' income. Growth in farmers' income has been slow since 1997, basically due to an irrational agricultural structure, irrational agricultural employment structure, and underdeveloped rural urbanisation. Therefore, the main method for increasing the farmers' incomes changed from reliance on increasing quantity and raising the prices of agricultural products to reliance on structural adjustment and expanding non-agricultural industries.

Expanding town and village enterprises (TVEs) is an effective means of increasing the income of farmers. China has strengthened the institutional foundations for the development of TVEs especially after agricultural development entered a new phase in the "Ninth Five" period. The "Town and Village Enterprise Law of the People's Republic of China" was promulgated in 1996, bringing town and village enterprises into a legal business and regulation phase; in 1999 the "Notification on Stimulating the Reform and Expansion of Town and Village Enterprises in the Spirit of the 15th Session of the Party's 4th Chinese National People's Congress" was issued, encouraging town and village enterprises to complete ownership reform, establish a modern enterprise system, complete an enterprise business system and strengthen the progress of enterprise vitality. In 2001, the TVEs' value added was

290 million yuan, an increase of 8% over the previous year. TVEs employed a rural workforce of 128 million and made a huge contribution to increasing the income of farmers.

Promoting the flow of the surplus rural workforce is a new way to increase farmers' income. The entry of the rural workforce into the cities since the 1990s has become a trend in the migration of the rural workforce. By 2001, approximately 80 million rural workers had left to work outside their farms, with each farmer on average remitting back an income of 3 841 yuan. Based on this figure, it is estimated that the annual remittance from migrant farmers is over 300 billion yuan, which bring about an average increase of 376 yuan for each rural inhabitant, accounting for 15.7% of farmers' incomes. Ensuring an orderly flow of the surplus rural workforce and establishing a unified labour market in the countryside is the State's basic policy approach to adjusting rural employment. The first approach is to establish pilot employment experiments, organising a rational flow of the rural workforce between different farming areas and between the cities and the countryside. The second approach is to establish pilot employment experiments in urban and rural areas, selecting some small and medium cities or towns areas which meet the conditions and establishing a unified urban and rural labour market. The third is offering training to raise the qualifications of rural labourers and establish a labour preparation system. The fourth is reforming the small town household registration (*hukou*) system. In March 2002, the State Council approved the reform proposal by the Ministry of Public Security -- "Suggestions on Promoting the Reform of the Small Town Household Registration Regulation System", permitting those with housing and with stable occupations or sources of livelihood to settle down in towns and small cities. According to the law, these workers may retain the usage rights of their contracted land in the village or transfer them for remuneration. The persons who are permitted to settle down in small cities and towns enjoy the same rights and have the same obligations as the local inhabitants. No discriminatory policy may be implemented with regard to them.

Great emphasis is placed on poverty alleviation, to solve the problems related to feeding, clothing and the incomes of poor rural populations. In 1996 and 1999, two "Working Conferences" were held by the central government to examine poverty alleviation and concrete measures were taken. In the "Eighth Five Year Plan" period, central government investment in poverty alleviation and development increased year on year, from 9.8 billion yuan in 1995 to 24.8 billion yuan in 2000, a 30-fold increase compared with 1978. In 2002 this has increased to 29.1 billion yuan (including financial and credit sources for poverty alleviation). If the poverty line is set at 300 yuan per habitant per year (1990 price), the poor population for whom the problems of food and clothing had not been solved fell from 250 million in 1978 to approximately 30 million now, so that the rural poverty rate fell from 30.7% to approximately 3%. China has already promulgated and implemented the 2001-2010 "Chinese Rural Poverty Alleviation and Development Guidelines", establishing the overall objectives for the poverty alleviation and development in China for the first 10 years of the 21st century. The concrete policy measures are: maintaining developmental poverty alleviation, increasing financial support for impoverished regions, and raising the efficiency with which the funds are used; strengthening infrastructure construction in impoverished regions and speeding up the development of education, culture and health care; enlarging the scope of providing work as a form of relief, strengthening basic infrastructure construction such as rural roads, providing a drinking water supply for livestock and people, basic farmland and small-scale irrigation facilities, and improving basic production and living conditions in impoverished regions. In certain poor regions where the living environment is bad, the conditions must be created to undertake development projects in places other than where the poor reside; and continuing to give support to impoverished regions and the poor.

The guidelines for policy adjustments concerning farmers' income in the immediate future will be: "giving much, taking little and enlivening". That is to say: effectively increasing financial investment in agriculture, speeding up the pace of rural infrastructure construction, adjusting the structure of agricultural investment, and changing from support for agricultural production towards support for

comprehensive rural development, changing from support to increase the volume of agricultural production towards support for quality improvements; undertaking further strategic adjustments to agriculture and the structure of the rural economy, and speeding up the development of agro-food processing industries; speeding up structural adjustments to rural employment, and speeding up the migration of the surplus rural workforce; activating land usage rights transaction, so that farmers can share the benefits of the added value from land; and actively but steadily undertaking “tax-for-fee” reforms, to reduce the peasants burden. In summary, creating a good environment and taking comprehensive measures to enlarge channels for increasing farmers' income.

5. Adjustments in agricultural support

After entry into the WTO, the agricultural products that are uncompetitive on the international market will inevitably be affected negatively. However, within the scope of the WTO “agricultural agreement” regulations, it is possible for the government to adjust the domestic agricultural support system, taking reasonable measures to protect agricultural products that will be affected.

Implementing “green box” policies. The green box policy consists of measures with no or few distorting effects on production and trade. Viewed from China's current situation, we should increase government support for agriculture, with a view to increasing the overall quantity and adjusting the structure. For example: gradually implementing direct subsidies for farmers' income (either through direct subsidies or by reducing or abolishing agricultural taxes); increasing expenditure on public services for farmers, such as market information services, product marketing services and technical extension services; increasing construction of agricultural infrastructure, scientific research and education, and investment in ecological protection which can bring benefits to farmers; establishing food subsidies for low income groups, regional development aid, disaster relief; and expenditure on safe food storage and domestic food aid, etc.

Adjusting “amber box” policies. As required by WTO regulations, government support should be aimed at those involved in agricultural production rather than for marketing products. China must re-establish the focus on “amber box” policies, turning mainly from subsidies for agricultural marketing to direct subsidies for those involved in agricultural production. For example: providing price support and preferential treatment for agricultural production inputs, including improved seed, chemical fertilisers, agrochemicals, oil for agricultural use and agricultural machinery; increasing basic agricultural infrastructure and providing preferential loans for technical innovation, increasing preferential loans for agricultural production; sales loans, subsidies based on area or livestock quantity etc. Under “amber box” policies, China's support in 1996-1998 accounted for under 1.4% of gross agricultural production, leaving a relatively large support margin.

Rationalisation of regulations for market entry, by firstly improving and strengthening TRQs for key agricultural products such as wheat, maize, rice, cotton, sugar, soybean oil, rapeseed oil, wool and spun wool. Secondly, providing a proper quarantine infrastructure for animal and plant products. Following WTO entry there will be some changes in animal and plant quarantine rules, and the scope and complexity of quarantine will both increase. Animal and plant quarantine in China must abide by WTO rules to stimulate and develop international trade in agricultural products and must also stop pests harmful to animals and plants from entering China and multiplying. China will strengthen entry-level quarantine in accordance with international practices and will establish a quarantine monitoring and regulation system. Thirdly, establishing a market information system which is responsive and has complete and accurate data. Important information on international trade and the price levels will be accurately analysed and promptly disseminated.

6. Adjustments in rural urbanisation

Industrial progress has been accompanied by rural urbanisation, which is a general trend of socio-economic development. The process of industrialisation in developed countries was one of urbanisation in which the rural population migrated to the cities, with industrialisation and urbanisation occurring in parallel. In China, however, the process is different: while industrialisation progress is rapid, 62.3% of the population remain in the countryside, and urbanisation is lagging behind industrialisation. In countries in which the average per capita GDP and level of industrialisation are substantially the same as in China, the level of urbanisation is 10 and 20 percentage points higher than China.

The road to urbanisation in China has not been the general urbanisation route of developed countries, in which there has been an expansion of large and medium cities. Rather, rural urbanisation in China has followed a diverse road in accordance with the co-ordinated development of large and medium cities as well as small towns, gradually forming a rational urbanisation system. Large and medium cities have excellent economies of scale with a high degree of modernisation and jobs suitable for the rural workforce. Large cities with a relatively high degree of modernisation such as Beijing, Tianjin, Shanghai and Shenzhen all absorb millions of rural migrant labourers, showing that they are still an important channel for the migration of the surplus rural workforce. However, China's countryside has a surplus workforce numbered in the hundreds of millions, and large and medium cities would not be able to absorb such a huge workforce. Adjustments to the national economic structure and the rise of rural SMEs and the tertiary industry provide a tremendous capacity for small cities and towns to absorb the rural workforce. The small towns in China's coastal regions are expanding into small cities, and industrial zones are transforming into small towns. The rise of clusters of "small towns" in developing regions with highly dense populations illustrates the unique role of small cities and small towns in absorbing the rural labour surplus. These small towns develop mainly labour-intensive industries, which favour the large-scale absorption of the workforce; the enterprises in small towns are mainly privately owned, with clear property rights and flexible systems of operation. They develop very fast and do not require much investment from the State; small towns are "urban tails and rural heads", and they are communities open to farmers, favourable for the integration of the city and the countryside.

To develop small towns it is necessary to solve problems in development policy and the institutional environment, in particular: (1) Modifying regulations limiting the migration of the agricultural population to small towns, providing opportunities for farmers to enter the urban employment market and protecting the legal rights and interests of rural migrants in the cities; (2) Implementing fair policies in support of the development of small and medium enterprises (SME), establishing a financial system for urban SMEs and TVEs in rural areas; (3) Defining the regulatory and financial functions of small-town government, strengthening community public services and implementing "small government, large society" and "small organisation, large service" urban regulation systems; (4) Accomplishing construction and environmental protection in small towns, strengthening regional development, regional planning and regional layout, and improving the development of small towns.

7. Sustainable agricultural development policy adjustments

In the 1990s the Chinese Government took great efforts to implement a strategy of sustainable development. At the start of the 1990s the Chinese Government issued "Regulations for the Protection of Basic Farmland", which strengthened the regulation concerning arable land to ensure an adequate supply of the main agricultural products. In 1994 the Chinese Government created an "Agenda for the 21st Century", indicating an overall strategy for sustainable development and a scheme for its

implementation. In December 2000 the State Council of China promulgated the “National Guidelines for the Protection of the Ecological Environment”.

In order to accelerate sustainable development, the Chinese Government implemented a development strategy for the Western region at the beginning of 2000. The strategy promoted the following measures to develop agriculture and the rural economy in the Western region: firstly financial transfers were increased. Secondly a preferential tax policy was implemented. To protect the environment, there was a ten-year exemption of the special agricultural product tax on income from returning farmland to woodland and meadow. Regarding afforestation, the planting of grass and the returning of farmland to woodland and meadow in the barren hills and wilderness areas in the Western region, the policy was applied to “whoever returns the farmland to forestry and grassland, whoever runs or has usage rights for the land or ownership rights for forest and meadow”. Thirdly credits for agriculture and ecological construction were increased. And fourthly, subsidies were implemented for farmers returning farmland to woodland and meadow. By 2015, the government will try to reach the target of 0.033 hectares per capita of stable and high-yield farmland in the South and 0.067 hectares per capita in the North, basically putting a stop to the deteriorating environmental trends.

8. Reform of the agricultural management and regulatory system

The Chinese Government has established a basic policy for the long-term application of a “double layer management system combining individual farming with collective unified operations, but with family business as the foundation”. In following the principle of “voluntary, compensated and standard”, the transfer of land usage rights is encouraged. With a family business system, agricultural industrialisation is being steadily pursued with the integration of trade, industry and agriculture, and a chain for production, processing and sales. Currently agro-business organisations of all types throughout the country have expanded to 66 000. They have 59 million rural households as members, accounting for 25% of total rural households throughout the country, with each household on average showing an increased income of 900 yuan through its involvement in agro-business operations. For the future, the Chinese Government is taking the following measures to further promote the expansion of agro-businesses: the first is fostering a range of “dragon head” enterprises with broader radiating areas and strong attracting power. The second is vigorously expanding “customised or tailored agriculture with the construction of agricultural bases as the breakthrough point. The third is to use incentives to achieve a “win-win” situation for both the rural households and the “dragon head” enterprises. The fourth is properly implementing socialised services, giving play to the role of specialised farmers' co-operatives and professional associations.

Entry into the WTO will push reforms of the agricultural regulatory system. The main problem with China's existing regulatory system is that the production, processing and marketing of agricultural products are disconnected from foreign trade regulations. Following entry into the WTO, the existing agricultural regulatory system clearly does not meet the requirements of integrating the international and domestic markets for agricultural products. In order to implement effective and flexible regulations for agricultural development and marketing agricultural products, it is necessary for the government to deepen reforms of the agricultural regulatory system, adjust the regulatory functions of the various departments, adjust the relations between central and local governments, implement harmonious regulations for the upstream and downstream sectors, and establish a highly effective centralised, and co-ordinated agricultural regulatory system.

THE ROLE OF AGRICULTURAL AND OTHER POLICIES IN RAISING RURAL INCOMES IN CHINA[1]

By Andrzej Kwiecinski and Xiande Li
(Paper presented by Andrzej Kwiecinski)

Abstract

While incomes have grown and poverty in rural China has been reduced substantially over the last 20 years, the income gap between rural and urban China has widened. This has contributed to social tensions in rural areas and has become one of the major concerns for the government. The main argument of this paper is that while agriculture contributes almost one half to rural incomes, agricultural policy measures alone will have a very limited impact on rural incomes if they are not integrated with a wide range of other policies. In particular, the policy agenda has to include labour market reform to soften labour migration restrictions; education reform to provide the rural population with sufficient skills to compete on labour markets; fiscal policy reform combined with local administration reform to diminish the government-imposed burdens on rural households ("peasant burden"); and social policy reform to reduce the gap in access to social benefits between the rural and urban populations. As agricultural policy measures are characterised by varying degrees of effectiveness in transferring payments from taxpayers and consumers onto agricultural producers, it is important that policy makers select those measures which in the Chinese conditions would be most effective in raising incomes of targeted groups of farmers, least trade distortive and least detrimental for the environment.

Introduction

This paper consists of eight sections. The first section discusses changes in rural incomes during the reform period, presents sources of rural incomes and highlights the large rural-urban income gap, which has become a major policy issue in China. Sections two through six discuss labour market, education, fiscal, credit and social policies indicating their discriminatory effects on Chinese farmers. The seventh section assesses agricultural policies in China and provides a more positive agricultural reform agenda. Finally, the last section briefly summarises the main conclusions.

1. Rural incomes in China

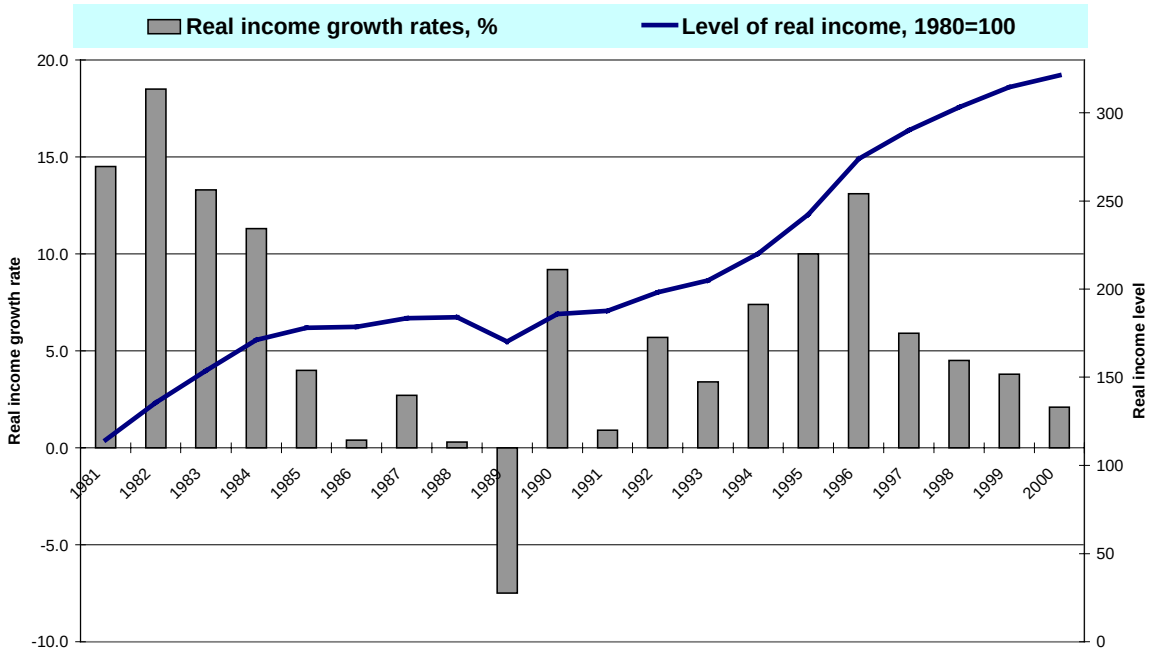
The evolution of rural incomes

One of the most important achievements of China's first two decades of reform has been the strong growth of real per capita rural incomes. Real rural income rose more than three-fold between 1980 and 2000, representing an annual rate of about 6%. The rate of increase, however, has not been the same across time or among all regions in China. After rising by 14% annually in the first half of the 1980s, the growth of rural incomes slowed in the late 1980s to below 3% on average. Subsequently, income

1. This paper draws on the study *China in the World Economy - The Domestic Policy Challenges*, OECD, 2002.

growth rates accelerated to above 10% in mid-1990s, but have since slowed again to 2-3% at the end of the 1990s (Figure 1).

Figure 1. **Rural household income per person, 1981-2000**



Note: Rural CPI used as deflator.
Source: Lu and Wang (2001); *China Statistical Yearbook*, various editions.

The income distribution across rural areas in different parts of China depends increasingly on the availability of non-agricultural job opportunities in rural areas. As the availability of such jobs is highly uneven, the variation in per capita income by province is much greater for rural than for urban areas (OECD, 2002). This is reflected in the Gini coefficient for rural incomes, which rose from 0.24 in the early 1980s to 0.35 in 1999. In particular, the average income per rural resident in the east (RMB 2 900) is almost double that in the west (RMB 1 500). Similarly, average expenditure levels are almost double in the east, while the percentage of income that a household needs to spend on food is much lower (Rozelle, 2001).

No matter how uneven the distribution of rural income may be, the overall rise of incomes in rural areas, including those in poor areas, has led to a dramatic fall in the incidence of poverty in China since the beginning of reforms in 1978. Using China's standard of defining poverty (below USD 0.70 per day per person), the number of people in poverty fell from 260 million in 1978 to 34 million in 1999 and the proportion of the rural population affected by poverty fell from 33% to 4% over the same period. However, China's poverty line is lower than the line applied by the World Bank to measure poverty in other countries (USD 1 per day, World Bank, 2000). According to World Bank estimates, the number of people living in poverty in rural China was still high at more than 100 million at the end of the 1990s, but the progress in eliminating poverty is still outstanding, as 174 million people rose above the poverty line between 1990 and 1998 (World Bank, 2000; Rozelle, 2001).

Table 1. **Rural poverty in China, 1978-99**

Year	Rural population (million)	Absolute poverty (million)	Incidence (%)
1978	780	260	32.9
1980	790	218	27.6
1985	808	96	11.9
1990	841	85	10.1
1995	859	65	7.6
1999	870	34	3.9

Sources: Poverty data for 1978-1985 are from "China: Strategies for Reducing Poverty in the 1990s", World Bank, Washington 1992; for 1990-1999, data are from *China Agricultural Development Report*, various issues, MOA; Rural population data are from NBS, *Statistical Yearbook of China*, various issues.

Rural incomes by source

While agriculture is still the main source of incomes for rural families, its share in total income has constantly been declining from 66% in the mid-1980s to 48% in 2000. In contrast, the shares of wages, mostly from rural industry jobs, and of incomes from non-agricultural household businesses, predominantly in the service sector, have been increasing during the reform period (Table 2).

Table 2. **Rural household incomes by source, 1985-2000**

	Net income[1] RMB/person	Per cent distribution				
		Agriculture[2]	Household non-agricultural business	Wages	Transfers and property income	Total
1985	398	66.4	8.1	18.1	7.4	100
1990	686	66.4	9.1	20.2	4.2	100
1995	1 578	60.6	10.7	22.4	6.2	100
1998	2 162	52.6	15.3	26.5	5.7	100
1999	2 210	51.5	14.0	28.5	6.0	100
2000	2 253	48.4	14.9	31.2	5.5	100

1. All incomes, monetary and in-kind; current prices.
2. Net income from household based farming and related activities, including crop production, animal husbandry, forestry and fishing.
Source: China Statistical Yearbook, 2000 and 2001.

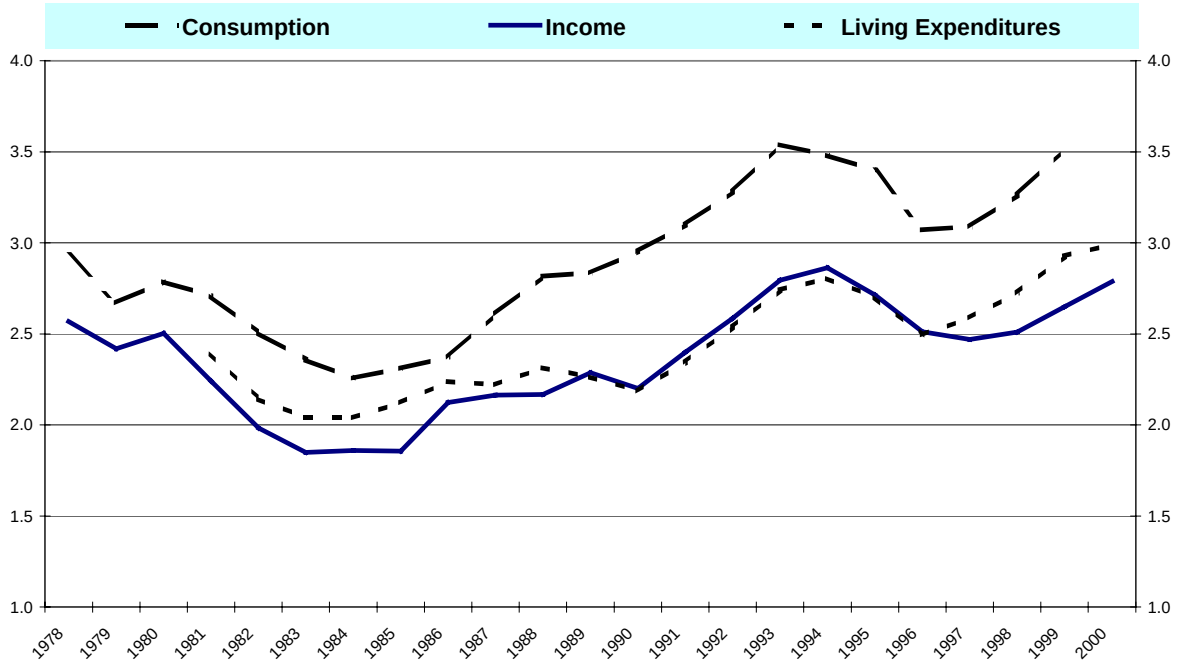
It is important to note that rural-urban income disparities, discussed below, have tended to worsen during the reform period despite rapid growth in rural industrial employment, output, and wages, and despite the substantial direct and indirect contributions that rural industries have made to the rural economy. Unquestionably, rapid rural industry expansion until the mid-1990s (see Section 2 and Box 1 below) prevented the income ratio from being even more unfavourable, but it was unable to reverse the worsening trend (Rozelle, 2001).

Rural-urban income gap

One of the most striking features of China's development in the reform period has been a large and, in more recent years, even growing income disparity between the rural and urban populations, nationally,

regionally and locally. Notwithstanding some methodological difficulties in measuring this disparity[2], all available indicators confirm an income gap between rural and urban areas, which is of growing concern for the government. Some of these indicators are summarised in Figure 2.

Figure 2. **Urban to rural per capita consumption, income and living expenditures ratios, 1978-2000**



Source: China Statistical Yearbook, various editions.

China's rural-urban income gap is one of the largest in the world. In nominal terms, the urban-rural per capita income ratio has fluctuated over the last two decades between 1.85 (in 1983) and 2.86 (in 1994) and was 2.79 in 2000 (Figure 2). These ratios compare unfavourably with Vietnam where in 1997/98 the ratio was just 1.49 (Bales, 1998). Yang and Zhou (1996) demonstrated, on the basis of urban-rural income ratios for 36 countries over the 1985-1995 decade, that urban incomes are rarely more than twice rural incomes. Only one country (out of 22 for which 1995 data were available) exceeded China's urban-rural income gap. Using consumption as an income proxy, China also compares poorly with India in terms of its urban-rural inequality. In 1993-94, China's per capita urban-rural consumption ratio was 3.57, while India's was 1.64 (Rozelle, 2001).

The large rural-urban income disparity stems from a considerable gap in labour productivity between agriculture and other sectors of the economy and, more generally, between rural and urban areas. This

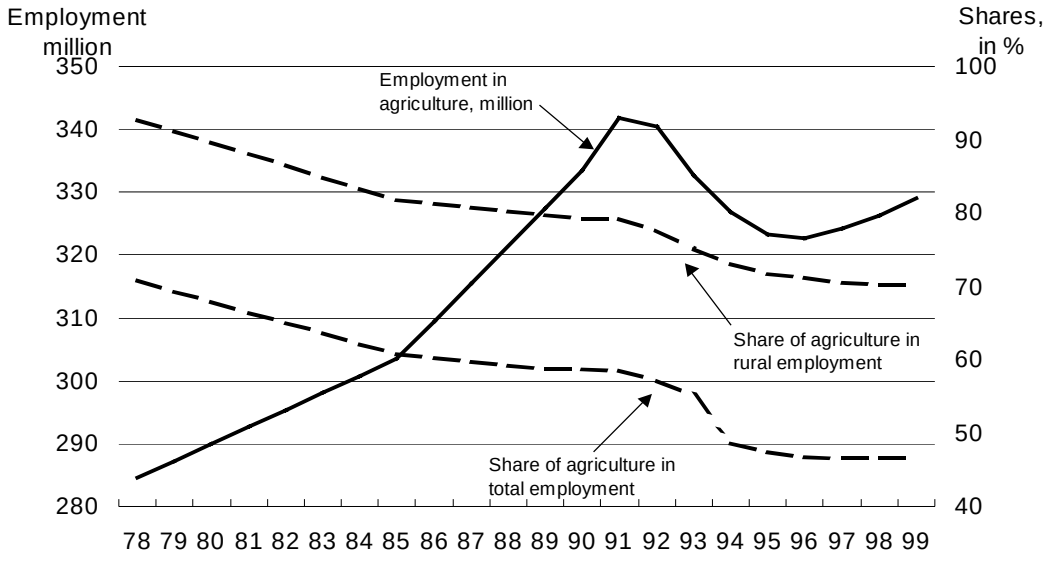
2. These difficulties include: substantial additions to urban residents' incomes in terms of direct provisions of goods and services from state employers and, until the recent past, price subsidies for many food products; the large share of food consumed in rural areas from a family's own production; different quality of products and services consumed in rural and urban areas, etc. For a discussion on this issue, see *e.g.* D.G. Johnson (2000).

is largely due to constrained factor mobility, especially of labour and capital, but other policy measures also contribute. For example, while education, medical, and other social services are still largely free of charge in urban areas, in rural China they are provided mostly on a fee basis. Although housing and enterprise reforms are mitigating some of these benefits, as urban workers now pay higher rents and contribute more to their pension and medical benefits, the gap in access to social services remains large. Soft budget constraints for state-owned enterprises protect urban jobs and allow for low-cost capital for urban enterprises, which impedes access to credit for farmers and rural industrial enterprises. In addition to formal taxes, covering both rural and urban populations, the rural population is exposed to various informal types of taxes, fees and penalties, which to a large extent diminish its disposable income. These and other policy measures are discussed in greater detail in the next sections of this paper as well as in selected papers prepared for this workshop.

2. Labour market policies

A considerable reduction in agricultural employment over the next decades will be a necessary condition for narrowing the income gap between rural and urban areas in China (D.G. Johnson, 2000). Total employment in China's agriculture increased until the beginning of the 1990s when it reached its highest level of above 340 million, before falling to below 330 million in mid-1990s. In recent years it has increased again, mostly due to the overall cooling of the Chinese economy and a fall in employment in township and village enterprises (TVEs) - until the mid-1990s, the major employer of redundant farm labour. As employment in other sectors of the Chinese economy increased at high rates, the share of agricultural labour in the total declined from 71% at the end of the 1970s to 47% at the end of the 1990s (Figure 3). However, unofficial estimates suggest that between 30 and 40% of the current agricultural workforce is still not productively employed, even under China's currently low level of technology in agriculture (Carter, 2001; Du, 2001). The high level of excess labour has brought low labour productivity in agriculture, low agricultural incomes, and hidden unemployment in rural areas.

Figure 3. **Evolution of employment in Chinese agriculture, 1978-1999**



Source: China Statistical Yearbook.

Numerical simulations suggest that labour market reforms would potentially bring substantial gains to rural labour, both through easier access to higher value non-agricultural activities and through improved labour productivity in agriculture due to increased capital/labour and land/labour ratios in agriculture. While the capital/labour ratio can be increased by making capital more accessible, significant increases in the land/labour ratio can be achieved only by transferring labour out of agriculture. It is estimated that if 35% of China's agricultural labour force exits agriculture and takes up jobs in urban industries, the current almost 3:1 urban/rural income gap would close (Carter, 2001). Therefore, the greatest challenge for labour markets and the Chinese authorities will be creating alternative employment opportunities for redundant farm labour. Experience from other nations suggests that this migration can be managed successfully. In South Korea, for instance, over 50% of the workforce was engaged in agriculture in 1970, but by 1997 this had declined to only 11% (OECD, 1999)[3].

3. In absolute numbers the fall was from 4.8 million people employed in agriculture in 1970 to about 2.3 million in 1997. This represents an average decrease of almost 3% per year. The migration from farming in Korea created a major source of labour for other sectors of the economy and, thus, was an important contributor to the development process (OECD, 1999).

Box 1. **WTO impacts on rural employment in China**

It is estimated that the direct effects of trade liberalisation linked with China's WTO accession on agricultural employment in China will not be large. Estimates differ, but according to a recent simulation based on a computable general equilibrium (CGE) model, agricultural employment would fall by around 78 million between 1997 and 2010 with China joining the WTO, compared to the baseline scenario (no WTO entry), estimating the fall at 75 million (OECD, 2002). Relatively more people would be employed in livestock, but fewer in grain production. Therefore, the question is not how to absorb the additional flow of labour from agriculture to other sectors of the economy stimulated by WTO accession, but rather how to benefit from the positive WTO framework to bring into practice policies which would facilitate the overall outflow from agriculture, vitally needed to improve farmers' incomes.

Over the last two decades, most of the labour that has shifted out of agriculture has moved to township and village enterprises (TVEs). These are small and medium-size rural non-agricultural enterprises, quite often affiliated with local governments. Between 1985 and 1996, TVEs were employing on average about 7 million new workers every year. However, the labour absorption capacity of TVEs has declined since the mid-1990s. In fact, between 1996 and 1998 total employment by TVEs fell by about 10 million as their ownership restructuring intensified, access to finance became more difficult, domestic competition became tougher, and the development of the Chinese economy slowed. In 1999 and 2000 this declining employment trend was somewhat reversed, and TVEs increased employment by about 1-2 million each year.

As a large share of TVE industrial production is located in labour-intensive industries, which should benefit from China's WTO accession, and a relatively small share is in capital-intensive and strongly protected industries that are likely to lose, the TVE sector as a whole should benefit from China's WTO accession. This should enable TVEs to absorb an important part of labour moving out from agriculture as a result of China's WTO accession. However, as mentioned above, WTO impacts on employment will be small compared to the simulated overall employment changes which would occur irrespective of China's WTO accession. Simulations suggest that it is realistic to expect that TVEs will be able to create about 2 million jobs annually by the year 2010, which would mean employing about one-third of the simulated annual out-flow of labour from agriculture (OECD, 2002). Such a scenario would require overcoming the fall in TVE employment of the second half of the 1990s, but would not entail a return to the TVE expansion period of 1984-1996. Therefore, even if TVE performance improves, a substantial shift of agricultural labour to higher productivity industries in, or close to, urban areas will be necessary. For this to take place there is a need to better integrate rural and urban labour markets.

A large part of non-agricultural job creation can take place in rural areas (see Box 1) and in the many towns and small cities that have growth potential. But it has to be recognised that the existing well-established urban areas, including big cities, present important advantages for investors in terms of infrastructure, access to skilled labour, and services that can be difficult to reproduce in the short term in more newly built-up areas (OECD, 2002). However, the government's concerns about increased migration of agricultural labour out of the countryside into the major urban centres are reflected in its policies, which increase the opportunity costs of leaving the farm and restrict migrants' access to social benefits and services in urban areas. In particular, the *hukou* system of household registrations, introduced in the 1950s to limit the number of urban residents and control access to rationed food and food subsidies, has been one major constraint to labour migration.[4]

4. Another policy that may increase the cost of leaving the farm is linked with the land tenure system, which imposes on a land user the obligation of cultivating the land leased from the local community or paying various taxes and fees linked with the land-use rights. However, field surveys indicate that these obligations are not perceived as a major impediment to migration (Rozelle, 2001).

In spite of the recent liberalisation,[5] the registration system remains in force, even though urban food subsidies have been eliminated. Rural *hukou* holders' possibilities to work in large cities are essentially limited to jobs that local residents find unattractive. The system continues to regulate access to urban housing, medical care, education, and other government and social services, and it is difficult and expensive for a rural resident to obtain an urban registration permit (OECD, 2002). While risks of migration leading to large concentrations of poverty in cities cannot be ignored, a continued easing of the *hukou* system gradually over some period of time is essential. A complementary policy solution could be major investments in road and transport infrastructure to link villages with urban centres. This would allow the rural population to live in villages and commute daily to jobs in urban areas at a reasonable cost in terms of money and time (D.G. Johnson, 2000). These and other policy measures are necessary to create a national labour market and to narrow income differentials.

3. Education policies

The level of education affects rural incomes in three important ways. First, it influences individuals' productivity in the rural area, whether in agricultural or non-agricultural activities. Second, it has an impact on the type of job and the wage or salary for the job that a rural migrant can obtain in the city. Third, it influences the ability of rural migrants to adapt to the conditions of life in urban areas and the perception of rural migrants by urban residents (D.G. Johnson, 2000).

In general, the rural population in China has much worse access to education than the urban population. The average schooling period for the rural population is almost three years shorter than for the urban population at 5.9 years and 8.7 years, respectively. Other indicators demonstrating the education gap are summarised in Table 3. The illiteracy rate in rural areas is twice as high as in cities, affecting, respectively, 16% and 8% of the population aged 6 or more. Similarly, the percentage of the rural population having completed only primary education is almost twice as high as in the cities. In 1999, the proportion with senior secondary education was only 5% in rural areas compared to 22% in the cities. Moreover, almost none of the population in rural areas had college and higher education compared with 9% in the cities.

Table 3. **Educational attainment in cities and rural areas in 1999[1]**

	China	City	Rural
Illiterate	13.4	7.8	16.1
Primary	38.5	24.7	45.2
Junior secondary	34.3	36.1	33.3
Senior secondary	10.7	22.0	5.1
College and higher	3.1	9.3	0.3
Total	100.0	100.0	100.0

1. Per cent of the population aged 6 or more. The figures in the Table do not cover towns. The educational attainment of town inhabitants (about 10% of China's population) generally falls between the figures shown for cities and rural areas.
Source: China Population Statistics Yearbook, Tables 1-15 and 1-17.

5. Since 1 October 2001, a person with stable work and residence in small and medium-size towns can normally obtain the local *hukou* registration. But *hukou* policies continue to be restrictive in the about 240 larger cities ranked as prefectures or provinces, which typically have around half a million inhabitants or more (OECD, 2002).

The education gap seems to be smaller for China's young generation, at least at the primary level. In 1999, practically all rural and urban children aged 6-11 (99%) were enrolled in the six-year primary education system (OECD, 2002). However, more than 15% of the population does not receive the nine years of obligatory education, almost all of them in the countryside (Guan, 2001). This indicates that while the problems of illiteracy and incomplete primary education in rural China will recede as new generations enter the labour force, the education gap at the junior secondary level and in particular at the senior secondary level and above is likely to persist.

One of the main reasons for the education gap between rural and urban areas is the way in which education is financed. While in urban areas compulsory education (this includes primary and junior secondary education, totalling 9 years) is financed almost totally by the government, in rural areas it is financed primarily by farmers themselves.

Overall public expenditures on education in China are relatively low at 2.3% of GNP, compared to 4.8% for the world as a whole and 3.3% for the low-income country group (World Bank, 2001). Moreover, expenditures are highly unevenly distributed between the city and the countryside. In 1999, public expenditures per primary and junior secondary school student in rural areas were at about 60% of their urban equivalent (Guan, 2001). Insufficient public financing forces farmers to cover a large part of the compulsory education costs of their children. In fact, farmers must pay various education fees, such as: a fee collected for education (*jizi banxue*), a rural education fee supplement (*jiaoyu fujia*) and schooling fees (*xue za fei*). These fees amount to about 60% of total compulsory education costs in rural China and in poor counties may account for up to 40% of farmers' total incomes (Dang and Wu, 2001).

Therefore, the current education financing system not only imposes additional costs on farmers, thus increasing directly the income gap between the rural and urban populations, but also impedes the competitiveness of the rural population on labour markets, thus undermining the possibility of closing the gap in the future. This contributes to differences in human capital and aggravates the problems of labour market segmentation and inequality, putting large numbers of the rural population at risk of exclusion from relatively attractive jobs, usually in the formal sector (OECD, 2002).

4. Fiscal policies

As shown in Table 4, over the reform period direct budgetary expenditures to support agricultural activities (C) have consistently been greater than official taxes paid by farmers (A), but the net *fiscal flow* to agriculture (C-A) declined during the 1990s with the exception of 1998 and 1999 when it increased substantially. However, as taxes from rural-based industries (TVEs) (B) have been considerably greater than the net flow to agriculture (C-A), a net outflow from the rural economy has occurred [C-(A+B)]. The net annual rural-to-urban fiscal flow increased substantially in the first half of the 1990s and then stabilised, averaging RMB 107 billion (constant 1999 prices) over the 1997–99 period.

Table 4. **Fiscal flows from agriculture to non-agriculture and from rural to urban areas (billion RMB, 1999 prices[1])**

	Taxes paid by farmers[2]	Taxes paid by TVEs	Government expenditures on agriculture[3]	Net fiscal flow to agriculture	Net fiscal flow to rural areas
	A	B	C	C - A	C - (A + B)
1980	10.8	10.0	51.7	40.8	30.8
1985	13.9	45.3	46.4	32.5	-12.8
1990	17.5	78.1	58.2	40.7	-37.5
1991	17.5	87.8	62.2	44.7	-43.1
1992	21.6	115.6	64.8	43.2	-72.4
1993	19.9	150.0	66.7	46.8	-103.2
1994	29.5	146.2	65.0	35.5	-110.8
1995	30.3	156.6	59.1	28.9	-127.7
1996	37.1	144.4	66.0	28.9	-115.5
1997	38.9	149.3	71.0	32.1	-117.1
1998	39.3	156.1	108.0	68.7	-87.3
1999	42.4	178.9	104.4	62.0	-116.9

1. Current values deflated by CPI (Consumer Price Index) for the period 1985-1999 and by RPI (Retail Price Index) for 1980 when CPI was not available.
2. Including: agricultural tax, animal husbandry tax, the tax on the use of cultivated land, special agricultural product tax and contract tax. The diverse fees paid by farmers are not included (Box 2).
3. Including central and regional governments' expenditures to support agricultural production, to cover "agricultural operating expenses", to support "capital construction" and to provide finance for science and technology promotion funds.
Source: China Statistical Yearbook, 2001; *China TVE Yearbook*, various issues; TVE tax data for 1980 from *China Agricultural Yearbook*, 1986.

Large amounts of off-budget funds (not included in Table 4) are generated in the rural sector through various unofficial fees, levies and fines charged particularly on TVEs but also on agriculture. To the extent that these resources are *not* spent in rural areas, additional outflow of rural resources may occur through unofficial channels that are not reflected in the consolidated fiscal statements (Rozelle, 2001). In fact, farmers in China are taxed through various taxes, levies and fees, which can be grouped into four categories: state or federal taxes; township levies; village levies and miscellaneous fees; levies and fines (Box 2; see also paper by C. Aubert and X. Li, prepared for this workshop). The first three categories are well recorded in official statistics, both at central and provincial levels. But the fourth category (miscellaneous fees, levies and fines) comprises payments which are arbitrary and mostly illegal, and as such not captured by statistics.

Box 2. **Taxes and fees paid by farmers**

Farmers face four categories of taxes, levies and fees:

1. *Government taxes.* These include the so-called agricultural tax, special agricultural product tax, animal husbandry tax; tax on the use of cultivated land and contract tax (see Note 2 to Table 4). This part of the overall tax burden is relatively small, at least relative to farm incomes.

2. *Township levies*. These levies fall under the so-called "Five Unified Plans" (*Five Tongchou*): Education supplement tax, social expenses, family planning, public (collective) transportation, and militia exercises.

3. *Village levies.* These levies are payable under the so-called "three contributions" (*Three Tiliu*): contributions to the public accumulation fund, the public welfare fund and other administration fees.

4. *Miscellaneous fees, levies and fines.* These are payable to other government institutions at different hierarchical levels.

In addition, each farmer has to contribute about one month of obligatory work for the local community in the framework of "*labour accumulation work*" and "*rural compulsory work*".

The various taxes, fees, and levies present a considerable and growing burden for farmers (*"peasant burden"*) and have led to social unrest and even violent demonstrations against local authorities. As far back as 1991, the government declared that the combined levies of categories 2 and 3 *("Five Tongchou" & "Three Tiliu"*) should not exceed a level of 5% of farmers' net income earned during the previous year. As the measure was limited to only two of the four categories, the effect on controlling the overall tax burden was limited in practice. To circumvent the 5% limit, fees in category 4 were increased or items of the tax base in categories 2 and 3 were shifted to category 4. As a result, the effective burden on farmers increased while the proportion paid under the *"Five Tongchou" & "Three Tiliu"* fell.

A new pilot tax experiment in 50 counties of seven provinces was launched in 1996. This experiment was extended to the whole province of Anhui in 2000. It was called the "tax-for-fees" reform and was designed to replace all "unreasonable" fees and charges levied upon farmers ("*Tiliu and Tongchou*") by an agricultural tax set at 7% of the value of agricultural output and an agricultural tax supplement at 1.4%. It was initially decided to extend this experiment to all other provinces in 2001, but later it was suspended due to inadequate financial resources. The success of reform will depend to a large extent on the restructuring of local administrations, including an estimated reduction of about 20% in the number of administrative workers. Equally important will be the reallocation of fiscal resources from the central to local government budgets, as the reform will lower local tax revenues, and improved governance at the local level, including more transparency in the funds' use.

5. Credit market policies

China's financial sector, like those in other Asian economies, lags behind the development of the real sector, remains structurally weak, and potentially puts rural growth and development at risk (Rozelle, 2001). Consolidated data on rural savings and loans would indicate a net transfer of financial resources from agriculture to industry throughout the reform period, although such findings need to be interpreted with caution because of concerns about the coverage of the available statistics (Park, Brandt, and Giles, 2000). The available data suggest that although TVEs absorb a portion of these

transfers from agriculture to industry, a significant rural-to-urban financial flow (estimated at RMB 64 billion per year in 1999 real terms) continued during the 1996-99 period (Li, 2002).

While it is difficult to determine the extent to which the financial flows from agriculture to industrial sectors and from rural to urban areas reflect the response of rational investors moving funds from low-return to high-return sectors and the extent to which they result from distortions in the financial and fiscal system, it is clear that both agriculture and TVEs face important credit constraints. This can be demonstrated by the large gap between TVEs' and agriculture's contributions to GDP and their shares in total lending (Table 5).

Table 5. **Credit constraints for agriculture and TVE**

	TVE share of GDP %	Agricultural share of GDP %	TVE share of total lending[1] %	Agricultural share of total lending %
1990	13.5	28.4	n.a.	6.8
1991	13.7	26.2	n.a.	6.7
1992	16.8	23.6	n.a.	6.7
1993	23.1	21.5	n.a.	6.5
1994	23.4	21.6	5.0	2.9
1995	25.0	20.8	5.0	3.1
1996	26.0	20.4	4.6	3.1
1997	27.9	18.3	6.7	4.4
1998	28.3	18.0	6.4	5.1
1999	30.3	17.6	6.6	5.1
2000	30.5	16.4	6.1	4.9

1. TVE shares of total lending for 1994-1996 reflect shares of collective TVEs.
Source: China TVE Yearbook; *China Statistical Yearbook*; *China Agricultural Development Report,* 2001.

For small-scale farmers, dominant in China, access to credit is particularly difficult. According to a national survey of 20 307 rural families, only 16% of farmers obtained any credit, formal or informal (National Office for Rural Surveys, 2001). This results partly from the lack of collateral (land belongs to collectives; see below) and the high transaction costs to obtain formal credit. As a result, more than 70% of credits are obtained through informal channels and less than 30% from financial institutions. In addition, more than half of informal credits are from relatives and villagers, with no interest charged. The solidarity among villagers and their relatives in credit provision is an important feature of Chinese rural communities (Li, 2000).

Financing has also emerged as a major obstacle for TVE development (Park, 2001). TVE performance is very sensitive to credit policies, as evidenced by a fall in TVE gross output in 1989 and low growth periods in 1988, 1990 and 1994, which coincides with a fall in lending or low credit expansion (World Bank, 1999). The financing problem reflects innate structural problems rooted in the continued channelling of financial resources to state owned enterprises (SOEs) as well as the growing financial fragility and management challenges facing Chinese banks. Privatisation of SOEs and financial market reforms should limit the level of funds channelled on privileged terms to the state-owned sector, but further reforms of bank lending and institutional innovation in the provision of finance (including in rural areas) would be needed to address this major constraint.

6. Social policies

In rural China, the family remains the principal provider of social security for its members, a traditional arrangement that has been codified in the Constitution and other laws (OECD, 2002). This contrasts with urban areas where state operated social insurance systems are much more prevalent, covering some 40% of the labour force, including civil servants. According to a household survey, 92% of the rural ageing population is supported by families (Cai *et al*., 2000) and only 8% by the rural pension scheme. Moreover, this pension scheme, covering almost exclusively TVE employees, is based entirely on savings in individual accounts.[6]

The rural population also has limited access to the subsidised medical care system. In fact, the rural co-operative medical system, organised at local level and providing good quality health care for farmers until the beginning of the 1980s, has largely been dismantled and replaced by a paid system. Therefore, only 10% of the rural population had access to subsidised health care by the mid-1990s compared to 90% in 1978 (World Bank, 1997). This percentage continues to decline and is much lower than for the urban population (Table 6).

Table 6. **Health-care systems in China in 1998 (%)**

	China	City	Countryside
Based on user fees	76.4	44.1	87.4
Co-operative	5.5	2.8	6.5
Public	5.0	16.0	1.2
Other	13.1	37.1	4.9
Total	100.0	100.0	100.0

Source: Ministry of Health. Quoted after Wang Yanzhong, "Establishing basic medical care system in rural area", *Economy and Management Study*, No. 3, 2001.

In rural areas, the most important social programme in terms of beneficiary numbers targets poor farmers and seeks to compensate them for natural disasters, *i.e.* crop failures. This programme covered 16.6 million persons in 1999 and is mostly concentrated in regions that are poor and characterised by frequent droughts. Another programme of some significance in rural areas is called the "five guarantees" (meals, clothes, housing, education and funeral). This programme covered 3 million persons in 1999 and is essentially financed locally. The beneficiaries are persons suffering "three withouts": no children, no family, no resources. The majority of beneficiaries are elderly persons and orphans (OECD, 2002).

Several arguments suggest that the current situation by which rural families are the main providers of social security will not be sustainable in the long term. First, as rural households become more and more dependent on off-farm incomes, access to land plots is becoming less satisfactory as a substitute for social insurance. Second, declining birth rates diminish the likelihood that children will be able to take care of three or four generations, including elderly family members. Third, the spread of urban value systems can have various impacts on traditional family responsibilities. While social policy reforms in rural areas could be potentially quite costly and should not be expected to be on the government's immediate policy agenda, there is a need to consider ways for more equitable

6. In rural areas, the basic scheme is based on a voluntary defined-contribution programme (individual accounts) in which workers select one of ten contribution rates of which they pay 80%. Their employers pay the rest and benefit from a tax reduction (OECD, 2002).

distribution of access to social policy schemes for the rural population, in particular to ensure acceptable old-age income for the rural population (OECD, 2002).

7. Agricultural policies

As agriculture still accounts for about half of rural families' incomes, agricultural policies have an impact on the income gap between rural and urban households. This impact can be negative or positive, depending on the policy measures applied. In China, there was a long tradition of taxing farmers through agricultural policy measures, in particular through suppressed grain prices. In more recent years this trend seems to be reversed, but this has to be interpreted cautiously (Box 3).

Box 3. **Implicit tax on producers through the grain marketing system**

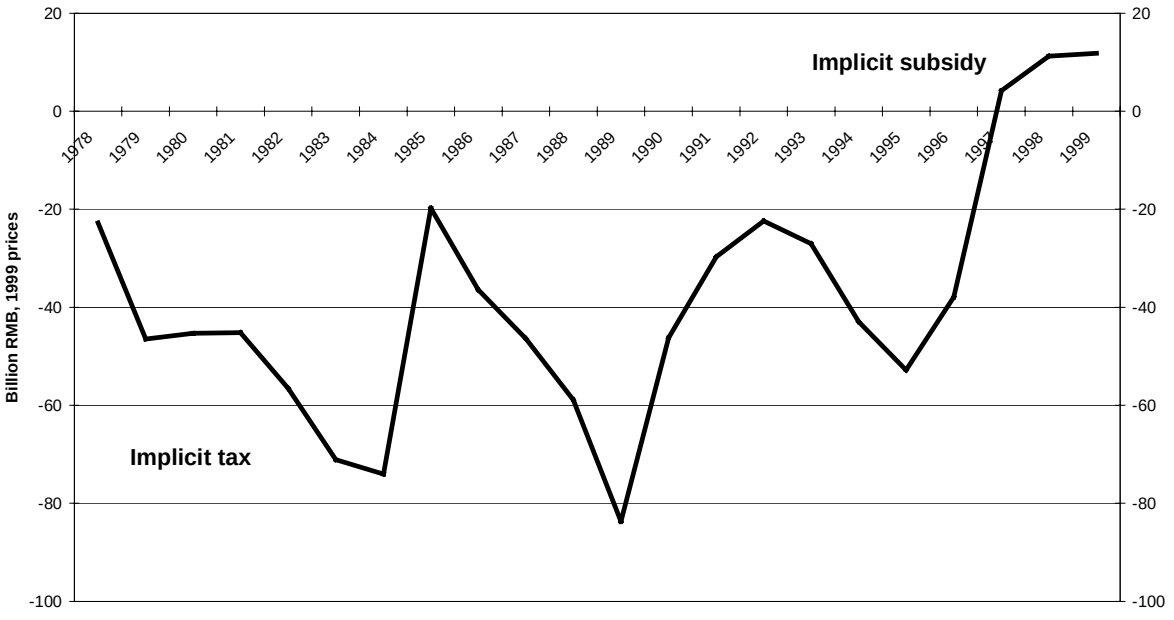
During the reform period the Chinese government monopolised the grain marketing system through state-owned grain procurement institutions and the procurement price system. While there have been several variations over the last two decades, the basic system has remained largely unchanged, requiring farmers to deliver a fixed quantity (quota) of grain produced at an administrative price (procurement or quota price) to government grain stations. For most of the reform period, the quota prices were kept artificially low compared to so called "market" prices, placing a considerable tax on producers of grain. This made it possible to keep urban food prices low and helped meet the overall development objective of "supporting industrial development by assuring stable supplies of reasonably priced food".

However, the effects of the system have changed markedly over the past six or seven years. With renewed emphasis on grain production in line with the Governors' Grain-Bag Responsibility System (GGBRS) launched in 1995, market prices started to fall below quota price levels. This meant that the implicit tax of quota prices on agricultural products turned into a subsidy. When prices for wheat and maize declined drastically in 1997, the government introduced another policy price for the remaining amount of grain farmers wanted to sell. This so-called "protective" price, though below the quota price level, should allow for cost coverage and include a small profit. It also sets a floor price for grain sold to the government. Both quota and protective prices have been cut every year since 1998. But the oversupply situation on grain markets contributed to even faster falls in market prices for all the major varieties of grains. As a result, market prices have constantly been below quota prices and in 2000 they even fell below protective prices.

There are two basic ways of estimating the level of implicit tax/subsidy on farmers from the grain delivery system in China. One is to calculate the weighted averages of farm gate grain prices in China and to compare them with the world market equivalents using the relevant exchange rates and applying the relevant value-added, handling and quality adjustments. This approach would be close to or the same as that used for the Producer Support Estimates applied for OECD Member and selected non-Member countries (see papers prepared by W. Legg and O. Melyukhina for this workshop). However, for this paper a simpler method has been applied which relies on the assumption that the opportunity cost for farmers of selling grains to the state procurement system is that of selling grains at domestic market prices or their closest equivalents (such as negotiated prices).

To calculate the value of implicit tax/subsidy over the period 1978-2000 three major grains (wheat, rice, corn) and soybean have been selected, accounting for almost total grain production in China (soybean is regarded in China as grain and included in grain production statistics). The results confirm that farmers were implicitly taxed between 1978 and 1996 and implicitly subsidised between 1997 and 1999 (Box Figure 1). However, this implicit subsidy should be interpreted with caution as there is much evidence that farmers do not receive the quota or protected prices at the announced levels due to the misuse or abuse of state regulations by the employees of state grain bureaux. This is partly due to the poor financial situation of grain bureaux. In fact, as market prices are lower than quota and protected prices, grain bureaux can either resell procured grains to the market at a loss, or stock grains and pay management fees, loan interest rates, etc.

Box Figure 1. **Implicit tax/subsidy on grain and soybean producers, 1978-1999**



Source: China Agricultural Development Report, 2001; Li, 2002.

In OECD countries agricultural policy measures are widely used to support farmers through transfers from taxpayers and consumers (see paper by W. Legg prepared for this workshop). However, it has to be recognised that the impact of agricultural policy measures on the level of farm incomes is rather limited, in particular in the case of market price support policies. This is due to the fact that output prices have a relatively small effect on the return to mobile factors such as labour and capital. In contrast, output prices have a large impact on the price of land, as it is relatively immobile. The European Union provides an interesting example. The prices for major farm commodities are roughly the same across the EU countries yet the net operating income (NOI) per farm varied in 1999 between EUR 6.0 thousand in Portugal to EUR 60.9 thousand in Luxembourg.[7] In other words, it is not product markets but rather factor markets and the general level of development that shape the level of return to agricultural labour (D.G. Johnson, 1991).

The analysis undertaken by OECD confirms that agricultural policy measures differ significantly in their relative impacts on production, trade, income and the environment. Empirical results suggest that in OECD countries such policy measures as market price support, payments based on output, and payments based on input use have a relatively strong impact on production and trade and are characterised by lower effectiveness in transferring income to farmers. They may also exert relatively strong pressure on the environment. In other words, their trade distorting effects are relatively strong and their income transfer efficiency is relatively low. On the other hand, payments based on input constraints and payments based on area or animal numbers are less trade distorting and are

7. For France and Germany, the largest agricultural producers in the EU, the NOI in 1999 was EUR 46.9 thousand and EUR 43.2 thousand, respectively (FADN, 1999).

characterised by higher efficiency of transferring payments to producers (for a detailed presentation of this issue see the paper prepared by Jesús Antón, OECD).

It has to be noted that these results are not necessarily applicable directly for less developed countries, characterised by limited budgetary resources, fragmented land use pattern and poorly developed administrative structures. However, the fact that policy measures differ strongly in their impacts suggests that policy makers should select those measures which in China's conditions would be most effective in transferring payments from taxpayers and/or consumers to targeted groups of farmers, either to increase farm household incomes in less developed areas and/or to stabilise income fluctuations for market-oriented, commercial-types of farm.

In the Chinese context, a precondition for improving agricultural incomes is that agricultural policies do not effectively tax producers (see Box 3). While during recent years, important agricultural production restructuring has been achieved, government policy should attempt to encourage cropping patterns and other agricultural production decisions, based on emerging market opportunities and regional comparative advantage rather than on the traditional approach of increasing grain output in all areas (OECD, 2002). Making agricultural policies less commodity-specific would allow for further reallocation of resources to higher value commodities, in line with China's comparative advantage in labour-intensive products such as fruits and vegetables. Such a shift, supported by biotechnological progress and a broader adoption of conventional technologies in agriculture, would contribute to an improvement in total factor productivity and would permit income growth in agriculture.

Restructuring of agricultural production should be supported by investment in rural infrastructure to better link farmers with markets and to attract other investors to rural areas. In large parts of rural China, there is still a fundamental need for more basic infrastructure of roads, clean water, electricity, advice, training and information. In the new market-oriented system the development of better agricultural price information systems, grading standards, and marketing channels is needed to support diversification of farm production patterns away from traditional practices. A more effective agricultural research and extension system is also needed in China to provide farmers with the varieties and knowledge necessary to compete.

However, as argued earlier, without a significant reduction in agricultural labour, land and capital per agricultural labourer would remain low and future per capita income growth would be slow. To increase the amount of land per farmer, the outflow of labour from agriculture should be combined with further reforms in land use and the land ownership system. This would ease the reallocation of land to more efficient farmers. Within the current system, farmland is owned by village collectives, which extend land lease contracts to individual farm households. Weak land rights limit the possibility to use land as collateral, undermine credit markets and, thus, limit the possibilities for more important farm restructuring. Therefore, either permanent-use contracts or even land privatisation should be envisaged (Rozelle, 2001).

Furthermore, the complex system of institutions dealing with agricultural policies would need to be reformed to make it more transparent, better co-ordinated and more consistent with market economy principles. This would allow for proper synchronisation, sequencing and implementation of various policy reforms to ease the adjustment processes in rural areas. It should be underlined that all policies mentioned above, and the budgetary expenditures linked with them, are considered to be "green box" items, and as such do not fall under the agricultural support ceilings that China has to respect by under WTO rules (OECD, 2002).

8. Conclusions

Rural areas in China benefited from the reforms launched more than 20 years ago: rural incomes increased more than three-fold in real terms and poverty fell significantly, both in percentage and total number terms. However, policy toward the rural economy continues to be carried out within frameworks and institutions different from those governing the rest of the economy. In particular, China's household registration system includes provisions that impede rural migrants from becoming legal residents of cities. Labour market and other policies have created barriers which limit the participation of the rural population in the benefits created by overall economic growth. This is the main reason for the large and even growing income gap between the rural and urban populations.

The development of the rural economy in China is increasingly dependent on conditions and policies affecting the economy as a whole. China's WTO accession risks increasing the income gap between rural and urban families if the rural population is not well integrated into the overall development process. Labour market, education, fiscal, social, credit and other policies need to be reformed progressively to allow the rural population to benefit from China's opening to the international economy. The role of agricultural policies in this context is rather limited, but, at a minimum, agricultural policy measures should be coherent with the overall goal of integrating the rural economy into the national development process. In particular, some policy measures, such as grain market policies, should avoid taxing producers. Moreover, measures which are intended to protect producer incomes should be selected on the basis of maximising efficiency in transferring payments from taxpayers and consumers to farmers and minimising both trade distorting effects and negative effects on the environment.

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CHINA'S WTO ACCESSION AND ITS AGRICULTURAL POLICY REFORM

By Xiwen Chen

Abstract

Since the mid-1990s, Chinese agriculture and agricultural policy have undergone important changes. In particular, policy incentives, scientific and technological progress as well as favourable weather conditions contributed to a rise in grain production, consistently exceeding domestic demand. This new situation, combined with China's WTO accession, stimulate further structural adjustments in China's agriculture and rural economy. This paper discusses directions and areas of such adjustments, and suggests policies to accelerate the adjustment process.

1. China's current agricultural policy

While the Chinese Government has been engaged in serious negotiations on WTO membership, Chinese agriculture and agricultural policy have been undergoing some important changes. In the mid and late-1990s one of the most important changes to affect China's economic life has been the alleviation of the medium and long-term supply and demand imbalances in the main agricultural products.

In 1995, when the Ninth Five-Year Plan was being drawn up, there were still serious concerns about increasing grain supply capacity in the second half of the decade. In fact, the Ninth Five-Year Plan did not even consider that the volume of grain production would reach the target of 500 million tonnes by 2000. Instead, it suggested that it would reach only 490 million tonnes. The White Paper on Grain Production published by the Chinese Government in 1996 for the first time indicated that China was aiming at 95% self-sufficiency in grain supply.

However, the volume of grain production in China in 1996 unexpectedly exceeded 500 million tonnes (actually 504.5 million). Moreover, for several years thereafter grain production has been maintained at a comparatively high level. In the four years from 1996 to 1999 average annual grain production amounted to 504.9 million tonnes, with a high of 512.3 million tonnes reached in 1998. This means that in the latter part of the 1990s grain production in China was in continual surplus.

The fact that grain production exceeded expectations can be attributed to the coincidence in the middle and late 1990s of a number of favourable factors that helped to bring about an increase in grain production. Among these, the three most important were:

- Policy incentives, which are twofold in nature. Firstly, a basic policy has been pursued of maintaining stable operating structures in agriculture. Land contracts originally running for 15 years have been extended to 30 years, thus encouraging farmers to invest in their land and improve the conditions of agricultural production. Secondly, there have been price policy incentives. In 1994 and 1996 the Government implemented two major increases in its procurement prices, as a result of which Government prices for grain doubled in the space of two years.

- In the second half of the 1990s the achievements of scientific and technological research on agriculture were fairly consistently applied in production. The main effects of this can be seen in three areas: the widespread distribution of improved varieties, the popularisation of techniques for bringing more land under cultivation, and water conservancy and irrigation techniques. These have made a great contribution to increasing grain production.

- Comparatively favourable climatic conditions. The second half of the 1990s was a period of abundant rainfall in China. Although a few places suffered from flooding or waterlogging, the greater danger to Chinese agricultural production still comes from drought, and so an increase in rainfall does more good than harm to grain production.

During the second half of the 1990s a combination of the above three factors meant that the supply of grain was consistently in excess of demand. As a consequence, in 1998 the Chinese Government judged that for grain and the other main agricultural products, the overall volume of output would be basically in balance and, in a good year, in surplus and that Chinese agricultural development had already entered a new stage.

In this new stage of agricultural development, the Chinese Government is proposing that its central task should be to carry through a strategic adjustment in the structure of production. There are two main reasons why such a structural adjustment is defined as strategic. Firstly, it is intended to change the approach to the long-term targets for increasing the volume of agricultural production and shift the focus in future agricultural development towards even greater emphasis on improving varieties, enhancing quality and increasing efficiency: in other words, to shift the priority from volume growth to quality and efficiency. Secondly, once the problems of the main shortcomings affecting agricultural products are basically resolved, China's policy on continued agricultural development must take into account not only the resource constraints, but even more so the constraints of market requirements. For this reason we need to gradually expand the market regulation function in agricultural production.

It is not difficult to see that structural adjustments in agriculture of this kind must necessarily involve many policy changes. While the mainspring for these policy changes is to be found in the major changes taking place in China's domestic agricultural supply and demand structure, the basic direction of the adjustments is perfectly consistent with the requirements of China's accession to the WTO. Therefore, even if China had not joined the WTO, China would have had to have made these agricultural policy adjustments of its own accord. As it is, China's accession to the WTO will encourage it to make even greater efforts to adjust its agricultural production structure and agricultural policy.

2. The basic orientation of the current adjustments being made to the structure of Chinese agriculture and China's rural economy

In brief, there are five basic facets to the structural adjustments taking place:

- Bringing about a general improvement in the range of agricultural products and enhancing their quality. This is required not only in the area of crop growing, but also in the area of animal husbandry, aquaculture and forestry products. In the present supply and demand situation on the market for agricultural products, agricultural production basically needs to aim at less volume, but better quality. The central government announced that from 2000 it would cease price protection purchases of products that are not ready for marketing such as early season *indica* rice, spring wheat in the north-east

and winter wheat in the south, with the aim of encouraging farmers to eliminate inferior varieties and produce higher-quality products.

- Encouraging the transformation of primary agricultural products. As the general standard of living rises, the income elasticity for food necessarily declines. By selling only primary agricultural products it is difficult to expand the size of the agricultural market. For this reason it is only by developing animal husbandry, aquaculture and processing that it will be possible to transform primary agricultural products into even more diversified and high-value foodstuffs, in order to meet market requirements and even open up new markets.

- Adjusting the regional distribution of agriculture in accordance with market requirements and exploiting the relative advantages of each region's agriculture. In particular, we should exploit the fact that funds and skills tend to be concentrated in the developed regions on the coast and in large and medium-sized cities and, where appropriate, reduce grain production in those areas and instead develop more cost-effective activities such as animal husbandry, aquaculture and horticultural products. This should not only increase the efficiency of local agriculture. It should also expand the size of the market for regions that specialise in grain production and set a pattern for a mutually beneficial and complementary style of agriculture for all regions. At the same time, it will also encourage all regions to develop their own characteristic agriculture. In 2001, the central government decided to liberalise the grain market in eight coastal grain-selling regions, namely Beijing, Tianjin, Shanghai, Jiangsu, Zhejiang, Fujian, Guangdong and Hainan, in order to encourage a structural adjustment in the regional pattern of agriculture.

- In ecologically vulnerable regions, such as the upper reaches of the Yangtze and Yellow Rivers and dry or desert areas, environmental measures in the form of government funding for farmers to switch from agriculture to forestry, arboriculture and pastureland, the development and restoration of vegetation and nature conservation.

- Support for village and township enterprises in implementing structural adjustments to industry and products and innovation in entrepreneurial structures, the active and stable promotion of a policy of urban development based on the construction of small towns and cities, encouraging surplus agricultural labour force and potential employees in the rural economy to move into non-agricultural sectors and to resettle in towns and cities, and creating the conditions for farmers to gradually increase the scale of operations engaged in cultivation.

3. Policies to encourage structural adjustments in agriculture and the rural economy

- Stepping up the pace of introducing and improving market information systems for agricultural products.

- Stepping up the pace of introducing a system of standards for quality and safety in agricultural products, especially food, and improving the inspection and examination procedures.

- Introducing a domestic system of support and protection for agriculture that satisfies the WTO requirements.

- Stepping up the pace of innovation in the structure of agricultural operations. Starting from China's actual conditions and on the basis of a stable family business, developing an integrated operational structure based on the "company + farm" model in order to reduce the costs and risks involved when farming households enter the market.

- Gradually reforming and improving the marketing systems for grain and the other main agricultural goods, reducing the cost of marketing and increasing competitiveness.

- Gradually reforming the system of rural finance and exploring the possibilities of setting up agricultural insurance systems appropriate to China's circumstances.

- Reforming the system of R&D in agriculture and of extension, stepping up international co-operation and the introduction of technology and accelerating the pace of scientific and technological advances in agriculture.

- Reforming the Household Registration (*Hukou*) system for small towns and cities and encouraging potential employees in the rural economy to settle in small towns and cities.

4. Other policy issues that need to be further examined

- An accurate analysis is needed of the prices of China's staple agricultural products, especially grain, soya beans and cotton, with a precise distinction made between producer prices, government selling prices and wholesale market prices.

- The relative advantages of China's agricultural products need to be exploited. In certain regional livestock, aquaculture and horticultural products, China has a relative international advantage. The key issue at the domestic level is how to produce goods that meet international quality and safety standards, while at the international level the key issue is opening up the market for China's agricultural goods.

- There is also the question of accelerating the pace of reform of the foreign trade arrangements for agricultural products. The key issue here is the granting of authority to export and import agricultural products to those non-State-owned undertakings that meet the conditions.

- In the transitional period it is perfectly legitimate to impose adjustable import duties on agricultural imports and import quotas. The key issue here is the need to consider how China will cope with the pressures of the international agricultural product markets after the transitional period. The research and preparations for the next round of WTO agricultural negotiations are not sufficient. The central government must set up as soon as possible special bodies and teams to look more closely into measures in these areas.

TRADE DISTORTIONS AND TRANSFER EFFICIENCY OF AGRICULTURAL SUPPORT MEASURES

By Jesús Antón

Abstract

Governments in OECD countries support agriculture in different ways and in pursuit of many different objectives. Ensuring farmers an income level that is comparable to that of other citizens is often stated as the intent of agricultural policies. But domestic policies also need to be designed not to have significant trade distorting effects. This is especially the case under the domestic support commitments of the WTO agreement on agriculture. However, not all types of support are equally efficient in transferring income to farmers and they also differ with respect to their trade impacts. This paper summarises the methodology and the results of the research carried out at the OECD on these issues. It has been found for OECD countries that payments based on area are more transfer efficient and less trade distorting than other types of support examined. The extent to which these results can be extrapolated to countries with very different institutional frameworks and production systems is an empirical question of considerable interest in those countries. The methodology used in analysing transfer efficiency and trade distortions in OECD countries may be adapted to be applied to other countries.

1. Introduction

Governments in OECD and in non-OECD countries support agriculture in many different ways and in pursuit of many different objectives. Prominent among these objectives is that related to income. The idea that government intervention is needed to ensure that farm families reach a level of income that is reasonable or comparable to that of other citizens is found, implicitly or explicitly, in many statements of the intent of agricultural policy. This objective is not always achieved to the same degree because not all agricultural support policies are equally efficient in transferring income to farmers.

Many of these same Governments have signed the Uruguay Round Agreement on Agriculture (URAA) that is a constituent part of the WTO agreements. Among other commitments, the URAA commits WTO members to reduce their domestic support to agriculture with the view to facilitating a "fair and market-oriented agricultural trading system"[1]. However, there are some measures that are excluded from this commitment under the so-called green box. These measures "shall meet the fundamental requirement that they have no, or at most minimal, trade distorting effects or other effects on production".[2] This characteristic of creating minimal trade distortions has been denoted in the literature by the term "decoupling" and comes under the objective of reducing negative spill-over effects of domestic policies on other countries and, in general, the efficiency losses from resource misallocation.

Transfer efficiency and minimising trade distortions are important aspects of any policy, *i.e.* looking at the most efficient ways of achieving well defined policy objectives and avoiding negative spill-overs. There may be trade-offs between the desired objectives and the undesired negative spill-overs. Being

1. Preamble of the Uruguay Round Agreement on Agriculture (WTO, 1995).

2. Annex 2, paragraph 1 of the Uruguay Round Agreement on Agriculture (WTO, 1995).

aware of these trade-offs and analysing them with the appropriate tools is the best strategy for good policy making.

These two desired characteristics of agricultural support (transfer efficiency and decoupling) may be present to different degrees in different types of support. The issue of which policies have a larger degree of transfer efficiency and a larger degree of decoupling deserves the attention of policy makers when designing agricultural support policies[3]. Acknowledging this need, the OECD has done analytical and empirical work on these two areas (OECD 2001a, 2001b and 2001c). Some of the results and methodologies of this research are presented below.

2. Indicators of transfer efficiency and trade distortion

There are different ways in which policy measures affect resource allocation in agriculture. That is why they may have different degrees of decoupling and of transfer efficiency. Most agricultural support policies have a direct incidence[4] on the effective price of an input or an output. This change in relative prices[5] will generate both a transfer of income from some agents to others and an adjustment in production, consumption and trade.

Trade distortions: decoupling support from production and trade

Many OECD countries support their farmers by providing producer prices that are higher than the prices in the international markets. For this to happen some kind of border measure is normally required to avoid imports entering at a low price. This kind of support is called market price support and - for a net importer - is financed entirely by consumers who pay a higher price than if border measures did not exist. Market price support creates a higher price for producers and consumers. Therefore, producers will produce more and consumers will consume less. This generates additional net supply that will need to be exported with implicit or explicit subsidies, or stocked. Here is where the trade distortion appears in the form of a trade impact and an inefficient allocation of resources. Part A of Figure 1 represents this situation.

The support that has been provided to farmers can be measured by multiplying the price differential between domestic and world prices (the price gap) by the total level of production. The support is represented by the dashed area in the figure. In order to calculate trade impacts that we can compare for different support measures, the trade impact is calculated by dividing additional exports by the amount of support that is provided. Supporting farmers through domestic prices has impacts on both production and consumption, which makes it an *a priori* trade distorting policy. It could happen that

3. Other policy objectives and spill-overs may be related to the environment. Agriculture is the source of many externalities, especially with respect to land, water and biodiversity. Some of these externalities are positive, others negative. Different agricultural policies can also have different impacts on the environment.

4. The term “incidence” is used here to denote a measurable first direct consequence of a given policy measure. In general this first incidence in the PEM crop model is defined as a price wedge. On the contrary the term “impact” is used to denote the total effect in a given indicator such as trade or income.

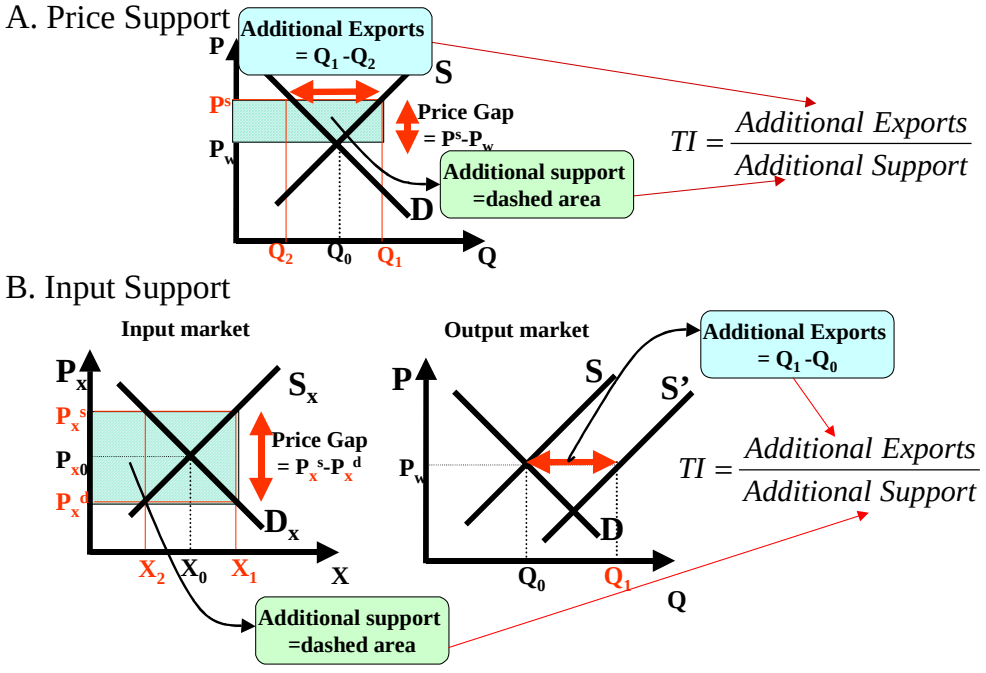
5. There are other mechanisms additional to relative price effects through which support policies could affect the allocation of resources and therefore, production, trade and farm income. Among these effects there are at least risk related effects (insurance and wealth effects), investment and expectations effects. See OECD (2001*b*) for an analytical definition of these effects.

price support is negative, meaning that farmers are getting a price below the corresponding international price. In that case the impact on trade will also be negative.

Other kinds of support to farmers involve some budgetary transfer from the Government, *i.e.* paid by the taxpayer. This budgetary transfer can be provided according to different criteria. For instance, a payment per tonne (or proportional to the current level of production) will have the same impact on production as market price support. This type of support also generates a price gap, this time between the price received by the producer (which includes a payment) and the price paid by consumers. It has no direct effect on domestic consumption and, in general, is less trade distorting than market price support.

Other forms of support to agriculture have their first incidence on the use of agricultural inputs such as land, labour, fertilisers, pesticides, energy or other materials used in agricultural production. This kind of support has an impact on the allocation of resources in the corresponding input markets. They reduce the effective price paid by the farmer for that input and induce him to demand a larger quantity of it. This is reflected in the input market as a price differential between the price received by the supplier of that input and the price paid by the farmer as shown in Part B of Figure 1. This reduction in production costs will increase the output supply for a given price, and increase exports. In this case the additional exports do not require export subsidies to be sold in the international markets. However they will anyway increase world supply to the detriment of unsupported producers and pull down world prices.

Figure 1. **The concept of Trade Impact (TI) measured in tonnes per USD of support**[1]



1. For graphical convenience we draw the curves as if before the support measure is introduced, the country has zero excess supply (no imports and no exports) and zero initial level of support.

The amount of support provided to a given input can be measured using the same price gap methodology defined for price support: multiplying the price gap by the quantity of that input used in production. Given that this kind of support is usually provided through budgetary expenditure, support could also be measured by the budgetary costs associated with the measure.

Once the amount of support provided through a given measure and its impacts on trade are quantified as shown in Figure 1, a trade impact per dollar of support can be measured for each type of support. This trade impact (TI) indicator allows for comparisons across types of measures. Very often the TI of market price support is used as reference for comparison and the trade ratio between the TI of a given measure and the TI of market price support is used as an indicator of the trade distortions (see, for example, OECD, 2001a).

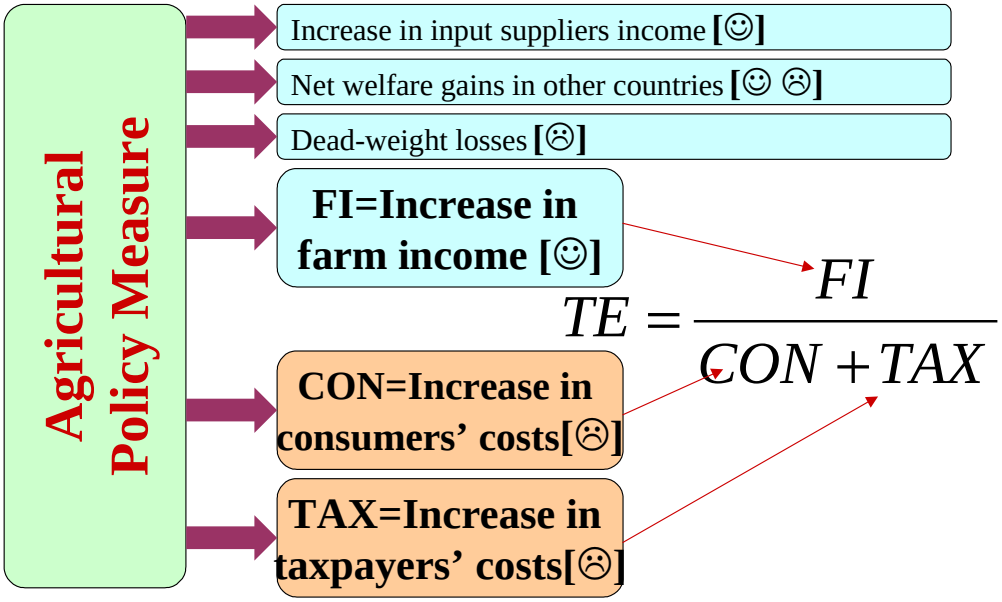
The value of the TI of a given measure will crucially depend on many underlying structural characteristics of agriculture in a given country. These include the different production systems (technology), as well as the institutional and economic characteristics of output and factor markets.

Transferring income to farmers: designing transfer efficient policies

The support measures described above induce farmers to produce more than they otherwise would have done. This larger production could generate additional income to farmers to the extent that it results in remuneration for the inputs that are owned or directly supplied by the farmer. In most OECD countries those inputs are mainly land, labour and capital. However, in general, none of them is exclusively provided by the farmers. Measuring income transfers requires reliable data on the extent to which farmers own each factor of production. It is also necessary to measure the increase in the remuneration of farm-owned factors after a support measure is implemented.

The transfer efficiency indicator has been used to measure the efficiency of a given measure in providing support to farmers. Standard welfare economics based on consumer and producer surplus calculations is used to measure the different income gains and losses following the implementation of a support measure. This is how the impact on farm income is measured. However, every support measure is financed by other economic agents. For some support measures - such as market price support - consumers pay higher prices thus bearing at least part of the costs. For most of the support measures there are some budgetary outlays that will be borne by the taxpayers. The transfer efficiency indicator (TE) measures the ratio between the income gains obtained by farmers and the welfare losses suffered by consumers and taxpayers. This indicator is explained in Figure 2.

Figure 2. **The concept of Transfer Efficiency (TE) measured as per cent of welfare costs**



Why do the farm income gains differ from consumers' plus taxpayers' losses? Some of the welfare gains do not reach the farmers because of leakages of different kinds. Some of the inputs used in farming are bought off-farm, with the result that input suppliers benefit from support to agriculture. There are also gains or losses in other countries through the trade spill-over effects. Finally, there are always some dead weight losses due to inefficient allocation of resources. All these factors contribute to transfer efficiency levels that are, in general, below perfect transfer efficiency (TE equal to unity).

3. A methodology to measure the degree of decoupling and the transfer efficiency in OECD countries

Two tools are required in order to measure the trade impact and the transfer efficiency of different support policies: a good database covering existing support measures in a given country, and an economic model able to simulate the impact of different support measures and the adjustment in the different interrelated markets. In that sense, the OECD database on the Producer Support Estimate (PSE) and the Policy Evaluation Matrix (PEM) model have been used to measure TE and TI of different stylised support measures.

Policy data: Producer Support Estimate (PSE)

In order to link the data with an economic model, the policy data required to measure economic impacts of agricultural support have to be organised following criteria related to the first incidence of the different policy measures. The economic impact of each measure is not always directly related to the policy objectives assigned to that measure. The analysis of impacts requires a classification that follows implementation criteria that identify the first incidence of the policy. From this perspective, the OECD's classification and methodology to estimate producer support based on implementation

criteria[6] represent a useful database from the perspective of analysing the economic impacts of support measures.

The PSE classification is commodity specific and covers market price support and a set of seven different kinds of budgetary payments. ***Market price support*** is typically calculated using observed domestic and international prices, which provides useful information about the effective price gap for each year. This information is very useful as a summary of border and non-border measures that affect the link between domestic and international prices. Under the budgetary support classification, ***payments based on output*** are payments based on current production or payments per tonne. ***Payments based on area planted/animal numbers*** are payments per unit of area used in production or per hectare payments (for crops) or per animal payments (for livestock products). ***Payments based on historical entitlements*** are also per hectare or per animal payments, but they are not based on the current use of land and animals, but on a given historical use in a base period. ***Payments based on input use*** are payments per unit of input use, excluding land and animals. There is a sub-classification of these payments according to the type of input: variable inputs, on-farm services and fixed inputs. The database often includes details about the specific inputs that benefit from different programmes, so that this information can be eventually used to model detailed input markets. ***Payments based on input constraints*** are payments that impose a constraint on the use of specific inputs and, therefore, they may condition the choice of production techniques. ***Payments based on overall farming income*** are provided on the basis of overall income or revenue from farming and they are not conditional on production decisions. Finally, **miscellaneous payments** represent a residual category for producer support measures.

All these categories of support are implemented differently. *A priori*, it is possible to say something about their different trade impacts and transfer efficiency. However, both TI and TE are empirical indicators that depend not only on the implementation criteria of support measures, but also on the structural characteristics of countries and markets. That is why a modelling framework is required to measure an *ex post* indicator of the trade impacts and transfer efficiency of the different measures.

A modelling framework: Policy Evaluation Matrix (PEM) model

The OECD Secretariat in co-operation with some Member countries has developed a partial equilibrium model that currently covers six OECD countries or groups of countries (Canada, the European Union as a whole, Japan, Mexico, Switzerland and the United States) and four crops or groups of crops (wheat, coarse grains, oilseeds and rice). The comparative advantage of this model is its representation of input markets with an explicit supply and demand function derived from an implicit production function[7]. The model needs some empirical information that describes the technological relationships, the structure of factor markets and the responsiveness of the demand. This information is key for the quantitative value of the estimated impacts. Figure 3 summarises the basic data needs and the outputs produced by the model.

6. See the articles presented in Session 4 of this Workshop by Dimitris Diakosavvas and Wilfrid Legg for a detailed discussion of the PSE methodology as compared to WTO methodology to measure support, and the evolution of different PSE categories in OECD countries.

7. A log-linear version of the Constant Elasticity of Substitution (CES) production function is used in this model.

Figure 3. **The PEM model**

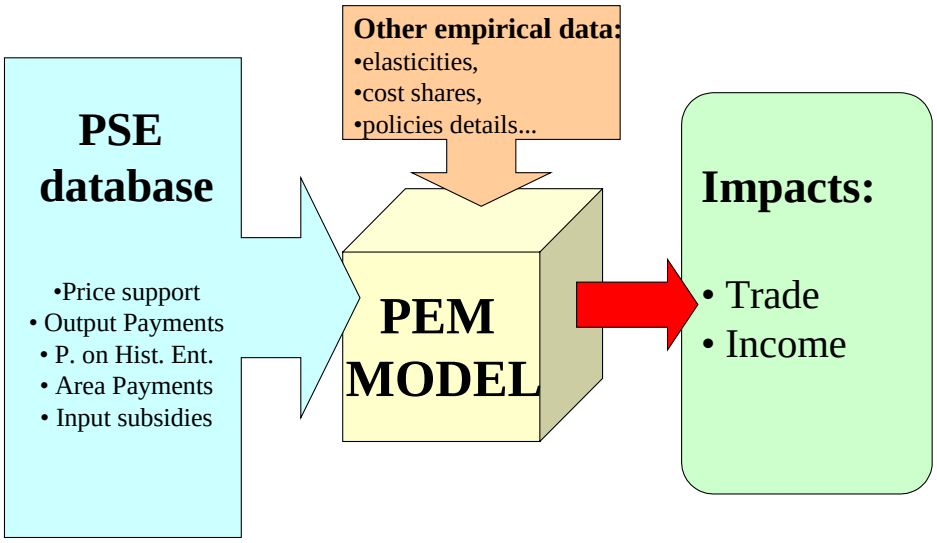


Table 1. **How different categories of the PSE are represented in the PEM crop model**

PSE classification:	First incidence of support in price wedge between:
Market price support	Domestic (producer and consumer) and the world price
Payments based on output	Domestic producer and domestic consumer prices
Payments based on area planted	Rent per hectare received (by landowners) and rent per hectare paid (by land users) - this wedge may be the same for different crops, or it may be different[1]
Payments based on historical entitlements	Rent per hectare received by land owners and rent per hectare paid by land users - not specific to any one crop
Payments based on input use	Domestic supply price and demand price - not specific to any one crop

1. In the model, landowners are distinguished from land users to provide a basis for distributing the economic effects of policy changes. In reality, not all cropland is rented. The per hectare 'rent' for land not rented needs to be interpreted as a shadow price reflecting the opportunity costs of using land in one or another of the crops under study here, as opposed to in some other use.

The policy data in the PSE database are introduced in the PEM model using price wedges that are calculated from the PSE data. The wedges assigned to each PSE category are described in Table 1. Only five PSE categories are covered. They are the categories whose first incidence can be interpreted as a price gap. The value of support under these five PSE categories represented 95% of the total Producer Support Estimate in OECD countries in 2001. This first incidence determines the nature of the subsequent adjustments in the model when there is a change in policy measures.

4. Estimated trade impacts and transfer efficiency of support measures in OECD countries

The PSE database in conjunction with the PEM crop model and some results from the empirical literature were used to estimate the trade impacts and the transfer efficiency of the most important PSE measures. The results in this section refer to 1998 and are taken from OECD (2001a and 2001c) and Dewbre *et al.* (2001). Figure 4 represents the average estimated trade impacts for the five PSE categories listed in Table 1, in the selected OECD countries[8]. The impacts are normalised using market price support as reference equal to unity. The largest trade impacts occur when support is provided through payments based on non-land inputs. This happens because purchased inputs are, in general, very elastically supplied. Those impacts are 22% higher than those of market price support. The trade impacts of payments based on output are only 6% smaller than the impacts of price support. Area payments may have trade impacts that are, on average, only 24% of those of price support. Therefore, there are significant differences in the trade impacts of different PSE measures: payments based on area and on historical entitlements having smaller impacts on trade than other forms of support.

Figure 4. **Average of estimated Trade Impacts (TI) ratios for some OECD countries**

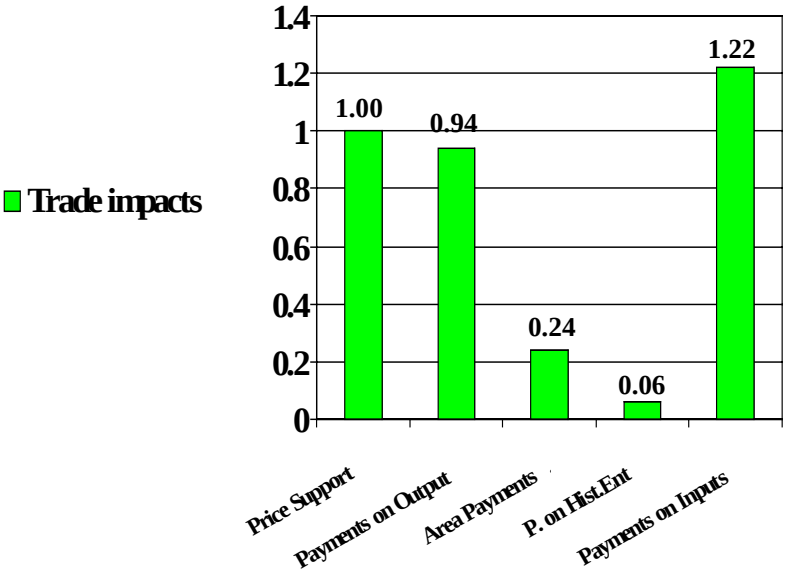


Figure 5 presents the estimated transfer efficiency of different forms of support for an average OECD country. The first conclusion is that all the categories considered have very low levels of transfer efficiency. Payments based on area tend to have the highest levels of transfer efficiency. However, even for this form of support only 47% of the associated costs reach the pocket of the farmer. Furthermore, most of these gains are in the form of higher land rents and not higher remuneration to farm household labour. The percentage of the costs of support effectively reaching farmers' income is

8. Those are the countries included in the PEM crop model; that is, Canada, the European Union as a whole, Japan, Mexico, Switzerland and the United States.

only 26% for payments based on output, 23% for market price support and 17% for payments based on inputs. For these latter payments the suppliers of purchased non-land inputs get a larger proportion of the benefits. Even if the most commonly used categories of support all seem to have low degrees of efficiency in transferring income to farmers, there are significant differences between them.

The most striking feature of the results on transfer efficiency and trade impacts of support measures in OECD countries is the strong, inverse correlation between the trade impact of a measure and its transfer efficiency. Area payments and, especially, payments based on historical entitlements happen to have the smallest trade impacts and, at the same time, the largest transfer efficiency. This correlation is shown in Figure 6. According to the results, moving from input subsidies, price support and output payments to payments based on area would have a positive impact both in terms of the efficiency of the transfers to farmers who own their land, and on the degree of decoupling of agricultural support. But this movement has occurred only to a limited extent in OECD countries in the last decade (W. Legg, 2002).

Figure 5. **Estimated Transfer Efficiency (TE) of some PSE measures for OECD countries**

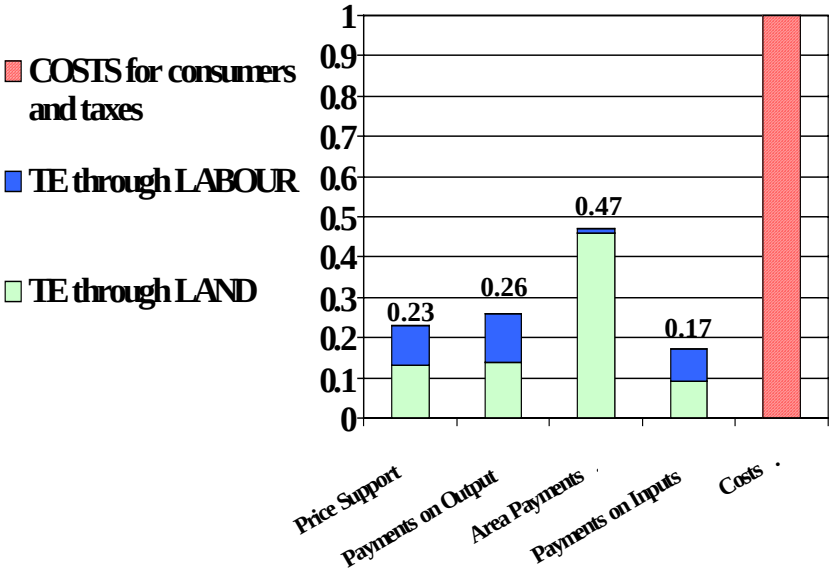
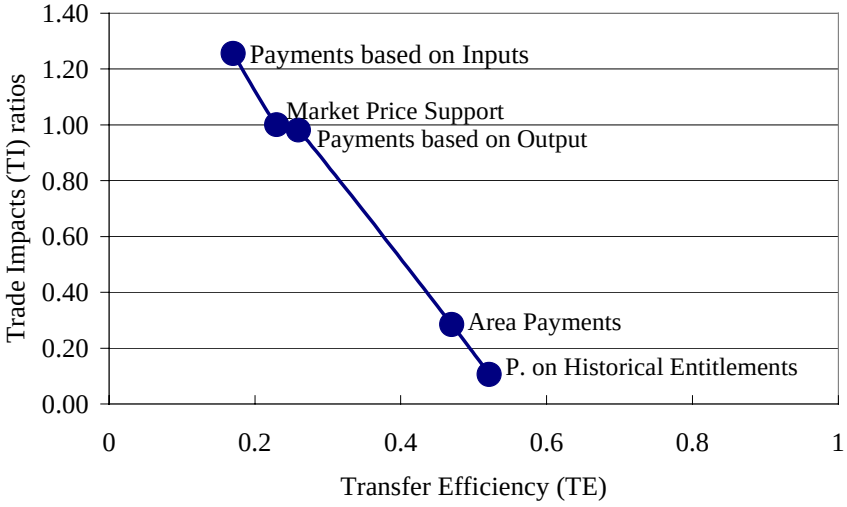


Figure 6. **Estimated Transfer Efficiency (TE) and Trade Impacts[1] (TI) of some PSE measures for OECD countries**



1. As in Figure 4, the trade impacts are normalised making the impacts of price support equal to unity.

The results presented in Figures 4 to 6 represent the averages for six OECD countries (with the European Union considered as one). The sensitivity analysis carried out underlines that relaxing some assumptions and incorporating specific circumstances leads to a reduction of these differences. However, it seems very unlikely for OECD countries that the ordering of the different categories of support according to their transfer efficiency and trade impacts would differ from the order presented in Figure 6. Nonetheless, the differences among categories may be less significant in some circumstances. For instance part of the payments based on area are capitalised into land values, which reduces their transfer efficiency for new entrants.

It has been proved (OECD, 2002a) that the larger the initial level of support, the smaller are the trade impacts. That is, if there is already a big amount of support in the form of area payments, additional area payments will have smaller trade impacts. It is also known that all these types of support have impacts on production through reducing farmers' risk. These effects are expected to be different for different support measures in a way that could reduce the differences in the trade impacts across support measures (OECD, 2002). Finally, these measures are not targeted to farm households with lower farm income, and larger farms get a proportion of the support that reflects their size. It has been demonstrated that because support is distributed, to a large extent, according to farm sales or area it has hardly any effect on income distribution in the sector (OECD, 1999). If the intention is to fight low income and poverty in agriculture, more targeted social policies are required (Kwiecinski and Li, 2002).

5. Could these results differ for non-OECD countries?

Why are the trade impacts smaller for payments based on area than for market price support? When a policy is put in place to support farmers by providing payments based on the area planted of a given crop, the payment creates incentives to cultivate more land for that crop. The supply of land is usually limited, particularly when compared to other production inputs such as fertilisers or pesticides. Market price support or payments based on output create incentives to increase the use of all of the inputs.

However, as area payments offer an incentive for the use of one of the most rigid inputs (land), they have a smaller impact on production.

Two underlying assumptions support this argument. First, land is scarce and not very mobile and therefore access to additional land to produce is more difficult than access to other inputs, especially purchased inputs. Secondly, land and other inputs are assumed to be substitutes in production rather than complements: when land is less expensive the farmer uses more land and less of other inputs.

Why is transfer efficiency of area payments higher that the transfer efficiency of price support? In most OECD countries farmers largely own agricultural land. In general, more than 50% of agricultural land is farm owned. Providing support to land instead of output prices avoids some income leakage to the suppliers of purchased inputs.

Two main underlying assumptions sustain this argument. First, land is mostly farm owned and relatively immobile, so that much of the additional support goes into higher land rents for farmers. Secondly, the cost share of inputs owned by farmers (like land or farm household labour) is rather limited, that is, production is intensive in other purchased inputs. If this is the case, income leakages to purchased input suppliers when supporting output prices are very significant. The share of farm owned factors in the total costs of agricultural production in OECD countries is, in general, below 40%.

Technology and farming systems

Under farming systems that are very labour intensive and with a low share of hired labour, it could happen that the cost share of farm owned inputs is high. When most of the cost of production relates to farm owned factors, the income leakage associated with price support and output payments could be very small and their transfer efficiency high. If there is a low share of land owned by farmers the transfer efficiency of area payments can be low. Under a combination of both circumstances, it is theoretically possible that price support is more transfer efficient than area payments.

We have shown that supporting a more immobile or less elastic input tends to have smaller trade impacts than supporting very elastic inputs. However, if land complements (and not substitutes) other significant inputs that are very elastic, it is theoretically possible that the trade impacts of area payments are larger than those of market price support.

Both theoretical possibilities seem highly unlikely in most OECD countries. However, it is an empirical question to determine if this can happen in countries with very different production systems.

Factor markets

Land markets tend to be highly regulated and with specific (or particular) institutional frameworks in OECD countries. These rigidities exist also - and sometimes to a greater extent - in non-OECD countries. When land property rights are not well defined, or there are institutional rigidities impeding the development of a fully functioning rental market, or the land is owned by a single local agent exerting some kind of market power, there will be inefficiencies in allocation of land. Furthermore, under any of these circumstances, it is not obvious who gets the additional rents from payments based on area.

Labour markets can also play a significant role in the transfer efficiency and trade impacts of different agricultural support measures. More rigid labour markets, due to lack of alternative employment

possibilities, or to institutional segmentation will tend to accentuate the differences in household income between farm households and other households. However, with this type of institutional framework - especially if production is labour intensive - the transfer efficiency of price support may be larger than otherwise, and the elasticity of supply smaller.

Some questions are relevant when trying to apply our methodology to a country like China. To what extent are China's farming systems intensive in farm labour? Who would get the rents of higher land prices? To what extent is farm labour mobile to other sectors? Can the answers to the previous questions differ from some Chinese provinces to others?

6. Conclusions

Designing good agricultural support measures requires a precise definition of the objectives pursued. Once these objectives are clear, an analysis of the different alternatives can be undertaken. This analysis needs to take into account both the efficiency of the different options in achieving the policy objective, and the costs imposed on other agents. These costs should always include those imposed on other countries through trade. This is an obligation in the case of members of the World Trade Organisation (WTO).

This paper has presented an analysis of the relationship between the policy objective of transferring income to farmers and the side effect on trade flows. The analysis of these features of agricultural support in OECD countries was summarised as requiring the following tools and steps:

1. an appropriate database with the required information about policies and markets: the OECD's PSE database;

2. a precise definition of the indicators: the transfer efficiency and the trade impacts;

3. a modelling framework compatible with the available data and calibrated with the appropriate empirical evidence: the PEM crop model; and

4. a systematic analysis of the results and their sensitivity with respect to the main assumptions.

There is robust evidence for OECD countries that different agricultural support categories can be ordered according to their transfer efficiency and their degree of decoupling, and that both rankings happen to be the same. From the highest degree of transfer efficiency and decoupling to the lowest degree, the ranking is: payments based on historical entitlements, area payments, payments based on output, market price support and payments based on input use. However, transfer efficiency is low for all types of support considered and none of them has a special impact on low-income farms. Therefore, the objective of transferring income to farmers, especially low income farmers, may better be served with measures outside the sphere of agricultural policies, such as social policies, training or public services.

These results are robust across different OECD countries under different plausible assumptions. However, under very different production systems and institutional frameworks affecting farm labour and land markets, the ordering of these measures in terms of their transfer efficiency and their trade impacts may not be the same. Empirical evidence using appropriate data sets and modelling frameworks are needed to draw conclusions in each case.

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SESSION 2. MARKET PRICE SUPPORT POLICIES

CHANGES IN CHINA'S PRICE AND MARKETING SYSTEMS FOR PRIMARY AGRICULTURAL COMMODITIES

By Hongyuan Song

Abstract

This paper highlights recent trends in, and interrelations between, price indices for agricultural products in China. On the basis of statistics published by the State Statistical Bureau and other ministries, it analyses developments in wholesale and retail trade as well as in market structures, focusing on marketing organisations and their financial performance. Finally, based on an overview of reforms in the marketing and pricing systems in China, the paper assesses the outlook for the coming years.

1. An analysis of trends in prices and systems for primary agricultural commodities in China

China's price index system for agricultural commodities

The main price indices currently compiled for agricultural products are presented below. The State Statistics Bureau compiles the purchasing price index for farm products, the price index for variable inputs used for agricultural production (later condensed to price index for variable inputs), the ex-factory price index for food, the consumer price index for food and the retail price index for food. The People's Bank of China compiles a domestic wholesale price index for agricultural commodities and a purchasing price index for agricultural means of production. The General Administration for Customs compiles an import and export commodity price index for agricultural commodities (Table 1).

For the above categories of price indices, Pascal's formula with variable weights is used to calculate the indices for retail prices, consumer prices, agricultural commodity purchasing prices and import and export commodity prices, a geometric mean formula is used for calculating the domestic wholesale price index and a weighted arithmetic mean formula for the calculation of the purchasing price index for agricultural means of production.

Table 1. **The Chinese agricultural commodity price index system**

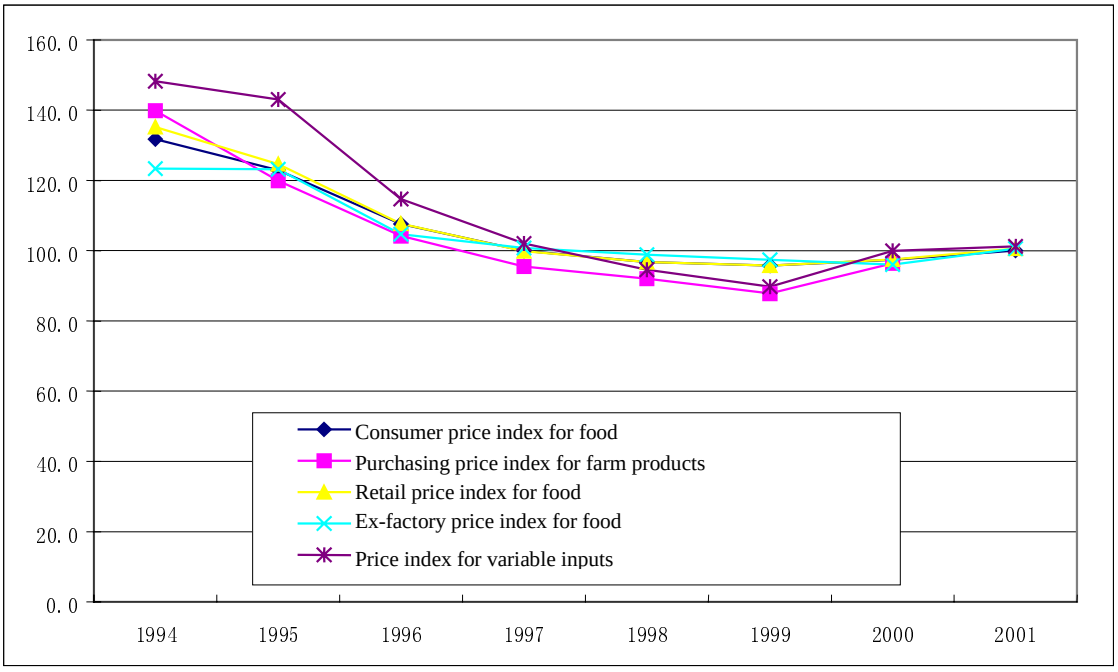
Compiled by	Price indices	Date of commencement	Range of products
State Statistical Bureau	Purchasing price index for farm products	Surveyed annually since 1951.	276 products of 11 categories concerning food, cash crops, livestock products and aquatic products
	Price index for variable inputs used for agricultural production	Surveyed once in March, May, August and November every year since 1985 and monthly since January 1999.	Raw materials, fuel and energy
	Ex-factory price index for food	Surveyed once in March, May, August and November every year since 1985 and monthly since January 1999. Historical data goes back to 1951.	
	Consumer price index for food	Surveyed monthly since 1985. 1951-1984, used another indicator - employee consumer price indices.	Food, oils, meat, poultry, eggs, aquatic products, vegetables, sugar, dry and fresh melons and fruits, catering.
	Retail price index for food	Surveyed monthly since 1985. Included agricultural means of production until 1993. Since 1994, they have been compiled separately. Historical data goes back to 1951.	Food, oils, meat, poultry, eggs, aquatic products, vegetables, fruits, other food products, catering.
People's Bank of China	Domestic wholesale price index for agricultural commodities	Surveyed since December 1993 and compiled monthly since 1994.	Grains and other crops, forestry, livestock, fisheries.
	Agricultural means of production price index	Surveyed and compiled monthly since 1986.	Overlaps to some extent with price index for raw materials, fuel and energy purchasing price index.
General Administration of Customs	Import and export commodity price index	Surveyed quarterly since 1993.	Live animals, meat and edible offals, fish and other, edible vegetables and fruit, cereals, oils, sugar & miscellaneous foodstuffs.

Analysis of the main agricultural commodity price indices since the mid 1990s

Using openly published price indices for agricultural commodities, this paper examines their structure and analyses fluctuations in each price index with the objective of examining the interrelationships among different price indices.

Trends in the purchasing price index for farm products, the consumer price index for food, the retail price index for food, the price index for variable inputs and the ex-factory price index for food, show roughly the same tendency, but changes in the latter two indices lag behind changes in the former three price indices.

Figure 1. **The evolution of price indices in China, 1994-2000**



It can be seen from Figure 1 that, since 1994, trends in the above five price indices have shown only minor differences. Changes in the price index for variable inputs and the ex-factory price index for food lag behind the purchasing price index for farm products, the retail price index for food and the consumer price index for food. This is illustrated by the drop in the indices for purchasing prices for farm products, food retail prices and food consumer prices in March, April and May 1997 respectively while it was not until 1998 that the negative growth manifested itself in the price index for variable inputs and the ex-factory price index for food.

Since the beginning of 1993, the central government has implemented macroeconomic policy adjustments in order to bring inflation under control and to curb economic overheating. As a consequence, the five price indices began to drop year on year from their highest-levels in 1994 and switched to negative growth in 1997 and 1998. They rose again in 2001 (Table 2).

Table 2. **The evolution of price indices in China, 1994-2001**

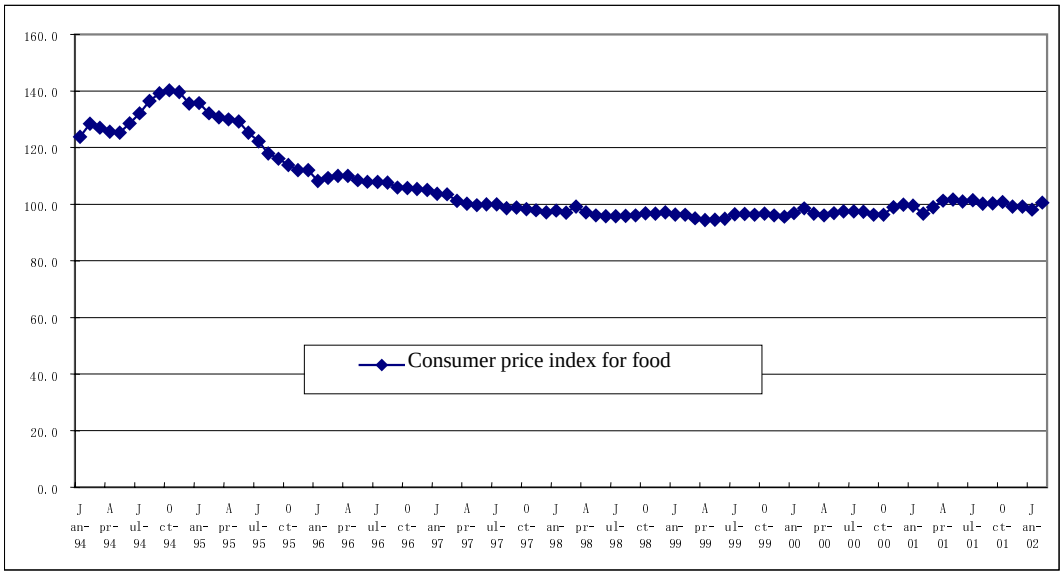
Year	Consumer price index for food	Purchasing price index for farm products	Retail price index for food	Ex-factory price index for food	Price index for variable inputs
1994	131.8	139.9	135.2	123.4	148.3
1995	122.9	119.9	124.7	123.2	143.1
1996	107.6	104.2	107.7	104.7	114.7
1997	99.9	95.5	99.8	100.8	102.0
1998	96.8	92.0	96.8	98.9	94.5
1999	95.8	87.8	95.8	97.4	89.8
2000	97.4	96.4	97.5	96.0	99.9
2001	100.0		100.6	100.5	101.2

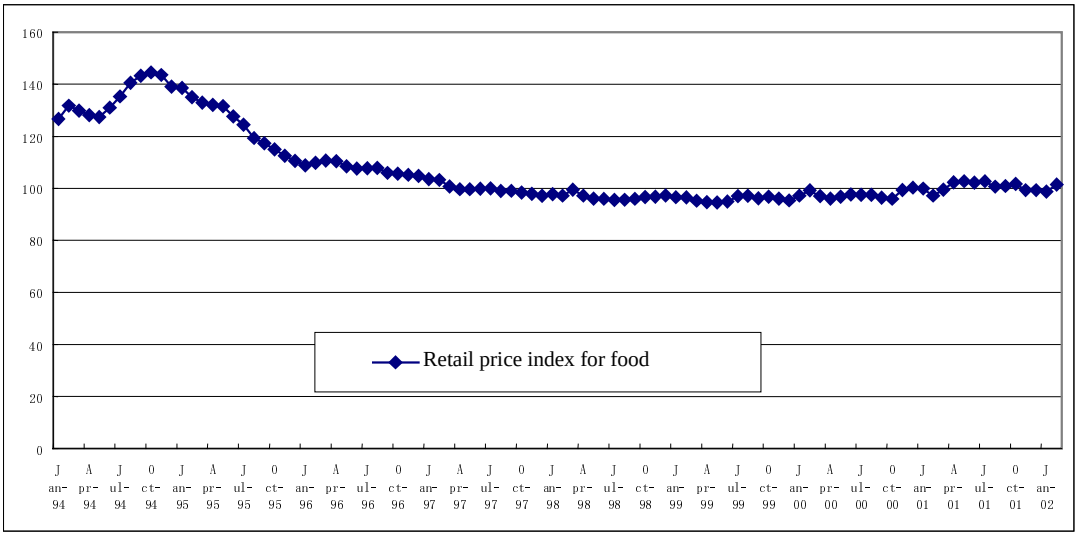
The monthly consumer price index for food fell from October 1994 to March 2001. This period can be divided into two phases, namely from October 1994 to June 1997 and from July 1997 to March 2001. During the former phase, the maximum monthly growth rate occurred in October 1994 (40.2%). The lowest observed was in April 1997 (0.1%). During the latter phase, the maximum growth rate fell to 5.5% in April 1999 (Figure 2).

The monthly food retail price index fell from October 1994 to November 2001. This period can be divided into two stages, namely from October 1994 to June 1997 and from October 1997 to November 2001. During the first period the maximum monthly growth rate occurred in October 1994 (44.5%). The lowest occurred in March 1997 (0.3%). During the latter period, the maximum growth rate fell to 5.5% in May 1999 (Figure 2).

Figure 2. **The evolution of consumer and retail price indices for food from January 1994 to February 2002**

Same period of the previous year = 100





Of the purchasing price indices by product, the indices for grain, poultry and livestock fell from 1994 to 2000 while those for cash crops and aquatic products fell from 1994 to 1999. The gap between the maximum and minimum price index ranged from 60.7 (cash crops), 59.5 (grain), 57.7 (poultry and livestock products) and 30.4 (aquatic products) (Table 3).

Table 3. **National purchasing price indices for farm products by category, 1991–2000**

Last year = 100

Year	Overall index	Grain	Cash crops	Poultry and livestock products	Aquatic products
1991	98.0	93.8	101.6	97.4	104.7
1992	103.4	105.3	96.5	106.3	108.1
1993	113.4	116.7	112.6	114.2	122.1
1994	139.9	146.6	144.4	144.6	122.0
1995	119.9	129.0	122.5	115.8	112.4
1996	104.2	105.8	105.7	103.3	103.4
1997	95.5	90.2	98.0	101.8	91.7
1998	92.0	96.7	91.2	86.9	93.9
1999	87.8	87.1	83.7	88.5	92.5
2000	96.4	90.2	101.8	99.0	100.5
Maximum – minimum	52.1	59.5	60.7	57.7	30.4

Of the indices by category for food consumer prices, the gaps between the maximum and minimum price index between 1994 and 2000 were as follows, by descending order: oils (74.5), grain (62.1), meat, poultry and their manufactured products (50.9), eggs (37.2), vegetables (33.7), catering (30.1), aquatic products (27.0), dried and fresh melons and fruit (26.8), alcohol and beverages (16.1) (Table 4).

Table 4. **National consumer price indices for food by category, 1994–2000**

Last year = 100

Year	Foods	Grain	Oils	Meat, poultry & products	Eggs	Aquatic products	Vegetables	Alcohol & beverages	Dried & fresh melons & fruit	Catering
1994	131.8	150.7	161.3	141.6	115.0	120.3	133.3	114.1	120.6	129.8
1995	122.9	136.8	116.0	126.4	114.6	114.4	127.3	112.3	121.2	124.6
1996	107.6	106.5	92.1	104.5	116.5	106.0	119.1	106.1	104.5	109.4
1997	99.9	91.1	101.5	105.5	79.3	100.2	100.0	102.3	94.4	104.7
1998	96.8	96.9	100.0	90.9	100.9	93.9	99.6	98.9	96.2	101.1
1999	95.8	96.9	94.5	90.7	91.6	93.3	101.0	98.0	97.8	99.9
2000	97.4	88.6	86.8	98.5	84.5	101.7	104.7	98.6	96.6	99.7
Max - min	36.0	62.1	74.5	50.9	37.2	27.0	33.7	16.1	26.8	30.1

Of the indices by category for retail food prices, the swings between 1994 and 2000 from highest to lowest were in oils (75.2), grain (58.6), meat, poultry and eggs (46.1), fresh vegetables (38.7), dried fruit (34.0), catering (28.6), fresh fruit (28.3) and aquatic products (27.1) (Table 5).

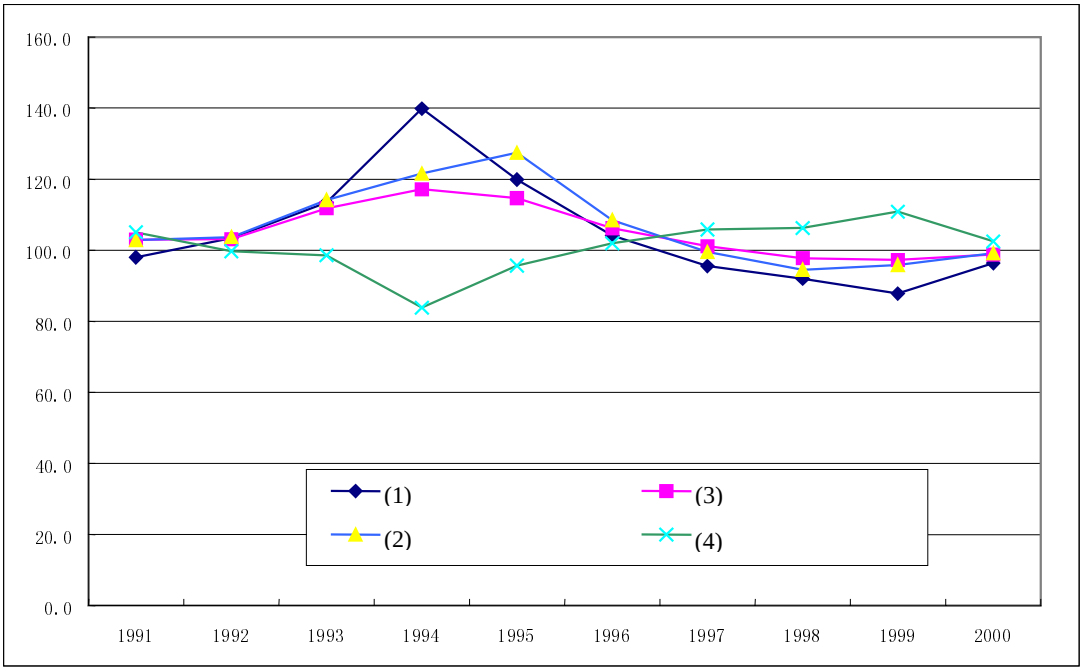
Table 5. **National retail price indices for food by category, 1991–2001**

Last year = 100

Year	Foods	Grain	Oils	Meat, poultry & eggs	Aquatic products	Fresh vegetables	Fresh fruit	Dried fruit	Catering
1991	103.3	108.6	109.9	97.7	101.5	106.1	103.8	101.1	
1992	107.7	124.3	105.9	104.8	105.4	109.6	103.4	105.8	
1993	114.3	127.7	116.2	114	116.3	115.7	109.7	117.7	
1994	135.2	148.7	161.4	137.2	120.7	138.2	119.4	125.5	128.2
1995	124.7	134.4	116.3	124.2	114.2	129.3	120.4	124.4	123.5
1996	107.7	107.5	92.1	106.4	105.6	118.4	102.8	110.3	108.6
1997	99.8	92.1	101.6	101.3	101.2	99.5	92.1	106.6	104.7
1998	96.8	96.9	100.7	92.6	94.2	100.3	95.7	94.8	101.1
1999	95.8	96.4	94.4	91.1	93.6	100.4	99.4	91.5	99.6
2000	97.5	90.1	86.2	96.1	102.7	105.3	95.7	99.1	99.8
2001	100.6	101.5		102.9	96.3	103.3			100.4
Max - min	39.4	58.6	75.2	46.1	27.1	38.7	28.3	34.0	28.6

Since 1994, the purchasing price index for farm products has fallen year on year as have the indices for industrial products and agricultural means of production. Between 1996 and 2000, the purchasing price index for farm products was continuously lower than the indices for industrial products and agricultural means of production. Since the fall in the purchasing price index for farm products was greater than that for industrial products, there was a significant change in the price parity index for industrial and agricultural products (with the purchasing price index for farm products = 100, see Figure 3). From 1992 to 1995, the price parity index for industrial and agricultural products was less than 100 but from 1996 to 2000, it was greater than 100.

Figure 3. **Trends in industrial and agricultural commodity price indices, 1991-2000**



Key: (1): Purchasing price index for farm products.
(2): Agricultural means of production price index.
(3): Retail price index for rural industrial products.
(4): Price parity index of industrial and agricultural products.

If labour productivity and the growth rate in agriculture and industry (Tables 6 and 7) are taken into consideration, the gap between purchasing price index for farm products and retail price index for rural industrial products becomes even greater.

Table 6. **Agricultural labour productivity and growth rate, 1990-2000**

Year	Agricultural value added (billion yuan, 1978 prices)	Employment (million)	Labour productivity (yuan/person)	Annual growth rate (%)
1990	194.21	384.3	505.4	
1991	198.79	386.9	513.9	1.68
1992	208.16	383.5	542.8	5.63
1993	217.94	374.3	582.2	7.26
1994	226.70	364.9	621.3	6.71
1995	238.00	354.7	671.0	8.01
1996	250.12	347.7	719.4	7.20
1997	258.88	347.3	745.4	3.62
1998	267.98	348.4	769.2	3.20
1999	275.49	353.6	779.0	1.27
2000	282.10	355.8	793.0	1.79

Table 7. **Industrial labour productivity and growth rate,1990-2000**

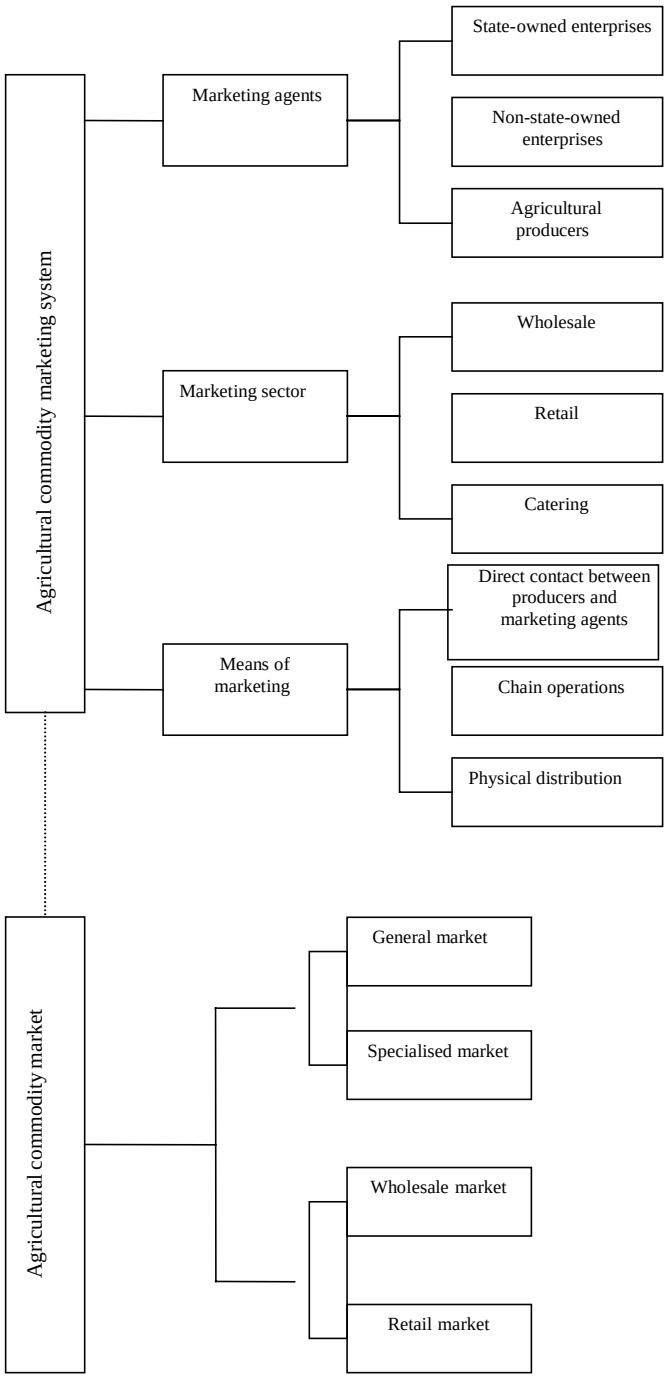
Year	Industrial value added (billion yuan, 1978 prices)	Employment (million)	Labour productivity (yuan/person)	Annual growth rate (%)
1990	489.97	63.78	7 682.3	
1991	560.52	65.51	8 556.3	11.38
1992	679.12	66.21	10 257.0	19.88
1993	815.55	66.26	12 308.4	20.00
1994	969.82	65.80	14 739.0	19.75
1995	1 105.94	66.10	16 731.3	13.52
1996	1 244.30	64.50	19 291.5	15.30
1997	1 385.07	62.15	22 286.0	15.52
1998	1 508.39	47.53	31 735.6	42.40
1999	1 636.85	44.28	36 962.6	16.47
2000	1 799.68	41.02	43 873.2	18.70

2. The marketing system for agricultural commodities and the state of market development

The marketing system and market structure for Chinese agricultural commodities

Since reform and opening up, there have been major developments in the marketing system for Chinese agricultural commodities and a diversified system with multiple entities and industries now exists. Figure 4 shows the current marketing system and the market framework for Chinese agricultural commodities. The system encompasses both sole state-funded corporations, state-owned and state-holding enterprises, as well as collective and other jointly-run enterprises together with private and foreign-capital enterprises. Domestic trading enterprises and SOE grain bureaux, supply and marketing co-operatives and agricultural producers are the main actors in agricultural commodity marketing and market transactions. Compared to large and medium-sized wholesale markets for agricultural products, local free markets need to be further developed in terms of infrastructure and market management. It may be said that the coexistence of marketing agents under different economic ownership, different management practices and levels are a prominent feature of the marketing system and market structure for China's agricultural commodities.

Figure 4. **The marketing system and market structure for China's agricultural commodities**



Developments in trade in, and markets for, agricultural commodities since the mid 1990s

Based mainly on statistical data published by the SSB and other ministries, this paper analyses developments in the wholesale and retail markets for agricultural commodities as well as the market structure.

From the perspective of marketing organisations, networks and persons engaged, there has been considerable development in wholesale and retail trade for Chinese agricultural commodities (Table 8).

Table 8. **Corporate organisations, networks and employment in the wholesale and catering trade, 1994–1996**

Unit: 1 000

	1994			1995			1996		
	Organi-sations	Networks	Employ-ment	Organi-sations	Networks	Employ-ment	Organi-sations	Networks	Employ-ment
Wholesale trade of food, beverages and tobacco and daily consumer goods	106	913	6 314	119	1 150	6 974	146	1 367	7 708
# food, beverages, tobacco	49	403	3 007	55	536	3 349	65	657	3 758
Retail trade	299	11 875	26 531	313	13 287	29 951	286	13 963	31 892
# food, beverages, tobacco	94	4 359	8 844	84	4 913	9 974	72	5 177	10 739
Catering trade	48	2 174	6 351	45	2 493	7 101	48	2 588	7 753

We can calculate from Table 8 that the average annual growth rate for organisations, networks and personnel engaged in the wholesale of food, beverages and tobacco between 1994 and 1996 was 14.7%, 27.7% and 11.8% respectively. The average annual growth rate for networks and personnel in retail trade was 9.0% and 10.2% respectively. The average annual growth rate for organisations, networks and personnel in catering was 0.7%, 9.1% and 10.5% respectively. By 1996, organisations, networks and personnel in the wholesale of food, beverages and tobacco numbered 65 000, 657 000 and 3 758 000 respectively while organisations, networks and personnel in the retail trade of food, beverages and tobacco numbered 72 000, 5 177 000 and 10 739 000 respectively.

The overall growth both in terms of total purchase value and structures related to state-owned enterprises, as well as non state-owned enterprises (Table 9).

Table 9. **Total value and structure of agricultural wholesale and retail trade, 1994-1996**

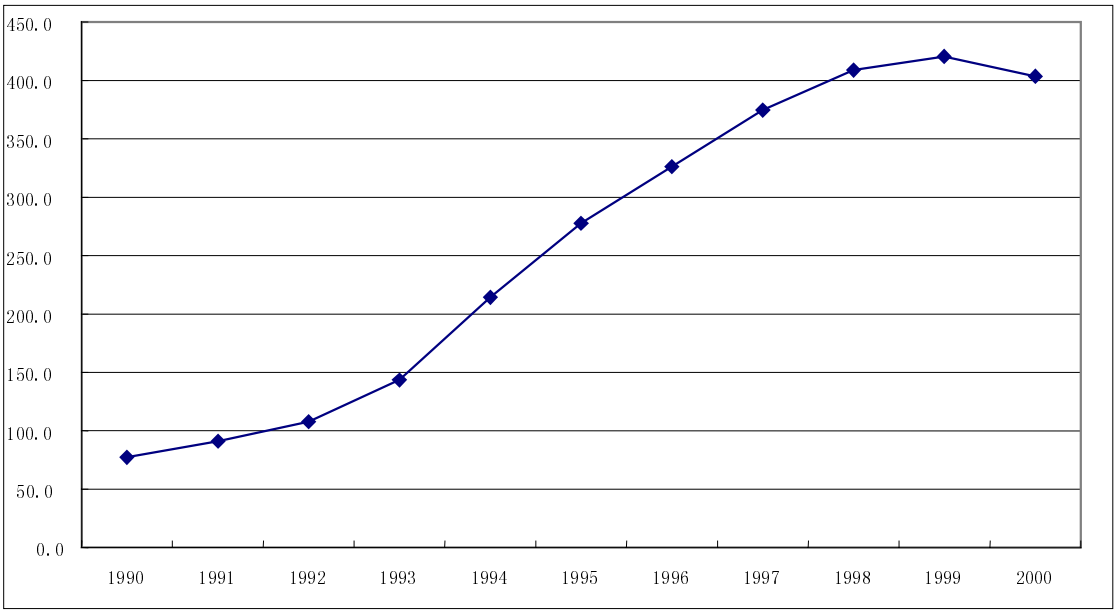
	1994		1995		1996	
	Value (billion yuan)	Structure (%)	Value (billion yuan)	Structure (%)	Value (billion yuan)	Structure (%)
Total purchases value	246.89	100.0	290.05	100.0	296.55	100.0
State-owned enterprises	177.95	72.1	205.09	70.7	217.66	73.4
Collective-owned enterprises	63.24	25.6	78.79	27.2	70.84	23.9
Private enterprises	0.68	0.3	0.07	0.0	1.62	0.5
Joint ownership enterprises	1.40	0.6	1.77	0.6	1.03	0.3
Joint-stock enterprises	2.36	1.0	2.31	0.8	3.98	1.3
Foreign investment enterprises	0.29	0.1	0.23	0.1	0.42	0.1
Hong Kong, Macau, Taiwan investment enterprises	0.07	0.0	0.10	0.0	0.33	0.1
Others	0.89	0.4	0.99	0.3	0.67	0.2

It can be calculated from Table 9 that growth has been faster in private, foreign investment entities and in Hong Kong, Macau and Taiwan with a growth rate between 1994 and 1996 of 54.3%, 29.9%, 20.3% and 117% respectively. Their share in total purchase value for agricultural products has clearly risen.

From the perspective of total retail sales and the structure of consumer goods, there has been a steady increase in retail sales of agricultural products (Figure 5).

Figure 5. **Retail sales of agricultural products, 1990–2000**

Unit: billion yuan



From the perspective of commodity marketing in wholesale and retail trade, between 1994 and 1996, total purchases, sales and inventory in the wholesale of food, beverages and tobacco all grew steadily while, for retail trade, they fell during 1996 in comparison with the previous year (Table 10).

Table 10. **Total purchases, sales and inventory in wholesale and retail trade**

Unit: billion yuan

	1994			1995			1996		
	Purchases	Sales	Year-end inventory	Purchases	Sales	Year-end inventory	Purchases	Sales	Year-end inventory
Total	**3 243.3**	**3 516.1**	**610.1**	**3 698.4**	**4 054.5**	**670.6**	**3 855.0**	**4 254.7**	**722.7**
Wholesale trade of food, beverages and tobacco and daily consumer goods	1 267.7	1 375.6	260.3	1 476.2	1 603.7	304.0	1 556.8	1 716.8	331.3
# food, beverages tobacco	570.5	618.0	122.2	698.0	749.5	147.0	767.9	825.3	184.7
Retail trade	**620.7**	**703.4**	**158.6**	**726.1**	**815.4**	**170.8**	751.7	853.6	186.7
# food, beverages, tobacco	156.6	160.6	47.5	185.2	12.4	53.2	178.1	90.6	59.8

From the perspective of enterprises in wholesale and retail trade above a specific threshold, between 1998 and 2000, total purchases, sales and inventory of food, beverages and tobacco all grew steadily while, for retail trade, they fell during 1999 in comparison with the previous year (Table 11).

Table 11. **Total purchases, sales and inventory in wholesale and retail trade by enterprises above a specific threshold**

Unit: billion yuan

Index	1998			1999			2000		
	Purchases	Sales	Year-end inventory	Purchases	Sales	Year-end inventory	Purchases	Sales	Year-end inventory
Total	2 429.7	2 714.7	379.0	2 458.1	2 744.8	363.0	2 978.4	3 226.5	357.0
1. Wholesale trade				2 044.2	2 261.5	279.1	2 498.0	2 694.7	283.1
Foods, beverages & tobaccos	510.8	592.0	87.0	541.6	618.4	92.8	568.6	651.8	89.0
# Grain and edible oil	81.9	85.0	40.2	81.6	88.1	43.1	75.4	82.3	38.1
2. Retail				413.8	483.4	83.9	480.4	531.8	73.9
Foods, beverages & tobaccos	58.9	67.5	14.1	55.4	63.5	12.9	60.8	68.0	12.5
# Grain and edible oil	15.0	15.7	7.9	11.5	12.9	6.4	10.5	10.5	5.5

From the perspective of the financial status of large and medium-sized wholesale and retail traders in agricultural commodities, sales and operational costs for commodities all rose in the period between 1994 and 1997. There was an increase in sales margins between 1994 and 1996 and a fall in 1997 (Table 12).

Table 12. **The main financial indicators for large and medium-size wholesale and retail traders in agricultural commodities**

Unit: billion yuan

	1994		1995		1996		1997	
	Total	Wholesale foods etc.	Total	Wholesale foods etc.	Total	Wholesale foods etc.	Total	Wholesale foods etc.
Capital	196.7	69.0	203.8	71.6	226.6	81.4	233.7	80.1
Total assets	1 387.9	544.0	1 482.4	641.6	1 638.2	710.9	1 801.1	806.7
Cost of sales	2 036.1	769.8	2 145.0	884.7	2 182.8	901.7	2 201.0	931.5
Operational costs	82.8	29.9	89.0	33.6	98.2	38.0	100.1	41.0
Business sales tax and surcharges	5.4	1.6	8.0	3.3	8.3	3.6	8.3	3.4
Commodity sales margin	113.6	49.3	118.2	52.3	122.0	57.7	103.7	50.3
Total profit	34.8	17.4	25.9	12.9	20.4	14.1	10.4	10.4

From the perspective of the financial status of enterprises above a specific threshold in wholesale and retail trade, there was some increase in commodity sales revenue and sales value between 1998 and 2000: commodity sales margins continued to rise and economic benefits gradually improved (Table 13).

Table 13. **Main financial indices for enterprises in wholesale and retail trade above a specific threshold**

Unit: billion yuan

	Index	Total assets	Commodity sales revenue	Commodity cost of sales	Operational costs	Commodity sales tax & surcharges	Commodity sales margin
1998	Wholesale of food, beverages, tobaccos	402.2	551.0	495.7	21.6	2.2	30.0
	Retail of food, beverages, tobaccos	45.8	49.8	44.6	3.5	0.2	1.1
1999	Wholesale of food, beverages, tobaccos	410.0	544.6	490.1	19.4	1.9	30.1
	Retail of food, beverages, tobaccos	44.0	46.2	40.7	3.2	0.2	1.5
2000	Wholesale of food, beverages, tobaccos	405.2	586.4	520.7	22.0	1.9	35.8
	Retail of food, beverages, tobaccos	48.7	52.9	46.8	3.5	0.2	2.1

The number of markets and the trade value for agricultural products increased nation-wide between 1995 and 2000 (Table 14).

Table 14. **The number of markets and the trade value for agricultural products in China, 1995–2000**

	Markets for agricultural products		1. General markets		2. Specialised markets	
	No. of markets	Trade value (billion yuan)	No. of markets	Trade value (billion yuan)	No. of markets	Trade value (billion yuan)
1995	23 502		16 309		7 193	
1996	24 626		17 190		7 436	
1997	25 673	480.45	17 745		7 928	
1998	26 236	537.29	18 192		8 044	
1999	26 414	642.38	19 004	403.94	7 410	238.44
2000	27 445	755.47	20 006	461.16	7 439	294.31

The volume and value of transactions for agricultural products by category, all increased steadily between 1994 and 2000 apart from some annual fluctuations in cotton, tobacco and hemp (Table 15).

Table 15. **The volume and value of transactions for agricultural products by category, 1994–2000**

Units: billion yuan; million tonnes

Item		1994	1995	1996	1997	1998	1999	2000
Grain	Value	38.1	60.3	77.5	89.6	93.1	100.4	130.6
	Volume	22.4	24.6	29.2	38.2	40.0	46.7	55.0
Oil and oilseeds	Value	21.3	30.2	36.7	46.5	53.4	58.7	65.4
	Volume	2.5	3.9	5.1	6.3	7.3	8.8	9.6
Cotton, tobacco, hemp	Value	4.6	8.5	7.6	9.1	11.1	9.0	9.8
	Volume		1.0	0.7	0.6	1.2	0.7	1.0
Meat, poultry & eggs	Value	162.6	222.1	275.4	333.8	355.7	380.2	420.2
	Volume	18.1	20.4	26.3	29.1	32.4	36.4	45.3
Aquatic products	Value	62.9	87.0	113.5	138.6	165.9	180.1	207.2
	Volume	6.7	8.4	10.2	12.5	14.9	16.5	19.6
Vegetables	Value	85.0	120.3	159.0	194.5	220.7	242.6	266.2
	Volume	64.1	77.2	84.7	102.6	122.5	129.4	148.3
Dried & fresh fruits	Value	57.2	78.2	98.0	110.6	123.5	139.8	154.6
	Volume	26.3	27.0	32.6	38.3	43.8	47.6	55.1

3. Reform of the marketing system and price adjustments for agricultural commodities in China

Furthering the reform of the marketing system for agricultural commodities

Since reform and opening up, the Chinese government has adopted methods and measures corresponding to the various characteristics and supply and demand situation of all types of agricultural commodities in order to reform their marketing system. By the latter part of the 1990s, the marketing of agricultural commodities in China, apart from grain and cotton, had been deregulated with the implementation of market-set prices and freedom to buy and sell. Agricultural development entered a new phase and, in order to further stimulate the marketing of agricultural commodities and promote the sustained and stable development of production, the state also expedited steps to reform the marketing system for major agricultural commodities such as grain and cotton.

Market-oriented reform of the system of grain marketing is gradually being advanced. In 1995 and 1996, in order to reinforce support for grain production and market control, a "two-line operation" reform, separating the management of policy-related operations from commercial ones, was implemented. Following changes in grain production and in the supply and demand situation, in 1998 the state also proposed a series of policy measures to "implement the separation of government and enterprises, reserves and management, central and local responsibilities and new and old financial accounting in order to improve the grain pricing mechanism". The government also proposed "to open up the purchase of surplus grain from peasants at protected prices, to sell grain at a price higher than the purchasing price to make profits, to introduce an intervention fund managed by the Agricultural Development Bank to be used only for purchasing grain and to accelerate reform of state-owned grain enterprises". In 2000, with the active promotion of reform of the grain marketing system by relevant departments, the state also further improved policy measures to reform the grain marketing system by permitting and encouraging the direct purchase of grain from the countryside by enterprises using grain and dealing in grain while insisting on the opening up of rural trade fairs throughout the year. Building on these reforms, the state introduced a series of new reforms in 2001 "to deregulate the purchasing market and prices in the major grain areas, to support the unrestricted purchase of grain from peasants in the main production areas at protected prices, to develop co-operative relations in the purchase and sale of grain between different provinces and to strengthen the state's capacity for regulation and control of the grain market through improvements to the regulatory systems for grain venture capital and reserves".

Reform of the marketing system for cotton has made substantial progress. From 1996 onwards, the state began to improve the systems governing the supply and price of cotton, implementing a system of national cotton trade fairs for individual transactions. Since 1998, following structural adjustments in the textiles industry and changes in the supply and demand situation for cotton, the state has promoted the comprehensive reform of the cotton marketing system in accordance with market principles. In the first place, marketing and operational channels for cotton were extended. In 1999, cotton processing factories with recognised qualifications were allowed to directly purchase, process and deal in cotton. However, supply and marketing co-operatives and cotton enterprises, as well as state farms and textile enterprises were excluded from this directive. In 2000, restrictions were further relaxed on all categories of cotton purchasing and all processing enterprises that complied with the relevant regulations were allowed to take part in cotton purchasing and processing. The establishment of production bases in proximity to cotton weaving enterprises in cotton-producing areas was encouraged to boost the industrialisation of the cotton business. In the second place, the separation of enterprises and co-operatives and of reserves and operations began. Since 2001, on the basis of an appraisal of assets and funds and the definition of property rights, cotton enterprises and supply and

marketing co-operatives have been completely separated so that cotton enterprises have become true autonomous entities responsible for profits and losses. The formation of the State Cotton Reserves Management Company has implemented the complete separation of reserves and operations, overseeing the purchase, clearance and rotation of state cotton reserves. In the third place, cotton quality and market monitoring were enhanced. The "Regulations for monitoring cotton quality" and "Provisional methods for purchasing and processing cotton and controlling the market" promulgated by the state have made it clear that cotton businesses must comply with obligations concerning quality and be subjected to supervision by quality control organisations and to penalties for illegal actions. Conditions for entering the market and dealings with market entities are strictly regulated.

The marketing of other agricultural commodities has also been reformed. From 1999, reform of the marketing system for industrial raw materials such as flue-cured tobacco, silkworm cocoons and wool has been extended to fresh agricultural commodities, with the deregulation of meat, poultry, eggs, vegetables and fruit and new mechanisms have been put in place that depend mainly on the market to achieve a rational allocation of resources.

Improvements in the pricing mechanisms for agricultural commodities

Since the mid 1990s, while actively promoting reform of the marketing system for agricultural commodities such as grain and cotton, the Chinese government has also adopted a series of policy measures to gradually promote reform in the price system for agricultural commodities.

The reform of grain prices has been extended and the price relationships for agricultural commodities have been rationalised. In order to provide incentives for growing grain and rationalise the relationship between grain prices and those for other agricultural commodities and products, the state raised the purchase and sale price for grain twice in succession in 1994 and 1996. Beginning in 1997, it implemented protected prices for grain purchases. In order to guide the adjustment of cropping structures the price of high-grade paddy rice was floated upwards in 1998. In 1999, the purchase and protected prices for grain were also reduced and this further widened the price differences for grain quality, quality of grade, seasonal grade and locality. From 2000, varieties of grain such as northern spring wheat, southern early *Indica* rice and wheat from south of the Yangtse, which were of inferior quality and difficult to sell on the market, were dropped from the range of state grain protection prices and a policy of high quality at high prices was implemented. From 2001, grain purchase prices in the main sales areas were deregulated and market adjustment was implemented. The policy of high quality at high prices was further reinforced on the basis of the maintenance of a basically stable protected grain purchase price.

Adjustments have been made to allow for changes in the supply and demand situation for cotton and reform of the mechanisms for cotton pricing. In 1998, in order to address problems such as impediments in sales of cotton and overstocking, guided by the principle of switching from a fixed government price for cotton to a guide price and with the cotton supply price determined by the market the cotton purchase price was adjusted downwards and the sales price for "export cotton" was floated downwards. From 1999, the cotton purchase price was deregulated and the cotton sales price was mainly determined by the market. At the same time, in order to implement a smooth transition between the old and new cotton marketing systems, the creation of rational market prices for cotton was actively sought through the issue of market forecasts on cotton prices. In 2000, with the agreement of the State Council, cotton price information was issued by the Price Information Centre. Previously, purchase guide prices for cotton for the following year were issued before the sowing of winter wheat. This was changed to the issue of forecasts for the current year before spring sowing and led to peasants adjusting their cropping structure.

There has been adjustment and improvement to the price mechanisms for agricultural commodities such as raw sugar, tobacco leaf and silkworm cocoons to facilitate agricultural structural adjustment. In order to resolve problems of excessive and chaotic non-price subsidies which stimulated the rash development of tobacco leaf production and resulted in supply exceeding demand and overstocking, in 1998, while rectifying the pricing methods for tobacco leaf and abolishing all non-price subsidies for tobacco leaf purchase, the government increased the purchase price for tobacco leaf, adjusted fiscal policies for tobacco leaf and cigarettes and encouraged the overall balance of the supply and demand of tobacco leaf. In order to bring about the transformation of sugar production from quantitative to qualitative, co-operative purchasing and sales relations between sugar factories and sugar farms and rational pricing mechanisms were established. In 1999, the government strengthened sugar price reforms, implementing measures to increase the price of high-quality raw sugar and linking the purchase price of raw sugar to the sale of edible sugar. In order to maintain regular purchasing methods and to strengthen market control, in 2000, at the same time as the purchase price for tobacco leaf was stabilised, an appropriate increase was made to the autumn cocoon purchase price, improving pricing policies for tobacco leaf and cocoon silk. In 2001, local and variety price differences for the purchase prices of leaf tobacco were extended to encourage adjustment and optimisation of agricultural cropping structures.

Strengthening the establishment of a market system for agricultural commodities

In order to further stimulate the marketing of agricultural commodities and set up an open, unified, competitive, and orderly market system as quickly as possible, while accelerating the establishment of a wholesale market for agricultural commodities, market information systems, quality standards and test and inspection systems for agricultural commodities have been expanded.

The implementation of a marketing system for agricultural commodities with wholesale markets established around the producing areas has been strengthened. Prior to 1998, implementation of a market system for agricultural commodities was mainly based on the “vegetable basket” project with the building of reserve storage for commodities such as grain, cotton, oils and raw sugar. The focus was on establishing a wholesale market for agricultural commodities in sales areas. In 1998, the government proposed that the construction of market facilities should be intensified while continuing to develop multiple primary markets, with the aim of developing regional or national wholesale markets at collection and distribution points for agricultural commodities. In 1999, it further explicitly proposed that credits should be made available and investment increased for wholesale markets in production areas. The objective was building public facilities and speeding up construction of a wholesale market for agricultural commodities. In 2000, the government also emphasised that the construction of storage for important commodities such as grain, cotton and edible sugar should be intensified, the construction of the wholesale market for agricultural products should be accelerated and the construction of marketing facilities for trade-industry-agriculture integration projects should be strengthened.

The implementation of information systems, quality standards and test and inspection systems for agricultural commodities is being intensified. In order to promote the sustained, stable development of agriculture and the rural economy, the government explicitly proposed in 1998 that the system for the collection and dissemination of information should be improved to provide peasants with timely and correct market information. In 2000, it also explicitly requested that the establishment of market information for agricultural commodities and safety and quality standards for food should be accelerated leading to the production of high-quality agricultural products by peasants in accordance with market demand. Therefore, the Ministry of Agriculture is planning to establish a rural market information service network between three and five years from 2001, which will cover all provinces,

cities and counties in China together with the vast majority of township enterprises, markets and peasants. From 2000, over a period of five years or slightly longer, the work of formulating and revising about 2 500 agricultural industry and commodity standards will be completed. From 2001, at preliminary experimental units in Beijing, Tianjin, Shanghai and Shenzhen, implementation began of the "action plan for a new century with no polluted food". Within three years, a process of full supervision and control of the quality and safety of agricultural commodities will begin with "vegetable basket" products as the first objective.

A marketing system for agricultural commodities with multiple forms of organisation and structures is actively being promoted. First, the reform of state-owned trading enterprises and supply and marketing co-operatives is continuing to be deepened so that they become true market entities with autonomous operations and responsibility for profits and losses. Second, in order to accommodate demand for the development of agricultural production and the marketing of agricultural commodities, trans-ownership, trans-regional and trans-sectors union and co-operation should be developed. Third, flexible, effective policy measures are being adopted to encourage development of the non-state economy such as rural, individual industrial and commercial enterprises. Fourth, the peasants' own organisations for marketing are being encouraged and entry into the market should be increased. Fifth, the establishment of social services for agriculture centred around science and technology and information services, is being promoted to encourage and support the joint development of unified trade-industry-agriculture operations by agricultural processing enterprises, distribution enterprises and peasants. Sixth, new marketing modes are being actively sought for new modes of marketing such as direct links between production and marketing, interlinked operations, co-ordinated materials marketing, multimodal transport and e-business, developing agricultural commodity industries such as sales, storage, transportation and the preservation of freshness.

The establishment and improvement of a regulatory system for the storage of agricultural commodities

After the state decided to establish a regulation system for agricultural commodities beginning with grain in 1990, a grain storage system and risk adjustment system were basically established by 1994 while storage systems for non-staple products such as cotton, meat and sugar were begun. In 1997, while the State increased the national and local storage for grain, it also increased provisional storage for raw sugar. After 1998, while the state stabilised storage for cotton and non-staple products, it focused on the reform and improvement of a regulation system for grain markets. First, there was a rational delineation of central and local responsibility for grain, with the local government fully responsible for production and marketing under central government guidance. Second, separate management of grain reserves and grain turnover both at central and local levels was implemented. Third, the completion of grain storage and venture capital and price adjustment systems to further improve the central and local grain storage regulatory systems was implemented. Fourth, central grain reserves were increased and local grain reserves were maintained. Fifth, the state grain storage capacity was extended. Sixth, the State Bureau for Grain and the China Grain Reserve Management Corporation were established. The State Bureau for Grain is responsible for the regulation of grain marketing nation-wide, providing guidance to the grain industry and administering the central reserves. The China Grain Reserve Management Corporation is responsible for allocation, transport, rotation, storage management and import and export of central grain reserves and for vertical management.

Rectification and standardisation of practices for marketing agricultural commodities

Since 1994, the main price indices for agricultural commodities have been circulated and issued monthly. In 1996, surveillance of the purchase price for important agricultural commodities was strengthened and illegal practices such as "paying less than announced" were curbed. A major investigation of market prices was carried out focusing on "rice bag" products and powers of scrutiny and sanction were reinforced. Beginning in 1998, while continuing to reinforce control of the grain purchasing market and survey grain prices, work on the standardisation of practices in the agricultural commodities market was comprehensively strengthened and legal offensives on the manufacture and sale of counterfeit goods, unfair competition and infringements of the rights and interests of consumers were reinforced. First, action was launched against counterfeiting with regard to important agricultural commodities such as grain and cotton, with stronger attacks on illegal and criminal activities such as the manufacture and sale of counterfeit commodities. Second, the surveillance of marketing agents was strengthened, all illegal production and operational activities were closed down. Third, market surveillance was reinforced to counter unfair competition. Fourth, punitive measures were taken against the manufacture and sale of counterfeited goods in order to protect the consumers' interests. Fifth, the systems for monitoring agricultural commodity prices, including statistics and analysis, were reformed, and progress was made towards establishing an authority to monitor prices and to publicly notify policies.

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AGRICULTURAL PROTECTION AND REGIONAL MARKET INTEGRATION IN CHINA: THE IMPACT OF CHINA'S WTO MEMBERSHIP ON THE AGRICULTURAL SECTOR[1]

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(Paper presented by Jikun Huang)

Abstract

China has steadily liberalised its international trading system over the past 20 years. This liberalisation is reflected in the fall in Nominal Protection Rates of major agricultural commodities over the whole reform period. Therefore, China's entry to the WTO represents another step in the gradual opening of the economy to the rest of the world and is not a "big bang" trade liberalisation. Such factors as policy safeguards and the ability of farm households to adjust through their production and investment decisions may further attenuate the possible negative impacts of opening to international competition. The analysis presented in this paper suggests that many of China's markets may be fairly well integrated into the rest of the economy. This means that poor farmers in inland areas can benefit from falling input prices and rising export opportunities, but they will be negatively affected by reductions in import restrictions on commodities they produce. As these groups of farmers are most dependent on agriculture and least able to adjust, the government should adopt adequate policy measures to address the possible negative welfare impacts.

Introduction

The forces of development have been responsible for generating both progress and problems that rural China has experienced during the past 20 years. Likewise, the efforts at pushing ambitious trade and investment liberalisation policies will have both positive and negative consequences. On the one hand, trade can bring rising efficiency, new technology and opportunities to increase economic growth (Lardy, 2001). On the other hand, trade, marketing and investment liberalisation will also almost certainly accentuate many of the negative trends in rural China, at least in the short run.

Surprisingly, despite the historic nature of China's move to join the World Trade Organisation (WTO), little serious empirically-based research exists to answer some of the most basic questions about the expected effects of China's entry into the WTO.[2] On balance, will accession to the WTO help or hurt the rural economy and rural incomes? Who in the rural economy will get hurt? Are there some in the rural economy who will be insulated from the effects of WTO?

1. The authors would like to thank the research assistance of Yuping Xie and Min Chang, without which this work could not have been done. We also acknowledge the helpful comments and suggestions of Kym Anderson, Fred Crook, Tom Hertel, Elena Ianchovichina, Will Martin, Francis Tuan, and participants in the World Bank sponsored meeting on the "Impact of Accession into WTO on China". We acknowledge the financial support of the World Bank's Trade and Rural Development divisions.

2. A number of good analytical papers exist that identify the conditions under which China will enter WTO, the possible sources of gain and losses, as well as what effects might be on aggregate trade (see, for example, Johnson, 2000; CARD, 2001; OECD, 2002; Carter and Estrin, 2001; Tuan and Cheng, 2001 etc.). Little of this work, however, tries to track regional, sectoral or specific effects with empirically based methods.

Although many of the important effects will occur through off-farm labour markets (*e.g.*, OECD, 2002; Zhao and Sicular, 2002), WTO also will affect the food economy in many complex ways and these effects are equally difficult to fully identify and measure. For example, consumers will gain from lower prices as tariffs and non-tariff barriers fall letting in imports that previously had been kept out by trade barriers. They will lose, however, if prices rise for some commodities as the nation begins to export other goods that had been kept out of markets around the world. The nature and magnitude of the effects, or even their existence, will also depend on how closely households are integrated into the consumer markets (Taylor, 1998). Subsistent households in remote areas might not be affected at all even though consumers in areas that are linked to international markets enjoy a fall in the price of important commodities in their daily consumption basket.

Despite the difficulties and complexities, researchers need to examine these important questions. We take on this challenge in this paper. But, to make the task more manageable, we necessarily restrict our attention to one subsector of the rural economy: agriculture.

We begin the study with the basic premise that to assess the impact of WTO on agriculture, we need to answer two basic sets of questions. First, we need to understand the magnitude of the current distortions to agriculture. In essence, this means estimating the nominal rates of protection (NPRs) of the agricultural sector's major commodities, or the gap between the price at which commodities can be landed at China's borders and the price in the domestic markets. Second, once the size of the "shock" at the border is estimated, to understand the crop-specific and regional impacts of WTO's accession (as well as impacts on certain groups of rural residents, such as the poor), this means understanding how well price shocks are transmitted throughout the economy. If large areas of the country are isolated from coastal markets where imports land, then the effects of WTO may be circumscribed to restricted parts of the country and should not be expected to have much impact on the poor, who are largely located in inland areas far from major urban centres. However, if markets exist that link together distant regions with the coast and price changes in one part of the economy ripple through the economy, even though imports enter into (and exports flow out of) areas concentrated around a few large coastal cities, they could have ramifications for poor households thousands of kilometres away.

In summary, the overall goal of our paper is to understand how WTO will affect the agriculture sector in China. To accomplish this goal we have two specific objectives. First, we seek to provide measures of the distortions in China's agricultural sector at a time prior to the nation's accession to WTO. Second, we seek to assess how well integrated China's markets are in order to understand which areas of the country and which segments of the farming population will likely be isolated from or affected by the changes that WTO accession will bring. Ultimately, with a knowledge of the magnitude of the impacts, researchers will be better able to understand how the policies that WTO will impose on China will change the gap between domestic and international prices and affect imports and exports, domestic production and consumption, income and poverty.

To meet these objectives, the rest of the paper is organised as following. First, we will seek to provide a context for our analysis of the current distortions that affect China's agriculture. Second, we present measures of NPRs for a set of China's major agricultural commodities. In this section, we discuss how these distortions should be expected to change as China implements its WTO obligations and gains access (or not) to the promises that were made to it. The third section analyses the transmission of prices through the economy and seeks to make a guess on the size and scope of price impact as China's WTO commitments are implemented. The final section offers some conclusions.

Gradual opening and remaining distortions

Although agriculture has been at the centre of China's negotiations over its entry into the WTO, the likely shifts in China's future agricultural policy and its impacts are not well understood. Debates on the future of China's food security are growing. Some argue that the impacts on its agriculture of China's joining the WTO will be substantial (Carter and Estrin, 2001; Li *et al.,* 1999). Others believe that, although there will be impacts, even severe in some specific sectors, overall the effects of accession on agriculture will be modest (Anderson and Peng, 1998; Martin, 2002). In part, some of the confusion comes from the examination by many studies of "snap shots" of price gaps between international and domestic products at a particular time, instead of examining the general trend of changes over time due to China's policies. As with all work on NPRs, it is difficult to choose the right prices - domestically and internationally -to compare.

Hence, it is unsurprising that different research efforts have generated different estimates of NPR. For example, Tuan and Cheng (1999) estimated quite high and variable nominal rates of protection for agricultural commodities. Their estimates for wheat, maize and soybeans in 1997 were 62%, 15% and 140% respectively. On the other hand, Carter and Estrin (2001) find generally negative price distortions. Such a wide range of measures raises questions as to the validity of all the research efforts.

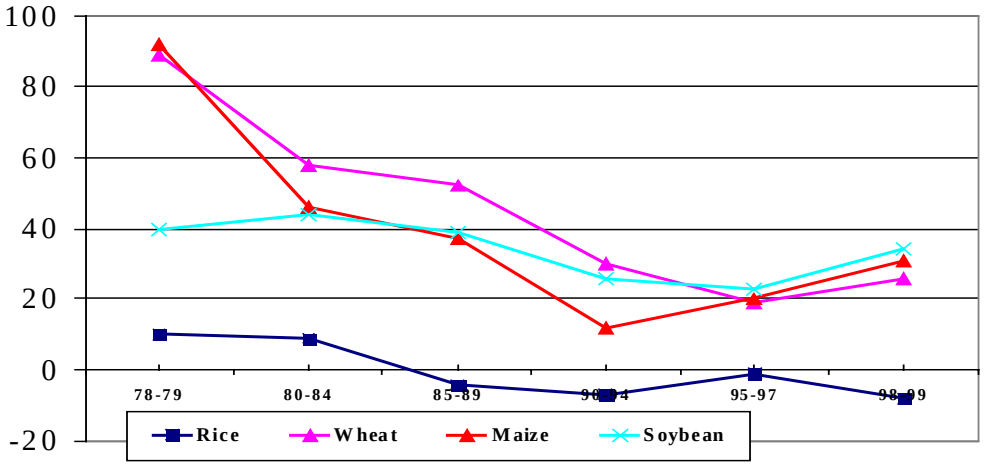
The confusion about the ultimate impact of WTO also can be traced to a widespread lack of understanding of the policy changes that may be induced from China's WTO accession (Martin, 2002) and an understanding that in fact the current changes are really in some sense an extension of past trends. Traditionally, analysts have focused on four sets of trade policy measures that are most frequently used by other countries to protect their agricultural sectors. In examining the previous work (*e.g.,* CARD, 2001; Tuan and Cheng, 1999; and OECD, 2002), we find that almost all of the discussion is directed at tariffs, quotas and licensing, state trading and traditional non-tariff barriers (NTBs). It is implicitly assumed that the WTO agreement is focused solely on these policies, that these policies are responsible for most if not all of the protection that China was enjoying prior to accession, and that accession represents China's initial assault on protection at the border. In fact, although at one time these policies were highly distortive, after nearly two decades of trade reform some of the worst of the distortions caused by these policies have already disappeared. Instead, other policies like domestic and border tax policy and subsidisation policy may be the source of some of the largest distortions in the period of China's accession to WTO.

Over the past 20 years, not only recently as some of the WTO literature seems to imply, China has steadily liberalised its international trading system. Lower tariffs and rising imports and exports of agricultural products began to affect the domestic terms of trade. In the initial years, most of the fall in protection came from a reduction in the commodities that were controlled by single desk state traders (Huang and Chen, 1999). In the case of many products, competition among non-state foreign trade corporations began to stimulate imports and exports (Martin, 2002). And, although many major agricultural commodities were not included in the move to decentralise trade, policy shifts in the early 1980s also changed the trading behaviour of state traders. More imports entered China in the 1980s and 1990s, though there continued to be many year-to-year fluctuations for some commodities. After the reduction of restrictions on imports and exports of many of China's agricultural commodities, a new effort was begun in the early 1990s, to reduce the level of formal protection. From 1992 to 1998, the simple average agricultural import tariff fell from 42.2% in 1992 to 23.6% in 1998 (MOFTEC, 2001).

So although WTO must be seen as a time when China is entering a new phase in its external and domestic economy management, earlier achievements and policy shifts actually mean that China's level of border protection for its agricultural commodities had already been evolving for more than

20 years. For example, Figure 1 clearly shows the fall in NPR throughout the reform era. Protection for all crops has fallen uniformly since 1978. Huang (2001) shows that the protection for wheat has fallen from more than 90% in the early 1980s to around 20% in the late 1990s. Similar falls have occurred for rice, corn (maize) and soybeans.[3]

Figure 1. Nominal Protection Rates of Major Agricultural Commodities, 1978 to 1999
(%)



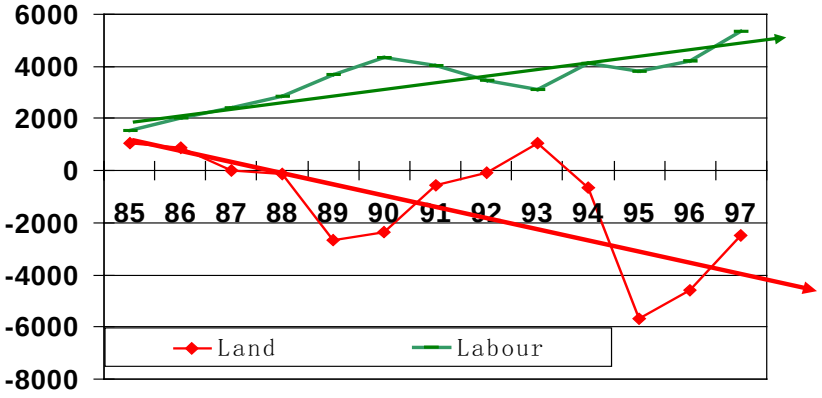
Source: Huang, 2001.

Changes in trade and domestic marketing policies have resulted in dramatically shifting trade patterns. Disaggregated, crop-specific trade trends show how exports and imports increasingly are moving in a direction that is more consistent with China's comparative advantage. Net exports of land-intensive bulk commodities, such as grains and oilseeds, have fallen; while exports of higher-valued, more labour-intensive products, such as horticultural and animal products, have risen. The proportion of grain exports, which was around 20% of total agricultural exports in the 1990s, is less than half of what it was in the early 1980s. By the late 1990s horticultural products and animal and aquatic products accounted for about 80% of agricultural exports (Huang and Chen, 1999). These trends are even more evident when reorganising the trade data on the basis of factor intensity (Figure 2).

3. NPRi = (Pid - Piw) / Piw x 100 where *i* is the commodity index, Pid is average domestic wholesale price for commodity *i* with average quality in China's market. Piw is average border price. The official exchange rate is used to convert foreign currency to RMB (yuan). For the importable commodity (*i.e.*, wheat, maize and soybean), the border price is the product of the averaged C.I.F. and quality adjustment factor. For the exportable commodity (*i.e.*, rice), the border price is the product of the averaged F.O.B. and quality adjustment factor. The quality adjustment factors are 1.1, 1.05, 1.1, and 0.95 for wheat, maize, soybeans and rice, respectively.

Figure 2. Agricultural Trade Balance by Factor Intensity

(million USD)



Source: Huang and Chen, 1999.

From Figures 1 and 2, two facts become clear. First, distortions have declined significantly in the past 20 years. Considering this fact, the current episode of policy reform that accompanied China's accession to the WTO should be considered an extension of past efforts. Second, much of the falling protection has come from decentralising authority and relaxing licensing procedures for some crops (*e.g.*, moving oil and oil seed imports away from state trading firms), reducing the scope of non tariff barriers, the relaxation of real tariff rates at the border, and changing quotas, (Huang and Chen, 1999). It is perhaps for these reasons that much research on China's entry into the WTO focuses on the policies that were responsible for much of the earlier progress. And studying these policy tools, in fact, might be merited. Undoubtedly, changes in China's tariff regimes, state trading system and matrix of NTBs will play a continuing role in creating or eliminating distortions in China's agriculture.

However, in part - because many of the gains from traditional trade reforms have already been experienced - it may be that there also are other, less-discussed policies which are contributing to maintaining a gap between China's and the world's price. For example, tax policy at the border and domestically may be a source of remaining distortions. As shown in Huang and Rozelle (2002), tax officials assess a 13 to 17% value added tax on China's agricultural commodity imports. The same domestic commodities are taxed at a rate of less than 5%. Prior to China's entry into WTO, local and central authorities subsidised the exports of several agricultural commodities, most conspicuously maize (providing exporters rebates of up to 30% of the export price) and cotton (about 10%). Hence, even if traditional policies (*e.g.*, tariffs or TRQs) are still important, it could be that the gains from reforming these other policy reforms may be as important as those that can result from traditional trade reform.

Protection on the eve of WTO accession

In fact, analysis using a data set that we collected on the eve of China's accession to WTO shows that some of these new policies may be providing most of the protection from international competition.[4] We were particularly concerned with understanding the transactions that the interviewees were involved with or knew about that related to imported or exported grains, fibre, meat and other goods. The survey recorded the characteristics of the commodities that were involved in trade in the immediate marketing area during the autumn of 2001. Enumerators then asked the interviewee a series of questions about commodities about which the traders were most familiar. For imported commodities, interviewees first told the enumerators the international CIF price of the good. Second, the interviewee then told enumerators what the good would sell for if auctioned in a competitive auction. In other words, we elicited a series of price gaps for a defined set of goods. Since, on average, each interviewee had information about a number of commodities, we obtained several hundred observations. A similar set of questions was asked about exportable goods, including maize, rice, cotton, and meat products.

4. In Table 3, we estimated a new set of NPRs on the eve of China's accession to the WTO. These estimates attempt to overcome some of the previous problems of researchers. In particular, we try to understand, in a more disaggregated way, the part of certain markets (in terms of varieties or commodity type) that China is protecting. Such an analysis, should help us more accurately assess what the impacts will be after China implements its WTO obligations. To overcome previous shortcomings of NPR studies, we primarily rely on a new data set, collected from interviews and surveys with more than 100 importers and exporters, domestic traders, and grain officials with the stated goal of precisely identifying the differences in prices at a precise point of time and a particular location between an imported good on one side of the border (outside China) and a domestic good of identical quality on the other side (inside China). Likewise, we also wanted to identify the same price gap between exportable domestic goods as they leave the country and the same goods from other countries that are being traded in international markets. Such information provides the raw data that we used to estimate NPRs on a highly disaggregated basis. While such information is of interest in its own right (which we analyse in more detail in Huang and Rozelle, 2002), it can also be used to construct more aggregate NPRs (for the entire crop) by making certain assumptions about the structure of the distribution of quality of the commodity in the domestic economy. The enumeration team was in the field for more than 3 months during 2001, from August to November. The team visited 7 port cities - Guangzhou, Shenzhen, Ningbo, Shanghai, Lianyungang, Qinghuangdao and Dalian - and 2 other more inland cities, Beijing and Changchun. In each location, a number of "sampling frames" were used to select a sample of domestic traders, importers and exporters, wholesalers, grain and oilseed users, trade regulators, agents, and other grain and fibre officials. Because of the absence of a single central authority that manages grain flows, the enumeration team chose their sample in a number of ways. In each location, we first visited the local grain bureau and obtained access to a list of all grain traders and users, the firms that they were operating on a commercial basis, and their subsidiaries. We interviewed officials in the grain marketing and transportation divisions. We also chose three firms that were owned directly by the grain bureau and three that were affiliated with the grain bureau. In several cities, the grain bureau had a list of large grain trading and grain using firms (*e.g.*, mills and feed lots). In others, this information was obtained from the market administration bureau. Five firms were chosen on the basis that they were private and had yearly sales that exceeded one million yuan. We interviewed at least two flour or rice mills and feed mills in each location. Finally, we visited the wholesale market and randomly chose five stalls to interview. The team also visited a number of other entities, such as the grain reserve, the local COFCO agency, and supermarket chains. In some cases, the managers of these entities knew the grain trade business well enough to answer our questions, in other cases they did not. In total more than 100 people were interviewed. Only a small fraction (less than 10%) of those contacted refused to be interviewed.

Although there are differences among major varieties (*e.g.*, high and low quality varieties) of any individual agricultural commodity (*e.g.*, wheat or rice), by weighting the NPRs of the different varieties by their sown area (for crops) and production (for meats) shares, a set of by crop aggregate NPRs can be created (Table 1). Wheat, for example, has a NPR of 12% (row 1). Since the value added tax on wheat is typically not assessed at the border, the gap between China's domestic wheat price and that of the international market means that (assuming that wheat will continue to be exempt from VAT) when wheat begins to fall under TRQ management, importers will have an incentive to import wheat. Rice, on the other hand, is implicitly taxed by 3%. Although there may still be some special types of rice that traders can profitably import after the commencement of TRQ management, the negative rates of protection mean that if China can get access to international rice markets having acceded to WTO, traders should be able to export somewhat larger volumes of rice than in the past.

Table 1. **Average nominal protection rates for major imports and exports in China, October 2001**

Major imports and exports	Domestic price (yuan per tonne)	Nominal Protection Rate (%)
Imports		
Wheat [a]	1 250	12
Maize	1 150	32
Soybeans	1 950	15
Cotton	9 500	17
Sugar	2 612	40
Exports		
Rice [a]	1 954	-3
Pork [a]	11 442	-30
Beef [a]	13 743	-10
Poultry [a]	9 904	-17
Fresh Fruits	5 472	-4

[a] Average Nominal Protection Rates are calculated by summing the NPR rates of individual varieties weighted by the sown area (production) share.

Source: Authors' Survey.

Beyond food crops, our findings also show that China should soon begin to increase its imports of a number of crops, especially certain feed and fibre crops. For example, maize prices, according to exporters, were more than 30% on average above world prices. Exporters in the northeast part of the country would have lost more than 30% of the value of their shipment, had the government not paid them a subsidy. In other parts of the nation, protection rates, when considering maize as an import, differed. Traders in the northeast told our survey team that if they were not exporting and foreign maize was to enter China, the importer could make a 21% profit. Our interviews in south China found that the price gap between imported maize, CIF, and maize being traded in the domestic market in Guangzhou was more than 35%. Aggregated across areas on the basis of their meat consumption shares, we estimate that China's maize NPR was 32% in 2001 (Table 1, row 2). Hence, as China implements its TRQ for maize, imports should rise and exports cease.

Interviewees also reported that despite the large increase of soybean imports in recent years, there is still a difference between the CIF and domestic price at the port (Table 1, row 3). The average difference between the domestic price and the international price was 15%. In one sense, the fact that

there is a remaining price gap is remarkable given that China imported almost 15 million tonnes of soybeans in 2001, the official tariff is only 3%, and the commodity is freely traded without securing a license. On the other hand, the remaining price gap reminds us that there may be other reasons for distortions beyond tariffs and state trading, most likely the existence of VAT. Hence, if China begins to comply with the national treatment clauses that it promised to implement, an exploitable gap between the international price of soybeans and China's domestic price will appear, which as before will likely result in higher imports (though, it could also come in the form of soybean oil). Our results also find that cotton and sugar were fairly highly protected in October 2001 (Table 1, rows 4 and 5).

On the other hand, in the same way that China's rice price was below that of the world market on the eve of its accession to WTO, the price of most major livestock commodities, pork, beef and poultry, and that of many horticulture crops were also below international levels (rows 7 to 10). While part of the reason that China's meat prices are below international levels is due to sanitary and phyto-sanitary restrictions, the price gap is also in part due to a number of artificial barriers that other countries have erected against China's exports (Huang and Chen, 1999). Hence, to the extent that China can use WTO to open up new commodity markets in which they have a comparative advantage, its producers of these commodities should be able to increase exports.

In summary, as China enters the WTO, there are still a number of challenges that China will face in liberalising its trade. Alternatively, China also has a number of instruments that it has been using and may continue to use (legally or not) in managing its domestic economy. In addition to traditional trade policies, tariffs, quotas and licensing, state trading and NTBs, we have shown that China has protected and/or has the potential of protecting its agriculture with a number of other policy measures. In particular, our analysis has shown that taxation policy may still be a tool that China could try to use to protect or further open its agricultural sector. It also has used export subsidies and rebates to create wedges between the domestic and international prices of importable commodities and to decrease the domestic price relative to the world price of exportable goods.

WTO effects at the border

The magnitude of the effect of the WTO agreement on China's farmers depends on several factors. First, the magnitude will depend on the size of the true NPR as discussed in the previous section, which is a function of the distortions in the economy. The second factor is the size and nature of China's market. To compute a set of estimates of post-WTO supply, demand, trade and price effects, a complete assessment must include an analysis of both supply and demand behaviour of producers and consumers of each commodity inside China as well as an analysis of the supply and demand behaviour of the rest of the world. Such analysis, however, is beyond the scope of this paper. In other work done by the authors, when we use the CAPSIM framework to project the impact of completely liberalising prices, we find that rice farmers and livestock producers benefit greatly; while wheat, maize, and soybean producers suffer large falls in prices and income cuts (Huang and Chen, 1999).[5] Given the sizeable gaps that our analysis has measured between domestic and international price for some crops, it would be plausible that if China were to undergo complete trade liberalisation, the economy would experience possibly wrenching changes. There would potentially be big winners and losers.

5. Without considering the political-economy factors that affect how fast and how complete the distortions are removed, traditional supply, demand and trade analysis, such as with the use of a CGE or partial equilibrium modeling framework, is needed to project the changes in output, consumption, prices and income.

However, China's accession to WTO is not "big bang" trade liberalisation. In reality, as we have tried to argue above, China's entry into the WTO represents another gradual step in the opening of the economy to the rest of the world. In fact, there are at least three factors - policy safeguards, household responses and high transaction costs (or isolated markets) that can possibly serve to buffer the effects of liberalisation policies on those who live in rural areas in China.

Policy safeguards and household responses

Even when China's producers face the most liberalised conditions under the agreement to enter the WTO (the peak year is currently specified as 2004), there are provisions that will allow China to protect its rural sector—both under the letter of the agreement and by actions that it should be expected to take. Under the accession agreement, China's TRQ levels are set at modest enough levels that the quotas may not even be binding. It is possible, for example, that after WTO when TRQs are offered to private traders at such narrow price gaps between the international and domestic market (10% or less for the type of wheat that China's consumers demand the most), importers only find that the highest quality of wheat is worth bringing in and the market for such grain may not be enough to fill the TRQ.

Moreover, even after China does everything to meet its obligations, the TRQs are low enough and the above quota tariff rates are set at high enough rates that if the TRQs are filled and leaders believe its rural sector was being seriously hurt, it has means at its disposal to minimise any damage, either real or perceived. For example, after bringing in imports up to its TRQ level (*e.g.*, 9.636 million tonnes for wheat), China's leaders can legally assess a tariff of 65% on any additional imports. At such high tariff levels, China's wheat producers almost certainly would be shielded from any other competition from international producers for many years since, according to almost any set of predictions, there are almost no conceivable scenarios under which China's domestic price would rise by more than 50% of the world price for a long period of time - especially if China continues to commit itself to carry through with its ambitious set of "green-light" investments in water control, rural roads, and agricultural research and extension. The same would be true for almost all other commodities. Of course, there would be pressure to continue to liberalise in the next round of world trade and investment liberalisation negotiations, but, if the effects were damaging enough (or were perceived to be damaging enough), China's leaders would almost certainly not agree to any further concessions, at least not without large enough gains in other parts of the agreement that they thought they would adequately be able to take other measures (*e.g.*, delinked producer payments) with which they could offset the negative impact.

The case of soybeans before the WTO agreement, however, shows that when protection does come down and China allows more or less access to its markets (that is except for the official tariff and VAT), imports can surge. Before 2000, the import tariff for soybeans was as high as 114%, importers required licenses, and China's farmers grew most of the nation's soybeans. However, in anticipation of China's WTO accession, tariffs were lowered to 3% in 2000. After this lowering, officials also phased out import quotas. Consequently, imports surged from 4.32 million metric tonnes (mmt) in 1999 to 10.42 mmt in 2000. In 2001, most observers believe soybean imports exceeded 14 mmt. Prices also fell and the nominal protection rates of soybean declined from 44% in early 2000 to 15% in October 2001. From this case it is possible to see that when the protection rates are high and there is high demand for a commodity, imports can increase sharply.

While there will be losers, especially in the short run, when these households live in areas that are highly integrated into the rest of the economy, they have the ability to adapt. Hence, even though there may be large negative effects in the initial period, the costs may diminish over time. For example,

farmers in some areas may find that their soybean crop will be unprofitable in the first years after the onset of the implementation of the WTO agreement measures. Undoubtedly, their incomes will fall. These farmers, however, are not locked into soybeans by policy or regulation. And they will not continue to produce at a loss. Instead, they will undoubtedly respond, adopt new technologies, and make investments that will allow them to take advantage of positive opportunities that arise in the wake of the WTO agreement. There is no assurance that all farmers will ultimately come out better, and some will be losers. But, because of the ability of farmers to respond, their losses in subsequent years can be substantially lower than in the initial years.

Hence, in China the magnitude and severity of the negative impact of WTO policies on agricultural production will depend in part in how well households are able to respond. The rapidity with which the rural economy has evolved in the past when facing changes in the external environment (such as how they responded to the fiscal reforms in the 1980s with the rise of TVEs; the marketing responses to grain reforms in the early 1990s; and the restructuring of ownership patterns in response to banking reforms in the late 1990s) provides optimism. WTO policies themselves may help the rural economy respond even faster if they promote more liberalised credit, better property rights, the rise of wholesaling networks, encourage foreign direct investment and - more fundamentally - will encourage the government to remove itself from the day to day involvement in the economy as a producer or investor and take a role of facilitating the emergence of complete and efficient markets.

WTO effects away from the border: market integration in rural China

To the extent that there are high transaction costs in China and to the extent that certain domestic markets are isolated from others in the country - especially those inland areas that are isolated from port regions where imports land - it could be that the impact of WTO policies are not evenly distributed. In previous work done on China's agricultural markets (*e.g.*, Park *et al.*, 2002), it was found that, in general, China's markets were fairly integrated by the mid-1990s. However, this conclusion should be qualified. First, although there has been a large improvement, this previous work still found that large parts of the country, especially poorer areas, were not completely integrated. Moreover, the work is dated. Since the study, more than 7 years have passed and while markets have had even more time to mature, Chinese leaders have taken a number of policy actions that could possibly have led to greater fragmentation and thus less integration. Surprisingly, given the fragile nature of reforming China's agricultural markets, there is almost no recent work that addresses these questions.

Why is it important to know if China's markets are integrated or not? If markets do not operate well and there is poor integration, the effects of WTO policies on producers in isolated areas will be correspondingly attenuated. According to a study by Taylor (1998) the impact of NAFTA varied dramatically on Mexican farmers in border regions and those in more remote regions that faced high transaction costs for marketing their output and buying inputs. In fact, Taylor finds that NAFTA has had little impact on those in the poorest areas mainly because they have been insulated from the changes by high transaction costs. Before NAFTA since most of their economic activities were either entirely within the household or with others in their own village or township, the prices that they were facing as buyers or sellers were determined locally and were not affected by what happened far away in Mexico's border areas.[6]

6. Moreover, because farm households in poorer areas are operating in economies that are characterised by poor, incomplete or absent markets for many factors, such as land and on-farm labour, even when they do interact with commodity or input markets, some of the impact of any changes in prices are

Alternatively, if markets are well integrated, a drop of prices in coastal areas will be followed by a corresponding drop in prices in inland areas. If integrated markets do transmit price effects into inland areas, since some of the poorest farmers in China are those in remote areas that are dependent on agriculture and many of China's poorest households are relatively undiversified, it could be that there will be a large impact on the incomes of those least able to cope with price falls**.**

To assess how integrated and developed markets in rural China were since the late 1990s, we proceed as follows. First, we describe the data. Second, we examine how prices are determined. We want to examine if prices across China's marketing regions behave as if they are in an integrated, well-functioning market. If so, we should expect to see prices become lower as market locations move away from the main consumption centres, in the case of China's, its main ports. We should also expect to see prices become lower as markets are further away from road and railways. Third, we will test for integration and conduct direct tests of how well prices in different markets move together.

Data

The data come from a unique price data set collected by China's State Market Administration Bureau (SMAB) in Beijing. Nearly 50 sample sites from 15 of China's provinces report prices of different agricultural commodities every 10 days. The prices are the average price of transactions that day in the local rural periodic or wet market. The Ministry of Agriculture's Research Centre for Rural Economy (RCRE) assembles them in Beijing, making them available to researchers and policy makers.

We examine rice, maize, and soybean prices from 1996 to 2000 (except for maize that was only available through 1998). These three crops are produced and consumed in nearly every province in China. Rice price data are available for 31 markets. Because of quality differences among rice varieties in different regions of China, we look at price formation at the national level and within four regions, South China (South), the Yangtse Valley (YV), the North China Plain (and Northwest China - NCP) and Northeast China (NE). For the provinces included in the sample, rice prices are available for over 90% of the time periods.

Prices for maize and soybean data are available for 13 and 20 markets respectively. Product homogeneity makes it possible to include a broader geographic range of buyers and sellers in a single analysis, and we are able to assess the integration of markets spread out over 1 000s of kilometres. For example, the sample includes maize-producing regions in Shaanxi and Gansu Provinces and a maize-consuming region in Guangdong. However, because trading patterns differ from those of rice, for the purposes of establishing distance from the major consumption region, China is divided into three maize and soybean marketing regions: coastal China (north of the Yangtse Valley between Beijing and Shanghai); the North-South coast-inland axis (a marketing region running between

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"absorbed" by changes in the shadow value of the un-marketed household resources, such as its land or labour. For example, part of the fall in agricultural prices could affect the shadow value of land, which is unrealised since the household is not able to (or is not willing to) sell or rent the land in any case. Such impacts, rather than having their full effect fall on family nutrition or consumption, often end up mainly affecting the farmer's valuation of leisure or un-marketed land. That is not to say that WTO policies will not affect welfare in these areas; they do. However, the complicated ways in which farmers in these economies respond to changes in prices and marketing opportunities usually mean the effects are much smaller than they would be on households that live and work in completely commercialised economies.

Guangzhou, Wuhan, Xian and further north); and the NE (between the northeast provinces and Beijing).

Since we use data over time, we need to convert prices to a real basis. Nominal prices from our data set are deflated using monthly consumer price indices calculated and reported by the State Statistical Bureau. Deflation facilitates transaction cost comparisons across time and allows us to disregard transaction cost increases within periods associated with inflation.

We also conducted extensive field-work, visiting nearly every major producing and consuming region in China over the past year to gain a better understanding of the institutions and policies affecting rice, maize, and soybean trade and to collect information on trade patterns. Interviews were conducted with national, provincial, and county grain officials, traders in buying and selling regions, transport officials (responsible for rail, trucking, and shipping), futures and wholesale market staff, managers of grain retail outlets, and local private traders in rural periodic markets. Traders in major grain exchange centres and officials in provincial capitals provided estimates of the volume and direction of grain flows and transport, handling, and other transaction costs. Interview data are used to restrict the sample to pairs of provinces that actually trade rice and maize, where appropriate disaggregate results are available regionally to validate transaction cost estimates, and assist in interpreting the empirical results.

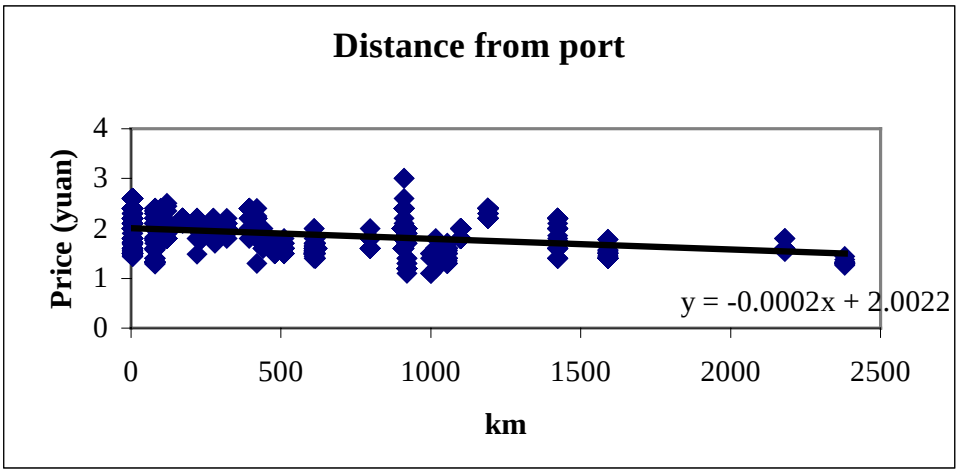
We also have put together a data set that provides several characteristics that theoretically should affect the price that traders and producers should receive in an area if markets are functioning well and are integrated. We know how far each market is by way of the shortest and most commonly used transportation route from the consumption centre (Guangzhou, Shanghai, Beijing and Dalian). This variable is called "distance from the port." We also know how far a market is from a national highway and the distance to the nearest grain terminal on the rail system. Descriptive statistics are provided in Appendix Table 1.

Price determination

Our first test of how well markets are functioning depends on the analysis of the behaviour of prices of several of China's main commodities, maize, soybeans, and rice. If China's markets are well-functioning, then there is a greater likelihood that price effects in one region of the country, in this case shocks caused at the border from increased imports or exports (or increased consumption in the coastal market), will affect producers (and consumers) in other parts of the country. If price formation does not appear to be consistent with the existence of adequately functioning markets, whereas the border effects may still be significant (indeed, they may be sharper since demand curves would be more inelastic), large regions of the country should be shielded from the falling or rising prices. Hence, the hypothesis that we are interested in is that price relations across China's regions exhibit characteristics that make it appear as if China's domestic producers, consumers and traders face price pressures that are being created in part by market forces.

A simple plotting of the relationship between the price of rice in South China in 2000 and the distance from South China's main port city, Guangzhou, shows a price contour that is consistent with the existence of well-functioning markets (Figure 3). Since the main demand centre and point of export for varieties of rice produced and traded in south China is Guangzhou, one would expect that in an integrated marketing system, as a market became more remote, the price should fall. Indeed, the price in a market a 1 000 kilometres away from Guangzhou (*e.g.*, a market on the Yunnan Plateau), is, on average, about 0.20 yuan lower per kilogramme (or about 11% of the average rice price in China - see Appendix Table 1).

Figure 3. **Changes in rice price across China as markets increase its distance from port, 2000**



Note: Graph of bivariate relationship between rice price and distance from port. Slope of line given by the simple linear regression of rice price on distance.

The results of a multivariate analysis of the relationship between price and several factors, including distance from port and measures of the access of the market to transportation infrastructure, show similar results for maize, soybeans, and rice across China (Tables 2 and 3).[7] Holding all other factors constant, as maize marketing sites move farther away from Guangzhou and Shanghai, the price falls (row 1). Although the magnitudes of the coefficient on the distance from port variable change from year to year, their sizes still fall in a fairly narrow range (from 0.16 yuan per kg to 0.39 yuan per kg). This is what one would expect from markets for commodities for which traders use fairly similar transportation routes, equipment, and infrastructure to get their products to markets. Since the value of the commodities on a per kg basis differ, the transportation/transaction cost in percentage terms varies from commodity to commodity. Soybeans are lowest (about 5% average in 1999 and 2000); followed by rice (8.7% in 2000 and 6.6% in 1998); with maize the highest (22% in 1998). Interestingly, the magnitudes of the transportation/transaction costs are similar, though lower, than those reported in Park *et al.*, 2002. This result, however, also should not be surprising, since China's infrastructure has improved so rapidly in recent years as has the nation's transportation sector (Luo, 1998).

7. The cases of maize and soybeans might be expected to provide the strongest cases since, unlike rice (China's main food grain), feed grains are inherently more homogeneous in terms of quality. Also, maize and soybean markets should be more robust from year to year in any given region, since a larger fraction of the output of feed grains is typically marketed, and less is used on-farm for own consumption needs of the farm family - a feature that may make local growing conditions (*i.e.*, if there was a drought or flood that reduces on-farm output, but would not reduce the family's consumption needs) more likely to affect the participation of food grain farmers in output sales markets.

Table 2. **Factors explaining soybean and maize price variation in China and selected marketing regions in China, 1998 and 1999 (Dependent variable: real price of maize or soybeans)**

Explanatory Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Maize price, 1998		Soybean price, 1999		Soybean price, 1998	
Distance from Guangdong:	-9.3E-05 (9.32)**	-0.00029 (12.4)**	-0.00039 (-17.72)**	-0.00021 (8.01)**	-0.0004 (8.40)**	-0.00019 (3.24)**
Distance from Road [a]	-	0.005319 (13.1)**	-	-0.00828 (9.91)**	-	-0.00928 (4.84)**
Distance from Rail	-	-0.00103 (6.15)**	-	0.005106 (8.29)**	-	0.001669 (1.18)
Marketing Region Dummies:						
East (or Inland)	-	-0.34 (6.09)**	-	0.245 (4.82)**	-	0.23 (1.98)**
West (or Coast)	-	-0.039 (1.03)	-	0.46 (8.69)**	-	1.08 (8.89)**
Period Dummies [b]	Included	Included	Included	Included	Included	Included
Adjusted R-square	0.1401	0.525	0.3121	0.4069	0.1321	0.2992
No. of observations	318	318	648	648	648	648

Note: Ordinary least square regression. T-ratios in parentheses. Coefficients marked with * and ** were statistically significant from zero at the 10 and 5% level, respectively.

[a] Distance of market from road was measured as distance in kilometres from nearest "national-level" road.

[b] Dummy variables were included for each sampling period throughout the year. Survey was conducted every 10 days. Therefore, we included 35 period dummies. The one for the first 10-day period of January was dropped.

Table 3. **Factors explaining rice price variation in China and selected marketing regions, 1999**

Explanatory Variable	(1) Full Sample	(2) South China Region	(3) Yangtze River Region	(4) Yellow River Region
Distance from Port:				
Linear term	-0.00016	-.0003787	.0000184	-.0000361
	(-7.14)	(-4.35)	(0.26)	(-1.29)
Squared	5.17e-08	2.47e-07	-1.09e-07	2.40e-08
	(8.41)	(5.57)	(-3.24)	(3.48)
Distance from Road[a]	-0.00378	-.0034828	-.0097497	-.0046768
	(-12.04)	(-5.95)	(-5.70)	(-5.16)
Distance from Rail	-0.00025	-.0004541	.0058257	-.0023546
	(-1.66)	(-2.75)	(2.92)	(-3.75)
Marketing Region Dummies:				
South	0.23573			
	(9.35)			
Yangtse	-0.05628			
	(-2.83)			
Northeast	-0.17794			
	(-5.37)			
Income	Not included			
Period Dummies[b]	Included	Included	Included	Included
Adjusted R-square	0.3088	0.4167	0.2239	0.1582
No. of observations	1 170	307	343	520

Note: Ordinary least square regression. T-ratios in parentheses.

[a] Distance of market from road was measured as distance in kilometres from nearest "national-level" road.
[b] Dummy variables were included for each sampling period throughout the year. Survey was conducted every 10 days. Therefore, we included 35 period dummies and the one for the first 10 day period of January was dropped.

The case of rice is somewhat more complicated. Although the simple relationship between rice price and distance from the port (either Guangzhou, Shanghai, Qinhuangdao, or Dalian) is negative (Table 3, column 1), when other variables are added (using a specification similar to those used for maize and soybeans), the coefficient on the "distance from port" variable becomes positive

(column 2). The coefficients become negative again only after either a squared distance term or a set of two dummy variables is added to the regression (columns 3 and 4). Both of the changes to the specifications suggest that in the rice market in 2000, there was a non-linear relationship between distance to port and price. In other words, in 2000 the rice price begins to fall as markets move away from the port. However, after rice prices hit a certain point (in this case about 1 600 kilometres from the port), the price begins to rise. Interviews with traders in Guangzhou, Kunming and Beijing provide an explanation for the finding. In some years, (*e.g.* in 2000, the year we find this price non-linearity), production in the surplus regions of the Yunnan Plateau was lower than normal. If so, it is possible that the regional rice price rose high enough so traders could not earn a profit shipping rice to the Guangzhou market after paying for transportation and procurement price. In fact, during interviews with traders we found that most of the rice produced and sold in Yunnan markets that year stayed inside the province. Hence, in this year, we should not expect to see a linear relationship between price and the distance from the coastal port. Analysis of the determinants of price in other years supports such an explanation. For example, in a more normal production year (*e.g.*, 1996), the coefficient on the distance to port variable is negative and significant, using the same specification as in Table 3, column 2.

Hence, our findings in the rice market suggest that in some years, some inland markets are isolated from coastal and international markets. In other years, however, the links are re-established. To the extent that it is local supply and demand characteristics that determine the participation and not a policy intervention (or infrastructure failure) that artificially isolates a region, the findings are consistent with China having well-functioning, though emerging markets.[8]

Integration tests

In this section we use more formal tests of market integration. Cointegration statistics measure the proportion of movement in one price that is transmitted to another price during the period of observation. The coefficient on the "causing" price is bounded between 0 and 1, where 0 indicates that there is no impact on the "affected" price variable (and thus markets are not integrated), and where 1 indicates that markets completely adjust within the analysis period. A coefficient inside the 0-1 interval indicates that prices adjust only partially within the period of observation (or that markets are integrated but frictions slow down price transmission). Two markets are cointegrated if the coefficient is not different than one at a 5% level of significance.

The results of the cointegration analysis support both our descriptive findings and the conclusions of the determinants of commodity price analysis in the previous page, especially when they are compared to the findings of research on market integration in the late 1980s and early 1990s (Table 4). In the middle part of the reform period (1988 to 1995), a time when markets were starting to emerge (Park *et al.*, 2002), an analysis using the same data as used in our present study found that between 20 to 25% of markets showed signs that prices were moving together during the study periods and sub-periods.

8. Maize, soybeans and rice prices also vary in most cases in most years with the development of the regional infrastructure (Table 3 and 4, rows 2 and 3). In most regressions, the signs of the coefficients on the distance from the nearest national road and distance to the nearest rail variables are negative and significant in many of those cases. As one would expect, when a market is one with a major road or rail link, the cost of getting that grain into the national marketing network and to the consumption centre is lower and so the price of procurement would be higher. The further away the market is, the lower the price (in most cases). Such a finding is also consistent with competitive and integrated markets.

According to their findings, although there were many market pairs in which prices did not move together, between the late 1980s and mid-1990s, there was evidence of rising integration.

Table 4. **Percentage of market pairs that test positive for being integrated based on Dickey Fuller Test in rural China, 1989 to 2000**

Commodity	1989-1995	1996-2000
	(% of Market Pairs)	
Maize	28	89
Soybeans	28	68
Rice, Yellow River Valley (mostly japonica rice)	25	60
Rice, Yangtse Valley and South China (mostly indica rice)	25	47

Note: Results for two periods from same data set. For results from 1989 to 1995 for maize and rice, see Rozelle *et al.* (2000). Rice results are for the whole country in 1989-1995. Results from soybeans for 1989 to 1995 from Wang (1998). Results from 1996 to 2000 are by authors.

Using the Park *et al.* (2002) study as a base line, our current analysis shows that during the late 1990s, China's markets have not only continued along their previous path of maturation, but especially those for maize and soybeans, are also remarkably integrated. In the late 1990s, examining the co-movement of prices between pairs of markets in our sample, we see a large increase in the number of integrated markets. In the case of maize, for example, in 89% of the cases, prices in one market move at the same time as in another (Table 4, column 2). This is up from only 28% of the time in the early 1990s. The number of pairs of markets for soybeans, japonica and indica rice show similar increases (rows 2 to 4).

Moreover, in many cases these markets were separated by more than a 1 000 kilometres. For example, we frequently found prices to be integrated between markets in Shaanxi and Guangdong provinces and between those in Sichuan province and southern Jiangsu. Interviews with traders in remote parts of China support our findings. In one case, we were interviewing traders in northern Shaanxi, more than 200 kilometres north of Xian, the provincial capital. We found that on a daily basis purchasing agents of a large trading network originating in Guangdong would phone their regional headquarters nearly everyday receiving price guidelines for procurement. The regional co-ordinators, in turn, stayed in nearly constant contact with those in South China, the destination of much of their purchases. To the extent that there are many such networks (and indeed one can not help but run into grain buyers many times in any given day when working in villages in rural China), it is unsurprising that price data from the local markets in a remote inland location would more or less move with data collected from markets in the coastal regions.

Based on each of the market performance analyses, the impacts of WTO on China's agriculture will be experienced across many regions, a finding that has both positive and negative implications for China's rural residents. First, to the extent that WTO will lead to price falls at the border (see previous section for discussion of the complicated set of factors that this realisation will depend on), farmers of certain crops – most likely maize, cotton, wheat, and soybean – will suffer a cut in revenue. However, if prices rise due to China's accession because agricultural traders are able to increase their exports, integration will allow some of China's farmers to benefit.

Moreover, if China's markets are broadly linked across large regions of the country, the mere market size and number of people who will be affected actually may help attenuate the effect of negative impacts, at least as long as China's TRQ commitments are relatively low. The main reason for this

attenuation is that the bigger the region over which the price effect of a given quantity of increased imports is spread, the smaller the price effect will be (on the region in question). To illustrate this point, assume an extreme case. If markets in China were completely isolated (in other words between the local areas around a major port and inland regions), one would expect the price in coastal cities to fall immediately from the current price to the international price level, making any price gap disappear completely. Inland areas (which have been shown to be above the world market price), however, would not be affected and the price received in the inland area would depend on its own supply and demand. Even if prices in the inland region were higher, the price gap between that region and the world market would persist. At the other extreme, if markets were perfectly integrated, the reduction in the price gap would be somewhere between zero and the full amount of the reduction, depending on the quantity that was imported. Since China's TRQs are relatively small and since markets appear to be fairly well integrated during most years, it is plausible to expect that the price fall will be relatively small. Of course, in this case, this means that it would be more likely that the entire amount of the TRQ would be imported.

Conclusion

In this paper, which focuses on the agricultural sector, we show that in the cases of some commodities in some regions of the country, farmers will be negatively affected by WTO accession. Especially in the cases of maize, soybeans, sugar and cotton, the price gaps that exist between the prices of China and the world will mean that imports should flow inwards as the WTO agreement is implemented. However, even if the short run negative effects on agriculture are substantial, there will be many other indirect effects due to the WTO. To the extent that it positively affects the efficiency of the rural economy, the economy in the longer run should be stronger and result in broadly positive effects. Moreover, the negative effects can be mitigated by the ability of households being able to respond in their production and investment decisions. Hence, as China enters the 21st century, it should combine trade policy and investment liberalisation policy with a number of other transition and rural development policies in order to push for as rapid a evolution of China towards a modern economy as possible.

Moreover, our study's focus on the agricultural sector showed that even in agriculture the mix would not all be negative. Our findings, based on new methods to collect data and create NPRs, suggest that there are also commodities in which China has considerable comparative advantage – *e.g.*, rice, meats (some parts), and horticulture products and, hence, WTO accession could provide benefits to those engaged in these activities. China needs to pursue policies that will encourage the export of these commodities.

The extent to which prices fall (from rising imports) or rise (from rising exports) in part depends on how China's executes its WTO obligations. Although there may be room for footdragging (which could delay the negative effects), it is more important to note that the nature of the agreement itself also provides many ways by which to limit the downside effects. Likewise, China's benefits are going to depend on how well their trading partners honour their commitment and provide China with better access to global markets. We suggest that rather than footdragging, China would be better using some of its capital and goodwill to fight measures in its trading partners, such as Japan's safeguards against mushrooms. Here, China has already had a huge, unheralded win by getting Japan to move from its original proposal for WTO illegal SPS measures to safeguards that are transparent and temporary. Complainants against foreign trade barriers in WTO tend to have a high success rate. To gain the most in the long run from the agreement, both China and its partners need to try to live up to their agreements in practice.

Our paper also found that unlike the case of Mexico, it appears as if many of China's markets may be fairly well-integrated into the rest of the economy. This is good news and bad news for poor farmers in inland areas. The good news is that they can benefit from falling input prices and rising export opportunities. The bad news is that unlike a large number of maize farmers in Mexico who were not affected by NAFTA's reduction in maize import restrictions, if our results are correct for large parts of China, its farmers will be affected. The problem, although it is in the short run, may be that it is this group of rural households that are most dependent on agriculture and least able to be flexible. Consequently, our findings should be taken as a warning to government leaders that they need to begin to be concerned about the welfare of these susceptible groups.

Appendix Table 1. **A summary of price data and key determinants for rice, maize and soybeans in China, 1996 to 2000**

	1996	1997	1998	1999	2000
Rice					
Price (average annual price)	3.01	2.32	2.27	2.15	1.81
Average distance from the port	-	-	-	-	882.22
Average distance from the railway	-	-	-	-	39.70
Average distance from the national hwy	-	-	-	-	11.97
Corn					
Price (average annual price)	1.56	1.22	1.32	N/A	N/A
Average distance from the port	-	-	-	-	1 125.91
Average distance from the railway	-	-	-	-	34.54
Average distance from the national hwy	-	-	-	-	13.17
Soybean					
Price (average annual price)	3.64	3.96	3.54	2.83	2.81
Average distance from the port	-	-	-	-	638.15
Average distance from the railway	-	-	-	-	18.93
Average distance from the national hwy	-	-	-	-	10.98

Source: Authors' Survey.

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MANAGING TARIFF QUOTAS FOR GRAINS IN CHINA: POSSIBLE EFFECTS ON IMPORTS AND DOMESTIC PRICES

By Harry de Gorter and Jianwen Liu
(Paper presented by Harry de Gorter)

Abstract

The paper analyses the effect of tariff-rate quotas on grain markets in China. An overview of the ever changing grain policy in China is given first, followed by the basic economics of a tariff-quota regime. Although alternative quota administrative methods have not been finalised in China, we describe the economic implications of alternative methods like licenses on demand and first come, first served. Tariff quotas are then analysed in the context of the grain market in China where COFCO and its provincial subordinate units still play a very important role in grain imports and exports. We show how domestic policy matters, including the market power of COFCO, control over exports and imports, and the effects of tariff quotas on domestic price changes. We describe how foreign competition and increased transparency in trade will inevitably lead to further reform of both the domestic grain marketing and international trade regimes.

I. Introduction

China has greatly changed its centrally planned grain economy since the market-oriented reform beginning in the late 1970s. The stated-owned grain purchasing and marketing enterprises which previously had monopoly and/or monopsony power are now facing a larger degree of competition from private traders. However, the Cereals, Oils and Foodstuff Export/Import Corporation (COFCO) and its provincial subordinate units still play a very important role in grain imports and exports. After becoming a member country of the World Trade Organisation (WTO) in November 2001, China has agreed to a set of rules that replaces state trading with tariff rate quotas and expands market access by reducing tariff rates, allowing foreign firms to compete, and generating more transparency for foreign exporters. This will inevitably lead to further reform of both the domestic grain marketing and international trade regimes. Current policies and institutions will be difficult to sustain by expanding the shares of private importers and end users and making China's domestic market a more competitive one in the future.

The purpose of this paper is to analyse the effects of tariff quotas on grain markets in China. This is a difficult exercise because many policy details are still in flux like quota administration methods, potential changes in agricultural policies and government administrative organs. We first provide an overview of grain policy in China to provide a context for the analysis of tariff quotas. An outline of the economics of tariff quotas is followed by a discussion of the potential inefficiencies generated by alternative administration methods. Tariff quotas are then analysed in the context of the grain market in China and we show how domestic policy matters to domestic price changes, including the market power of COFCO, control over exports and imports, and the effects of TRQ. The last part of the paper provides conclusions.

II. Domestic grain policy and the interaction with the export/import regime

An overview of China's domestic grain marketing system reform since the late 1970s

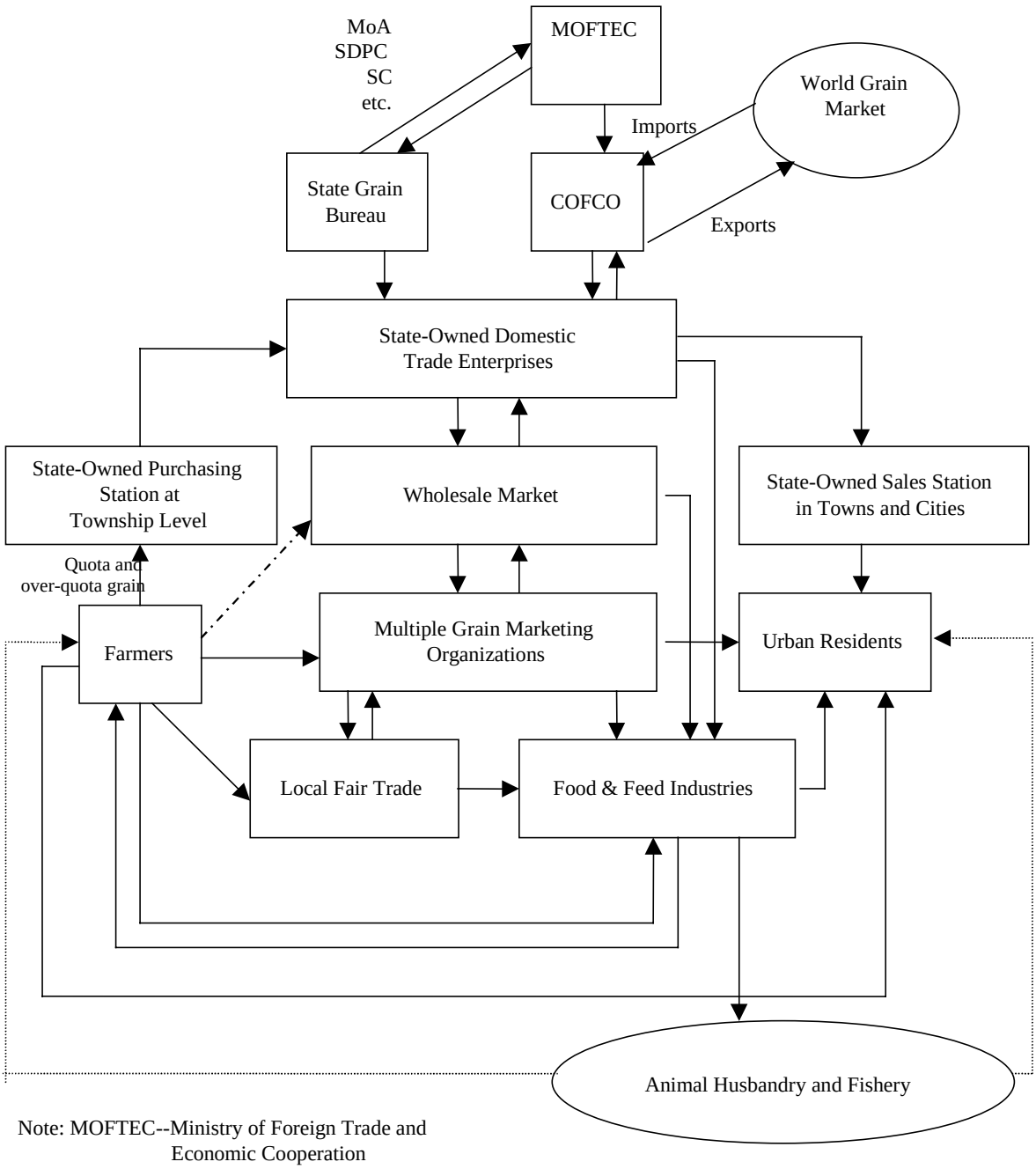
The original goal of China's grain production and marketing policy was to serve the national goal of industrialisation through central planning. Workers were to be provided basic food at extremely low prices to decrease the labour costs and accumulate agricultural surplus for industrialisation. Since the late 1970s, economic reforms marked a shift to a national policy of food security, maintenance of resources in agriculture, and enhanced farm incomes.

The path of reform of the domestic purchasing and marketing system in China has been gradual but steadily deepening since the late 1970s. The reform has passed three major stages and is currently undergoing a fourth stage of reform.

(1) The initial stage of reform: 1978-1984. In this stage, the monopoly-purchase prices, which had remained unchanged for more than 20 years, were raised an average of 20% in the summer of 1979, with the monopoly-purchasing, marketing and government pricing system still in place. For purchases in excess of the government procurement quota (above quota), the price was 50% above the new monopoly-purchase prices. Meanwhile, the government relinquished its control of grain sales by rehabilitating fair trade of grains in the countryside and began to encourage other marketing channels in the grain market as well. This reform, coinciding with the reform of land property rights, led to a dramatic increase in China's grain production, and thus in farm incomes.

(2) The dual grain purchasing and marketing system: 1985-1992. This was "the system of state contract purchasing with fixed quantity of grains" (government procurement quota) functioning together with free market in lieu of monopoly grain purchasing and marketing. The weighted average price for the contract purchased grains was 30% of the monopoly purchasing price (quota price) and 70% of the excess purchase price (above quota price) in the base year of 1979. The most important change in policy was that the market mechanism was primarily and legally admitted and the government allowed farmers to market their grains after the quotas were delivered (see Figure 1 below). As a result of the reform, the contract-purchased grains purchased from the free market accounted for 63% of total commercial grains in 1990, in contrast to monopoly-purchased grains accounting for 87% of total commercial grains in 1984 (Chen *et al.*, 2000). Apparently, the policy was to reform the monopoly purchasing system and to foster multiple marketing channels including individual farmers, farmer intermediary organisations, food processing industries, and other grain marketing organisations. In the meantime, the state marketing system was maintained and the "food ration coupon system" for urban residents was kept in place with low prices. This policy also led to a huge government financial burden, which in turn led to further reform in future years.

Figure 1. **China's grain purchasing and marketing system**



Note: MOFTEC--Ministry of Foreign Trade and Economic Cooperation
COFCO--China National Cereal, Oils, and Foodstuffs, Import and Export Corporation
MoA--Ministry of Agriculture
SDPC--State Development Planning Commission
SC--State Council

_ _ _ _ _ means "a few"
_ _ _ _ _ is not included in the grain marketing system

Source: Authors' depiction.

(3) Further liberalisation of domestic grain markets: 1992-1997. In order to eliminate the financial deficit created by price subsidies to grain consumption by urban residents, the government began to raise consumer prices for grains, which had stayed quite stable and low for more than two decades. Meanwhile, multiple grain marketing organisations were encouraged to function. The average monopoly consumption price was raised by 50% in 1991 and 1992, when the government began to change its urban-consumer-centred bias to address the importance of further reform of the grain marketing system and the importance of increasing grain production and farm income. As a result, the consumer price subsidy was reduced by 16%, and the producer price of grains raised again by 20% in 1992. The motivation of this policy was to eliminate the subsidies to urban consumers, to balance the financial budget, and to allow the "invisible hand" to determine market prices according to supply and demand. In fact, most provinces began to abolish the monopoly-purchase marketing system and to bring the market mechanism into play in 1993. It seemed that the market mechanism was going to play an important role in the grain markets of China. Unfortunately, there was a fluctuation in grain production, specifically a decrease of rice production in the last half of 1993, resulting in a sharp increase in grain prices in southern China and eventually enveloping the price in the north. The central government changed the original reform schedule, and reinstated monopolistic measures for purchases and sales of grains through state grain enterprises. Instead, a new policy known as "the Governor's Grain-Bag Responsibility System" (GGBRS) was initiated to be implemented in 1994, which emphasised the importance of the balance of grain supply and demand at provincial level. It addressed the importance of increasing grain production so as to keep market prices stable and to increase farmer income, and to ensure national food security. In order to keep the balance of grain supply and demand at the provincial level, provinces were required to establish their own risk funds of grains, to keep adequate quantities of grain in storage, and to import/export grains between provinces to balance the local supply and demand.

(4) The recent reform period: 1998-current: The current stage of reform can be characterised as a period of implementing an integrated set of measures in reforming the state grain enterprises and improving the functioning of the grain market system. The contents of the reform are "four separations and one improvement". The separations are: of government agencies from state grain enterprises; of the responsibilities of the central government from those of the local governments; of grain storage from grain trade; and of new accounts from the old ones. The improvement was to be in the pricing system of grains. The concrete institutions were "three policies and one reform", which are:

- *Unlimited purchase of grains at protection prices*. The objectives of this measure are to increase farmer income and stabilise grain production when market prices decrease below the protection prices; to concentrate most grain resources in the hands of state grain enterprises by prohibiting other grain channels from purchasing grains directly from farmers so as to achieve the following goal of profitability.

- *Selling grains at profitable prices*. The state grain enterprises must sell grains at a price that not only covers the managing and marketing costs but also makes enough profit to avoid new budget deficits and default loans that would require the government to stop grain storage subsidies and gradual resolution of defaulted loans.

- *Closed circulation of grain procurement funds of the Agricultural Development Bank of China (ADBC)*. ADBC, as an agricultural policy bank of China, provides the purchase funds (loans) for grains, cotton and oilseeds to the state-owned enterprises. The ADBC can only provide the purchase funds (loans) to the enterprises in accordance with the purchasing schedule and quantities of grains. The enterprises must ensure the funds are

only used for grain purchases. Otherwise, the bank must stop providing funds to the enterprises.

– *Deepening the reform of state grain enterprises*. The new policy requires the state grain enterprises to move from operating as a monopoly to market competition, and establish an independent management pattern by which the enterprises take the responsibility for their profits or losses from grain marketing and management. In order to enable the policy system to work, certain measures were adopted, such as improving government supervision of the grain purchase market; creating positive conditions for the reform of the management mechanism of state enterprises (*e.g.*, reducing employees in the enterprises to decrease costs); and provide incentives for the governor at each level of local government, etc.

Since 2000, new reforms have been implemented including the elimination of unlimited purchases at protection prices for some varieties with poor quality and low market demand such as early indica rice, maize in the south, spring wheat in the north and all wheat in the south. In addition, the price difference between grains of varying quality has been widened, the grain subsidies provided by the central government are now fixed and the grain processing and feed enterprises are allowed to procure grains for their own use. The policy led to an almost immediate adjustment in the mix of crops produced. Farmers have begun planting varieties to improve grain quality. Furthermore, the central government implemented a more liberalised policy that allowed the grain deficit regions to keep their grain balance not by local grain production but by importing grains from surplus regions and encouraging the two regions to co-ordinate grain supply and demand.

How domestic grain marketing system interacts with international trade

China began to reform its international grain trade regime after 1989. The major characteristic of the reform is the China's National Cereals, Oils and Foodstuffs Import and Export Corporation, the central COFCO, being separated from its subordinate provincial units and entering into competition with them in agricultural trade. After a decade of reform, the essential characteristics of the basic institutions that determine the amount of grain exports/imports has been maintained. A set of government agencies co-ordinate and consult together to work out a grain trade plan if exports or imports are deemed necessary. These agencies include the State Council (SC), the State Development Planning Commission (SDPC), the State Grain Bureau (SGB), the State Administration of Grain Reserves (SAGR), the Domestic Trade Bureau (DTB), the Ministry of Foreign Trade and Economic Co-operation (MOFTEC), the Ministry of Finance (MoF), and the Ministry of Agriculture (MoA) and so on.

The SGB and its subordinate provincial units organise grain supply using the "Grain Supply-Demand Balance Tables (GSDBT)" including the indices of domestic production, various consumption needs, import/export and the stocks. The SGB fixes the amount of grain to be purchased at the fixed quota price for each province, and the subordinate provincial units of SGB allocate the quota to prefecture level, then county level and down to village level, and the villages allocate quotas to individual farmer households according to their land scale. Farmers deliver the quota grains at the fixed quota price and sell their grains at above quota prices to the SGB's township purchasing station. It is the SGB's responsibility to store, transport and distribute the purchased and imported grains according to a distribution plan.

When there is a need to export/import grains, the MOFTEC then requires COFCO to purchase or sell grains at the world market price. COFCO receives a fee for exports/imports of grains. For grain

imports, MOFTEC requires COFCO to purchase specified quantities of specific grains and then transfers the grains to SGB based on the "Government Fixed Imported Grain Transfer Prices (GFIGTP)". These prices are based on the average procurement prices of the same type of imported grains purchased in China. If the average procurement price is above the imported price, the surplus is turned over to the SGB. If the average procurement price is lower than the import price, then the Ministry of Finance subsidises the SGB's subordinate units for the losses of distributing the imports.

When there is a need to export grains, MOFTEC requires COFCO to sell the fixed quantities of grains at the fixed "Government Fixed Exported Grain Transfer Prices (GFEGPT)". The prices are fixed according to the following formula:

$$GFEGTP = (PI + CE) * (1 + I)$$

where PI is the internal transfer prices in the SGB (the sum of procurement prices in the province); CE is the export operation costs, including price differentials for quality variations and additional processing costs for meeting export standards and contract requirements; and I is the interest rate paid.

III. The economics of tariff-rate quotas and the effects of trade liberalisation

The effects of trade liberalisation depend critically on which of the three basic regimes is operational to begin with (the quota, the in-quota tariff or the out-of-quota tariff), the trade liberalisation option under consideration (lowering either tariff or increasing the quota level), and how close one is to a regime switch with trade liberalisation. It is important to be able to identify the condition under which the quota or either tier tariff becomes effective, *i.e.*, which policy instrument is the constraint and so determines the level of imports and domestic/world prices. One can then describe the interaction between the tariffs and quota in their effects on trade and welfare, and the distribution of quota rents and tariff revenues. Liberalising trade via a reduction in tariffs has a different effect on these variables than increasing quota levels.

Let us formally define the three basic policy instruments in a tariff-quota scheme: the import quota Q^{quota}; the tariff t_1 on in-quota imports (including possibly over-quota imports), and the higher tariff t_2 on out-of-quota imports.[1] Only one of the import tariffs or the quota can be *effective* in determining imports and domestic/world prices, rendering the other two policy instruments *redundant.* For a tariff to be effective, therefore, it must change the volume of trade from the bound quota level. Otherwise, each tariff is redundant and the quota becomes effective, in which case the world price plus the out-of-quota tariff must be greater than (and the world price plus the in-quota tariff must be less than) the domestic price resulting from the import quota alone.

The in-quota tariff can be effective when the world price plus the in-quota tariff is greater than the unobserved or 'what if' domestic price that would have occurred if the import quota was the only policy instrument (likewise for the out-of-quota tariff if the world price including the out-of-quota tariff is below the hypothetical import determining domestic price).

1. We ignore the possibility of quota under-fill (other than that due to the in-quota tariff being the effective instrument), over-quota imports with government discretion at in-quota tariffs (where imports can be above the quota), quota and non-quota imports at preferential tariff rates, and "non-notified" import quotas.

Figure 2 shows that if the quota level is very high and close to the free trade level (*i.e.* such as Q_1^{quota} which is close to the intersection of the excess demand curve ED and the excess supply curve ES), then the in-quota tariff t_1 is effective and the domestic price = $P_W + t_1$. A tariff causes a wedge between the domestic price and the world price P_W. The equilibrium is determined when the wedge between the excess supply (determining P_W) and the excess demand (determining the domestic price) curves is equal to the tariff. This equilibrium determines total imports that are lower than free trade levels. Indeed, when the in-quota tariff t_1 is effective, imports would be at the maximum level M^*_{MAX} in Figure 2 and will remain so as long as the quota level is to the right of M^*_{MAX}. The resulting domestic price would be at the minimum P_{MIN} and quota under-fill occurs.

If, on the other hand, the quota is very low and close to the origin like Q_2^{quota} in Figure 2, then the out-of-quota tariff t_2 is effective. The out-of-quota tariff determines the minimum level of total imports M^*_{MIN} and the maximum possible domestic price P_{MAX} occur under this scenario. Because the quota level is to the left of the minimum level of total imports (the requirement for the t_2 tariff to be effective in the first place), out-of-quota imports occur. If the quota falls between the minimum and maximum level of imports, then the quota is effective in determining the domestic price like that depicted by Q_e^{quota} in Figure 2.

Hence, there are three possible regimes over all levels of the import tariff rate quota:

- The "in-quota tariff regime" where the lower in-quota tariff t_1 is operative (for example, Q_1^{quota} in Figure 2), where quota rents and out-of-quota revenues are zero, but in-quota tariff revenues are areas *c+f+h+i*.

- The "out-of-quota tariff regime" where the higher out-of-quota tariff t_2 is operative (for example, Q_2^{quota} in Figure 2), where quota rents equal areas *a+b*, out-of-quota tariff revenues are areas *d+e+f*, and in-quota tariff revenues of area *c*.

- The "quota regime" where the import quota (for example, Q_e^{quota} in Figure 2) determines price, where quota rents are areas *b+e+g*, in-quota tariff revenues are areas *c+f+h*, and out-of-quota tariff revenues are zero.

The implications for trade negotiations

The analysis in Figure 2 demonstrates that, depending on the regime in effect, only one instrument can be effective at a time, so reducing either tariff (namely, the effective one) or increasing the quota will result in trade liberalisation. Therefore, negotiators need to identify and change the one policy instrument of the three that is effective to begin with in order to maximise the effects of trade liberalisation. Under some circumstances, regime switches could occur (perhaps with only small changes in the one effective policy instrument). A further reduction in the tariff (or an increase in the quota) would then become ineffective in liberalising trade. To counter this, it is important to not only identify the effective instrument in the current situation but also how soon the instrument becomes redundant upon liberalisation. To do this, one can compare the relative level of out-of-quota imports to the quota and the quota fill rate. This provides information about how close one is to a regime switch.

Consider, for example, the case where t^*_e is close to but less than t^*_2 (*i.e.*, imagine Q_e^{quota} in Figure 2 to be close to but to the right of M^*_{MIN}), where t^*_e is the tariff equivalent of the binding quota. A small reduction in the out-of-quota tariff rate t_2 will have no impact on imports. A simultaneous increase in the quota will be required in order for trade liberalisation to occur. However, once t^*_2 reaches t^*_e (the tariff equivalent when the quota is binding), further decreases in the rate t_2 will have maximal effect in

liberalising trade. Hence, for such cases where t^*_e is close to t^*_2, it may be sufficient to focus on negotiating significant reductions in the tariff rate t_2 only.

Table 1 summarises the effects of alternative trade liberalisation scenarios. Notice that when the out-of-quota tariff rate t_2 is effective (like with Q_2^{quota} in Figure 2), then an increase in the quota has no volume effect initially until imports under the quota are greater than M^*_{MIN}. Conversely, when the quota is initially effective (like Q_e^{quota} in Figure 2), then a decrease in the tariff rate t_2 has no effect unless t_2 goes so low as to generate imports beyond the quota level Q_e^{quota}. Hence, because the domestic price with a quota (world price plus some tariff equivalent t_e) described earlier is unobserved when the quota is not effective, it is sufficient to observe how large out-of-quota imports are relative to the quota, or the quota fill rate. This gives information on how close the unobserved t_e plus the world price is to the domestic price. Indeed, to avoid an instrument becoming redundant upon liberalisation, it may be necessary to have at least two liberalising instruments at the same time.

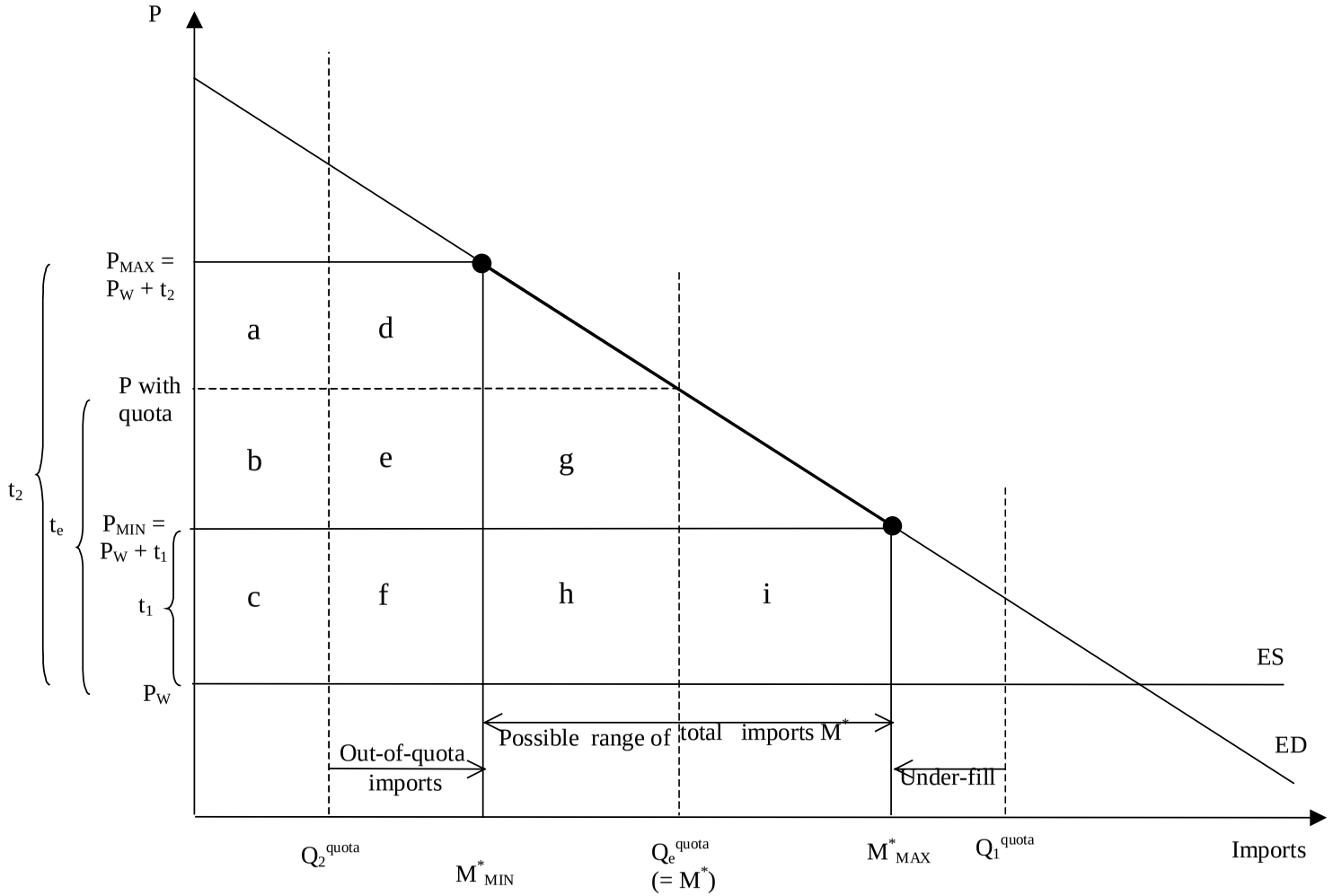
To summarise, in order to liberalise trade, negotiators should especially focus on reducing out-of-quota tariffs, in those cases with out-of-quota imports or if the out-of-quota tariff t_2 is close to the tariff equivalent of the quota t_e. If t_e is far below t_2, increasing the quota will have a greater chance of liberalising trade in the short run. A reduction in t_1 will liberalise trade only if t_2 is close to and below t_1, in which case both tariffs need to be reduced, or if under-fill is significant because t_1 is effective — otherwise, quotas will also have to be increased in order to obtain trade-liberalising effects. This is highlighted in Table 1 where one notices that many cells have '0' in them. This analysis shows the importance of understanding the relationship between three tariffs: the in-quota tariff t_1, the out-of-quota tariff t_2 and the tariff equivalent of the quota when the quota is effective (where the latter can be derived from observed domestic market and world prices).

IV. The administration of tariff-quotas for grains and its impact on domestic prices

Alternative quota administration methods

There are several administrative methods plus four categories of additional conditions that are reported to the WTO for agriculture (Table 2). Almost 50% of the total 1 371 + agricultural tariff quotas scheduled in the WTO are administered by "applied tariffs". An applied tariff regime means no quota shares are allocated and imports are allowed in unlimited quantities at the in-quota tariff rate or lower. "Licenses on demand" are 25% of the administration methods whereby import licenses are allocated in relation to quantities demanded (and requests are typically reduced pro rata if they exceed the quota volume). "First come, first served" is the third most commonly used administration method where imports are allowed in at the in-quota tariff rate until the quota is filled. "Historical allocation" is a method whereby licenses are issued in relation to past imports while "auctions" result in licenses allocated on the basis of a competitive bid system. Imports directly controlled by "state trading enterprises" and "producer groups" are the remaining major type of administration methods of tariff quotas.

Figure 2. **The economics of the 3 tariff-quota regimes**



Source: International Agricultural Trade Research Consortium (IATRC), 2001.

Table 1. **Effects of trade liberalisation with TRQs**

Baseline (initial situation)	Policy Change	- - - - change in - - - -					
		Imports	Farm Welfare	Efficiency	t_1 revenue	t_2 revenue	Quota rents
t_1 effective (Q_1^{quota})	Decrease t_1	+	-	+	+ or -[1]	0	0[2]
	Decrease t_2	0[3]	0	0	0	0	0
	Increase quota	0	0	0	0	0	0
t_2 effective (Q_2^{quota})	Decrease t_1	0	0	0	-	0	+
	Decrease t_2	+	-	+	0	+ or -[1]	-
	Increase quota	0 then + if $M > M^*_{MIN}$	0 then - if $M > M^*_{MIN}$	0 then + if $M > M^*_{MIN}$	0 then + if $M > M^*_{MIN}$	- then 0 if $M > M^*_{MIN}$	+ then + or -[1] if $M > M^*_{MIN}$
quota effective (Q_e^{quota})	Decrease t_1	0	0	0	-	0	+
	Decrease t_2	0 then + if $M > Q_e^{quota}$	0 then - if $M > Q_e^{quota}$	0 then + if $M > Q_e^{quota}$	0	0 then + if $M > Q_e^{quota}$	0 then - if $M > Q_e^{quota}$
	Increase quota	+	-	+	+	0	+ or -[1]

1.Outcome depends on the elasticity of excess demand and excess supply.
2. If t_1 goes so low that the quota becomes effective, then quota rents are generated.
3. If t_2 falls below t_1 (as has happened in some cases), then imports increase.
Source: International Agricultural Trade Research Consortium (IATRC), 2001.

Additional conditions are also often specified, like a domestic purchase requirement (a condition requiring the purchase of domestic production of the product in order to be eligible), limits on tariff quota shares (limits the maximum share or quantity of the quota allowed), export certificates (requires an export certificate administered by the exporting country), and past trading performance (limits eligibility to established importers of the product concerned). Each of these conditions can lead to wasteful rent seeking activities as well. A domestic purchase requirement increases the cost for some importing firms that otherwise would not be involved in domestic production. Thus, part of the quota rents is dissipated and fill rates would be lower as domestic consumption declines and production increases. Limits on quota shares do not allow for economies of size and co-ordination, again resulting in the dissipation of quota rents. Limits on quota shares discriminate against more distant suppliers for whom shipload amounts are the economic size of shipment, rather than truckload lots, for example. Export certificate requirements that are non-tradable and allocate the rights to rents to higher cost exporters as could the condition of past trading performance, can both lead to partial dissipation of quota rents.

Table 2. **Methods of TRQ administration in agriculture worldwide**

		%
Applied tariff	Unlimited imports at in-quota tariff & quota not enforced	47
License on demand	Licenses to import at the in-quota tariff allocated to those who apply. If the demand for licenses exceeds the quota, the import volume requested is prorated	25
First-come, first-served	The first units of imports are charged the in-quota tariff until the quota is filled, all subsequent imports are charged the over-quota tariff	11
Historical	Licenses in proportion to import market shares in a base period	5
Auction	The right to import at the in-quota tariff is auctioned	4
State trader Producer group	The right to import in-quota is granted to a state trading organisation or producer group	2
Mixed	A combination of two or more of the seven methods	4
Other or not specified	Methods that do not correspond to the seven methods above or are not specified in WTO notifications	2

Source: Calculated from the World Trade Organisation 2000a, b. "Tariff Quota Administration Methods and Tariff Quota Fill." Background Paper by the Secretariat, 6 November (AIE/S4) and "Tariff and Other Quotas", 23 May 2000 G/AG/NG/S7 and /S8.

The sources of inefficiency due to quota administration methods are manifold and we will only discuss the most common methods here in detail. It is not clear what methods China will adopt but the following options we analyse now have been discussed.

Licenses on demand

Import licenses are allocated to individual firms pro rated on the difference between the quota level and the total amount of licenses requested. Over subscription can result in uneconomic quantities allocated to each applicant. This method also enables higher cost importers to obtain the rights to the rents if the licenses are non-tradable. Only *bona fide* importing firms qualify for licenses in the current period, which means that each firm had to be an importer in the previous period. Thus, firms will rent seek by incurring losses in importing in order to receive valuable quotas in the future.

Inefficiency increases with licenses on demand because low cost firms on average get fewer licenses than with a penalty for unused quotas and quota under fill occurs that creates an additional deadweight cost. Transfer of licenses to the high cost participants increases the gap between the desired and actual number of licenses for the low cost participants. In addition, these transferred licenses are left unused by the high cost firms as these only retain their desired levels. The higher cost the firm, the closer their license allocation to their desired quantity and the higher the probability that they receive exactly their desired quantity. Allocating licenses-by-demand enables high cost firms to remain in business and achieve license allocation that under an efficient outcome would be assigned to low cost firms. The inefficient distribution of licenses across firms generates economic waste of quota rents with the extra costs associated with importation. Thus, relative to both the auction and first come first served methods, a license on demand administration method generates waste through its inability to eliminate the inefficient firms.

As long as the total quantity demanded exceeds the quota amount, the quota will be fully filled. This is because there is a high penalty for failure to use awarded licenses. This penalty may take a form of a non-refundable down payment when firms receive their awarded licenses at the beginning of the year. In case of agriculture, European Union importers are often required to pay 20% of the value of the product in advance.

The presence of fixed costs has an indeterminate effect on deadweight cost. It may decrease the inefficiency if the fixed costs prevent the highest cost importers from bidding. Relative to the case with zero fixed costs and the same variable cost function, fixed costs add to the deadweight cost because they constitute an additional cost for the firms that should be out of business. The same reasoning applies to a decrease in the revenue margin due to an increase in the in-quota tariff (for tariff quotas) or the world price, or a decrease in the domestic price due to some economic shock. The absolute level of inefficiency may decrease due to an elimination of the highest cost importers but relative distortion for the remaining firms still exists. An increase in the quota, on the other hand, decreases inefficiency through reducing the relative distortion. The high cost firms that originally received their optimal amount will remain at their desired levels and the quota expansion is transferred to the lower cost firms. In addition, per unit rent declines, increasing the probability that the highest cost firm will not participate. Hence, trade liberalisation by reducing in-quota tariffs or expanding quotas will reduce the inefficiency of the licenses-on-demand method. When a limit on the licenses received by each firm is imposed, inefficiency increases because the limit will be more binding on low cost firms. This result is in sharp contrast to that of non-transferable rents with historical allocation (as assumed in Lott, for example).

An increase in the per unit quota rent brought about by either a decrease in the in-quota tariff or change in world or domestic prices will result in a decline in deadweight costs if the highest cost firm is forced to exit the bidding process. The per firm deadweight costs of the remaining higher cost firms increase but total deadweight costs decline. The identical effect on deadweight costs occurs if a license fee is imposed that forces the highest cost firm to exit.

For example, it is shown in the literature that if licenses are allocated inefficiently by the historical share method to higher cost importers, a reduction of in-quota tariffs may result in increased quota fill, whereas an increase in the quota may result in quota under-fill (IATRC). However, the opposite occurs with a licenses-on-demand method of allocating import quotas.

An increase in the quota through trade negotiations will have an indeterminate effect on deadweight costs because domestic prices fall (and world prices increase if a large importer) and so high cost importers may exit the bidding process [the outcome depends on the elasticity of excess demand (and excess supply if a large country importer)]. If there is no exit, then deadweight costs increases. A limit on the import licenses received by a firm can increase (but not decrease) deadweight costs but quota under fill never occurs. The implications of the various factors affecting the efficiency of licenses on demand are summarised in Table 3.

Table 3. **Efficiency of licenses on demand**

Factors that decrease inefficiency of licenses on demand:

- Fixed Costs
- Decrease in per unit quota rent due to:
  - increase in t_1
  - increase in world price
  - reduction in excess demand
- Non use license penalties
- Eliminate license fees
- Reduce limit on # of licenses per firm
- Allow trade in quotas and licenses

Source: Hranaiova, Falk and de Gorter 2002.

Historical importers

Allocating import licenses to importing firms or 'country specific' export quotas on the basis of historical shares can lead to a waste of global resources if the lowest cost exporting country or importing firm does not receive the rights to imports. Historical import allocation therefore enables high cost importing firms and/or high cost exporting countries to operate, leading to the partial dissipation of quota rents (provided licenses and quotas are non-tradable). If licenses are known to be allocated as a share of historical imports, firms may act strategically to increase market share.

The impact of trade liberalisation with historical shares has an opposite effect than that with licenses on demand. A reduction in the in-quota tariff increases the quota fill rate while an increase in the quota reduces the quota fill rate. These results are opposite to that of "licenses on demand" because, in the latter case, reducing tariffs results in an increase in high cost firm participation while increasing the

quota reduces high cost firm shares for a fixed rent (quota less of a constraint to low cost firms now) and rent also declines. A summary of the effects of the historical share method is given in Table 4.

Table 4. **Quotas based on historical import shares**

- High cost-importing firms operate because
  - Market conditions change over time across trading firms or exporting countries
  - Historical importers not competitive in first place
  - Strategic behaviour in "rent seeking" (*e.g.*, Chiquita and banana production in Africa)
- Effects of Trade Liberalisation:
  - Reduce in-quota tariff increases quota fill rate
  - Increase quota reduces quota fill rate

Results opposite to "licenses on demand" because reducing tariff increases high cost firm participation while increasing the quota reduces high cost firm shares for a fixed rent (quota less of a constraint to low cost firms now) and rent also declines

Source: Authors' summary.

First-Come, First–Served (FCFS)[2]

Of the tariff quotas in agriculture, a majority of them do not require import or export licenses (WTO, 2000). With no property rights assigned to these import quota rents, rent seeking can occur such that rents are dissipated. The WTO reports that almost 50% of the quotas are not binding in that a tariff is operational. However, of the remaining administration methods where the quota is binding, the WTO lists 147 official 'first-come first-served' (FCFS) situations.

With no import rights allocated to either the importer or the exporter, an exporter may not risk the costs of shipping the product and find that the quota has been filled. The costs of storage until the following quota season, of paying the higher out-of-quota tariff or of shipping the product elsewhere may be high. The costs for traders of establishing a business relationship over time with importers are also a factor contributing to under-fill. Exporters do not have information on who holds the import license. The first come, first served method is prone to wasting resources by concentrating imports at the beginning of the season, increasing costs for importers who have to store the product, and discriminating against exporters farther from the import market and with different seasons, generating higher exporting costs at the beginning of the quota year. First-come, first served can also encourage low value bulk shipments as exporters cannot guarantee customers regular shipments of finished products throughout the year.

The waiting in line literature implies rent dissipation through rent seeking (Barzel; Suen). Barzel shows that with perfect information rents are completely dissipated through waiting in line if agents are identical. With asymmetric valuations of the good, rent is dissipated only for the marginal

2. This section relies heavily on Chau, de Gorter and Hranaiova.

participant. The infra-marginal participants are still able to earn a part of the rent, resulting in under-dissipation of rents. Mitigating action while waiting in line such as storage can potentially cause over dissipation (Deacon and Sonstelie). Suen argues that the degree of rent dissipation depends on the degree of heterogeneity in individual valuations.

Both the rent seeking and waiting in line literatures assume that the marginal valuation (the price or per unit rent) of the rationed good is fixed. This will not always be the case for FCFS import quotas. Note that the literature has cases where rent is fully dissipated and sometimes even over dissipated.

However, in agriculture, the rent is reduced as imports occur earlier in the year. Rent can still be dissipated in wasteful activities (*e.g.*, lowest cost importers would import continuously over the year but because of the FCFS proviso, higher cost importers can compete) but can also be transferred to (or 'appropriated' by) domestic consumers because imports are 'hurried up', causing domestic prices to fall. Hence, the economics of FCFS import quotas differs from these models because rents are endogenous. Skully provides empirical evidence of imports mostly in the first month and domestic prices falling with FCFS import quotas.

If the product is not perishable with costless storage, the value of the product does not vary with the timing of the imports. Therefore, firms compete to be first by arriving before the market opens with the product in the port and form a queue. The waiting time rises, until in equilibrium, the money-plus-time price clears the market. Thus, when firms are homogenous, waiting dissipates the rent completely (Barzel).[3] Every firm arrives at the same optimal time that is before the supply is gone and no unnecessary waiting occurs (each firm chooses an optimal arrival time, given arrival times of all others). With zero serving time, the queue forms immediately such that the marginal valuation equals the price plus cost of waiting. When firms are asymmetric (*e.g.* different opportunity costs of time), everybody still waits the same time but only the marginal firm dissipates the rent completely. If there is "serving time" (*e.g.*, clearing customs, unloading etc.), then importing firms still wait the same amount of time but come at different times of the day (week or month) that are the serving time apart.

To motivate, consider a race to the border with FCFS quota but there is no queuing at the ports because of a perishable product like fresh lamb meat (and product has to be in port to queue). The result is that rents are reduced to zero but not dissipated, unlike the case analysed above. Instead, FCFS import quotas result in the domestic price being reduced to world price levels as importers compete for the rents. Once the quota limit is reached, the domestic price rises again but domestic consumers have appropriated the entire quota rent – rents are not dissipated in wasteful rent seeking activities. The same situation arises when product is non-perishable but storage costs are prohibitive.

State Trading Enterprises (STEs)

The one possible advantage of STEs that control imports directly or indirectly is that exporters only deal with only one entity, and hence do not face the transactions and information costs when dealing with many importing firms owning import licenses under other schemes. An STE is also more visible and so perhaps even scrutinised more with political pressures by foreign governments. The ability to seek rents is still possible, however. Some STEs deliberately allocate export quotas to higher cost exporters for political reasons (ABARE 1999), resulting in inefficiencies and inequities. STEs have the ability to restrict imports further to help farmers, provided it is in the purview of GATT rules.

3. Actions to mitigate costs of waiting like paying storage costs or pay others to wait may induce over- or under-dissipation of rents (Deacon and Sonstelie).

Many factors need to be analysed for an importing STE (Hranaiova and de Gorter). These are summarised in Table 5.

Table 5. **Analysing an STE for importing country**

2 things STE can control:

[A] Trade (exports and/or imports); *and/or*

[B] Domestic market structure (*e.g.*, imperfect market behaviour by controlling prices and quantities)

2 cases:

- No obligation to fill quota
- Obligation to fill quota if t_1 not binding (option to destroy)

3 potential objective functions:

- Maximise Producer Welfare
- Maximise Consumer Welfare
- Maximise Regulatory Intermediary Welfare

- Effect of STE depends on what instrument is binding initially under perfect competition (quota, t_1, t_2 or autarky)
- Effect of trade liberalisation depends on what instrument is binding initially under the STE equilibrium (quota, t_1, t_2 or autarky)

Source: Hranaiova and de Gorter 2002.

Producer groups

The control over imports by producer groups leads them to trade off the benefits from owning the quota rents and the loss in producer surplus through competition from imports. Failing to fill the quota is advantageous only if the quota rents are smaller than the loss in producer surplus due to increased imports (ABARE 1999). The outcome depends on the relative domestic supply/demand elasticities for the product, the level of the domestic price with imports (which depends on the world price and excess supply conditions in the world market) and the level of the import quota. There remains a problem of distributing the rents to farmers, which if blended with revenues from sales from domestic production, would cause an increase in domestic production and so reduce welfare. Another option is to destroy the imported product, representing a cost to farmers (unless the domestic government finances it on behalf of the producer group). Producer groups could instead import a product that is of inferior quality, thereby fulfilling their quota and at the same time maintaining income from domestic production provided the cross elasticity of demand is low.

Administrating tariff-rate quotas for grains in China

Grain quotas

China's accession to the WTO will bring major changes to all aspects of domestic and international policies for agriculture in China and bring about substantial market liberalisation. China decreased its average tariffs from 43% in l992 to 17% in l997 prior to its WTO accession. Under the accession

protocol of China, tariffs on many agricultural products are reduced, while import quotas for many commodities are rapidly expanded. Its overall average tariff for agricultural products will fall from 22% to 17% and from 31% to 14.5% for the US priority agricultural products by January 2004, with even sharper drops in tariffs for beef, poultry, pork, cheese, and other commodities.

China committed to set up tariff rate quotas for the sensitive "country strategic commodities" such as corn, wheat, rice, soybean oil, cotton and wool. The in-quota tariff for grains is 1%, while over-quota tariffs are at the level of 65% by the end of the implementation period (Table 6). China also made specific commitments to administer its tariff quotas so as to maximise the fill rate. Specifically, tariff quotas will be reallocated to other end users if they are not used. Moreover, a certain percentage of the tariff quota imports of each commodity will be allocated to non-state trading entities. If any proportion of the tariff quota allocated to state traders is not contracted for by October of any given year, it will be reallocated to non-state trading entities.

Table 6. **Tariff-rate quotas for grains, 2002-2004**

Commodity	Year	Quota Quantity mmt	In-quota tariff %	State trading		Non-state traders		Over-Quota Tariff %
				Percentage of quota quantity %	Quota quantity mmt	Percentage of quota quantity %	Quota quantity mmt	
Wheat	2002	8.468	1	90	7.6212	10	0.8468	71
	2003	9.052	1	90	8.1468	10	0.9052	68
	2004	9.636	1	90	8.6724	10	0.9636	65
Corn	2002	5.850	1--10	68	3.9780	32	1.872	71
	2003	6.525	1--10	64	4.1760	36	2.349	68
	2004	7.200	1--10	60	4.3200	40	2.88	65
Rice, short and round, Japonica	2002	1.995	1--9	50	0.9975	50	0.9975	71
	2003	2.3275	1--9	50	1.1638	50	1.1638	68
	2004	2.660	1--9	50	1.3300	50	1.33	65
Rice, long, Indica	2002	1.995	1--9	50	0.9975	50	0.9975	71
	2003	2.3275	1--9	50	1.1638	50	1.1638	68
	2004	2.660	1--9	50	1.3300	50	1.33	65
Rice in total	2002	3.990	1--9	50	1.9950	50	1.995	71
	2003	4.655	1--9	50	2.3275	50	2.3275	68
	2004	5.320	1--9	50	2.6600	50	2.66	65

Source: Information Centre, Ministry of Agriculture, China.

The agricultural import quotas in China are classified into two different categories: general imports and processing imports. The types of China's tariff quota administration for grains are mainly state trading and past importing performance plus some additional conditions. Non-state owned end users that apply for general import quotas should have satisfied processing or milling capacity. For example, an end user applying for wheat importation must have the capacity to process 400 tonnes of wheat daily, and a corn processing industry must meet the requirement of using 100 000 tonnes of corn per year for any production or 50 000 tonnes of corn to process feed. For rice import quotas, an end user must have the certificate to wholesale or retail grains, and its annual sales value must be above 200 million yuan, and a grain trader applying for rice import quota must have a historic record of export/import grains above USD 50 million per year. Those additional conditions eliminate the small

traders and end users and make the use of import quotas more efficient and will result in a higher fill rate.

Once the trader/end user gets the quota, it is required to get an import license from the TRQ administration office under the SDPC. The possible inefficiencies of such a license on demand procedure is discussed earlier.

Possible effects of TRQ imports on domestic grains prices

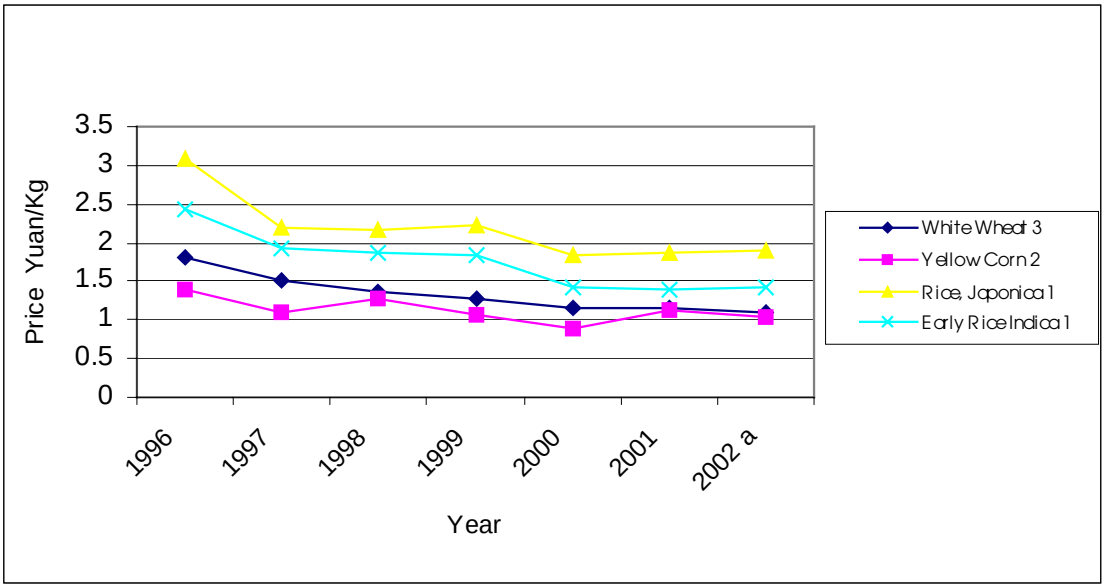
There is a serious common concern among policy makers, government officials, and researchers that China's WTO accession will lower domestic grain production and market prices, which will in turn decrease the national ability of maintaining grain self-sufficiency and farm income which is already a big concern of both farmers and the government. Some argue that tariff rate quota imports will bring big challenges to the land-intensive sector such as field crops like grains, cotton and soybeans. Domestic production of those sectors would shrink when facing the strong competition of foreign high quality and low price identical products. The tariff quota imports would not only influence domestic markets, it will lower the market price, which would create more supply surplus of the agricultural products and make agricultural restructuring more difficult. This will lead to a decrease in farm income and will create higher unemployment rates in rural sectors. Some argue that although tariff quotas will create better and bigger market shares for foreign products, the proportion of tariff quota imports to aggregate domestic production and consumption will still be reasonable and acceptable, when China's import rates for the grains are already at about the same level. The reality is that tariff quota imports have had little impact on domestic market prices in the past few months. Would China's domestic prices decrease in the future? How can one forecast China's production, consumption and trade trends for the future? These are the issues behind the analysis of the impact of tariff quota imports on domestic market prices. Here, we will provide some basic data analysis to show the potential effects of tariff quota imports on grain prices.

Changes in grain prices in China and the world market

To conduct the analysis, we choose the prices and products as follows: *Indica* rice price data from the Zhengzhou Grain Wholesale Market (ZGWM) and Thailand (FOB); yellow corn No. 2, price data from ZGWM and Mexican Bay (deliver price); soft red winter wheat No. 2 imported from the US compared to the first class Chinese winter wheat, data from Northwest Pacific Harbour (deliver price) and ZGWM.

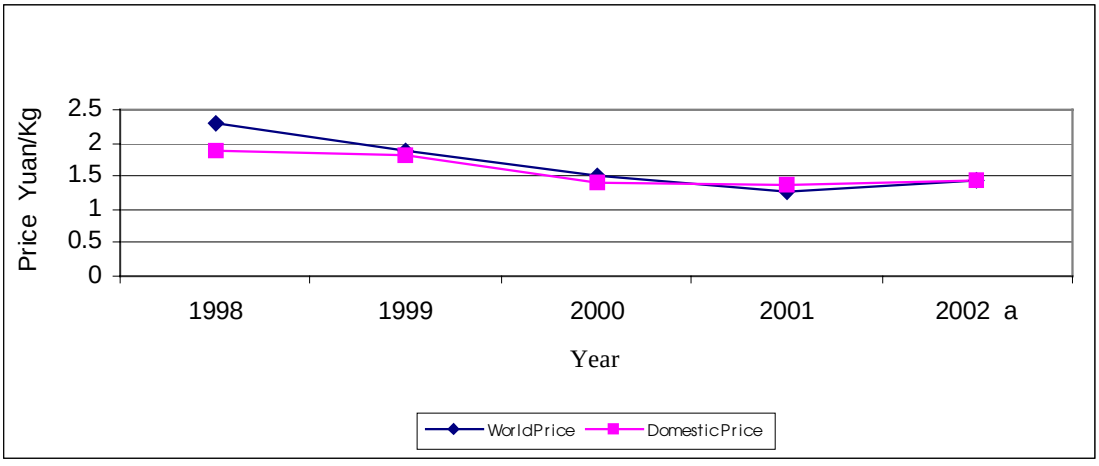
China's domestic grain market has experienced a price decrease since 1996. Agricultural productivity has increased significantly during the last two decades because of new agro-technology and improvements in extension services, which led China's agriculture to phase in a new stage of agricultural development, in which the output of grains increased under the "Grain Bag" policy, with an over supply of almost all agricultural products that has lasted since 1996. Figure 3 shows a decline trend of domestic wholesale prices of wheat, corn and rice during the past 6 years. Figures 4 through 6 show both domestic and international price changes. Figure 7 shows the changes of import/export of grains in the past few years.

Figure 3. **Annual average domestic wholesale prices for grains, 1996-2001**



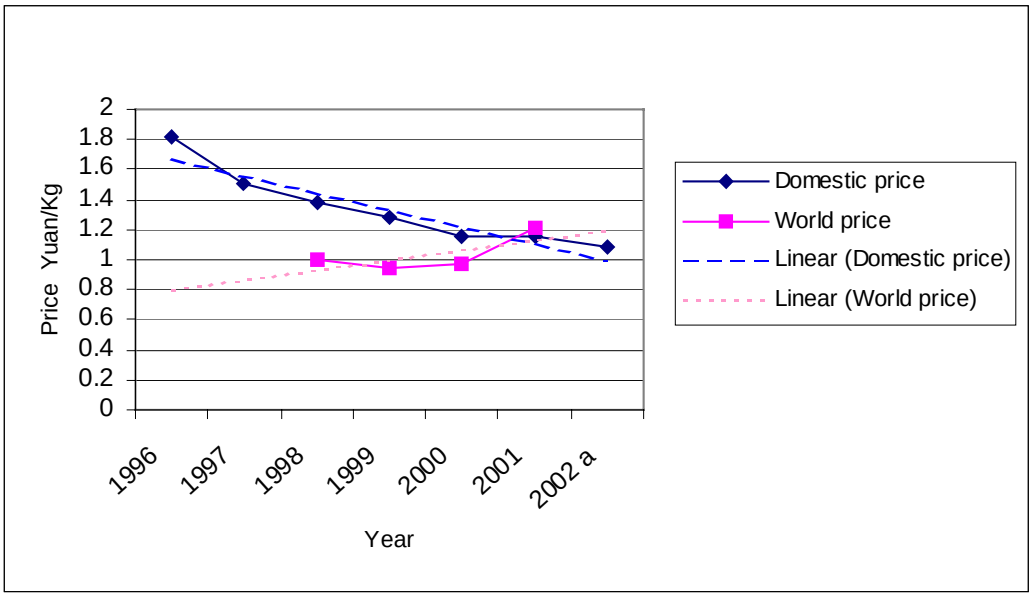
a) Two first months of 2002.
Source: Information Centre of the Ministry of Agriculture.

Figure 4. **Domestic and world prices for rice, 1998-2002**



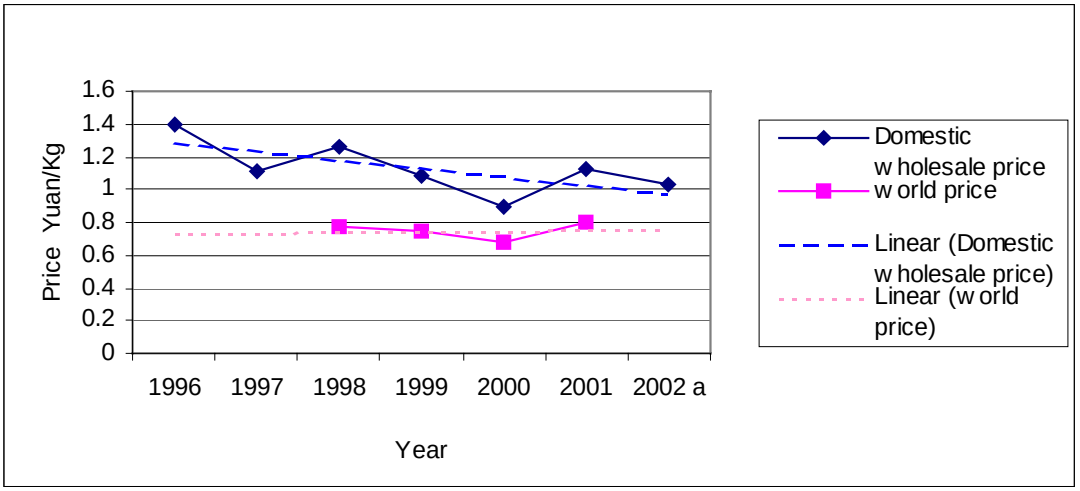
a) Two first months of 2002.
Source: Information Centre of the Ministry of Agriculture.

Figure 5. **Domestic and world prices for wheat, 1996-2002**



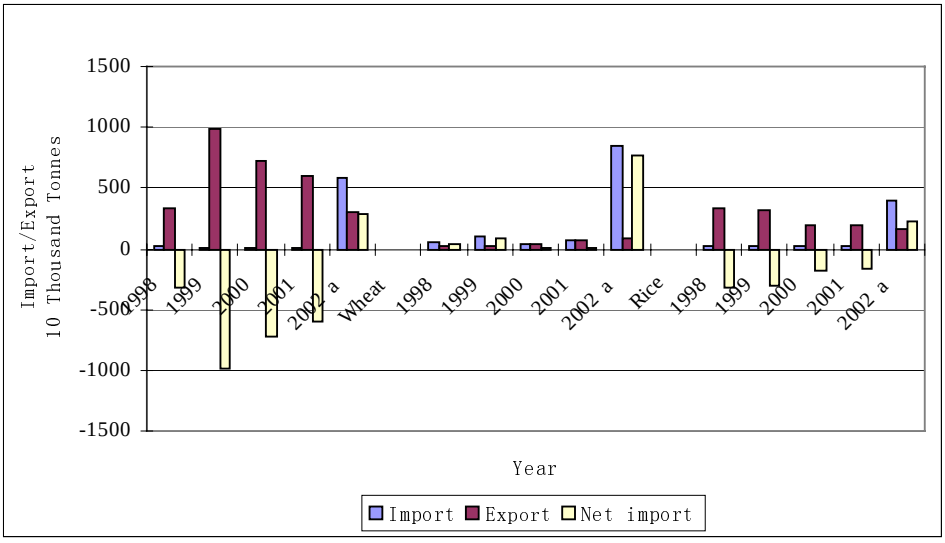
a) Two first months of 2002.
Source: Information Centre of the Ministry of Agriculture.

Figure 6. **Domestic and world prices for corn, 1996-2002**



a) Two first months of 2002.
Source: Information Centre of the Ministry of Agriculture.

Figure 7. **Import/export of grains in China, 1998-2002**



a) Two first months of 2002.
Source: Information Centre of the Ministry of Agriculture.

V. Conclusions

China will be a net beneficiary of WTO accession from world trade in the long run. Nevertheless, challenges will still be serious for both Chinese government and farmers. China will facilitate its domestic economic reforms and make the process of policy-making and the rules and regulations more transparent in complying with the WTO agreement. Reforms and liberalisation in China's trade laws and regulations are perhaps the most advanced, in part, because of its strategic role in the economy (Lardy). Through nearly 20 years of reform, China's foreign trade regime has gradually changed from a highly centralised, planned and import substitution regime to a more decentralised, market-oriented and export promotion one (Huang and Chen). These changes in trade and other policies have significantly affected the total and composition of China's trade in favour of the products in which China has a comparative advantage. On the other hand, as argued by Martin, while China's trade policies in most areas have been transformed in the reform era, trade in many agricultural goods remains under relatively non-transparent state trading arrangements. Accession to the WTO will be a critical time for China to push its trade reform in agricultural sector, including both tariff and non-tariff measures.

Changes in tariff policy are more straightforward and simpler than non-tariff policy reforms. China followed its tariff reduction schedule specified in the Protocol on the first day of 2002. Average tariff rates for agriculture were reduced from 21.2% in 1999 to 17% as of 2004, and 14.5% for the sensitive commodities of the US. China has also started to implement its three years of transition of progressively liberalising the scope and availability of trading rights for agricultural products as discussed in the last section.

Compared to the trend of tariff reduction in the past decade, the tariff changes due to China's WTO accession should present relatively few problems. Significant reforms will, however, be required in the area of non-tariff measures. Among various aspects of non-tariff barriers, state trading could be a particular important area to consider when reforming China's agricultural trade policy. China has agreed to phase out restrictions on trading rights for all products except those under tariff quota trade regime where a more gradual approach in phasing out the state-trading regime will be implemented.

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INCREASING RURAL INCOMES IN CHINA: POLICY REFORMS IN THE SPIRIT OF THE HOUSEHOLD RESPONSIBILITY SYSTEM[1]

By Bryan Lohmar

Abstract

The success of China's reforms in the late 1970s and early 1980s shows that market-supporting reforms can have a dramatic positive effect on rural incomes. This paper argues that rural incomes can be significantly improved by continuing down the path of market-supporting policy reforms rather than policies that may distort markets. In particular, policies that give farm households more decision making authority over the use of productive assets and the returns to those assets will benefit rural households and farm incomes. Policies to lower transportation costs and the costs of acquiring information will also improve markets and help rural workers raise their incomes. Increasing investment into general education and specific human capital will provide rural households with the tools they need to allocate resources efficiently and take advantage of the changes occurring in China's dynamic rural economy.

Introduction

The process of economic development inevitably shifts the focus of production away from subsistence agriculture and toward commercial agriculture, industry and services, and these changes generally induce changes in agricultural policy. China is currently facing these types of changes as the share of agriculture in GDP has fallen from over 30% to less than 18% in the last 20 years, despite substantial growth in the agricultural sector (National Bureau of Statistics, various years). In addition, the share of farm households engaged in subsistence agriculture fell significantly over this period (World Bank, 1997). Because of the higher growth rates in the industrial and service sectors, rural income growth has lagged behind urban income growth (Johnson, 1999). These structural changes underlying economic development generally induce a shift in agricultural policies to help farmers adjust to the industrial economy and maintain income growth.

Policy makers, when facing these changes, often establish policies that raise the price paid to farmers in order to directly increase farm incomes. These policies increase the gross value of agricultural output (GVAO) but they are expensive, distort markets and are not ideal means to transfer income to farm households. Countries have tried a wide range of subsidy programmes to increase prices farmers receive for their production, but these policies tend to distort markets through excess production despite various inventive and complicated schemes to prevent such behaviour. With scarce physical resources relative to labour, it is particularly important that policies do not distort markets in China, since markets are the best means to ensure that scarce resources are allocated efficiently. The diversified nature of the typical farm household in China also makes it difficult to significantly raise farm incomes by supporting any one crop. Even direct income transfers could distort production in a rural economy like China's, where there are millions of small farm households that are relatively constrained in their access to credit, since income transfers loosen credit constraints and could keep inefficient farmers in production.

1. I thank William Coyle, John Dyck, Fred Gale, Jianwen Liu, Francis Tuan and participants at the OECD-MoA Workshop for helpful comments and suggestions.

In addition to policies that increase GVAO, policies that increase the share of GVAO that accrues to farm households and policies to increase farm households' capacity to earn income outside of agriculture also increase farm incomes. In the late 1970s and early 1980s, rural income growth in China soared after a series of reforms that affected all three ways of increasing rural incomes, and did so with policies that supported rather than distorted rural markets. These reforms, collectively known as the Household (Production) Responsibility System (HRS) reforms, raised the government purchase price for most agricultural production (although it still remained below market value) and gave households more authority to make land use and labour allocation decisions and the rights to income from those decisions. HRS reforms also established rural markets that lowered transaction costs and drew labour out of agriculture to market sideline production and work in rural enterprises. Together, these policies helped increase GVAO, increased the share of GVAO that accrued to rural households, and increased household employment opportunities off the farm. The symbiotic combination of all three effects drew hundreds of millions out of absolute poverty in a short period (World Bank, 1992, 2000).

I argue in this paper that there are still a variety of policy options to raise the incomes of rural households in China that will support and improve rather than distort markets. Policies that improve market performance can have a significant positive impact on farm incomes, as was witnessed in China when markets were re-established under HRS in the late 1970s. While markets have been established in China and are increasingly integrated, output markets tend to be better established than input markets. In addition, market-supporting policies and services that could lower the costs and increase the number of market transactions have yet to be fully established. Further gains in wealth from using inputs in more productive ways lie ahead if markets are improved and farm households are given more authority over input use and the returns to those inputs. To take advantage of the market opportunities provided by China's growing and modernising economy households need to assimilate information, learn new skills and make more complex decisions. Investments in both general and specific human capital will help households take advantage of these opportunities, and these investments have become more important since HRS because the market has developed extensively since then.

Policies that strengthen rights to productive assets

Extending land use rights to farm households and the rights to income from the land was the central feature of HRS reforms. Households were free to make almost all agricultural production decisions on their own, and since they could keep the revenue earned by selling extra production, they had incentive to maximise this revenue by allocating labour and other inputs effectively. In the first few years of HRS, yields increased so much that total grain output increased even while land sown to grain decreased (Carter, Zhong and Cai, 1996). The extension of rights allowed households to increase GVAO as well as the share of GVAO that accrued to them.

The HRS reforms, however, stopped short of fully establishing a clear system of rights to land, and rights to many other important physical assets in China are still ambiguous. Lack of transparency in rights of access results not only in inefficient use of these assets, but also causes the returns to these assets to be claimed, in part, by agents other than farm households and adversely affects rural household incomes (Huang, 1999). Reforming the system of rights to productive assets can have positive effects on farm incomes and can also improve the markets for important inputs.

Land tenure practices offer a good example. Land is relatively scarce in China and land values are roughly 2 000 yuan/*mu*, or roughly 10 000 yuan/household for land sown to grain.[2] Land in cash crop production can be worth far more, and land in non-agricultural uses can be even more valuable. But important rights to farmland are not allocated to households and are often ambiguously held (Ho, 2001). The ambiguous rights to land leave the return to land assets open to meddling, so the returns to land do not always accrue to farm households (Guo, 2001). The ambiguous system of rights to land also may make land transactions more difficult and may discourage farm households from moving into high valued crops or accessing economies of scale.

Land is collectively owned in China, and the collective owners allocate limited usufruct rights to farmers. The usufruct rights are limited by the fact that farmers must keep the land in agricultural production and, in some cases, may be encouraged to grow certain types of crops. Originally, village leaders encouraged the production of grain crops, but recently there has been a push to cultivate cash crops and village leaders sometimes may seek to benefit from these operations. In a recent survey sponsored by the World Bank, 38.5% of the respondents reported that their village has imposed compulsory planting requirements either currently or in the past (World Bank, 2002). The right to rent land is extended to farm households in most villages, but it is widely believed that rentals fall short of clearing the market (Benjamin and Brandt, 1999). Other than these rental rights, farm households receive no rights of alienation. The collectives maintain some alienation rights, and may periodically exercise these rights to reallocate land among village households, or away from village households to other, sometimes non-agricultural, users. For the reallocations among village households, farmers are not compensated and this causes heightened tenure insecurity. When land is taken from farm households to be given to a non-agricultural user, farm households often have little say in the matter and compensation is arbitrary (Guo, 2001).

More secure rights to land for farm households will help increase land productivity and raise rural incomes. In particular, extending to households the rights to be compensated for land dispossession will allow households to enjoy the increased value of their land as the economy around them grows. Such policies would give farmers more incentive to make investments that have a long-term payoff. Some of these types of investments may be specific to certain lucrative cash crops, thus more secure tenure rights would facilitate movement into these crops and increase GVAO. More secure and enforceable rights may also induce more independent land transfers since households may currently view transfers as a signal to village leaders that the land is not needed by the household is thus eligible for reallocation. In addition, when land is reallocated from village households, the rights to compensation will ensure that they receive the returns on any investment they make in land improvements, and maybe receive even higher payments if the land is allocated to a non-agricultural user. Such policies will particularly help incomes in areas near urban centres where the demand for non-agricultural land is high.

Water represents another valuable asset in China's rural economy that, under a reformed system of rights, could serve to increase rural incomes. Currently, the problem of rapidly depleting water resources, particularly in parts of north China, has generated debate over how to implement policies that encourage water conservation without adversely affecting farm incomes. Raising the price of water will induce water saving practices, but will hurt farm incomes. Water in China, however, is still owned by the state, and independent transfers technically are not allowed. If water rights were allocated to farm households along with the rights to transfer the water, then farmers could theoretically benefit from saving water and selling the saved water to non-agricultural users. The price

2. Based on rental rates of around 100 yuan/*mu* for land in grain production, land sown to cash crops can rent for as high as 800 yuan/*mu* (from interviews by the author) and 5 *mu* per household (Diao, Zhang and Somwaru, 2000).

non-agricultural water users pay is roughly ten times what agricultural users pay, and even the non-agricultural price is well below the marginal value of water in that sector (Lohmar, *et al.*, 2002). The proceeds from this difference would accrue to farm households. This would induce farmers to use less water and also increase their income. Water transfers from agricultural to non-agricultural uses, of course, would necessitate an underlying infrastructure to support such transfers.

Simply clarifying rights to productive assets will not be sufficient to ensure that farm households benefit from these rights. Establishing fair, effective and accessible enforcement institutions will be key. According to a recent study sponsored by the World Bank, nearly half of the farm households that hold written 30-year use right contracts to their land still expect that the village will instigate a land reallocation before the end of the 30 year period (World Bank, 2002). Without an accessible and fair enforcement mechanism, it will be difficult to extend to farmers secure rights to productive assets.

Establishing clearer and more enforceable property rights will help increase rural incomes in several ways. Such rights will allow farm households to transfer the assets into higher value crop production and other high value uses. Giving farmers more secure rights to assets and allowing farmers to transfer assets to higher-valued uses will also assure that more of the returns to these assets accrue to farm households. If the increased revenues come from decisions made by the farmer, and the farmers have clear property rights to the assets directed toward such production, then they will have a greater claim on the increased wealth that results. In addition, more secure and enforceable rights to assets, particularly land, may also allow farmers to access non-farm employment more easily. Under the current system of ambiguous property rights, many households may stay in their village as a means to maintain a claim to land and other collectively held assets. Secure and enforceable rights to such assets will allow these households to rent the land out while they leave the village for opportunities that generate higher incomes (Lohmar, 2000).

Decreasing transaction costs

Another important component of the HRS reforms was the re-establishment of rural markets. Nearly all traditional markets and "village fairs" were closed during the collective period (some were re-opened in the early 1960s, only to be closed again during the Cultural Revolution, 1966-1976). The HRS reforms re-established these markets so that rural households had the means to sell their excess crop and agricultural sideline production. Establishing these markets usually entailed providing a variety of public services such as constructing market facilities, allocating space in the facilities, and implementing market rules and dispute settlement procedures. Such public services reduced transaction costs so that small producers of certain crops could market their production themselves and ensure that a higher share of their GVAO accrued to them. Marketing reforms also facilitated movement into cash crops, which increased GVAO, and provided a host of non-farm income earning opportunities in the marketing and service sector.

Markets have become well established in China but there are a variety of market-supporting policies and institutions yet to be established that could further reduce transaction costs and serve to increase rural incomes. Often the term "transaction costs" is thought to refer primarily to transportation costs, but information costs may be more important in China. China has invested heavily in rural infrastructure in the last decade, greatly improving its rural transportation network. While transportation costs are still high in China, the costs of acquiring both market information and production information may be more onerous in terms of curtailing economic activity. Establishing policies that lower the costs of acquiring information that will allow farmers to receive higher prices, market speciality products and produce high-value and high quality agricultural goods will serve to increase farm incomes.

Several types of policies can reduce transaction costs. Investment in transportation and telecommunication infrastructure has induced economic growth in many parts of China (Demurger, 2001). Continued investments will help bring remaining remote areas in China into the larger economy and increase agricultural productivity more generally. In addition, more sophisticated refrigerated transport and cold storage facilities will support growth of cash crop production. By facilitating the movement of goods and people, investments in infrastructure will also lower information costs and help farmers find better markets for their products.

Improving market support services will also lower information costs in ways that will help farmers raise their incomes. Services to set and assess quality standards that are accessible to farm households will lower the costs of acquiring information regarding product quality. These services will allow farmers to increase the quality of their production and receive higher prices for these goods. Some qualities of wheat, for example, can fetch prices 40-50% higher than wheat of average quality. Legal services can lower the costs of acquiring information on the reputation of distant buyers, facilitating farmers' ability to enter into contracts with distant or unfamiliar buyers and enforce these contracts. Enabling farmers to easily enter into and enforce contracts will also help farmers reduce inter-temporal price risk. Farmers can enter contracts that offer some price assurances upon harvest before making the investments in planting cash crops. Year to year investments for some cash crops can be substantial and many low-income farmers will not make these investments without some assurances that they will be able to cover their costs.

Policies that allow for and encourage associations of households will also lower the costs of acquiring production and marketing information for individual farm households. Households that seek to produce the same crops can gain from exchanging production and marketing information, information that may be too costly for an individual household to acquire given their small production potential. Policies that allow for these associations to be formalised so that they can enter into contracts as legal entities will also help to reduce important transaction costs for rural households in China. These associations potentially can interact with local extension agents to facilitate the adoption of technology generated by investments into agricultural research. In addition, associations can provide feedback to the research centres so that research investment addresses farmers' needs.

Establishing policies to lower transaction costs in China will serve to increase rural incomes in the following ways. By lowering the cost of acquiring special information necessary for cultivating many high-value crops, these policies will facilitate farmers' movement into higher-valued crops and increase GVAO. In addition, by lowering the cost of marketing information for farm households, such policies will reduce the share of GVAO that accrues to marketing services and increase the share that accrues to farm households. Establishing publicly funded market support services will also increase the demand for non-agricultural labour to staff these services.

Increasing human capital

The positive effects that education has on agricultural production and the returns to labour off-farm are well established. Education may be even more valuable in a dynamic, modernising rural economy than in a static, traditional one. Schultz (1974) argues that an economy that is modernising generates disequilibrium as traditional resource allocations become inefficient in the new economic environment. These changes generate a demand for the ability to allocate resources efficiently given economic incentives, and the high demand in turn increases the value of this ability. Since education is an important component of the ability to determine optimal resource allocation as the economy changes, the importance of education is higher in a changing agricultural economy than in a static one.

It is hard to imagine a more dynamic and rapidly changing rural economy than China's. Rural China is not only experiencing the effects of rapid economic development and the shift from subsistence to commercial agriculture, but it is also undergoing transition from a planned economy to a market economy. The adjustments that workers need to make to take advantage of these changes overlap. Both processes will break down policies and institutions that enforced local self-sufficiency and emphasis on grain production under the collective period, but there are also differences. The transition from collective to household farming will put the authority to make more and more resource allocation decisions under farm households. Development will give farm households more demand for cash crops, more sophisticated production technologies, and more non-farm employment opportunities. As China implements its commitments to WTO, rural workers will have incentives to adjust to trade liberalisation as well, which may accelerate the pace of change.

A commitment to rural education was not central to the HRS reforms, but today it is much more important than at the time of HRS. Directly as a result of the greater autonomy given farm households to make economic decisions in the late 1970s and early 1980s, China's rural economy has become one of the most rapidly changing agrarian economies in the world. Thus, at China's current stage of development, rural workers' capacity to acquire information and make complex decisions to benefit from the changing economic environment, and to increase their skill levels in non-farm trades, will be a key part of any successful economic reform. A commitment to education is often cited as key to the successful development experience of other Asian economies (Ranis, 1995).

While rural education lags behind urban education, China's rural educational attainment is still relatively successful given the level of income in rural areas.[3] Literacy in rural China is over 90% of the level in urban China (83.9% in rural areas compared to 92.2% in urban areas), yet rural incomes are only about one third of urban incomes. China's rural literacy rate is also very high compared to other countries at the same income levels. Fiscal constraints, however, may prevent rural areas from increasing or even maintaining access to education (also noted by Kwiecinski and Li in this Proceedings). Urban governments subsidise education for urban households, but village governments often do not have sufficient funds to pay for education services and rely on farm households to contribute funds to their children's education. The differences in wealth between urban and rural areas also affect education quality; per pupil spending in urban areas is four times the level in rural areas (Johnson, 2001).

Local government financial support for education in rural areas is limited not just because of fiscal constraints, but also because of a lack of incentive to invest in education. Rural workers who receive local education have few opportunities to capitalise on that education in the village where they received it. Returns to education tend to be higher in non-farm employment, and education also helps lower the costs of assimilating into urban areas. In this environment, village investment into education does not always pay off in increased village revenues, but is more likely to leave the village for more attractive non-farm opportunities elsewhere. While migrants do remit some of their income to village households, remittances are not particularly large and do not get invested into productive agricultural assets (DeBrauw, Rozelle and Taylor, 2001). Villages, however, tend to tax agriculture or local industry, so migrant remittances do not help support the village government's budget. Therefore, village governments may have more incentive to invest in rural infrastructure or cash-crop operations that will bring a more direct benefit to village budgets than they have for investing in general education. The lack of incentive is greater as the level of education increases since education is

3. In 1979, China's per capita GDP was below India's and Egypt's (USD 337 compared to 562 and 967), but literacy for 15-24 year olds was much higher than in both countries, 88% compared to 54% in India and 51% in Egypt. Today, China's literacy rate is similar to Mexico's or Thailand's, countries with much higher GDP than China's (World Bank Development Indicators).

correlated with propensity to migrate (Rozelle *et al.* 1999). Higher levels of government have more incentive to invest in education since they will more likely benefit from the returns to labour productivity that result.

Investments in certain types of education for rural migrants in urban areas will also help increase rural incomes. Rural-urban migrants tend to take very low-wage and difficult jobs that are not wanted by urban residents (Wang, 1997). This limits rural-urban migrants' ability to remit income to rural areas and dulls the incentive for talented workers to migrate. Part of the problem is a legacy of barriers to rural-urban migration, but many of these formal barriers have come down. Formal institutions for rural workers to improve their job skills and make careers in urban areas, however, have yet to be established. Policies that provide more opportunities for talented rural-urban migrants to improve their skills and make careers in urban areas would draw more rural workers out of the countryside and allow them to compete for higher income earning positions in urban areas.

Farmers also do not have easily accessible opportunities to learn agricultural and management practices that will help them move into more profitable crops. While there is an extensive network of agricultural schools, they are available only to the small percentage of farmers who graduate from high school (*gao zhong*). In addition, they tend to teach production practices rather than business practices such as marketing and cost-benefit analysis. Thus it is difficult for farmers to learn how to select profitable crops and market these crops, and nearly impossible for the many talented farmers who do not finish high school to learn production and marketing skills.

Village leaders sometimes decide which higher-valued crops to cultivate and induce farm households to commit some of their land to these crops.[4] While this system may effectively induce a shift out of subsistence and into commercial crops, it is not based on profit maximisation and limits farm households' ability to respond to market signals. Village-instigated cash-crop operations lack the flexibility to move into the most profitable crops, or to diversify among several crops. In addition, the added level of administration, the village leadership, may add to the overall costs of the operation so the full benefits of commercial agriculture may not accrue to farm households.

An effective way to allow households to learn the skills they need to move into profitable commercial crops might be to foster the establishment of independent associations of farm households. Again, as argued in the transactions cost section of this paper, to reduce the costs of acquiring production information, farm households could interact with each other and share valuable production information. Making household associations more formal would enable them to interact with local extension agents, not only to learn production techniques, but also to provide feedback on farm-level needs that could be addressed by the research community. By doing so, they will serve to increase farmers' skill levels and increase their agricultural specific human capital.

Farm households may also learn techniques that will help them develop high-value crops through policies that make the extension services more effective and responsive to farmers' needs and inquiries. This would entail not only increasing investment in the existing extension network, but also establishing institutions that allow for more direct interactions between farmers, the extension system and research communities. Independent associations of farm households can help in this process. These organisations can serve to connect small producers to the extension system and facilitate the adoption of production information. Extension management reform to reduce the adverse incentives extension service agents may face due to their need to raise operating funds will also help agents inform farmers of the best production techniques available.

4. Village compulsory planting requirements are also discussed in the "Strengthening the Rights to Productive Assets" section of this paper.

Improving the human capital of rural workers will help increase farm incomes in several ways. Overall, greater human capital changes the nature of skills so that they can be applied more effectively in a modernising and commercialising economy. Labour is the most important asset of most rural workers. Greater skills and more capacity to acquire information and make decisions will facilitate movement into higher-valued cash-crops and increase overall GVAO. By increasing the returns to capital embodied in household labour, greater human capital will also raise the share of GVAO that accrues to rural households. Improved human capital will also increase rural households' capacity to earn income off-farm. Education is the one of the most important determinants of labour market participation, and greater skills training will increase the wages rural workers can receive.

Conclusion

The three sets of policies presented in this paper are not independent but rather share a common thread. Taken together, these policies could have the effect of increasing the value of important inputs for the person who receives the income from the farm operation and lowering the costs of allocating these inputs. Important inputs such as labour, land, water and capital represent more value to farmers as their rights to these or complementary inputs become more defined and enforceable. At the same time, lower transportation and information costs of finding profitable opportunities to allocate these resources to take advantage of market conditions will increase households' opportunities to gain from their input allocation decisions. Farm households will benefit from these changes if they have higher levels of human capital that increase their capacity to adapt to new opportunities.

The policies and institutions suggested in this paper maintain the spirit of Household (Production) Responsibility System (HRS) reforms of the late 1970s and early 1980s. The HRS gave households decision making authority over land and labour inputs and established markets to lower the costs of marketing output, and the result was a remarkable reduction in poverty. Further reform to give households more authority over rural productive assets, lower transaction costs to promote market activity, and develop human capital to increase the value of labour and rural workers' ability to take advantage of market opportunities, holds great potential to carry on the process started by the HRS reforms.

These changes not only have potential for generating wealth in rural areas, but also will be critical for rural households in adapting to the fast changing economy around them. With accession to the WTO, prospects for China's continued growth and market liberalisation are enhanced. Rural workers will need to make a variety of important changes to keep pace with the forces of economic development, transition to a market economy and trade liberalisation. Rural households will be best able to make these changes if they are given the means to make production decisions, the skills to improve these decisions, and the ability to profit from these decisions. Continued reform in the spirit of HRS will serve to help rural households increase their income as China grows, develops and opens to international markets.

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SESSION 3. BUDGETARY SUPPORT POLICIES

ON THE POLICY OF AGRICULTURAL FINANCIAL SUPPORT IN CHINA

By Ming Su

Abstract

This paper studies the coverage and the role of budgetary support policy for agriculture, its current situation and problems. Based on this analysis, the author puts forward some suggestions for improvements. These suggestions include: an increase in agricultural investment financed by the state budget; clarification of objectives and priorities of budgetary support for agriculture; attracting other entities to invest in agriculture by investments financed from the state budget; equal treatment of support policy for different kinds of economic entities operating in agriculture and rural areas; and, establishment of a supervisory mechanism for state investment in agriculture.

Introduction

China is a developing country and in its drive for modernisation needs to find the right solution to the problem of agriculture. In view of the particular importance of agriculture and the implications for agriculture of China's accession to the WTO, we need to focus on and develop the functions and effects of the policy on budgetary support to agriculture and to strengthen the national investment in agriculture, so as to promote a mutual interdependence between agriculture and the national economy. The present paper looks at a number of issues relating to budgetary support to agriculture and offers a number of views and suggestions.

1. The scope and effects of budgetary support to agriculture

Policy on budgetary support to agriculture is an important part of public financial policy. It is also an effective means whereby the government supports and protects agriculture. In practice, the scope of budgetary support for Chinese agriculture comprises the following: expenditure to assist agricultural production, operating expenditure in the farming, forestry and waterpower sectors, investment in agricultural infrastructure, funds for the general exploitation of agriculture, financial aid for disadvantaged areas, rural relief funds, etc. These are of the utmost importance in promoting the development of China's agricultural and rural economy and certainly cannot be replaced by other agricultural support policies. The chief effects of policy on budgetary support to agriculture are set forth below.

Firstly, financial expenditure on agriculture is a net inflow to agriculture from national income. The mechanism whereby it helps to increase agricultural investment is relatively transparent and direct. Increasing financial expenditure on agriculture, *e.g.* through investment in agricultural infrastructure, expenditure to assist agricultural production and operational expenditure in the various agricultural sectors, means to some extent directly increasing agricultural investment.

Secondly, it increases the public-sector capital project activity in the agricultural sector. Since public-sector funds mainly represent centralised State funds allocated from tax revenue, they clearly differ from bank credits in so far as the first priority is to encourage public investment projects where the social benefits are considerable even though the economic returns may be doubtful. This was the case for the Yellow River and Yangtze water control projects, dam construction, projects to develop

and expand agriculture, projects to improve the ecological environment in agriculture, training in agricultural science and technology. These are the areas which should benefit from the government support, provided that adequate resources exist.

Another issue relating to government support for agriculture concerns measures for increasing the sustainability of agricultural development, raising agriculture's overall productive capacity and enabling China's agriculture to take another step forward. These are important responsibilities which agricultural support policy must assume.

Third, government support should serve as a guiding force for investment in agriculture by society as a whole by creating the conditions for increasing agricultural investment by collectives and farming households. In the area of agricultural infrastructure, once the conditions have been created for collective and individual farms to bring new land under cultivation and set up small-scale investment (by increasing infrastructure investment and managing large and medium-sized agricultural infrastructure projects, such as dam construction), this will be a means of encouraging collective and individual farmers to invest their own funds and labour. Indeed, these are the usual means used at present to implement policy. Increasing operating expenditure, improving scientific research, creating the conditions for spreading the use of technology, increasing the efficiency of each operating unit are all preconditions for modernising agriculture and then increasing the economic return on agricultural production. For this reason, increasing budgetary expenditure on agriculture by providing the right basis and technological conditions for agricultural production, reducing the risks involved in agricultural production and activity, and increasing the financial return on agriculture will help to encourage farmers to invest even more in agriculture.

2. Budgetary support for Chinese agriculture: the background and current issues

Since the mid-1990s, China's agricultural and rural economy has undergone considerable changes. In general, there has been a surplus of agricultural products. Yet there have been also frequent natural disasters which have had implications for the stable development of agriculture and the stable growth of farmers' incomes. In order to adapt to the new conditions and situation, adjustments and improvements have been made in the policies on budgetary support to agriculture and considerable efforts have been made to increase investment in agriculture, adapt the structure of expenditure and strengthen the management of funds. For the period of the Ninth Five-Year Plan, total expenditure on assisting agricultural production, expenditure on general agricultural development and operating expenditure on farming, forestry, waterpower and meteorology was RMB 312.5 billion, 1.9 times the amount during the Eighth Five-Year Plan. In 2001 the State Finance Budget assigned RMB 25.1 billion to aid for agricultural production, RMB 13.2 billion to general agricultural development and RMB 45.7 billion to operating expenses on farming, forestry, waterpower and meteorology, for a total of RMB 84 billion, which is an increase of RMB 9.3 billion (+12.5%) on the out-turn for 2000. This exceeded the growth rate of the state budget revenues (+10.3%). In particular, China has pursued an active public finances policy since 1998, increasing the national debt and focusing on the construction of basic facilities. This has led to a large increase in the rate of investment in the construction of basic agricultural facilities. During the period of the Ninth Five-Year Plan, expenditure on such facilities totalled RMB 157.602 billion, which is 3.7 times the total for the Eighth Five-Year Plan. This investment was mainly funded from the national debt and has made a great contribution to increasing agriculture's capacity to cope with natural disasters and reduce the associated losses, as well as consolidate and strengthen agriculture's basic position.

It must be acknowledged, however, that China's current policy on agricultural finance is far from perfect. In practice, there remain a number of issues that are worth considering. The most important of these are set forth below.

– *The total amount of government funds for assisting agriculture is insufficient*

In the domestic economy, when measured against the calls from society for assistance to agriculture, the government is unable to meet the demand for investment in agriculture due to the limits on its financial resources. Even if it meets the requirement contained in the Agriculture Act that the growth rate of annual expenditures on agriculture should not fall below the growth rate of budgetary revenues, the total amount of support to the Chinese agricultural sector is still at a low level.

Table 1. **State spending on agriculture**

RMB million

Year	Total	% of total expenditure	Expenditure to assist agricultural production & operating expenditure on farming, forestry, waterpower & meteorology	Expenditure on agricultural infrastructure	Science & technology expenditure	Relief expenditure	Other
1980	14 995	12.2	8 212	4 859	131	726	1 067
1985	15 362	7.66	10 104	3 773	195	1 290	
1990	30 784	9.98	22 176	6 671	311	1 626	
1995	57 493	8.43	43 022	11 000	300	3 171	
1996	70 043	8.82	51 007	14 151	494	4 391	
1997	76 639	8.3	56 077	15 978	548	4 036	
1998	115 476	10.69	62 602	46 070	914	5 890	
1999	108 576	8.23	67 746	35 700	913	4 217	

Source: China Financial Yearbook 2001, p. 356.

It can be seen from Table 1 that there has been a steady upward trend in the State expenditures on agriculture in absolute terms, but as a proportion of total expenditure it is quite low, remaining at around 8% in recent years, contrasting with the 10% recorded in 1990 and the 12% in 1980.

– *The increase in local spending on agriculture is not satisfactory*

We have already offered a general analysis of government support for agriculture. On closer examination, we shall see that the objectives of local activity are not entirely consistent with central policy. The issue of local investment in agriculture is an extremely important one. Firstly, the bulk of public funding for agriculture is at the local level (some 80%) and, secondly, the important issues relating to public-sector investment in agriculture also arise at the local level. According to the data, in the period 1991-2000 overall local spending rose by 352% from RMB 229.6 billion to RMB 1 036.7 billion, whereas local spending on agriculture rose by only 213% from RMB 22.1 billion to RMB 68.9 billion. As a proportion the trend has been falling steadily, from 9.6% in 1991 to 7.9% in 1995 and 6.6% in 2000 (Table 2).

Table 2. **Local spending on support for agriculture**

RMB million

Year	Local expenditure on support for agriculture *	Overall local expenditure	Spending on support for agriculture as a proportion of total expenditure (%)
1991	22 074	229 580	9.6
1992	24 152	257 176	9.4
1993	29 110	333 024	8.7
1994	35 474	403 819	8.8
1995	38 382	482 833	7.9
1996	45 512	578 628	7.9
1997	50 465	670 106	7.5
1998	55 723	767 258	7.3
1999	60 882	903 534	6.7
2000	68 947	1 036 665	6.6
Percentage change between 1991 and 2000	+213%	+352%	-3

* Spending on support for agriculture only includes support for agricultural production and operational expenditure on various agricultural activities.
Source: Compilation of relevant data from *China Financial Yearbook 2001*, p. 380.

Implementation of the local agricultural expenditure budget remains subject to considerable deviations. In practice, on the assumption of budget cutbacks, local funds to support agriculture get discounted during the implementation process. Payments are stopped or even seized or misappropriated. In terms of total funds, this has reduced the amount of local funds for supporting agriculture. Some local governments use the limits on revenue and relatively large expenditure gaps as an excuse to manipulate the agricultural budget, by transferring balances to the following year, thus eroding agricultural spending. Some local governments even alter the uses to which special funds are put, diverting them to other projects or using them to pay salaries. This inevitably affects the proper implementation of the agricultural support budget. The main reasons for the decline in the proportion of local spending on agricultural support and the implementation gaps are described below.

First, the direction in the profit mechanism: in a developing market economy the function of market mechanisms in the deployment of resources becomes steadily more important. The factor of capital has a natural tendency to concentrate in the highly profitable undertakings. Agriculture is a basic industry, however, in which investment and especially the construction of basic facilities are long-term in nature, large in scale, involve high risks, offer a low level of profitability and do not easily attract market capital. In these objective conditions created by a market economy, it becomes necessary to increase government support for and protection of agriculture. However, because of a failure to resolve the problems arising from the fact that central and local governments engaged in reform have duties and responsibilities that cannot be separated, local governments mistakenly follow ordinary market behaviour, *i.e.* allow the profit mechanism to decide the deployment of resources, and do their utmost to shift responsibility for agricultural support to the central government level. This creates an objective need for government to support agriculture.

Secondly, it is clear that at the present time some regions of China are in considerable financial difficulty. Incomes are rising too slowly, the pressures on expenditure are increasing and local governments' first priority on the financial front is to protect salaries and safeguard stability. There is no doubt that this is an objective factor that affects local government support for agriculture. However, this must not be allowed to excuse or conceal systematic malpractice. However plentiful local funds might be, unless appropriate structures can be put in place it will still be difficult to increase agricultural investment.

Third, the structure of budgetary support to agriculture is not rational. In the first place, the proportion of expenditure on agricultural production is falling, while the proportion of operational expenditure is rising. In the second place, while the proportion of operational expenditure is rising, the system of sectoral allocation is defective and biased. Expenditure on personnel is rising quite fast, while operational expenditure is rising slowly, resulting in a situation where there is money for manpower but not equipment. This explains why in recent years the increase in the proportion of operational expenditure on agriculture has not ensured a satisfactory level of funds for developing agricultural activities, but rather the opposite. Generally speaking, the funding of development of agriculture is facing puzzling contradictions. Again, in China the amount of indirect support for agriculture exceeds that of direct support. For example, government development-type aid-the-poor projects — allocating support for agricultural units as an example of supplying science and technology to agriculture and providing means of pest and disease control, road construction and irrigation projects, giving training and direction, and creating the most basic production and subsistence conditions in the poorest areas to help people escape poverty — are all necessary. However, this is not the same as assigning a larger proportion of direct budgetary support to farmers or income subsidies for farm owners.

Fourth, the objectives of agricultural support are simplistic. Basically, the funds which the government provides to support agriculture can only be used by State-owned or collective enterprises and not by private individuals or joint-stock companies. For a long time the recipients of agricultural funding provided by all levels of government in China have presented three characteristics: (i) such funding can basically only go to State-owned and collective enterprises, but not to private individuals or joint-stock companies; (ii) it goes primarily to not-for-profit activities rather than profit-making enterprises, and (iii) it can only be used by an entity within the same system and in general cannot be used for agricultural projects in another sector or system. This approach is not conducive to implementing a policy of joint diversified development, nor to encouraging society as a whole to actively invest in agriculture or to promoting fair competition. Nor does it meet the basic principles of the WTO.

Fifth, the administration of budgetary support to agriculture is weak. In the administration of funds there still remain a large number of intermediaries. The processing of funds takes too long. The proportion of funds reaching the right destination at the right time is too low. The supervision procedures are underdeveloped and the funds are not efficiently applied. The problem of weak administration manifests itself as follows.

- *Weakness of budget management*

The promulgation and implementation of the "Budget Act" show that funds administration has entered a new stage of legal reliability. However, it is not easy to administer agricultural funds entirely in accordance with the law and herein lies a serious challenge. There are frequent cases of budget revisions and erratic changes being introduced without going through the proper legal procedures. Then, budget items are arbitrarily reallocated or readjusted, resulting in funds not being provided in time or sufficient funds not arriving in time. This affects the guidance function of the funds, meaning that it is not possible to properly implement the government's development programme.

– *The feedback from supervision is poor*

The main tasks when dealing with budgetary support to agriculture are often to distribute funds and set targets. However, the task of keeping track of the feedback is completely unsystematic and unstandardised. The complexity of the procedures makes them impossible to manage properly.

– *Too few funds reach the right destination at the right time*

Under the current system there are generally too many intermediaries and the processing of funds takes too long. Implementing budgeted spending on agricultural support is too slow. Fund expenditure within the year is not balanced.

– *Misappropriation and diversion of funds*

Poorly managed regions (*xian* or counties) in financial straits often misappropriate agricultural support funds for salaries or to make up for deficiencies in public expenditure. In recent years serious problems have arisen with some agricultural sectors misappropriating or diverting agricultural funds. A particularly glaring example of this is the diversion of production funds into conference allowances, business travel allowances, professional allowances, research allowances and similar non-production expenditure resulting in special funds not being used for the purpose for which they were intended. In addition, there is also a serious problem with agricultural funds being dispersed and the management function being paralysed owing to some specialised agricultural projects having too many administrative and organisational levels.

3. Some basic ideas and suggestions on how to improve agricultural support policy

A new issue that now requires thorough investigation is how to adapt and improve the policy on budgetary support to agriculture and to increase financial investment in agriculture so as to meet the WTO rules and China's agricultural development needs. The basic approach and measures proposed in the present paper comprise the following main points:

– *Increasing State financial investment in agriculture as far as is practical and effective*

China's circumstances mean that the government must always act as a major channel for agricultural investment and so spending to support agriculture is the main medium for government support to agriculture. Therefore, the task of strengthening the government's agricultural support function and improving the methods of implementing agricultural support policy must focus above all on increasing financial investment in agriculture. This is a necessary condition for promoting stability in agricultural production and thus realising the State's objectives for agricultural development. In recent years State financial investment in agriculture has ensured steady growth. However, spending on agriculture as a proportion of total expenditure remains well below the historical highs and is even further from the funding requirements for agricultural development. Given the backward state of China's agricultural production and the impact on agriculture of China's accession to the WTO, a basic aim of future agricultural support policy will be to adopt effective measures to gradually increase the proportion of spending on support for agriculture from its present 8% to 10% by the end of the Tenth Five-Year Plan.

First, we need to ensure that new financial resources are tilted towards agriculture. In recent years the national income has risen by between 150 and 200 billion annually. According to provisional estimates, this upward trend will continue during the Tenth Five-Year Plan. We suggest that the

annual allocation of new State resources should allocate 10-15% to be spent on agriculture. This would be an important measure to increase agricultural investment.

Secondly, we need to ensure that the proceeds raised via State debt issues favour agriculture. Since 1998 China has pursued an active financial policy of increasing the issue of long-term State debt so as to increase investment in basic agricultural facilities. The benefits and effects of this policy are quite evident. In the short term, there is no prospect of completely abandoning this active financial policy. Continuing to issue State debt remains a necessary policy option in China. We suggest that in future an appropriate proportion of State debt proceeds, net of interest payments, should go to agriculture. This will certainly make a major contribution to improving agricultural and rural infrastructure and boosting long-term agricultural development.

Thirdly, an Agricultural Investment Act needs to be passed as soon as possible in order to place support for agriculture at all levels of government within a statutory framework. This is also necessary in order to place the country in a better position to realise its objectives of supporting and protecting adjustments in agriculture and to change arbitrary behaviour in the area of agricultural investment. The legislation must focus on setting standards of behaviour applicable to agricultural investment by the State (at central and local government levels) and, at the same time, clarify the responsibilities of all levels of government in the area of support for agriculture as well as lay down rules on the quantitative limits on the State's investment in agriculture. This will certainly encourage the development of standards of behaviour for all investors in agriculture and underline the guidance function of the government as investor.

– *Clarifying the aim and priorities of budgetary support to agriculture*

In future the main tasks of agricultural support policy will be to step up the momentum of government budgetary support to agriculture in accordance with the WTO's rules and requirements and in the light of the serious practical shortcomings and weaknesses relating to China's long-term agricultural development. This is an important issue which has a bearing on the long-term sustainability of agricultural development. More specifically it concerns (a) increasing investment in agricultural and rural infrastructure, including irrigation installations, the ecological environment for agriculture, land reclamation, population resettlement projects, the construction of small cities and towns, the installation and refurbishment of electricity networks, and (b) structural adjustment in agricultural support.

Chinese agriculture is already entering a new stage of development and will be undergoing a strategic structural adjustment. This means that it will have to adjust the structure of agricultural production, develop competitive agricultural products, develop the animal husbandry and forestry sectors, encourage added-value activities in the form of product processing and actively promote small urban and village enterprises. This will require increased budgetary support for seed projects, for improving the breeds of livestock, for the introduction of superior animal feed, for regional specialisation for certain high-quality agricultural products, for the creation of leading enterprises and for the conversion of some cultivated land to forestry or pasture. It also means improving the public services provided for agriculture.

China has 230 million farming households. They are small-scale operations and their production costs are high. The government price support and subsidies they rely on are limited. It is essential to improve the public services as well as those services provided before, during and after production. Indeed, special natural disaster forecasting services must be set up or improved; for example, there must be an increase in investment in weather forecasting. Investment in disease and pest monitoring and controls also needs to be increased.

Agricultural losses need to be reduced through increased investment in the setting-up of agricultural product information network and selling organisations. It is necessary to gradually build up agricultural product information network and selling organisations covering the whole country and even the international market. Support is needed to assist farmers to build up appropriate stores of grain so as to reduce the pressure on national grain reserves. A further task is to revise the policy on agricultural subsidies and make changes in the system of subsidies. For many years the State has invested a huge amount of resources in subsidising the channels used to market agricultural products, but which are presently inefficient and do not benefit agriculture or farmers. Reform is therefore necessary and must include the following: first, it is necessary to significantly reduce financial subsidies for these type of market channels and to allocate those funds to agricultural production, to improving the conditions for agricultural production and to improving the long-term development of agriculture. There is also a need to consider ways of spending part of this money directly on increasing farmers' incomes, to carry out detailed research on the creation of schemes to assist farmers in times of natural disaster and to provide protection against market risks affecting agricultural products, grain support for rural areas in difficulty and assistance for production for farmers in special difficulties. This would reduce losses suffered by farmers and provide institutional guarantees for increasing farmers' income.

– *Promoting the guidance function of the policy on budgetary support to agriculture*

Budgetary support to agriculture exists not only to directly increase investment in agriculture, but also to attract and promote agricultural investment by society as a whole. Agriculture is a weak but key industry which all national governments invest in and protect. However, not all funds invested in agriculture come out of public-sector resources or should come from the central State. According to research, of China's overall investment in agriculture in 2000, which totalled RMB 1.2 trillion, 40% was accounted for by agricultural credit investment, 37% by farmers' own independent investment and 17% by central and local government investment, while the remaining 6% was accounted for by, for example, marketing companies, urban and village enterprises and foreign capital. This shows that the amount of funds invested in agriculture by industrial and commercial enterprises, the capital market and foreign business is very small, even though the modernisation of Chinese agriculture will be difficult to carry through without industrial, commercial and financial capital. Over the past 50 years, China's industrialisation has relied to a large degree on the accumulation of funds provided by agriculture. In future, industry and commerce will be expected to repay their debt to agriculture as it modernises. We therefore need to encourage urban and village enterprises, marketing companies, foreign business and funding institutions to invest in agriculture. Public welfare and non-profit-making irrigation projects, environmental projects and scientific and technical amenities for agriculture, schemes to help poor farmers, grain buffer stocks, etc., should be in future funded by State investment, while profitable agricultural operations, agricultural product processing, etc., should rely on funds raised on the market and on investment by farmers or various types of enterprise.

To make it more attractive to invest in agriculture, it is necessary to promote the guidance function of budgetary support to agriculture and gradually set up an incentive mechanism for agricultural investment. First, it will be necessary to adjust and optimise the structure of spending on agriculture, to increase basic investment in agriculture and create a favourable external environment to encourage investors generally to increase their investment in agriculture. Secondly, the State must provide favourable tax, subsidy and interest rate terms and incentives for agricultural investment so as to encourage people to invest their funds in agriculture. Thirdly, it is necessary to change the style of public-sector investment, by reducing direct government involvement in projects and increasing the amount of assistance going to projects managed by farmers and the public. There also need to be preferential tax arrangements to encourage the reinvestment of agricultural profits in agriculture.

– *A support policy that ensures equal treatment for all forms of economic entity*

Agricultural development requires commitment on all fronts. At present the agricultural and rural economy comprises many different forms of joint enterprise, *e.g.* State-owned enterprises, State-owned operating units, collective organisations, individual operators, private companies, joint-stock companies, joint-stock co-operatives, contractual operators, non-contractual operators. This helps to invigorate agricultural development and diversify the sources of farmers' incomes. Agricultural finance must adapt to the new conditions and make the necessary adjustments to support policy. Encouragement for farmers to increase their income will help to develop productive forces in agriculture, and support for this is needed whether in the State-owned, collective, individual or private sectors. This is also what China's accession to the WTO requires and what is required in order to implement the principle maintaining the standard of living in China. If we seek to implement equality of treatment in our support policy, we must draw up and revise the schemes and measures in this area in due time so as to ensure that support policy is objectively fair and that standards are open, transparent and scientific, and that corruption and malpractice are eliminated.

– *Establishing a supervisory mechanism for investment in agriculture*

The limits on the funds available for agriculture make it even more necessary to manage them properly and efficiently. We therefore need to continuously improve the way they are managed, introduce scientific methods of allocation, draw up realistic standards governing expenditure and implement an open and transparent management mechanism. Over the past two years, the Finance Ministry has drawn up and implemented a sector budget, made some experimental reforms in the systems of centralised Treasury payments, reformed the special agricultural funds, made some experimental reforms to the written application procedures for agricultural project funds and to the expert assessment and special fund procedures, introduced a more scientific management approach and enhanced the supervision by bodies such as the National People's Congress. The results have been positive. These successful approaches need to be made more general. The future will also need to see the introduction of such scientific management features as tender procedures for agricultural projects, project budgeting, centralised payments, government procurement, accounting systems, public announcements, assessment by experts and third parties, the introduction of more objective methods of allocation that provide for proportional allocation and the allocation of factors of production to what they do most efficiently, and the extension of the use of funds, *e.g.* for natural disaster insurance programmes and reforestation, in a way that directly benefits the farmer. This will ensure that agricultural funds end up in the right place, encourage efficient production and materially benefit the farmer.

"PEASANT BURDEN": TAXES AND LEVIES IMPOSED ON CHINESE FARMERS

By Claude Aubert and Xiande Li
(Paper presented by Claude Aubert)

Abstract

The policies concerning the taxes and levies imposed on Chinese farmers need to complement those aimed at raising peasant incomes. The efforts at lessening this burden are indeed all the more necessary as the entry of China into the WTO may result in a decline of agricultural revenues. And they are the more pressing as abuses in levying rural taxes and fees have, in some places, resulted in disturbances which threaten the very social stability of the Chinese countryside.

The issue is complicated by the great number and variety of existing taxes and fees, rendering more difficult an assessment of the total financial burden, which is much higher than the official published figures. Many illegal surcharges at the local levels of government have inflated the total amount paid by the farmers. These surchages may result from the expansion of rural bureaucracy or the predatory behaviour of some cadres[1]. Should this be the case, the issue involved is, of course, about the quality of governance in rural administrations. However, and more particularly in the main agricultural counties or townships, the lack of diversified sources of revenue often results in a poorer financial capacity to deliver the necessary public goods, especially for education. In that case, the problem is much more one of unequal sharing of fiscal revenues and social responsibilities between the central and local governments.

This is to say that the solution to the "peasant burden" will imply much more than a simple reform of the taxation system.

Introduction

In 2001, peasant income in China grew by 4.2%, up to 2 366 yuan per capita, an apparent recovery from the declining trend in growth of recent years (respectively 5.9, 4.5, 3.8 and 2.1% for 1997, 1998, 1999 and 2000). However, the gap between rural and urban incomes continued to grow, with the ratio declining from 0.36/1 in 2000 to 0.34/1. Indeed, following the rapid increase in peasant revenues in the immediate post-decollectivisation period (15% annual growth in real terms from 1978 to 1984), the situation of peasants, relative to urban dwellers, deteriorated considerably: in 1985, rural incomes were over half the level of urban incomes (54%, compared to 39% in 1978), while they are now less than one-third of their urban counterparts (Lu and Wang, 2001).

Moreover, the average peasant income masks huge disparities and the problem of rural poverty (much higher than implied by the officially reported figure of 30 million poor people) has become one of the main problems for the Chinese authorities. One solution put forward by current policies is to increase peasant incomes by restructuring the mix of agricultural production with better quality, higher value-added products. The other solution is to reduce the burden of taxes and fees imposed on farmers by the local authorities. This paper attempts to address the latter solution.

The "peasant burden" (*nongmin fudan*), which emerged in the late 1980s, became a major issue in the 1990s as increases in the charges paid by peasants to local authorities appeared to threaten social

1. In this paper "cadre" refers to local officials.

stability in the countryside. In some places, large-scale riots occurred following conflicts during the collection process[2]. The issue of the peasant burden soon attracted the attention of the central government[3]. In December 1991, a national regulation was passed that set a 5% ceiling on the amount to be charged (relative to peasant net income)[4]. Although a number of other measures have been taken and regulations passed to try to tackle the problem, including a tentative reform in *Anhui* province, the problem is still far from resolved.

There have been numerous academic studies, especially by scholars in political sciences (O'Brien and Li, 1995; Lü, 1997; Bernstein and Lü, 2000). But the whole issue of the "peasant burden" is obscured by the lack of a standard definition. In addition to the taxes and charges paid by peasants (state taxes, the "Tiliu" and "Tongchou", "Jizi" & "Tanpai", etc., Cf. Infra for their respective meanings), a broad definition should include also the effects of price policy fixing unfavourable ratios between prices for agricultural and industrial products. In the narrow sense, the peasant burden is defined as payments for public services outside regular taxes (Ye, 1997, p. 57). The latter definition is the one the Chinese government uses to monitor the share of "*Tiliu* & *Tongchou*" in the previous year's net income and to supervise the peasant burden (Zhang and Li, 1999, p. 76).

In this report, we will first attempt to define the different components of the "peasant burden", taxes as well as other charges, and to present the corresponding official figures (the implicit tax through the compulsory delivery of agricultural products is excluded from our analysis, as is the labour component)[5]. We will then assess the real extent of the burden, both in global terms and in regional disparities, and how it is imposed on the peasants. In analysing the roots of the rural fiscal problems, we will focus on the situation of the poor, mainly agricultural, counties where the burden is more prominent and the social consequences more acute. When discussing the reforms introduced since the year 2000, we will see that resolving this problem cannot be separated from more general considerations touching administrative reforms as well as the redistributive role of the State.

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2. For more information, see Lü 1997, p. 27, Bernstein and Lü 2000, pp. 752-760. According to a report published in the Hong Kong-based *South China Morning Post*, 9 February 2000: "in 1999, there were more than 2000 cases of farmers staging riots and other violent demonstrations against rural authorities. The majority of these confrontations were caused by excessive taxes and corruption".

3. As early as 1990, in February and September, the State Council issued an "announcement" (*tongzhi*) and made a "decision" (*jueding*) on the problem on the "peasants' burden". See *China Agricultural Yearbook 1992*, p. 142.

4. "Regulations on Peasant Burden and Labour" (*nongmin chengdan feiyong he laowu guanli tiaoli*). The regulations decided that the "Three Tiliu" and "Five Tongchou" that the peasants paid for the village and township levels could not exceed 5% of the net income of the previous year. For the complete text, see Zhang Mingwei and Li Ling, "Handbook of cadres' work in rural China" (*Zhongguo nongcun ganbu gongzuo shouce*), Edition of Commercial Affairs, April 1999, pp. 76-83.

5. In addition, the Chinese farmers contribute a certain amount of labour during the year, without remuneration, for hydraulic projects, road construction, etc. (for more information, see Li, 2000). On the basis of 17 days of forced labour per rural worker, in the year 2000, and applying an average wage rate of 10 yuan/day (used by State Price Bureau, see *Compilation of national cost-benefit data of agricultural products, 2001*), a labourer would have contributed 170 yuan, or 88 yuan per rural habitant, which is equivalent to 4% of previous year's net income.

Agricultural taxes for the state

In official statistics, agricultural and related taxes include agricultural tax, animal husbandry tax, tax on the use of cultivated land, tax on special agricultural products and contract tax (Cf. *China Statistical Yearbook 2001*, p. 248).

Agricultural tax, the oldest in China, can be dated back to the Shang Dynasty (1600 to 1066 B.C.). The current agricultural tax is based on a law passed in 1958, which fixed the tax rate at 15.5% of the normal grain yield, although the actual rate applied is lower (12.5%). As the total collected has never been adjusted, the rate applied is less than 2.5% of real grain output in the late 1990s (*China Financial Yearbook 2001*, p. 378; see also Tang, 1995, p. 37).

It should be noted that the agricultural tax, based on agricultural production, is only a small part of the real tax burden, shouldered by farmers. As is the case in many developing countries, "governments have taxed the sector (agriculture) heavily through the price and distribution system and on its exports, to transfer a substantial portion off the agricultural surplus to industry, and raise revenue".[6] In the case of China, this was done through the compulsory delivery of agricultural products at administratively set quota prices (usually much lower than the market ones) and through the "price scissors" between industrial products and agricultural products. According to some estimates, if this "hidden" tax were taken into account, the implicit tax rate would be much higher than the official tax rate paid by farmers (Wen Tiejun estimated that the tax rate through compulsory delivery was on average 12% in rural China, and as high as 18 to 24% in some grain-producing areas, see Wen, 2000, p. 175).

The agricultural tax was imposed in kind during the collective period due to the severe grain shortage. Indeed, from the 1950s to the 1970s, the Chinese government implemented a policy of "taking grain as a core task" (*yiliang weigang*) and it naturally followed that the agricultural tax was calculated on the basis of grain. In the 1980s and 1990s, some areas began to pay their agricultural tax in cash.

Following decollectivisation and the establishment of the Household Responsibility System in the countryside, the government strongly encouraged the diversification of agriculture to include forestry as well as other commodities in addition to grain. In 1983, a new "special agricultural products' tax" was levied. In 1989, the coverage of this tax was extended and the rate was increased. In 1994, some of its components were adjusted and the applied tax rate for special agricultural products currently ranges from 10 to 15% (Tang, 1995, p. 40), with the highest rate - 31% - applied to tobacco (Peng, 1996, p. 72). The taxed products include tobacco, horticultural products, aquatic products, timber and animal products (pelts, wool, etc.).

The other taxes, as they relate to agriculture, are the tax on the use of cultivated land and the "contract tax"[7]. The land use tax was established in 1987 to control the growing impact of house building and other non-agricultural uses on cultivated land.

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6. Mahmood Hasan Khan, "Agricultural Taxation in Developing Countries: a survey of issues and policy", in *Agricultural Economics*, 24 (2001), p. 315.

7. The relevance of the inclusion of the "contract tax" (*qi shui*) within the agriculture and related taxes by the State Statistical Bureau (SSB) has been debated by some scholars (See Wu and Yuan, 1999). In reality, farmers pay also the slaughter tax, not counted in the "agricultural related taxes". As the amount of the slaughter tax is lower than the one of the contract tax, the inclusion of the latter may somewhat over-evaluate the total paid. On the other hand, the total taxes paid in the countryside are higher than their only "agricultural part": in the *Agricultural Yearbook 2001*, this total is reported as of 194.8 billion yuan, out of which 23.5 billion as "agricultural tax", 86.1 billion for the "agricultural

Table 1. **Agricultural related taxes and their shares in government finance and agricultural value**

(Billion yuan, current price)

	Total Agriculture & Related Taxes (TAT)	-of which Agric. & Husband. Tax	-of which Spec. Agric. Products Tax	-of which Other Taxes	TAT/ Total Taxes (%)	TAT/ Financ. Revenue (%)	TAT/ Agric. GDP (%)
1950	1.9				39.0	30.7	
1955	3.1				24.1	12.3	7.3
1958	3.3				17.4	8.6	7.3
1960	2.8				13.8	4.9	8.2
1965	2.6				12.6	5.4	4.0
1970	3.2				11.4	4.8	4.0
1975	2.9				7.3	3.6	3.0
1980	2.8				4.8	2.4	2.0
1985	4.2				2.1	2.1	1.7
1990	8.8	6.0	1.2	1.6	3.1	3.0	1.8
1991	9.1	5.7	1.4	2.0	3.0	2.9	1.7
1992	11.9	7.0	1.6	3.3	3.6	3.4	2.1
1993	12.6	7.3	1.8	3.5	3.0	2.9	1.8
1994	23.1	12.0	6.3	4.8	4.5	4.4	2.4
1995	27.8	12.8	9.7	5.3	4.6	4.5	2.3
1996	36.9	18.2	13.1	5.6	5.3	5.0	2.7
1997	39.7	18.2	15.0	6.5	4.8	4.6	2.8
1998	39.9	17.9	12.8	9.2	4.3	4.0	2.7
1999	42.4	16.3	13.2	12.9	4.0	3.7	2.9
2000	46.5	16.8	13.1	16.6	3.7	3.5	3.3

Note: Agricultural & related taxes include the agricultural tax & the animal husbandry tax, the tax on special agricultural products, and other taxes (tax on the use of cultivated land and the contract tax).
Sources: China Statistical Yearbook 2001, p. 248. and *China Financial Yearbook 2001*, p. 351.

The total of the agriculture related taxes shows a marked declining pattern over time. As high as 39% of all government taxes in 1950, it dropped to 2.1% in 1985, and has only partially recovered since then (up to 5% in the mid 90s, 3.7% in 2000, see Table 1). As for its share in the agricultural output added value, it similarly decreased from 7.3% in 1955 to 1.7% in 1985 (rising again to 3.3% in 2000).

The main cause of the (limited) rise in the agricultural tax which has been observed since 1985 is the growing importance of other taxes. In 2000, out of a total of 46.53 billion yuan, the agricultural tax accounted for only 16.54 billion (36%), whereas the special agricultural products tax reached 13.07 billion, equal to the contract tax (13.11 billion yuan). This was followed by the tax on occupancy of cultivated land (3.53 billion) and the tax on animal husbandry (0.27 billion; Cf. *China Statistical Yearbook 2001*, p. 264).

special products", the rest (162.7 billion), more than 80% of the total, including probably the slaughter tax, the industrial and commercial tax by rural individual households, etc. (Cf. *China Agricultural Yearbook 2001*, pp. 415-416). In our analysis, we use the data as published by the SSB.

Fees for local governments

In addition to agricultural taxes paid to the State[8], farmers also pay various fees to the townships and village governments. Even though these payments are not called taxes, they are in fact quasi-taxes for two reasons. First, farmers must pay them annually, the payments being duly registered in the official accounts (Table 2). Secondly, the ways of collection are similar to those of taxes (collected either on the basis of the number of persons within the families or on the cultivated surface under contract).

As concerns the township government, farmers pay the "Five Tongchou" (unified planned) fees: education supplement, social help, family planning, collective transportation and militia exercises. With regard to the obligations for the village administration, farmers pay the "Three Tiliu" (retained) fees, *i.e.* public accumulation fund, public welfare fund and administrative fees[9].

Payments by peasant families for the township (or commune) and village expenses have long existed. During the period of collectivisation, the distribution of the collective income was undertaken in a global way. The total revenue minus the production costs constituted the disposable income shared between the state, the collective (people's commune, brigade and production team) and the peasants. The state took one part in the name of the Agricultural Tax; the collective had the public accumulation and public welfare funds, administrative fees, etc. The remaining income was distributed to the peasants[10].

Distribution was mainly done in-kind. Usually the production team sold the agricultural products (mainly grain) to state agencies as payment of tax. This practice was called "*jiao gongliang*" (remittance of public grain). As for the collective, it set apart a portion of the agricultural products for seeds, feed, reserves, etc. Peasants received their grain rations from the collective harvests. At the end of the year, a final cash amount was calculated then distributed in order to "distribute the profits" *(nianzhong fenhong*). The production team acted as an accounting unit, for both distribution and production, in addition to collecting taxes.

Taking 1978 as an example, the gross income of the rural economy was distributed in the following proportions: production costs, depreciation charges and management fees combined were at 34.4%, tax at 3.4%, public accumulation and public welfare funds (*gongjijin & gongyijin*) at 9.1%, and farmers, 53.1% (Ye, 1997, p. 57, quoted from Zhu Daohua, 1980).

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8. In the 1994 tax-sharing reform programme, the agricultural tax was classified as a local tax, *i.e.* for the county and provincial level governments.

9. According to the rules, the uses of these fees are defined as follows: 1. The public accumulation fund is used for the development of the village-level economy such as agricultural investments or hydraulic works, afforestation, the buying of productive fixed assets, the opening of village enterprises, etc. 2. The public welfare fund is used for the welfare services such as the provisions for the "Five-Protected Family" (*wu baohu*), subsidies for the families in great difficulty, co-operative health and other collective welfare items. 3. The administrative fees are used for the remuneration of the village cadres and the administrative expenses.

10. For a general discussion about the income distribution in the countryside at that time, see *China's Agricultural Yearbook 1980*, pp. 382-383. Data from a survey on the situation of revenue distribution in 339 brigades in 1979, can be found in *Problems of Agricultural Economy*, 1980, 9, pp. 28-31. Detailed information is also given in Jean, C. Oi, *State and Peasant in Contemporary China: the Political Economy of Village Government*, University of California Press, 1989, pp. 16-29; and 105-113. Description from some Chinese communes can be found in C.S. Chen and Charles Price Ridley, *Rural People's Communes in Lien-Chiang*, California: Hoover Institute Press, 1969, and in Shahid Javed Burki, *A Study of Chinese Communes 1965*, Harvard University Press, 1969.

After the rural reform in the late 1970s and early 1980s, the production unit changed from the production team to individual farmers. The administration shifted accordingly from people's commune to township, and from brigade to village. In 1983, township-level finances were established in order to manage the affairs of the community. Whereas in the collective era the upper levels of government took a part of farmers' harvest for the working of administration and provision of certain public goods, such as education, co-operative medicine, infrastructures, etc., under the new institutional framework the individual farmers were to pay directly the various fees for the local governments.

The details of these payments to the village administration ("Three Tiliu") and township governments ("Five Tongchou") have been published since 1990 by the Ministry of Agriculture (Table 2).

Table 2. **Fees for village administration and township governments, and their shares in peasant income**

(Current billion yuan, yuan per capita)

	Three Tiliu & Five Tongchou	-of which Village Tiliu	-of which Township Tongchou	Total Fees per Rural Capita	Per Capita Peasant Incomes	Fees as % of Previous Year's Peasant Incomes
1989					601.5	
1990	33.3	21.6	11.7	39.6	686.3	6.6
1991	36.4	23.1	13.3	42.7	708.6	6.2
1992	37.3	21.9	15.4	44.0	784.0	6.2
1993	38.0	23.2	14.8	44.6	921.6	5.7
1994	46.1	28.7	17.4	53.9	1 221.0	5.9
1995	54.8	33.0	21.8	63.7	1 577.7	5.2
1996	61.1	37.7	23.4	70.7	1 926.1	4.5
1997	70.3	41.4	28.9	81.1	2 090.1	4.2
1998	73.0	43.0	30.0	84.0	2 162.0	4.0
1999	67.0	38.8	28.2	76.9	2 210.3	3.6
2000	62.0	35.2	26.8	76.8	2 253.4	3.5

Source: China Agricultural Yearbook, various issues.

The total fees paid by farmers to the village and township administrations ("Three Tiliu" and "Five Tongchou") are higher than the total agriculture related taxes paid to the State. In 2000, farmers paid 62.0 billion yuan of fees (of which 35.2 billion, or 57%, for the villages and 26.8 billion for the township governments), against 46.5 billion yuan for agriculture-related taxes. However, the total of these fees, as shown in the official data of Table 2 and representing the "peasant burden" according to the government's definition, has been contained in the last few years within the 5% ceiling (of the previous year's net peasant income) fixed by the regulations.

The objective of these payments is to pay for the administration of villages and townships, including staff salaries and the implementation of certain governmental functions such as the building and maintenance of roads, supplying for the public accumulation, and other administrative and political objectives such as family planning, etc.

Consolidated accounts of taxation on farmers

Apart from the agricultural tax and the "Three Tiliu and five Tongchou" for the local governments, there are still other payments made by farmers, such as "*xingzheng shiye xing shoufei*" (fee-charging for administrative and institutional purposes), "*jizi*" (fund-collection) and "*tanpai*" (apportionments), etc. These payments go not only to the township or higher level government organs, but also to the village committee. The items shouldered by farmers vary from region to region and from village to village. Their total value is difficult to estimate because there are no complete accounts for these kind of payments.

According to the official statistics of the Ministry of Agriculture, the annual total of 27 billion yuan collected from these payments, made outside the regular framework of the taxes and village and township fees, has changed little since the mid 90s. Using these official data, we are able to reconstruct the consolidated accounts of the taxation on farmers (taxes, fees, fund collections and apportionments) for the last ten years (Cf. Table 3).

Table 3. **Farmers' burden in China**

(Billion yuan, current price)

	Total Tax and Fees[1]	-of which Agriculture Related Taxes[2]	-of which Three Tiliu & Five Tongchou[3]	-of which Other Payments[3]	Total Tax and Fees per Rural Capita[4] (yuan/pers.)	Tax & fees/ Peasant Income[5] (%)
1990	46.9	8.8	33.3	4.8	55.8	9.3
1991	51.8	9.1	36.4	6.4	60.8	8.9
1992	60.3	11.9	37.3	11.1	71.1	10.0
1993	68.7	12.6	38.0	18.1	80.7	10.3
1994	95.8	23.1	46.1	26.6	112.0	12.2
1995	115.4	27.8	54.8	32.9	134.3	11.0
1996	124.9	36.9	61.1	26.8	144.4	9.2
1997	137.9	39.7	70.3	27.9	159.2	8.3
1998	139.9	39.9	73.0	27.0	161.0	7.7
1999	136.2	42.4	67.0	26.9	156.6	7.2
2000	135.9	46.5	62.0	27.4	168.4	7.6

NB: 1. Total tax and fees include agricultural & related taxes; "Three Tiliu" for the village; "Five Tongchou" for the township and payments to various institutions.
2. Agricultural & related taxes from *China Statistical Yearbook 2001*, p. 248. It includes the agricultural tax, the animal husbandry tax, the tax on the use of cultivated land, the tax on special agricultural products and the contract tax.
3. "Three Tiliu", "Five Tongchou" and other payments to institutions come from the *China Agricultural Yearbook*, various issues.
4. We use the rural population (*China Statistical Yearbook 2001*, p. 91) to calculate the tax & fees shouldered by each farmer.
5. Tax & fees/peasant income (%) designates the burden relative to the previous year's peasant net income. Income data come from *China Statistical Yearbook 2001*, p. 304.

For the distribution of these taxes and fees among the different categories, the shares of agriculture-related tax and payments to various institutions are on the rise, whereas the shares for the "Three Tiliu and Five Tongchou" have declined in the 1990s (Table 4). In 2000, the agriculture related

taxes accounted for one third (34%) of the total taxation, village *tiliu* for one quarter (26%), and 20% each for township *tongchou* and payments to various institutions.

Table 4. **Distribution of tax and fees shouldered by Chinese farmers**

	Total (billion yuan)	Total (%)	Agricultural tax (%)	Village Tiliu (%)	Township Tongchou (%)	Payments to various institutions (%)
1990	46.9	100	19	46	25	10
1991	51.8	100	17	45	26	12
1992	60.3	100	20	36	26	18
1993	68.7	100	18	34	21	26
1994	95.8	100	24	30	18	28
1995	115.4	100	24	29	19	28
1996	124.9	100	30	30	19	21
1997	137.9	100	29	30	21	20
1998	139.9	100	29	31	21	19
1999	136.2	100	31	28	21	20
2000	135.9	100	34	26	20	20

In 2000, farmers paid a total of 136 billion yuan in taxes and fees (supplemental charges included), *i.e.* 168 yuan for each rural habitant. These taxes and fees represented 7.6% of the farmer's previous year's net income (Table 3). In the first half of the 1990s, this proportion was over 10% and dropped in the second half. If we note that, of this total, the three *tiliu* and five *tongchou* (62 billion yuan in 2000, *i.e.* 77 yuan per rural capita) accounted for 3.5% of the previous year's net income (within the legal 5% range), one could conclude that the government's efforts to curb the "burden" achieved positive results in recent years. Why then does the problem of the peasant burden continue to be so acute?

The real magnitude of the peasant burden

A first answer is that the official statistics greatly under-estimate the payments made by peasants. Of the four categories of payments used in our analysis (taxes, three *tiliu*, five *tongchou*, other payments or surcharges), agricultural taxes are relatively stable and the amounts reported reliable. With respect to the "Three Tiliu and Five Tongchou", even though local authorities face financial problems, the rate of imposition is relatively well supervised by the superior levels of government (a regulation was passed for this purpose), and their nominal amounts can be considered as exact. This is not the case with the last category of payments of the various "*Jizi*" and "*Tanpai*". They have expanded rapidly and extensively throughout China and are less effectively controlled (Huang 1994, p. 40) to the extent that their real amount is far larger than the one recorded in official data. This is well acknowledged and a peasant saying describes the situation as follows: "The first levy (*i.e.* formal agricultural taxes) is light, the second levy (*i.e.* payments to collective funds) is heavy, the third levy (*i.e.* other payments and irregular charges) is a bottomless pit" (*toushui qing, er fei zhong, gezhong tanpai wu di dong*, Lü, 1997, p. 118).

Indeed, if some of these payments are legal and may seem justified (and therefore called "approved *jizi* and *tanpai*"), many are illegal, either under the form of unofficial levies, fines, etc., or under the form of illegal financial contributions. An exhaustive list would be difficult to establish (there are possibly

over 100 different kinds).[11] In addition to these unofficial levies, peasants must pay other disguised fees, at the village level or above. Two common examples are:

1. Insurance fees. The insurance company obliges (often with governmental intervention) peasants to buy or pay different types of insurance (for the children, buffaloes, houses, etc.) with or without the concerned farmers' agreement. The guaranteed reimbursements from these "compulsory" insurances are frequently badly (if ever) paid.

2. Fines for delays in paying the "taxes and charges". In general, the peasants must pay their taxes and fees on two occasions: first in summer, and second in the autumn. Usually, it is the first payment that is heaviest for the peasants, because it falls at the same time that they need the money to buy their inputs (fertilisers, etc.), while they have only harvested a minor part of their crops. If they cannot make the payments in time, they must repay an annual interest rate as high as 30 to 36% for the sum due, plus a fine named "*chi na jin*" (literally "fine for late payment").

The assessment of these surcharges is difficult. However, several surveys provide some clues on the extent of these "other payments" (the third category of our calculated burden, Table 3).

A survey was conducted by Fu Guangming in December 2000 of 62 rural households in seven counties in Hubei province. Whereas at the township level the official accounts indicated that the charges, other than the agricultural tax and the "three tiliu and five tongchou", accounted for 33% of the total peasant burden (according to our mode of calculation), the farmer-level survey showed that this accounted for no less than 49% of the total really paid (calculation based on Fu, 2001, p. 40). Another survey was conducted by Cai Pengyi *et al.* of 162 rural households in 10 counties in Zhejiang province. Zhejiang is one of the richest provinces and normally the farmers' burden should be very low because of the contribution of the local, well-developed private TVEs. This survey revealed, however, that in 1998 each rural habitant paid 141 yuan of burden, of which the surcharges accounted for 47% of the total (Cai *et al.*, 1999, p. 42).

These results seem to corroborate unofficial accounts presented by Li Changping for Hubei province (for 1998-1999, the surcharges would have constituted 54% of the total burden, Li, 2001, p. 34), and by Xu Zengyang and Ren Baoyu for Anhui (surcharges as 43% of the total burden, Xu and Ren, 2002). Whereas the official statistics indicate that the "other payments" would constitute only 20% of the peasants' total burden in the late 90s, as calculated in Table 4, the real weight of these surcharges would therefore be somewhere between 40 and 50% of the total payments made by the peasants.

The wide gap between the official data for the surcharges and their real magnitude may be explained by the very nature of these extra-charges, which are numerous and vary from place to place, and concern many different agencies that are not regularly supervised. The practice of double accounting seems common at both the township and village levels. Despite official dispositions to the contrary, the calculation methods for the "contracted amount" (*hetongkuan*, or the total amount of money that peasants must pay every year to the village accountant, including taxes, fees, charges, etc.) is neither clear nor public (Li, 2000). This fact has been well reflected by the survey, made directly at the farm household level, in 100 counties monitored by the Ministry of Agriculture, showing that the social charges actually paid by the farmers (fees-collection, *jizi*, *tanpai*, penalties, etc.) are three times higher than the official statistics (Sun, 1998, p. 9). The last figures from Sun's survey seem to indicate that

11. In 1990, 25 government departments issued the documents for charging fees from the peasants. These documents concerned 8 categories and 148 items of these kinds of unofficial payments. See *China Agricultural Yearbook 1991*, pp. 140-141.

this proliferation of surcharges is still out of control, as their total amount increased by 21% in 2000 compared to the previous year (*Farmers' Daily*, 23/3/2001).

Table 5. **Farmers' burden in China, 2000, official data and estimates**

(Billion yuan, current price)

	Total Tax and Fees	-of which Agriculture Related Taxes	-of which Three Tiliu & Five Tongchou	-of which Other Payments	Total Tax and Fees per Rural Capita (yuan/pers.)	Tax & Fees/ Peasant Income (%)
Official	135.9	46.5	62.0	27.4	168	7.6
	100	34	46	20		
Est. A	180.9	46.5	62.0	72.4	225	10.2
	100	26	34	40		
Est. B	217.1	46.5	62.0	108.6	269	12.2
	100	21	29	50		

From the above surveys, we can estimate that payments other than agricultural tax, three *tiliu* and five *tongchou*, could account for up to 40% or 50% of farmers' total taxes (Estimates A and B). If these ratios are used to adjust the total of the farmers' burden, the real payments could be as high as 181 billion yuan to 217 billion yuan, in which agricultural related taxes would account for only 21-26% of the total. Farmers' burden, 225 yuan per rural inhabitant in Estimate A and 269 yuan in estimate B, would therefore represent up to 10.2-12.2% of the previous year's net income (instead of 7.6% in the official accounts). The total payments would then be equivalent to 12.8-15.3% of the agricultural value-added of the year (instead of 9.6%).

These estimated burden rates (10-12% of peasant net income, 13-15% of the agricultural GDP) are very high. They mean that farmers who, in 2000, had an average monthly net income of only 200 yuan had to pay more than 10% of their income on taxes and fees, whereas the minimum taxable income for urban dwellers was 800 yuan per month.

The inequity and regressive character of the burden

This inequity between peasants and urban dwellers is the most obvious characteristic of the rural taxation system in China. The calculations made are only average ones and mask huge regional disparities, which are in fact difficult to measure precisely because the details for each province and for every category of payments are not fully known. According to Sun Meijun, in 1986 these burdens (108 yuan per capita on average, including only the three items of the taxes, *tiliu* and *tongchou*)[12] were respectively 100, 141 and 73 yuan per capita in East, Central and West China, representing 4, 8 and 6% of the corresponding incomes (Sun, 1998, p. 8). These figures would mean that the central provinces of China, the primary agricultural area, are comparatively more taxed than the developed

12. For the same year, the total official burden, including the surcharges, as calculated in Table 3 was 144 yuan per capita. The data used by Sun Meijun are probably taken from Wang Yaoxin and Lu Yanzhen, in *Tongji Yanjiu*, N°6, 1997, pp. 7-12, see Bernstein and Lü, 2000, p. 748.

areas of eastern China, whereas the low level of taxation in western China would reflect the low level of collective expenditures in backward areas.

The burden is not equitably distributed among the families according to their revenues. The data presented by Sun Meijun indicate that in 1996 the payments (surcharges excluded) made by farmers were equivalent to 16.7% of their net incomes for the income bracket of 400-500 yuan per capita, 8.7% for the 800-1 000 yuan, 6.7% for the 1 500-1 700 yuan, 4.9% for the 2 500-3 000 yuan, and only 2.8% for 4 500-5 000 yuan (Ibid. p. 8). The regressive character of the rural taxation was therefore quite clear.

The inequity and regressiveness of the taxation stems partly from its mode of calculation which benefits farmers with diversified activities at the expense of those more specialised in crops, particularly grain growers. Instead of being based on the actual income of each family, taxes and fees are apportioned indiscriminately according to the cultivated land (agricultural tax) or to the number of persons within the family (fees).

Taking the example of agricultural taxes, their real rates, as computed from the annual surveys of the Price Bureau (covering 60 000 rural households in 1 400 counties), are generally higher for grain than for cash crops (Table 6).

Table 6. **Actual tax rates for agricultural products, 2000**

(Unit: yuan per mu, one *mu* equals 1/15th of hectare)

	Output Value per *mu*	Net Income per *mu*	Profit per *mu*	Tax per *mu*	Tax % OP Value	Tax % Net Income	Tax % Benefit
Six grains	282.64	159.98	53.98	12.56	4.44	7.85	23.27
Rice	429.56	256.41	110.41	18.62	4.33	7.26	16.86
Wheat	263.34	94.37	-1.63	14.01	5.32	14.85	-859.51
Maize	300.10	161.97	37.97	11.94	3.98	7.37	31.45
Soybean	249.11	170.88	96.88	11.28	4.53	6.60	11.64
Three oilseeds	286.05	182.09	59.09	12.79	4.47	7.02	21.64
Rapeseeds	214.13	120.21	-9.79	14.45	6.75	12.02	-147.60
Peanuts	458.92	296.07	143.07	14.47	3.15	4.89	10.11
Cotton	737.99	511.49	220.49	20.03	2.71	3.92	9.08
Tobacco	851.08	540.50	139.50	13.68	1.61	2.53	9.81
Sugar cane	864.31	508.57	229.57	20.18	2.33	3.97	8.79
Silk cocoon	1 552.06	1 210.08	613.08	38.47	2.48	3.18	6.27
Green tea	1 229.62	965.11	489.11	60.62	4.94	6.28	12.39
Apple	1 431.60	979.38	540.38	88.10	6.15	9.00	16.30
Orange	1 556.94	1 069.83	662.83	71.40	4.59	6.67	10.77

Note: Output Value = Gross value of primary product at real sale price.
Net Income = Output Value less Material Costs (labour costs excluded).
Profit = Profit before Tax = Output Value less Total Cost (labour costs included).
Source: Compilation of National Cost-Benefit Data of Farm Products (*Quanguo Nongchanping Chenben Shouyi Ziliao Huibian*), 2001.

For the year 2000, the average tax rate relative to net income was higher for grain (7.87%) and oilseeds (7.02%) than for cotton (3.92%), tobacco (2.53%) or sugar cane (3.97%). Only other special

products such as green tea or fruits had comparable rates (6 to 9%). All the crops (with the notable exception of tobacco)[13] showed a tax rate (relative to net income) higher than the one calculated for the whole of agriculture (3.3% of agricultural GDP in 2000, Table 1)

If we use the tax rates relative to the profits, comparable to the rates applied to other sectors of activity, this rate is also quite high, at over 20% for grain and oilseeds and 10-15% for most of the other (cash) crops. Actually, these tax rates are much higher than the nominal income tax rate of 5% applied for other social groups (roughly at the same or higher income level than farmers) and paid by individual industrial and commercial households (Zhang, 1997, p. 7).

These taxes, which penalise grain and oilseeds farmers, are also unequal according to the price fluctuations of some products. The price of wheat decreased by more than 16% in 2000 compared to 1999 (already very low), and the farmers would have been growing this crop at a loss if the costs of labour were to be accounted for (negative profit). The situation was the same for rapeseeds for which price fell by 21% in 2000.

The financial constraints of local governments

If indeed the agricultural taxes are inequitable and regressive in character, the main source of disparities, at least for the geographical ones, is the different situation which characterises the counties and townships as concerns their financial revenues and charges.

It is not surprising that the peasant burden is heaviest in the central provinces of China, where the revenues in the countryside are mainly agricultural and where the industrial and commercial activities of the TVE are not well developed. Limited in their sources of income, the local governments, mainly at the township and village levels, are faced with significant social expenses (education, health) as well as expenses for economic development (construction of roads, etc.). As the collection of the "Three Tiliu and Five Tongchou" (normally earmarked for these purposes) is closely supervised, the local authorities are often obliged to multiply the surcharges, fees, collections of special funds, etc., at the expense of farmers, and the burden may be particularly heavy in poor localities. A good description of this situation has been made by Jean C. Oi:[14]

> "Villages with a primarily agricultural economy had few sources of revenues... The fiscal crisis faced by the villages was heightened by the centre's decision to shift the burden of infrastructure investment to the localities. Local governments that control a primarily agricultural, particularly grain-based, economy have few options other than to levy ad hoc surcharges and various other fees and penalties."

From this point of view, the financial relationship between the central and local governments seems to play a very important role.[15]

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13. This low rate for tobacco is the more astonishing as it is theoretically the most imposed, at 31%, by the special agricultural products tax, Cf. rates in Ouyang *et al.*, 2001, p. 50.

14. Jean C. Oi, *Rural China takes off…*, 1999. pp. 20-21, 191.

15. There are lots of publications on this issue. For the central-provincial fiscal relations, see Michel Oksenberg and James Tong, "The Evolution of Central-Provincial Fiscal Relations in China, 1971-1984: The Formal System", in *The China Quarterly*, No. 125, March 1991, pp. 1-32. Zhang Le-Yin, "Chinese Central-provincial Fiscal Relationships, Budgetary Decline and the Impact of the 1994 Fiscal Reform: An Evaluation", in *The China Quarterly*, No. 157, March 1999, pp. 115-141. For

In the past, in the people's communes, the possibility of acquiring financial resources through taxation was very limited, as there were very few financial transfers from the upper-level governments (county and province). Within this system, the provision of public goods could not satisfy the demand. After the dismantlement of the people's communes, part of the public services within the townships and the provision of all public services on the territory of the villages were not to be provided by public finances (taxes), and belonged to public goods delivered "outside of the system" (*zhidu wai*). So the current policy authorised the funds needed for the "five public affairs" (education, family planning, social help, militia exercises, transport) to be collected on the whole territory of township under the name of "The Five Tongchou" (Ye, 1997, p. 58). That is to say, farmers were to pay for the public services and share the costs. The same was true for villages with the payment of the "Three Tiliu".

In general, the current financial structure does not favour the adequate delivery of public services in the localities. In particular, the 1994 fiscal reform has aggravated the state of the local finances, especially at the township level[16]. Under the new fiscal regime, the central government receives 75% of the VAT and controls the whole consumption tax while the local governments hold other taxes (agricultural, industrial and commercial, etc.), which are less lucrative and more difficult to collect[17]. After the fiscal reform, the central part in total government revenues increased sharply from 22% in 1993 to 55.7% in 1994 (Zhang and Cui, 2001, p. 3). But the provision of public goods by the central government did not change much. In other words, local governments must assume the responsibility for public services in a tighter financial situation.

The consequences may be catastrophic in some places. Surveys have shown that often all the financial resources are used for paying the salaries of the public servants and administrative expenses, leaving little or no money for public services (where this occurs, the finances are aptly described as those of the "rice bowl", *chifan caizheng*, Cf. Li Yong, 2002, p. 36). In many localities, even the payment of the salaries may become difficult when governments are heavily indebted. According to some surveys, half of the counties (1 080 of 2 100 counties) could not pay the entire salary of their staff and, according to a survey by the Ministry of Agriculture, the debts were, on average, 4 million yuan per township in 1998 (this would mean a total of 220 billion yuan for all of China, Cf. Zhang and Cui, 2001, p. 4, Ma and Jiang, 2001, p. 37).

The problem is aggravated by the inflation of the local bureaucracy. Ironically, the reforms, tending to replace the redistributive role of the government by regulatory tasks, have resulted in the mushrooming of offices and agencies at the local level (Lü, 2000). The number of rural cadres grew accordingly. In his major study, Yang Dali (1996, p. 187) indicates that the ratio of township cadres versus agricultural labour increased from 1.2 cadres for 1 000 workers in 1978 to 2.1 in 1984, and to 3.4 in 1989, *i.e.* a three-fold increase in ten years! Today, each township counts about one hundred

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the topic of local (below provincial level) public finance, see Albert Park, Scott Rozelle, Christine Wong and Changqing Ren, "Distributional Consequences of Reforming Local Public Finance in China", in *The China Quarterly*, No. 147, Sept. 1996, pp. 751-778.

16. The main objective of the 1994 fiscal system reform was to establish a new tax-sharing system (*fenshuizhi*) between the Central government and the local governments, with a new distribution of the different taxes. In general, the taxes can be classified into 3 categories: devoted to the central government, devoted to the local government, and shared between the central and local government. For more details about this sharing scheme, See Jean C. Oi, *Rural China takes off...*, p. 217.

17. For the county-level, see Zhao Yang, "Rural Tax-for-Fees Reform: Another Important Institutional Innovation after the Household Responsibility System", in *China Rural Economy*, No. 6, 2001, pp. 45-51.

public servants (and sometimes 200-300 persons), which translates into a ratio of over 10 cadres for 1 000 workers.[18] In addition to the regular staff, one must add "out of the (budgeted) payroll" (*bianzhi wai*) employees who may be as numerous as the regular ones (Fu, 2001, p. 40). The staff of one township is often more numerous today than that of one county government in the 1950s (Lu, 2000, p. 7).

This inflation reflects poor management of personnel at the local level (with indiscriminate recruitment of relatives, friends, etc.). Nonetheless, the problem of financing some basic services is a structural one, not easy to solve without far reaching fiscal readjustments. The best example is that of education.

Education constitutes the major expense at the township level. It should be, at least in part, covered by the "Five Tongchou" with 50-60% of their amounts devoted to that purpose. Actually servicing education may represent up to 70-80% of the financial expenditure in some townships, and 60-70% at the county level, reflecting the financial constraints affecting local governments (*Outlook Weekly*, No. 34, 2001, p. 14).

With an estimated number of about 7 million persons, rural teachers (of which only two million are regular ones), constitute the lion's share of the local government employees (10 million persons, excluding the retired workers, Cf. Zhao Yang, 2001, p. 50). In ten pilot townships in Anhui province, their salaries constituted 75% of the total salaries paid by local governments (Zhu, 2001, p. 15). Despite this heavy burden on local finances, farmers continue to pay school fees either to complement the salaries of the teachers or towards the maintenance of schools. According to a 1997 survey in a county of Hubei, the fees were as high as 250 yuan per pupil and per semester for the primary schools (two semesters in one year), and 450 yuan per semester for junior middle schools (Li, 2000, p. 19).

Education is supposed to be compulsory for the six years of primary school. But schooling is not free, with farmers having to shoulder both the townships' "tongchou" and the school fees for paying the teachers. This is true of nearly all public services in the countryside where a fee is charged for every delivered "public" service.

The trial reform of the year 2000

The shortcomings of the fiscal system in the countryside have long been recognised by Chinese scholars. In particular, the agricultural tax has been criticised for having become estranged from its original purpose, not applied according to real yields or even to actual cultivated surfaces (some places having fields but not paying taxes, others paying taxes on fields that no longer exist, "*youdi wushui, youshui wudi*"), being redundant with the special agricultural products tax, etc. (Tang, 1995, pp. 37-38). Moreover, the malpractices associated with the collection of fees ("three disorders", or *san luan*: indiscriminate collection of funds, fees and fines), and the weight of the surcharges have prompted numerous proposals for reforming the system itself (Wu and Yuan, 1999, pp. 12-19).

Two of the proposals were to establish clearly distinct taxes: a "land use tax" (*duti shiyong shui*) and an "agricultural products sales tax" (*nongchanpin xiaogou shui*) in order to adjust the agricultural taxes more closely to the actual cultivated land and to the real agricultural output (Tang Renjian, Wu Ju and Yuan Xinghou). Other proposals included an all embracing tax for the "establishment of public

18. The most frequently quoted figure of 13 million cadres for the 48 000 townships, 800 000 villages and 5.2 million teams in rural China (*i.e.* about one cadre for 70 rural people, Cf. Zhu and Li, 2001, p. 36) actually includes the school teachers as well as health care personnel, etc.

goods in the countryside" (*nongcun gongyi shiye jianshe shui*) based on the actual needs of the localities for delivering the necessary public services (Ye Xingqing, 1997, p. 62).

As the measures previously taken by the State Council (imposing a "5%" ceiling on the "peasant burden" in 1991, cancelling some 43 varieties of contributions and 37 fund-raising items, as well as rectifying ten incorrect methods for the collection of funds from peasants in 1993, etc.)[19] had shown their limitations, a radical reform was tried in the year 2000 in Anhui province[20]. This reform, inspired by previous studies and proposals put forward by local scholars and experts (He Kaiyin and Sun Li, 2000), is usually summarised as follows:

- Three suppressions (*san ge quxiao*): *1)* cancelling the slaughter tax; *2)* cancelling the townships' "Tongchou"; *3)* cancelling the collection of funds for education and administrative fees.

- One progressive suppression (*yi ge zhubu quxiao*): progressive cancelling of the labour contributions[21]. Collection of funds for village projects will be done on the basis of consensus, with "one assembly for one affair" (*yishi, yiyi*).

- Two readjustments (*liang ge tiaozheng*): *1)* raising the agricultural tax to 7% of the average agricultural output value of the five years 1993-1997, calculated in grain equivalent on the corresponding cultivated surfaces; *2)* readjustment of the special agricultural tax (to be included in the agricultural tax).

- One reform (*yi xiang gaige*): replacing the collection of the villages' "tiliu" by one surtax, limited to 20% of the adjusted agricultural tax, collected by the township and used by the villages.

The major point of the reform was to cancel the different kinds of fee-charging or fee-collecting items at the township and village levels and replace them by an agricultural tax of up to 7% of the agricultural output value, and adding an "agricultural tax supplement" equivalent to 1.4% of this same value (He, 2001, p. 14, Zhu, 2001, p. 12). In the meantime, several concerted measures were proposed, such as increasing the central government's transfer payments, reforming local administrations and rural education, and strengthening grassroots democracy and farmers' participation in public affairs.

The government decided to extend the reform to the entire country at the beginning of 2001. However, due to budgetary constraints, it had to rapidly retreat from this ambitious goal and to postpone it to a later period.

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19. The suppressed contributions were those devoted to the achievement of certain standards and planned targets (*dabiao*), important for the assessment of the cadres' work and their career, but often not useful and quite onerous for the tax payers.

20. "Circular of the Central Committee of the CCP and the State Council on Trial Work for Rural Taxation Reform" (Document N°7, 2000). This decision followed pilot experiments conducted since 1996 in 50 counties of 7 provinces.

21. The forced labour contributions are those of the "labour for general interest" (*yiwu gong*), *i.e.* maintenance of roads, canals, etc. and of the "labour for accumulation" (*jilei gong*), devoted to special construction projects. Usually the total is over 15 labour days (non remunerated) per rural worker and per year (see infra, note 4).

This retreat is not surprising. Despite official announcements about the success of the Anhui reform (with an apparent decrease of 30% of the peasant burden in the surveyed pilot townships), many commentators pointed to flaws in the applied new measures. Based only on cultivated surfaces, the new agricultural and added taxes (taking the place of the per capita township and village fees) tended to transfer the whole fiscal burden on the shoulders of the crop growers (all the more penalised if they had no diversified activities and cultivated large plots). The prices used in 2000 for assessing the values of the crops were those of the grain quota, which were higher than the market prices (Fan, 2001, p. 38; He, 2001, p. 15).

More fundamentally, the reform's objective to diminish the peasants' burden resulted in decreasing the financial resources of the townships and, in particular, the villages (the additional tax being lower than the previous "*tiliu*" it replaced; Jiang, 2001, p. 18)[22]. The financial situation, which in some localities was already in dire straits, was thus worsened, affecting the very possibility to pay the local staffs and finance basic services such as education (Zhu, 2001, pp. 14-15).

Indeed, the taxation reform was not able to resolve the contradiction between the local needs for public goods and the lack of resources for providing them in poor, mainly agricultural areas. To be sustainable, this reform should have been accompanied by an overall reform of the local bureaucracy, and a radical readjustment between central and local governments for taking charge of some basic services, such as education and health care.

In early 2001, when the central government considered generalising the reform, it was proposed that the local bureaucracy should be drastically reduced, with a 20% cut in the number of its civil servants, while the townships were to be reorganised and merged (with the suppression of 25 000 of them out of a total of 44 000). At the same time, to make up for the losses in financial resources of the local governments, it was decided to transfer 20 billion yuan from the centre to the provinces, with the provincial governments being required to transfer resources to the lower levels of administration, particularly towards educational-related expenses.

It was beyond the administrative capacity of the government to effectively control its local agents through these projected measures. And the sum of 20 billion yuan was not in line with the scope of the official and unofficial surcharges, which we have estimated at 70-110 billion yuan for the year 2000, and which should be eliminated if one really wants to alleviate the peasants' burden. Confronted with other pressing issues (reforms of the State enterprises with the laying off of millions of urban workers, entry into the WTO, etc.), the government was obliged to postpone rural fiscal reform.

Conclusions

The sheer size of the burden shouldered by peasants gives the measure of the challenge of reforming the rural taxation system: diminishing this burden while solving the financial problems of the townships and villages.

With an estimated total of 180 to 220 billion yuan in 2000, the payments made by the peasants (including agricultural and related taxes, fees for the townships and the villages, legal and illegal

22. Taking into account only the official data, the total of the burden, 136 billion yuan in 2000 (see supra Table 3), would represent 9.8% of the gross value of "farming" (*China Statistical Yearbook 2001*, p. 366), the only activity probably accounted for in the calculation of the new taxes. Fixing them by law to a total of 8.4% of the "agricultural" ("farming"?) gross value could not but reduce the financial revenues of the local governments.

collected funds, apportionments and fines) represented a burden of 225 to 270 yuan per rural capita, *i.e.* 10 to 12% of the peasant net income of the previous year. This burden is much higher than that derived from official data (170 yuan, less than 8% of the peasants' net income). It is higher than the "official burden" as defined by the Chinese authorities (only the fees for the townships and villages: apparently less than 80 yuan per capita or 4% of the net income, compared to the legal ceiling of 5%). It would be higher still if the value of the (forced) labour contributions of the villagers were accounted for.

Due to regional disparities, insufficient financial resources in mainly agricultural counties and townships lead to numerous surcharges, or the predatory behaviour of local cadres. This real taxation rate is even doubled in some places, giving way to many grievances and even to violence. This issue, which calls into question the very social stability of the countryside, touches more fundamental problems related both to good governance at the local level and to the role of peasants in a development process which benefits first the urban communities. This problem is exacerbated by the entry of China into the WTO, where agriculture could be the losing sector.

The problem of good governance in the countryside is not new. In the past, numerous reforms have tried, without much success, to simplify and rationalise the collection of taxes imposed on peasants (dating back to the famous reform of the "single whip system", *yi tiao bian fa*, during the Ming Dynasty; Qin Hui, 2001, p. 28). No wonder that the last reform in Anhui met so many difficulties. Surtaxes were also very common before 1949, provoking many peasant riots. The difficulty then was of organising and financing the administrative apparatus necessary for controlling a large population. Today, local governments must also take care of new development tasks and provide social services (education, etc.) necessary for the economic development of the rural sector.

Financing these new tasks and providing these public services are indeed expensive. If peasants are not to be ignored in the modernisation process of the country, new trade-offs will have to be made; a larger share of central resources will have to be redistributed to needy counties or townships. Furthermore, the necessary control over the local bureaucracy to ensure the good use of public resources will be effective only if some transparency is restored at the grassroots level, thus entailing greater and more democratic participation of the concerned population.

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AGRICULTURAL INFRASTRUCTURE SUPPORT POLICY IN CHINA

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(Paper presented by Ying Du)

Abstract

This paper assesses the government's role in supporting the development of the agricultural infrastructure in China and summarises the evolution of investments in agricultural infrastructure as well as changes in the structure of these investments. The paper then assesses the impact of these policies on improving conditions for the development of agriculture, contributing to increasing farmers' incomes and promoting the sustainable development of agriculture. While there have been some positive results, these policies are not sustainable within the framework of a market-oriented economy and do not meet WTO requirements. Therefore, in accordance with WTO principles the government should adjust its policy objectives and adopt new priorities such as water management, environmental protection, market infrastructure and small-scale rural infrastructural projects.

Introduction

Investment in agricultural infrastructure is essential to improve agricultural productivity. In economic terms, agricultural investment can be defined in both a broad and narrow sense. Narrowly speaking, agricultural investment refers to fixed agricultural capital and working capital. Broadly speaking, it also includes investment in research, education, technology, natural resource management and environmental protection, and other areas related to agriculture, such as agricultural industries, water management, meteorology, and forestry. The connotation and denotation of agricultural investment has continuously changed as the agro-food industry has expanded. This paper uses the broad definition of agricultural investment. However, due to statistical and data constraints, the paper does not distinguish the benefits for non-agricultural sectors of investments in resources such as water management and meteorology.

Investment in agriculture can be divided into various categories. The use and type of investments can be classified as fixed capital and working capital. From the investor's point of view, investments can be classified as state investment, rural collective investment, farmers' investment, enterprise investment and foreign business investment. State investment can be further differentiated into central government and local government investment. Based on the source of the capital, investment can be divided into financial funds, credit funds, rural collective and farmers' funds, enterprise/business funds and foreign funds. In this paper, agricultural infrastructure mainly refers to fixed assets funded by the government treasury.

1. The importance of the government's role in supporting agricultural infrastructure

Agriculture is an essential part of the national economy and all governments around the world protect and support their agriculture to some extent. Various support and protection measures are practised in different countries. For example, in the United States, the government supports farm income through direct or indirect subsidies. The situation in China is different. China is a country with a large population in which farmers are in the majority. Agriculture is not only a fundamental industry for maintaining the livelihood of over 1.2 billion people but also the means of income for its farmers.

China is a country with limited agricultural resources, small-scale farms and intensive labour input. These characteristics of agriculture in China make it necessary for the government to play an important role in building the agricultural infrastructure. Over the years, the Chinese government has constantly increased agriculture inputs and strengthened the agricultural infrastructure as an important way of supporting agriculture. Government investment plays a crucial role in funding the agricultural infrastructure.

General information on the national agricultural investment

The Chinese State, rural collective groups, farmers, national enterprises, along with foreign businesses, are the five major investors in the Chinese agriculture. Research shows that in the past 20 years, investment levels, including fixed assets and working capital, have shown a constant rise. In 1980, total investment in agriculture was 125.1 billion yuan. By 1997, the figure had increased to 544.3 billion yuan, with an average growth of 9% per year.[1] In the same period, the reform of the family contract and responsibility system made farmers the key element in agricultural productivity and investment. During 1980-1997, farmers' share of overall investments in agriculture increased from less than 10% to around 50%, while the share of the state and collective groups declined. The state reduced its share in investment from 31.1% in 1980 to 13.5% in 1988, and it has remained at roughly that level since then. In 1997, the share was 13.0% and the share for fixed assets investment was 15.3%.

The state investment level and structure

The Chinese State has always viewed agricultural enhancement as a priority for the national economy. Over the past 50 years, the state treasury, including the central government and local treasuries, has steadily increased the actual amount of its expenditure for agriculture. During the first 4 years of the "Ninth Five Year Plan", the annual investment level was 7.5 times the level of the "Sixth Five Year Plan", and 38 times the level of the "First Five Year Plan" (Table 1). The share of treasury expenditure dedicated to agriculture varies greatly. Since 1990, the share has remained at 8-10%.

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Table 1. **Government expenditure for agriculture**

Unit: billion yuan

Year	Total government expenditure	Government expenditure for agriculture	Share of agricultural expenditure to total government expenditure (%)	The structure of agriculture expenditure provided by the government budget				
				Expenditure for supporting agricultural production and agricultural operating expenses	Expenditure for capital construction	Science & technology promotion funds	Rural relief funds	Others
1st five yrs	134.56	9.083	6.8	3.723	4.091	0.00	1.361	0.783
2nd five yrs	228.87	28.572	12.3	11.335	12.662	0.00	2.224	2.144
3rd five yrs	251.86	23.111	9.2	7.824	9.845	0.158	1.885	3.333
4th five yrs	391.96	40.122	10.2	16.100	17.475	0.043	2.375	4.129
5th five yrs	524.73	69.355	13.2	34.587	23.803	0.560	4.282	6.123
6th five yrs	**683.08**	**65.848**	**9.6**	**43.719**	**15.857**	**0.825**	**4.951**	**0.496**
1981	108.95	11.021	10.1	7.368	2.415	0.118	0.908	0.212
1982	112.40	12.049	10.7	7.988	2.881	0.113	0.860	0.207
1983	124.90	13.287	10.6	8.666	3.425	0.181	0.938	0.077
1984	150.19	14.129	9.4	9.593	3.363	0.218	0.955	
1985	186.64	15.362	8.2	10.104	3.773	0.195	1.290	
7th five yrs	**1 326.0**	**116.777**	**8.8**	**83.608**	**24.77**	**1.296**	**7.103**	
1986	226.03	18.420	8.1	12.430	4.387	0.270	1.333	
1987	236.89	19.546	8.3	13.416	4.681	0.228	1.247	
1988	262.80	21.407	8.1	15.874	3.967	0.239	1.327	
1989	291.92	26.594	9.1	19.712	5.064	0.248	1.570	
1990	308.36	30.784	10.0	22.176	6.671	0.311	1.626	
8th five yrs	**2 438.74**	**227.195**	**9.3**	**166.593**	**47.249**	**1.493**	**11.86**	
1991	338.66	34.757	10.3	24.355	7.549	0.293	2.560	
1992	374.22	37.602	10.0	26.904	8.500	0.300	1.898	
1993	464.23	44.045	9.5	32.342	9.500	0.300	1.903	
1994	579.26	53.298	9.2	39.970	10.700	0.300	2.328	
1995	682.37	57.493	8.4	43.022	11.000	0.300	3.171	
First 4 yrs of the 9th 5 yrs	**4 115.70**	**370.74**	**9.0**	**237.432**	**111.899**	**2.869**	**18.534**	
1996	793.75	70.043	8.8	51.007	14.151	0.494	4.391	
1997	923.36	76.639	8.3	56.077	15.978	0.548	4.036	
1998	1 079.82	115.476	10.7	62.602	46.070	0.914	5.890	
1999	1 318.77	108.576	8.2	67.746	35.700	0.913	4.217	

Source: China Statistical Yearbook 2001.

Expenditure on agricultural production and agricultural operating expenses dominates government expenditure on agriculture. The share was 65.8% in 1985, 74.8% in 1995, 72% in 1990, 74.8% in 1995 and 62.4% in 1999, hovering roughly around the level of 70%. During the same period, the share of expenditure for capital construction was 24.3%, 21.7%, 19%and 32.9% respectively. The Science & Technology Promotion Funds and Rural Relief Funds is only a small part of government expenditure

for agriculture. From the above, we can see that overheads and administration fees are the main component of government expenditure while infrastructure has a very small share, particularly investment in agricultural science and technology, which is less than 1%.

Government investment levels in agricultural infrastructure

Investment in infrastructure is the main component of fixed assets investment. Investment in agricultural infrastructure is one of the major measures adopted by the Chinese government to support agriculture, with a specific annual budget. Table 2 shows the evolution of investment in agricultural infrastructure and the share in the total of state treasury expenditure on infrastructure. The table shows that, apart from a few years, treasury expenditure on agricultural infrastructure has been rising continuously. The share of state treasury infrastructure expenditure on agricultural infrastructure dropped to 7.6% during the 6th five-year plan. It then gradually rose to 8.0% during the 7th five- year plan, to 15.1% during the 8th five-year plan and 20.6% during the first four years of the 9th five-year plan. At the end of the 1990s, the central government's budget was stable at a level of 11 billion yuan annually for agricultural infrastructure. In 1998, the government issued long-term national bonds for funding infrastructure construction. Since this new policy was adopted, agricultural infrastructure has improved tremendously. During 1998-2000, the funds raised by the government for agriculture infrastructure through national bonds represented 28% of the total funds raised by national bonds during the same period. With the input from the central government treasury and the funds raised by national bonds, the government's investment in agricultural infrastructure during the 9th five-year plan exceeded 160 billion yuan.

Table 2. **Government expenditure on agricultural infrastructure**

Year	Total government expenditure for capital construction (billion yuan)	Government expenditure on agricultural infrastructure construction (billion yuan)	Share of agricultural infrastructure construction expenditure (%)
1st five yrs	50.644	4.091	8.1
2nd five yrs	105.200	12.662	12.0
3rd five yrs	97.472	9.845	10.1
4th five yrs	157.561	17.475	11.1
5th five yrs	199.813	23.803	11.9
6th five yrs	**209.532**	**15.857**	**7.6**
1981	33.063	2.415	7.3
1982	30.915	2.881	9.3
1983	38.281	3.425	8.9
1984	48.893	3.363	6.9
1985	58.380	3.773	5.8
7th five yrs	**309.328**	**24.77**	**8.0**
1986	67.182	4.387	6.5
1987	62.812	4.681	7.5
1988	63.337	3.967	6.3
1989	61.258	5.064	8.3
1990	54.739	6.671	12.2
8th five yrs	**313.661**	**47.249**	**15.1**
1991	55.962	7.549	13.5
1992	55.590	8.500	15.3
1993	59.193	9.500	16.1
1994	63.972	10.700	16.7
1995	78.944	11.000	13.9
First 4 yrs of the 9th 5 yrs	**543.124**	**111.899**	**20.6**
1996	90.744	14.151	15.6
1997	101.95	15.978	15.7
1998	138.77	46.070	33.2
1999	211.66	35.700	16.9

Note: Since 1998, "infrastructure expenditure" includes expenditure raised by national bonds.
Source: China Statistical Yearbook 2001.

One can look at this issue from a different perspective. When we look at total investment in national infrastructure from all sources, the share for agriculture is really low and has been falling since the 1980s. During the 1st to 5th five-year plans, the share was about 10%. During the 6th to 8th five-year plans, it dropped to 5.1%, 3.3% and 3.0% respectively. During the 9th five-year plan, it bounced back to 5.3%. When compared with the share of agriculture in total government expenditure on infrastructure, government investment in agriculture represents over half of national expenditure, and the share of agriculture in total government expenditure on infrastructure is steadily increasing. This shows that government investment in agricultural infrastructure plays an essential and leading role.

The breakdown of the central government's investment in agricultural infrastructure

Table 3 shows the central government's total investment in agricultural infrastructure during the 9th five-year plan and the changes in the investment structure.

Table 3. **The central government's investment structure in agricultural infrastructure during the 9th five year plan**

Items	Total of the 9th five years		1996		2000	
	Infrastructure investment (billion yuan)	Share by sector (%)	Infrastructure investment (billion yuan)	Share by sector (%)	Infrastructure investment (billion yuan)	Share by sector (%)
Total	161.00	100.0	9.92	100.0	41.24	100.0
1. Water management	114.45	71.1	6.83	68.8	28.76	69.7
2. Forestry & Ecological Management	23.05	14.3	0.53	5.3	7.51	18.2
3. Agriculture	12.44	7.7	1.47	14.8	1.76	4.3
4. Meteorology	2.33	1.4	0.20	2.0	0.36	0.9
5. Others	8.73	5.4	0.90	9.1	2.86	6.9

Note: "Others" includes the central government's aid to agricultural infrastructure in disadvantaged areas and remote minority areas and other emergency pre-arranged investments.
Source: Reports from Agricultural Economy Department of the State Development and Planning Commission.

Table 3 shows the following features of the central government's investment in agricultural infrastructure: (1) Total investment has risen tremendously. Central government investment in agricultural infrastructure is roughly 5-6 times the level of the previous five years. This period shows the largest scale and growth in agricultural investment. (2) The investment structure has changed. Investment is still focused on water management infrastructure. During 1996-2000, total central government treasury investment in water management infrastructure exceeded 110 billion yuan, accounting for 70% of total central government investment in agricultural infrastructure. The share of investment in forestry and ecological management also rose rapidly. During 1996-2000, total central government investment in ecological forestry exceeded 23 billion yuan, representing 14.3% of central government investment in agriculture infrastructure during the same period, and this share is increasing annually. In 2000, it reached 18.2%, which is an increase of 13% compared to 1996. Meanwhile, the amount of investment in infrastructure such as meteorological facilities increased slightly, while the overall percentage decreased.

Investment performance

Over the years, the Chinese government has provided financial funds to enhance agricultural infrastructure in order to tackle bottlenecks and shortages in agricultural development, and has played a key role in continuously improving productivity. We can summarise the government's role in terms of the following three goals:

- *Improve conditions for agriculture production*

With the construction of large water management works, China has now established an initial security mechanism for controlling floods. Major river control projects are being carried out at all levels in the country to improve defences against flooding. Since 1998, 30 000 kilometres of banks have been reinforced along major rivers and lakes. The national flood defence system currently operates 270 000 kilometres protecting approximately 40 million hectares of farmland. The defence system has become an important element in China's fight against flooding. A great number of fully functional

flood control works have been completed. Currently, there are 86 000 reservoirs nation-wide, with a total storage volume exceeding 500 billion cubic metres. The works have provided flood defences, agricultural irrigation, water for daily consumption etc. The amount of irrigated farmland has increased from 18 million hectares in the 1950s to the current 53.3 million hectares. The 1 000 commercial grain producing counties and over 300 high quality cotton producing counties have become key elements in ensuring an effective and stable bulk supply to the market. Current Chinese grain production has reached a level of 450-500 million tonnes per year, an abundance that has put an end to the grain shortages. Now China can rely on itself to feed 1/5 of the world's population.

– *Increase farmers' income*

The government's huge investment in water management, arable land, and pre and post production infrastructure have improved conditions for farming and decreased costs. The profit margin for agricultural products has improved, leading to direct increases in farm income. In particular, the implementation of fine breed/improved variety projects in animal husbandry and agriculture have greatly increased productivity. Forty per cent of the research results have had immediate applications resulting in direct increases in farm income. The government's investment in local infrastructure such as rural roads, safe drinking water systems for people and animals, and reshaping the rural electricity network have vastly improved living conditions in rural areas. At present, the net income of Chinese farmers has increased to 2 366 yuan in 2001 from 134 yuan in 1978, with a yearly increase of over 7%. Most Chinese farmers are out of poverty and moving towards relatively comfortable lives.

– *Promote sustainable development in agriculture*

In 1998, the Chinese government issued for the first time a National Ecological Management Construction Plan to provide, from the perspective of economic and social sustainability, a comprehensive plan for sustainable development over the next 50 years. Meanwhile, the central government has hugely increased investment in ecological forestry management and organised major forestry ecological projects to preserve natural forests, to return farmland to forest, to create shelter forest systems, to slow desertification, and to carry out targeted ecological management. In some areas, ecological damage is now under control, and treatment in areas with fewer problems is now underway. As a consequence of the efforts made over the years, China now has 5 million hectares of man-made forest, water and sand treatment extending over 50 000 square kilometres, with a total area treated of 700 000 square kilometres. Ten per cent of the land subject to potential desertification is under control, and national forestry coverage has increased from 14.0% in the early 1990s to the current 16.6%.[2]

2. The major challenges facing the government's support policy on agricultural infrastructure

China's entry into the WTO has provided the country's agriculture with a great opportunity as well as serious challenges. In the short term, the challenges are greater. It is worth bearing in mind that many Chinese agricultural products will face disadvantages in the international market due to small-scale production, less advanced technology, and less established agricultural infrastructure. Only through increasing support for domestic agriculture and continuing to improve the conditions and environment for agricultural development, can we increase the competitiveness of Chinese agriculture and secure income for farmers. As effective as the measures taken by the government to support agriculture have

2. ZENG Peiyan, *Fifty Years of Investment and Construction in China*, Planning Publishing House in China, October, 1999, page 208.

been, many challenges still remain. In particular the current agricultural investment system is out of date: the investment and financial policy making and management mechanisms are no longer applicable for the socialist market economy, nor do they meet the requirements of WTO membership. Three specific points illustrate this:

– *Too little investment in agriculture, too many policy changes, diminishing marginal returns to investment*

Many years of effort, in particular the government's large-scale input following adoption of an active financial policy in 1998, have gradually improved the agricultural infrastructure in China. But there has not been any fundamental change in the unfavourable conditions faced by the Chinese agricultural infrastructure. The impact and loss caused by the floods of 1998 and the natural disasters in recent years have shown that Chinese agriculture is still very vulnerable to national disasters and too heavily reliant on weather conditions. In the new century, Chinese agriculture must advance in keeping with the economy, society, and the environment, in order to meet the market's complex demands and to continuously increase farmers' incomes. Far into the future, it can be expected that the Chinese agriculture will continue to face tough tasks. Existing research, points to the following three problems: (1) long-term shortage of funds. It is estimated that in the next 30 years, agriculture will face a shortfall in funding of around 5% per year. Supply and demand will remain seriously unbalanced and the conflict between investment demand and the shortage of funds will remain a long-term problem. (2) Dramatic swings over time. The impact of factors such as the state's macro policy, the supply and demand for agricultural products, and natural conditions means that, China's agricultural investment policy is not stable. From 1980-1997, overall investment in Chinese agriculture underwent three cycles. The fastest growth year showed a 20.8% increase while the lowest year was – 3.6%, with a difference of 24 percentage points. The yearly shifts in investment do not help to achieve steady agricultural growth and can result in resources being wasted. (3) Investment margins are falling: Analysis shows that the level of grain production achieved with every 100 yuan capital in 1985 was 893 grammes. This dropped to 570 grammes in 1992, and to 485 grammes in 1998, a downward trend. This shows that in order to achieve the same grain output, more investment is needed.[3] These realities challenge the government's policy on agriculture investment.

– *The investment structure is not appropriate, too often creating a "feast or famine" situation*

In agriculture investment, working capital has a higher share than fixed asset capital. As stated above, in the general breakdown of Chinese investment in agriculture, the share of fixed asset investment has dropped from 36.7% in 1980 to 18.0% in 1997 and the share of working capital has risen rapidly from 63.3% to 82.0%. Based on previous agricultural development experience, the ratio between fixed assets and working capital investments should not be less than 1/3. The current change in the environment for agricultural investment in China will have serious impacts on the long term development of agricultural infrastructure and could eventually lead to a drop in returns on investment and increased production costs.

Traditionally, most of the government investment in agriculture has been in middle or large-scale infrastructure rather than in small-scale rural infrastructure designed to improve living conditions for the rural population or increase farmers' incomes. Under the statistical methods used, investments in infrastructure with obvious social benefits such as water management, meteorology, and forestry

3. LI Yanling *et al.*, "Study on Investment for Agriculture", in *Chinese Agriculture Development Strategy of the 21st Century*, edited by Jiang LIU, Agriculture Publishing House of China, June, 2001, pages 290-291.

ecology, whose benefits extend beyond agriculture, have always been included under agricultural investment. To some extent, this has resulted in overstating the amount invested in agriculture by the government. When the limited funds under the current financial and investment system are allocated, the central government's funding goes mainly to large or medium-scale infrastructure projects and mostly to water management construction works. There is a shortage of funds for improving the conditions for agricultural production and providing infrastructure designed to increase farmers' income, and the funds available are unable to cover the huge rural areas. Investment from provincial governments is required to complement the central government's large or medium projects. The central and provincial governments only grant aid for specific areas or special small-scale, rural infrastructure projects (*i.e.* in disadvantaged areas). It should be borne in mind that many district (city), or county levels are currently experiencing difficulties with obtaining the funds to work with nationally funded projects, let alone getting funds for their own agricultural infrastructure investment. Therefore, the small infrastructure projects in rural areas rely on funds or services provided by farmers. More and more farmers are abandoning their land and work or doing business elsewhere. Rural migration is increasing, making it more and more difficult to organise funding for rural public facilities. Fund raising is facing new problems and challenges. In addition, profits from agriculture compared to other industries is low in the long run and farmers have little enthusiasm for investing in small rural infrastructure facilities, which have become the weakest link in the Chinese agricultural system.

Among the central government's investments in agriculture, more funds are used for production and very little goes into research, technology promotion and up- and downstream services. The input level to agricultural technology from the state is not in keeping with the key role agriculture plays in the national economy. According to research, investment in agricultural technology in China is over 6 billion yuan, 0.3% of the total agricultural gross output compared to an average of 2.4% in developed countries, and 0.7%-1.0% in developing countries. The share of agricultural technology funding in agricultural GDP is far below the world average. Only 30-40% of research outcomes can be transferred into practice, far below the 70% achieved in European and North American countries. Since 1996, under central government arrangements for agricultural infrastructure investment, the share for technology, improvements in breed engineering, information systems, testing or lab systems, is lower than 10% of the total investment in agriculture, which is far lower than the growth of agricultural production.

- *Agricultural investment mechanisms and management systems do not keep up with developments*

The current agricultural investment management system in China does not work with a market economy system and WTO requirements, mainly because:

Firstly, investment decision making is out of date. At present, the terms and conditions for agricultural projects funded by the government are set according to the investment amount. The approval and other procedures are complicated and out of date. There is room for the approval system to become more systematic, transparent and scientific. It is currently unrealistic and ineffective.

Secondly, the investment approach needs improving. Under the current financial management system, central government investments can only be used for the state-owned economy and tend to be in the form of direct investment rather than compensation. The leading role of central government investment is not obvious and it is far from the compensation role played internationally. It does not conform to WTO requirements.

Third, there is too much division amongst different government departments and an investment risk prevention mechanism is not in place. At present, there are too many channels for government investment in agriculture. Financial investment for construction can be channelled through agricultural infrastructure investment, agricultural comprehensive development investment and financial investment for poverty alleviation. These various channels to some extent overlap or duplicate their efforts in their use, implementation range, construction content and arrangements. But because they are the responsibility of different departments, there are problems caused by the lack of co-ordination, resulting both in over funding and under funding. This system causes confusion amongst different government departments and results in ineffective investment arrangements and allocation. Without a risk management mechanism in place, the investment responsibility is confusing and inefficient use of funds can easily result.

Fourth, agricultural investment relies heavily on central government without sufficient funds from local government. There are no clear boundaries for overall investment, and the division of responsibilities between central and local governments is unclear.

3. Thoughts on improving and reforming the government's support policy for agricultural infrastructure

The outline of the Chinese 10th five year plan, states that agriculture is a priority in national economic growth, and the aim is to achieve sustainable and steady growth in the agriculture with improvements in quality and profitability, and to rapidly raise farmers' income. In order to achieve these goals and meet the requirements of the current situation, we must further improve the state's agricultural investment policy, increase government support and protection of agriculture, particularly increasing construction of agricultural infrastructure, and broaden investment sources.

Aim of the policy

With China's entry into the WTO, the agricultural infrastructure investment policy should focus on increasing market competitiveness and farm incomes and trying to achieve "the four integrations": (1) To integrate the government's total investment in agricultural infrastructure and improve the investment structure in order to achieve a coherent government role in investment control and guidance; (2) To integrate the government's investment in agriculture and enhance investment management based on international conventions and WTO regulations, by clarifying the government's role in agricultural investment and improving the government's management system for investment in agricultural infrastructure; (3) To integrate increased central government investment in agriculture with local government investment, utilising financial institutions and involving farmers' actively seeking channels and economic sectors to help with agricultural development and infrastructure construction, and gradually establish a diversified agricultural investment and finance system; (4) To integrate the construction of large or medium scale agricultural infrastructure facilities with small rural ones to help create a public infrastructure, facilities, and supply system that are oriented to the needs of farmers and the rural population.

Support focus

Agricultural infrastructure is one of the key points in general government services as defined by the Green Box Policy in the WTO Agreement on Agriculture. It is the government's responsibility to provide such public facilities. Based on the WTO agricultural agreement, there is no limit to the

amount of this kind of support. Furthermore, under the green box, policies directly related to agricultural infrastructure include environmental planning, regional aid planning, investments related to structural adjustments, etc. Therefore, China should increase the government's investment in agriculture and speed up agricultural infrastructure construction in order to meet the new and urgent requirements of agriculture and national economic growth, and work within the socialist market economy and the WTO regulations. This should be the top priority in the government's support and protection of agriculture, rural areas and the farmers. We should focus on the following four types of support:

Firstly, focus on water management as the priority. We should focus on the construction of flood defence systems and comprehensive water management of the major rivers and lakes, particularly the defence systems on the Yangtze and the Yellow River. We urgently need to reinforce reservoirs that are deteriorating. We need to continue with the construction of major water management works that can help economic and national growth. We need to take measures to ease the water shortage in the north. Due to the serious shortage of water resources in China, we should give priority to effective irrigation systems and focus on the maintenance and construction of small and medium rural water management projects for irrigation and dry season, water-saving, agricultural schemes.

Secondly, focus on planting, reforestation and grass growing, to reinstate green coverage as a key element in ecological management. Continue the comprehensive ecological management projects in some areas; continue the natural forestry protection projects in parts of the Yangtze and the Yellow River basins, and in Inner Mongolia, and return some farmland to forest. We need water treatment and protection from wind and sand in Beijing and Tianjin, and the creation of an ecological protection band around these two cities. On pastureland, keep herds to an appropriate number, close down overly used pastureland and implement grass recovery. We should continue the construction of forest shelters and speed up the construction of "green ways". We should speed up water treatment in small rivers and reduce soil erosion.

Third, support an agricultural services system promoting the development and extension of new agricultural technology and market information services that focus on promoting agricultural structural adjustment and increasing farmers' income. Technology is the key to agricultural competitiveness. A revolution in agricultural technology is taking place around the globe. Each WTO member country is taking advantage of the fact that investment in agricultural technology falls within the guidelines of the green box and is constantly increasing its investment in agricultural technology so as to improve the international competitiveness of its agricultural products. (1) We need to focus on establishing international standards for agricultural science and technology and the necessary infrastructure such as laboratories, project centres, and display zones, in order to encourage the import of advanced technology and to develop new technologies based on advanced agricultural achievements from overseas. (2) Increase support for systems to promote agricultural technology, strengthen support to projects such as crop engineering, development of rare breeds and improved species engineering, animal feed safety engineering and animal and plant protection systems. (3) Speed up the establishment of an agricultural product market system, agricultural market information system, agricultural product quality standards and examination systems. Reward farmers for adopting advanced and appropriate technology in order to meet market demand; adjust agricultural structures; increase the production of quality and "niche" products; encourage brand names, new products and products with export potential; generally, help to improve the quality and competitiveness of Chinese agricultural products.

Fourth, improve general production conditions for farmers and improve the quality of rural life through the construction of new infrastructure and public facilities. In particular, support the construction of small rural infrastructure facilities such as water saving irrigation and drinking water

systems for rural populations and livestock, county roads, rural water and electricity supply, methane production, grazing land and fencing; in general, improve public facilities in the rural areas. Encourage farmers to invest in small rural infrastructure facilities. Co-ordinate rural infrastructure with farmers' needs; consider farmers' economic capacity and strike a good balance between basic food needs and construction. Take reasonable and appropriate actions and respect the opinion of the majority of the local farmers. Make systematic plans, encourage and organise farmers to engage in public project construction and leave the decision making to the farmers. Set up monitoring and management systems for work done with the farmers' funds or labour. Set up a rural public property supply system that can widely involve farmers, to resolve the shortage of small rural infrastructure facilities. The government should increase aid to people in poverty and to farmers in poor areas, particularly those low-income farmers who plant crops that will be less competitive after WTO entry. Their income will be decreased slightly in the short run. The state should take effective measures to support these farmers to improve productivity and life conditions, so that they can gradually move out of poverty and join in the general regional economic development.

Key measures

- *Increase government investment in agricultural infrastructure and establish sound investment channels*

Increase overall investment in agricultural construction as required by The Agricultural Law of the People's Republic of China. At present, the Chinese economy is growing at a rapid rate and the revenue received by the central government treasury is increasing. The government should consider adjusting the national revenue-distribution structure in keeping with the treasury growth and increase annual investment in agricultural infrastructure facilities so as to achieve a reasonable share of investment for agriculture from the central government. Increase central government transfer payment to agriculture in central and western regions. Local governments at all levels should also try to increase their investment in agricultural construction. Special funds to support agricultural and rural development such as funds for poverty alleviation projects and comprehensive agricultural development should also be increased according to the local financial capability.

- *With the guidance of the government, gradually develop a diversified agricultural investment and finance system*

With the deepening of reform in rural areas, the profile of investors for agricultural infrastructure facilities is becoming more and more diversified—from government as the sole investor to a key investor with multi-ownership before a truly diversified investor scheme is formed, engaging governments at all levels, rural collective enterprises, large industry and commercial enterprises, overseas business, private business and private investors. Generally speaking, agricultural infrastructure construction has a long cycle with a low rate of return, which discourages national investment to some extent. But in the broad sense agriculture has many links with high value marketing and has the potential to attract investors. Therefore, apart from increasing its direct investment, the government needs to reform its current agricultural investment and finance system and to attract investors through various channels and from various economic sectors to engage in funding agricultural infrastructure construction.

– *Improve the government's support and protection system for agriculture, farmers and rural areas*

Firstly, increase the level of protection and increase profits in order to form a better profit-related mechanism for agriculture investment and an internal market driven mechanism.

Secondly, improve the government's support approach by adopting government treasury aid and subsidy, or favourable tax and loan policies. Engage all economic sectors in agriculture investment. Encourage and support the involvement of industry and commerce in agricultural infrastructure construction. It is important for the government to use treasury subsidies to attract farmers and other sectors in the economy to invest in agriculture; such subsidies are a feasible and effective approach in a market economy country. The advantage of this approach is that the government plays a leading role in attracting funds and guiding investment. It can also avoid problems caused by confusion of ownership, bad management and low efficiency. This approach works particularly well for projects that benefit the public and directly involve production and operation. Policies and measures need to be systematised and issued for agricultural infrastructure construction, to provide government treasury subsidies for projects such as agricultural industrialised marketing, agricultural hi-tech and new-tech promotion, so as to attract and encourage investment from farmers, farmers' co-operative organisations, agricultural operation organisations, and leading enterprises.

Third, speed up reform in the system to allow and encourage non state-owned sectors to be involved in agricultural infrastructure construction and to encourage co-investment in various forms. Adhere to the principle of "whoever makes the investment or provides the operation will benefit", to encourage farmers to create farmland water management facilities, and build and operate small farmland water treatment facilities. Auction licences for the "four wastes" to encourage farmers and other sectors to invest in re-forestation, erosion management, and ecological management. In view of the Western China Development strategy, favourable policies should be adopted to encourage and support investment in agricultural infrastructure in the west.

Fourth, continue to improve the agricultural loan system; increase the size of agricultural loans and increase the share of loans for agricultural infrastructure, and promote favourable policies for agricultural loans. We also need to provide conditions to increase the amount and range of overseas investment that can be used for agriculture, particularly loans from overseas governments or international finance organisations, and focus on supporting central and western China's agricultural development and the construction of major infrastructure facilities.

Fifth, stabilise and improve current rural policies. Respect farmers' rights in the farmland contract and responsibility system and their rights in production and operation. Reduce the burden on farmers. No violation of the farmer's legal rights should be tolerated. Engage the farmers in investing. These are the pre-conditions for farmers to increase their investment in agricultural infrastructure.

– *Speed up agricultural investment and financial system reforms and regulate the government's investment behaviour; improve the government's agricultural investment management system and investment effectiveness in agriculture*

Based on the principle of "whoever makes the investment will benefit, and take the risk", clarify the responsibilities and liabilities. Make appropriate adjustments in the scope of projects to be approved, simplify procedures, and gradually establish a new agricultural investment and finance system that is adapted to the socialist market economy and WTO requirements. Closely focus on improving the conditions for agricultural development and ecological management, to improve the quality and profitability of agricultural products and their market competitiveness. Help agriculture to move

towards modernisation. Strictly monitor the use of government investment in agriculture to ensure the funds are used for infrastructure and public benefit projects, and gradually pull out from pure production or competitive projects. Appropriately define the boundaries between the central and local governments to ensure governments at all levels are clear about their responsibilities in agricultural investment and actively engage central and local governments. Meanwhile, following the principles of "co-operation leads to high efficiency" and "the more power, the more responsibility", further define the roles and responsibilities amongst government departments. Maximise the role of the investment macro control department and enhance co-ordination amongst treasury funds for agricultural construction raised through various channels, avoid duplication and overlapping or over-scattered investment, to maximise the effectiveness of limited funds. Improve project management and set up a monitoring mechanism. All government funded agricultural infrastructure projects should be thoroughly pre-planned and properly tested. The project location should take account of the long-term view of the national economy and development, the need to increase farm incomes and to promote rural productivity. Key infrastructural facility projects need to be extremely carefully planned and considered objectively. Strictly adhere to the state infrastructural construction procedure. Improve project preparation with an objective evaluation mechanism. Put in place a corporate liability system, project bidding system, project monitoring and control system and contract management system. Emphasise quality control, and improve post-project monitoring and control. Set up a project approval liability system to ensure the government's policy in agricultural investment is objective and regulated so that the funds can be used more effectively.

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AGRICULTURAL CREDIT POLICY IN CHINA: MEASUREMENTS, EFFECTS AND ADJUSTMENT

By Guangwen He

Abstract

The Chinese government has established various financial institutions in rural areas to provide loans at preferential interest rates to rural enterprises, farmers and rural development projects. The Central Bank of China has provided these institutions with capital at low interest rates to encourage them to issue loans in rural areas. Moreover, the Agricultural Development Bank of China has provided loans to support government grain procurement at protective prices. The implementation of these policy measures has resulted in a higher growth rate of rural loans than of gross agricultural output. However, because of defects in the agricultural credit management system, asymmetry between rural financial institutions and rural economic structure, and preferences for industry development, a number of problems have become apparent: there has been a net outflow of capital from rural to urban areas, the share of rural loans in total loans has been relatively low, and the financial institutions have not been able to provide sufficient support for rural credit. Therefore, it is necessary for the government to search for new ways to support agricultural credit and to redesign different types of "public financial products" with the aim of developing rural finance and establishing an open market system.

Introduction

Since the late 1970s, there has been sustained growth of China's agriculture and the rural economy. There were several factors contributing to this growth. Research by Wen Guanzhong and James (1989) indicate that in the early stages of Chinese agricultural reform, institutional factors (such as the application of the household responsibility system, the adjustment of prices for agricultural commodities, improvement to the grain marketing system and the promotion of agricultural industrialisation, etc.) were the main factors in accelerating growth of agricultural output. Research by Lin Yifu (1994) indicates that apart from the main source of growth being factors of institutional change, the major agricultural inputs including credit played a prominent role. In interpreting all the factors of growth in China's agriculture, capital flow (including the transfer of income in all forms such as the transfer of income in rural areas through prices, the transfer of income through public financial channels and the transfer of capital through credit channels) was undoubtedly an important factor. During the 1980s, of all the different modes of transfers and flow of rural capital and income, the transfer of income arising from the price gap between administrative procurement price and market price for grains occupied an important place. Research by Colin Carter, Zhong Funing and Cai Fang (1999) has substantiated this. However, as Chinese price reforms gradually come into place, this effect will gradually weaken, and the effects of the implementation of measures and instruments of public financial and credit policies in the promotion of the development of the rural economy will become more evident. Research has shown that credit policies were indeed important contributory factors to the rapid development of the rural economy and farmer incomes.[1] However, from the

1. Net per capita income for rural habitants in China rose from 191 yuan in 1980 to 2 366 yuan in 2001, an annual growth of 12.7%. Agricultural gross output value rose from 111.7 billion yuan to 1 461 billion yuan, an annual growth of 12.0%.

perspective of society as a whole, the provision of credit during the period between 1980 and 2001 was actually a growth cost, known within the framework of the WTO as "support". In order to give better support to the implementation of credit support policies, is it necessary to study the extent of credit support received by Chinese agriculture? What is the rate of contribution of credit support in agricultural development? Is the credit protection received positive or negative? Within the framework of the WTO, what adjustment should there be to credit support policies for agricultural development?

1. The main credit support measures in the growth of Chinese agriculture

– *The creation of excess formal financial supply in rural areas, especially in the economically undeveloped ones*

Historically, there has been an excessive network of credit institutions in rural areas due to administrative intervention. The per capita number of banks and credit co-operatives in rural areas has been higher than in cities and, secondly, it has been higher in the economically undeveloped central and western regions than the relatively developed eastern region (Table 1). The provision of financial services clearly exceeds the demands of economic development and can be excessive. This has also been the main cause for the large-scale withdrawal of state commercial banks from the economically undeveloped areas since the late 1990s[2]. As these banks have cut back their operational networks in the rural areas since the mid-1990s, the apparent excess of financial network has been reduced.

Table 1. **Number of banks and credit co-operatives[1] per 10 000 persons in different regions**

	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998
East	0.82	0.83	0.85	0.94	1.13	1.07	1.06	1.13	1.16	1.18	1.12	1.02
Centre	1.09	1.05	1.15	1.26	1.38	1.34	1.25	1.30	1.32	1.33	1.30	1.17
West	1.52	1.51	1.50	1.58	1.58	1.56	1.44	1.33	1.35	1.23	1.16	1.09

1. "Bank" indicates agricultural banks, "co-operative" indicates rural credit co-operatives with independent accounting. They are a combination of rural and village credit co-operatives and joint credit co-operatives. Credit co-operatives and credit centres without independent accounting are not included.
Note: The East is an economically developed region including twelve provinces, autonomous regions and cities directly under the central government, namely Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi and Hainan. The Centre is an undeveloped region and includes nine provinces and autonomous regions, namely Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei and Hunan. The West is an undeveloped region and includes nine provinces and autonomous regions, namely Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang and Tibet.
Sources: Based on relevant data and calculations in the *Yearbook of Rural Financial Statistics, Yearbook of Statistics for Rural China* and *Chinese Financial Yearbook*.

2. In 1999 and 2001, the four major national commercial banks withdrew from over 30 000 operational network points in undeveloped areas.

– *The establishment of financial institutions with peasants and rural enterprises as the main groups of customers and the adoption of strict measures to limit their scope of operation to the agricultural and rural sectors*

With the allocation of support and protection to Chinese agriculture and to the promotion of rural economic development, a structure combining policy-related finance as well as commercial and co-operative finance has only just taken shape in China. This structure brings together three major financial organisations – the Agricultural Development Bank of China, the Agricultural Bank of China (ABC) and rural credit co-operatives – to serve China's agriculture and countryside. The State Development Bank of China has also launched credit for certain developmental projects in the rural sector.

The ABC was founded as a specialised bank for China's countryside. Since its establishment, in accordance with national laws, regulations, guidelines and policies, and based on national credit system, the bank has taken on the task of serving agriculture and rural economic development, raising policy-related credit capital for agriculture, undertaking financial operations related to agricultural policy as provided by the state and acting for public finance in the appropriation of capital to aid agriculture. It specialises in the provision of capital for the purchase of agricultural products. While guaranteeing the supply of purchase capital, supporting open purchasing, safeguarding the interests of the peasants and promoting agricultural production, it also maintains rural stability.

In 1994, the responsibility for providing policy-related credit operations in support of agricultural development was transferred to a newly established bank, the Agricultural Development Bank of China. The ABC has served since as a specialised commercial bank, although it still retains certain policy-related loan business[3]. The main function of ABC is to provide credit services to agricultural enterprises and rural industrial and commercial enterprises.

Since 1980, driven by government pressure for institutional change, the operational mechanisms of rural credit co-operatives has changed significantly. However, in the reform of the rural credit co-operative management system, there has been no conclusion to the controversy on numerous matters such as whether it should evolve towards commercialisation or continue with the co-operative system. They also continue to be restricted to providing a service for farmers. At the end of 2001, there were over 40 000 rural credit co-operatives in China, with balances held on all deposits of 1 700 billion yuan, amounting to 12% of the total deposits in financial institutions. The balance of all loans was 1 200 billion yuan, amounting to 11% of the total loans by financial institutions. Of these, the balance of agricultural loans was 441.7 billion yuan, amounting to 77% of agricultural loans by financial institutions. Between 1998 and 2001, the loan limit set by People's Bank of China for rural credit co-operative was increased by 81.2 billion yuan.

– *The extension of loans for rural enterprises, peasants and rural development projects with interest rates lower than that for other industrial and commercial loans*

Although the Chinese government first proposed the establishment of a market economy system as early as the end of 1992, and put forward the concept of market-based interest rates, it continues to exercise control over loan interest rates, which allows the government to support rural development. Before the mid-1990s, the government's preferential treatment of interest rates for rural and

3. Loans already arranged by the Agricultural Development Bank of China and directed at aiding the poor and integrated agricultural development together with loans for the subsidiary business of grain enterprises.

agricultural loans was evident. The interest rates for loans set by the Central Bank for peasants, rural enterprises and rural development projects were generally between 0.5 and two percentage points lower than for ordinary industrial and commercial loans. This was especially the case before the 1980s (Table 2). From the early 1980s to the mid-1990s, the People's Bank of China continuously adjusted the level of interest rates for existing loans upwards. However, interest rates for agricultural loans were only raised after the same had been done for industrial and commercial loans. In general, such adjustments of interest rates for agricultural loans lagged between six months and one year behind industrial and commercial loans. It was only after the mid-1990s that the government gradually abolished the policy of loans at preferential rates for the countryside. However, it still required that commercial banks issue low interest loans to poor farmers and rural enterprises in impoverished areas and the government granted discounts to the Commercial Bank[4]. On 11 June 2001 the People's Bank of China, the Ministry of Finance, the Leading Group Office of Poverty Alleviation and Development of the State Council and the Agricultural Bank of China jointly promulgated the "Method of Implementing the Management of Discounted Loans to Aid the Poor". This method required the Agricultural Bank of China to issue low interest loans to poor farmers with the government providing the discount from public budget. For one-year loans, the interest rate on commercial loans was 5.85% while the interest rate for peasants obtaining one-year discounted loans was only 3%, with the discount paid to the Agricultural Bank from public finance being 2.85%. Peasants were at an advantage in obtaining loans at a discount and this helped speed up the changes to agricultural technology, increase agricultural output and improve the distribution of agricultural income.

Table 2. **Interest rates on working capital for industry and commerce in comparison with those for agriculture (%)**

	June 1960	May 1961-Sept. 1971	October 1971	1979-1980	1980-1981	1982-1983	1984-1985
Loans for industry and commerce	7.2	7.2	5.04	5.04	4.2	6	6
Loans for the current production expenses of agricultural enterprises	7.2	5.76	4.32	2.16	3.6	4.8	6
Agricultural development loans of one year or less	—	—	—	—	—	4.2	4.2

Source: Based on the *China Financial Yearbook*, various issues.

– *The provision by the Central Bank of low interest capital to rural financial institutions in order to encourage them to issue loans within the rural sector*

The Chinese government used its administrative powers to issue funds for rural financial institutions. During the last few years of the 20th Century, the extent to which the Agricultural Bank of China and Agricultural Development Bank of China depended on the Central Bank for funding was significant (Table 3). During 2001, the People's Bank of China's funds made available for rural credit

4. From the beginning of 1989, the government did its utmost to encourage banks to issue discounted loans to aid the poor. The discounted interest rate for loans to aid the poor was always only 2.88% Between 1998 and 2001, the Agricultural Bank's newly increased discounted loans were between 15 billion and 20 billion yuan annually. At the end of 2001, the balance of its discounted loans was already close to 80 billion yuan.

co-operatives amounted to 31.2 billion yuan, which is 22.4% of the total new loans of 139.5 billion yuan from rural credit co-operatives over the whole year. In the spring of 2002, the People's Bank of China projected to provide 26 billion yuan for rural credit co-operatives to support their lending activities.

Table 3. **Proportion (%) of loan balances of rural financial institutions from the Central Bank, 1997-2000**

	Agricultural Development Bank of China	Agricultural Bank of China	Rural Credit Co-operatives
1997	91.10	15.34	0.15
1998	88.71	21.18	0.33
1999	87.87	19.52	1.62
2000	84.96	5.80	2.87

Sources: Based on *China Financial Statistics* (1997-1999), *China Financial Yearbook* (2001).

– *Provision of purchase capital for the government grain procurement with minimum protective price*

Of all the Chinese government's measures to support agriculture, peasants have benefited most from the implementation of a minimum protective price for grain procurement. Between 1994 and 2000, the Agricultural Development Bank of China issued capital purchase loans to government grain bureaux of approximately 200 billion yuan[5].

The implementation of the various policy instruments and measures to promote agricultural development has had as a consequence a higher growth rate for rural loans than for agricultural gross output value (Figure 1). Shortly after the Asian financial crisis in 1997, the growth rate for agriculture, and of other sectors, slowed down. In order to promote agricultural production, increase farmer income and develop the rural economy, the financial institutions increased rural loans. During the whole period of the "Ninth Five Year" plan, the growth rate of rural loans was 11.3%, while the growth rate of agricultural gross output value was only 2.7% (Table 4).

5. At the end of 2000, the cumulative loans issued by the Agricultural Development Bank of China for agricultural products was 582.9 billion yuan with balances of 730.4 billion yuan. Of this, the balance of loans to protect the purchase of grain was 230.7 billion yuan.

Figure 1. **Comparison of growth rate of agricultural gross output value (AGOV) with the growth rate of rural loans, 1981-2000**

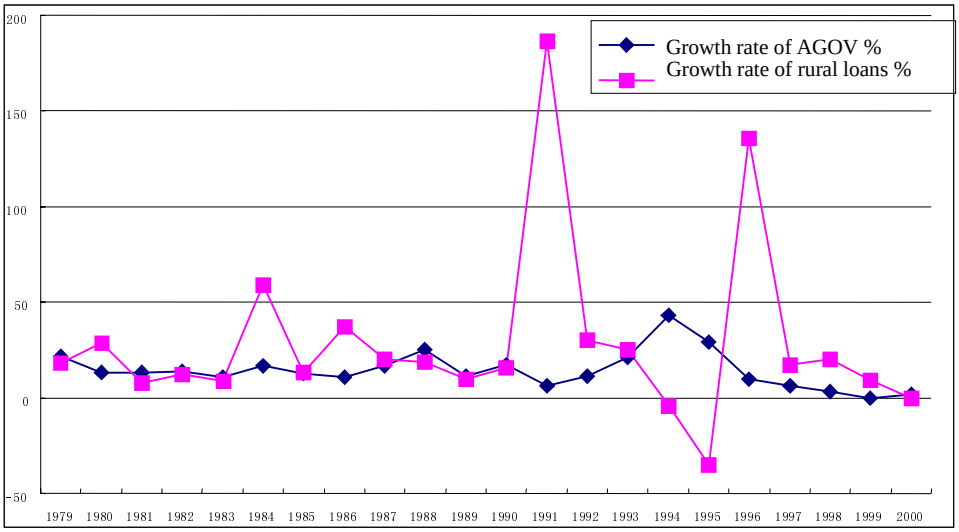

Table 4. **Comparison of the growth rate of the agricultural gross output value (AGOV) with the growth rate of rural loans, 1981-2000**

	Growth rate of the AGOV, %	Growth rate of rural loans, %
1981-1985 (6th Five-Year Plan)	13.5	20.2
1986-1990 (7th Five-Year Plan)	16.3	20.4
1991-1995 (8th Five-Year Plan)	22.3	40.5
1996-2000 (9th Five-Year Plan)	4.2	36.5

Note: Agriculture includes farming, forestry, livestock and fisheries sectors.

2. Characteristics of the supply of rural credit by financial institutions

Rural financial credit is provided by two sectors – formal and informal financial organisations. Formal financial organisations are mainly rural credit co-operatives, the Agricultural Bank, the Agricultural Development Bank and the State Development Bank. In some economically developed areas other state-owned commercial banks and municipal credit co-operatives, joint-stock commercial banks and some informal financial institutions (leasing companies, fiduciary investment companies and finance companies) also provide some financial services to peasants and rural enterprises.

Informal financial organisations mainly take the form of financial service companies, foundations, private money shops and unofficial financial institutions. In some respects, they represent the results of what is considered to be the reform and development of rural finance in China. However, the combination of formal and informal financial organisations are also a reflection of the dual structure of the Chinese rural financial market, namely a regulated financial system with governmental control and a non-regulated autonomous, unofficial financial system, and which is itself the result of the immaturity of government control and the growth of the rural financial market, the imbalance between

the supply and demand of capital and other financial commodities, regional imbalance in the development of the rural economy and regional imbalance in the distribution of rural financial institutions (He Guangwen, 2001a). This has brought with it insufficiency in the gross supply of credit to Chinese agriculture and a lack of balance in rural credit structures.

– *The net outflow of rural capital and the insufficiency in the total amount of rural credit support given by financial institutions*

Under the arrangements of the rural financial system which have been gradually developed, credit support is continuously given to the countryside and the agricultural sector while at the same time funds are raised from the rural sector in the form of savings services for rural inhabitants and enterprises. That is to say, a problem of equilibrium in transfers and liquidity driven by financial institutions exists where capital in the rural areas is concerned. The net amount of rural credit support by the financial institutions equals the amount of rural credit extended – the amount of rural deposits. For our analysis, we used the average annual deposits for financial institutions nation-wide at different times in order to eliminate the effect of unusual factors in particular years. Table 5 shows that since the "reform and opening up" policy, the balance of rural loans from Chinese financial institutions has, without exception, been less than the balance of deposits drawn from the countryside. This gap was a proportion of approximately 60% of rural deposits during the Sixth and Seventh Five-Year Plans. During the 1990s, there was some increase in the ratio of loans to deposits but during the Ninth Five-Year Plan the annual shortfall still amounted to 21.1%. If consideration is given to the diversion of rural capital by the Post Office Savings system and the absorption of savings in the rural areas by state-owned commercial banks, the shortfall is even greater. In 2001, the balance of deposits in the Post Office Savings system was 591.1 billion yuan, of which 378.1 billion yuan was at county level and below and which flowed straight out of the countryside. The balance of deposits absorbed from the rural areas by state-owned commercial banks was about 200 to 300 billion yuan. According to estimates, the total net outflow of capital realised through financial channels (including Post Office Savings) since "reform and opening up" was approximately 800 billion yuan.

Table 5. **Rural deposits and loans provided by financial institutions, 1981-2000**

	Annual average rural loan balance (billion yuan) (1)	Annual average rural deposit balance (billion yuan) (2)	Annual average margin between rural deposits and loans (billion yuan) (3)=(1)-(2)	Margin between rural deposits and loans as a proportion of rural deposits % (4)=(3)÷(2)×100	Ratio of loans to deposits % (5)=(1)÷(2)×100
1981-1985 (6th Five-year Plan)	28.36	70.84	-42.48	-60.1	39.9
1986-1990 (7th Five-year Plan)	80.07	191.74	-111.67	-57.9	42.1
1991-1995 (8th Five-year Plan)	386.94	494.06	-107.12	-14.9	85.1
1996-2000 (9th Five-year Plan)	948.02	1 204.61	-256.59	-21.1	78.9

N.B.: Rural deposits include general agricultural deposits and peasant savings while rural loans include general agricultural loans and township and village enterprise (TVE) loans.
Sources: China Financial Yearbook and *China Statistical Yearbook*, various issues.

Where the rural financial sector *per se* is concerned, similar conclusions can be reached from an analysis of the deposits and loan activity in the Agricultural Bank and rural credit co-operatives. Taking the rural credit co-operatives as an example, since 1980 there has been a major increase annually in the shortfall between deposit and loan activity for peasants in Chinese rural credit co-operatives (Table 6). In 1998, the shortfall was 75% of the balance of deposits at the end of the year, with loans to peasants being equivalent to only 25% of the deposits. The balance of net capital outflow from rural credit co-operative channels amounted to 778.2 billion yuan, but this by no means signified that the credit of rural credit co-operatives was abundant nor did it indicate that peasants did not need capital. Some consider this was caused by a "reluctance to issue loans". The author considers that the existence of such a large shortfall in the peasant deposit and loan activities of rural credit co-operatives is a result of the failure to make rural capital truly rural. It is only because of the large-scale presence of a shortfall between peasant deposit and loan activities that capital sources on a large scale can be created for the industrialisation of cities and the urbanisation of the countryside.

Table 6. **Changes in the difference between peasant deposits and loans in rural credit co-operatives**

Unit: billion yuan

	1980	1982	1984	1986	1988	1990	1992	1994	1996	1997	1998
Balance of peasant deposits (1)	11.7	22.8	43.8	76.6	114.2	184.2	286.7	481.6	767.1	913.2	1 044.1
Balance of peasant loans (2)	1.6	4.4	18.1	25.8	37.2	51.8	76.0	108.1	148.7	174.3	265.9
Margin between deposits and loans (3)=(2)-(1)	+10.1	+18.4	+25.7	+50.8	+77.0	+132.3	+210.8	+373.5	+618.4	+738.9	+778.2
Margin between deposits & loans as a % of deposit balances	86	81	59	66	67	72	74	78	81	81	75

N.B.: If the gap between deposits and loans (1)-(2) is "+", it shows an imbalance in deposits; if it is "-", it shows an imbalance in loans.
Sources: China Financial Yearbook and *China Statistical Yearbook*, various issues.

Table 6 shows that the net amount of credit provision from Chinese financial institutions for agricultural growth is negative. It has not been possible to implement the arrangements in the rural financial system which have been fostered and developed for the provision of support for agriculture. Not only has it not been possible to realise the transfer of urban financial resources to the countryside through financial channels, but, on the contrary, it is rural capital which has flowed into cities in great quantities. The politicised banking system uses the hard-earned savings of rural inhabitants to support the low efficient state-owned enterprises (SOE) and rural savings have become a channel for the provision of capital for urban industrialisation.

The outflow of resources from agriculture to other sectors is a phenomenon which has appeared widely during the development phases of national economic growth. However, along with the continued growth of finance, the outflow of a large amount of rural capital should be slowed down. It can be deduced from this that the rate of increase in the Chinese rural economy and peasant incomes which began in the mid-1990s has been reduced. The large-scale outflow of capital brought about through financial channels is inevitably a major cause.

- *The urban, industrial and commercial orientation of the rural financial system; the tendency of the supply of credit to flow towards industry, commerce and the cities; the resulting imbalance of the credit structure within rural financial institutions; the comparatively low proportion of agricultural credit and the weakening of agricultural financial support*

With the withdrawal and contraction of their grass-roots rural network by state-owned commercial banks and their concentration in cities, there seems to have been a tendency towards urbanisation in the organisational structure of rural financial organisations. Just as with the route taken by Chinese economic development, the development of Chinese rural finance has also centred on the eastern region. In the economically more developed areas of the east, the rural financial market is more developed and the supply of financial services is more comprehensive. In the rural financial market in

the central areas with grain as the main produce, although the tripartite base of rural credit co-operatives, the Agricultural Bank and the Agricultural Development Bank has already been formed, the Agricultural Development Bank has no direct credit business relations at all with individual peasants. Since the early 1990s, amid calls for "reduced staff and increased effectiveness", the Agricultural Bank has largely closed down its branch organisation established at the township level and below. Between 1999–2001, the four major state-owned commercial banks shut down over 30 000 of their branches in impoverished provinces. According to the central branch of the People's Bank in Fuzhou, 105 township operations were closed within the Agricultural Bank system in the Fuzhou area during the 1990s. Agricultural Bank business organisations were established in only 49% of townships. Rural co-operative foundations, which operate outside normal financial organisations and which are an important feature of the widening of finance, are important suppliers of financial services in the financial market to peasants and rural enterprises. A number of problems have arisen since control is insufficient in scope and development has been too fast, and there has been no alternative but to get rid of them completely. Where the vast majority of rural inhabitants and rural enterprises in backward areas of the central and western regions are concerned, they benefit only from financial services supplied as a monopoly by rural credit co-operatives. Since the mid-1990s, rural credit co-operatives throughout the country have been closing down. Since 1998, more than 10 000 local branches have been closed and staff reduced by about 40 000 workers. At the end of 2001, the number of rural credit co-operatives qualified as legal persons had declined by one fourth since the end of 1990.

Nationally, the proportion of loans by financial institutions to agriculture and rural enterprises is quite low. Before the reform period, the agricultural share of loans was 13%, but dropped to under 10% in the mid-1990s. Since 1998, it is situated at about 5%. The loans for township and village enterprises (TVEs) accounted for only 6% of total loans, while in 1999 the TVE accounted for 30% of national GDP, 49% of industry value added, 38% of total export delivery value, 64% of rural social value added and 34% of farmers' income. In 2000, agriculture's share of the Chinese GDP was 15.9% and agriculture's share of employment was 50%. The Chinese rural population was 796 million, 62% of the total. At the end of 2000, the balance for all types of loans by financial institutions nation-wide was 9 937 billion yuan. The balance for agricultural loans was only 4.92% while for industry, commerce and construction it was 37.84%. At the end of 1999, the sum of the balance of agricultural loans and loans to township enterprises was only 11.69% of the balance of loans of all kinds by financial institutions (*China Statistical Yearbook 2000*, page 640). According to statistical data from Chongqing municipal government, in the annual balance of loans for all banks, loans for the "three agricultures" (agriculture, countryside, farmers) was 22.6 billion yuan in 1998, a proportion of 16.6% of loans of all kinds. In 1999, it was 26.9 billion yuan, a proportion of 16.6%. In 2000, it was 29 billion yuan, a proportion of 15.4%. The proportion of loan capital for the "three agricultures" was very low and tended to decline.

The proportion of the loans from rural financial institutions allocated to agriculture is quite low. Rural credit co-operatives are the main rural credit organisations, acting as the only formal financial institution providing peasants with credit mainly by issuing loans for agricultural production. At the end of 2001, the balance of deposits of all types in rural credit co-operatives throughout Zhejiang Province was 150.1 billion yuan, while the balance of loans was 108.4 billion yuan. Of these, the balance of agricultural loans was 20.1 billion yuan, amounting to 85.2% of the overall balance of agricultural loans from all financial institutions throughout the province; the balance of township industrial loans was 64.5 billion yuan, amounting to 79.2% of the overall balance of loans to township enterprises from all financial institutions throughout the province (*Financial Times*, 14 March 2002).

It is clear that as far as the distribution and division of work by Chinese financial institutions is concerned, at present the action of rural credit co-operatives in supporting the "three agricultures"

cannot be replaced by other financial institutions. However, on a national level, statistical data since 1980 show that in the flow of loans from rural credit co-operatives, the ratio allotted to peasants is low. In 1980, the proportion of agricultural loans was as much as 61.9% of loans from rural credit co-operatives while loans for township enterprises amounted only to 38.1%. However, in the 1980s and early 1990s, the proportion of agricultural loans kept falling; it was down to 19.4% at the end of 1994. At the same time, the proportion of loans to township enterprises remained at a comparatively high level (Table 7). After 1994, the proportion of agricultural loans recovered somewhat. One explanation is that, since 1997, economic austerity has affected the development prospects for township enterprises and only thus has the relative position of agriculture improved.

Table 7. **Changes in the structure of rural credit co-operative loans in China, 1980-1997**

Unit: %

	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998	1999	2000
Agricultural loans	61.9	65.1	61.9	53.0	43.2	46.2	40.0	19.4	21.1	23.6	25.3	31.5	32.9	34.2
Township enterprise loans	38.1	34.9	38.1	45.4	48.4	49.6	52.7	54.7	53.7	51.9	50.7	44.6	45.4	43.6
Other loans	0.0	0.0	0.0	1.6	8.5	4.2	7.2	25.9	25.2	24.5	24.0	23.9	21.7	22.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Yearbook of China Rural Financial Statistics and *China Financial Yearbook*, various issues.

3. Analysis of the causes of the insufficiency in credit support for Chinese agriculture

Just as in Korea and Singapore, economic growth in China first occurred in agriculture rather than industry, and in light rather than heavy industry (William Oufuhaoerte, 2000); rational support for agriculture is therefore necessary. However, as far as the effects embodied in the current arrangements of the Chinese agricultural financial system are concerned, it has not been possible to fulfil the original intention of the institutional design.

In the first place, the superiority of the system could not be made manifest, low-cost operations could not be realised and the rural financial institutions could not realise beneficial operations by themselves. Not only did the Agricultural Bank of China and the rural credit co-operatives take on a heavy burden of bad assets, but the Agricultural Development Bank of China, founded at the end of 1994, also accumulated such a burden[6].

6. Between 1998 and 2000, bad loans from the Agricultural Development Bank of China accounted for 8.33%, 30.73% and 31.92% respectively of the balance of all its loans (*Statistical Yearbook of the Agricultural Development Bank of China*, 2001).

Secondly, in rural financial activity, the Agricultural Bank of China and the rural credit co-operatives strove to avoid irrational institutional arrangements. Capital was raised in the rural sector and invested in the urban or industrial and commercial sectors. This even became an important cause of slower growth in Chinese agriculture in the latter period of the 1990s. The causes of insufficiency in agricultural credit support also include the following:

– *Defects in the agricultural credit management system*

The government's implicit guarantee and its intervention in rural financial activities, the introduction of administration to grass-roots rural financial institutions, and the difference in the aims of administration and management are all defects easy to observe. The grass-roots rural financial organisations (rural credit co-operatives and the basic organs of the Agricultural Bank) lacked comprehensive decision-making powers regarding credit and could not extend loans in accordance with rural capital requirements.

– *The asymmetry of rural financial institutions and rural economic structures*

With changes to the mechanisms of agricultural and rural economic management, the weaknesses of the collective ownership system, rural microeconomic development and the speeding up of the process of privatisation, the rural individual economy became the main component of the rural economy. Demand for rural financial services was increasingly engendered by the non-state-owned and non-collective sections of the market, while rural financial facilities and the supply of finance were still mainly monopolised by state-owned departments and the rural credit co-operatives which were state-owned in character. However, state-owned financial institutions are mainly oriented towards large or medium-sized state-owned enterprises. The gateway to the issue of corporate bonds and the stock market is only open to large enterprises and, in particular, to state-owned enterprises. This results in a serious asymmetry in the financial supply and demand structures. In the assignment of the flow of capital in the issue of loans by state-owned financial institutions, discrimination by ownership has appeared, with discrimination against agriculture and rural enterprises slowing the growth of rural loans. Since 1994, there has been some increase in the proportion of agricultural and township enterprise loans among short-term loans from financial institutions, although growth is slow (Table 8). In December 2001 during a rural investigation in Guangxi, the author discovered that the proportion of loans from financial institutions to agriculture and rural enterprises in three representative agricultural areas, the Guangxi Autonomous Region and Donglan and Luocheng Counties in Guangxi, was quite small (Table 9).

Table 8. **The structure of loans[1] by Chinese financial institutions to enterprises of all types in 1994–2000**

Unit: %

	1994	1995	1996	1997	1998	1999
Short term loans	100.00	100.00	100.00	100.00	100.00	100.00
Loans for state-owned, independently-financed enterprises	78.21	76.14	75.90	65.82	64.68	61.54
Industrial enterprises	36.92	35.28	35.35	29.82	29.40	28.09
Commercial enterprises	39.00	38.47	38.13	33.12	32.59	31.13
Construction enterprises	2.29	2.40	2.42	2.87	2.69	2.31
Agricultural loans	4.24	4.63	4.77	5.98	7.33	7.50
Loans for non-state-owned independently-financed enterprises	10.95	11.12	11.06	13.20	14.09	15.22
Township enterprises	7.43	7.54	7.02	9.09	9.21	9.64
Loans to private and individual enterprises	0.58	0.59	0.70	0.70	0.78	0.91
"Three investment enterprises"[2]	2.94	2.99	3.35	3.41	4.10	4.67
Other short-term loans	6.60	8.11[4]	8.26	15.01	13.90	15.73
Ratio of short-term loans against the total of all types of loan (%)[3]	67.41	66.03	65.75	73.98	70.05	68.16

1. According to the current categorisation of the China Statistical Yearbook, loans from financial institutions include four types: short-term loans, long and medium-term loans, trust loans and other types of loan. The yearbook also makes a detailed categorisation of short-term loans into eight types: industrial, commercial, construction, agricultural, township enterprise, private enterprise and individual enterprise loans, three investment enterprise loans and other short-term loans. Using this standard, it may be considered that the sum of the first three types can basically represent "loans to state-owned, independently financed enterprises".
2. "Three investment enterprises" include: foreign investment, joint venture, and co-operative operation enterprises.
3. Apart from the final row, the ratios in the Table all indicate the ratio of each type of short-term loan in respect of all short-term loans.
4. In 1995, other loans included loans to "three investment enterprises".
Source: China Statistical Yearbook (1997, 1998, 1999, 2000).

Table 9. **The proportion of loans by financial institutions to agriculture and rural enterprises, 1995–2000**

Unit: %

		1995	1996	1997	1998	1999	2000
Rural enterprises	Guangxi Autonomous Region	5.63	5.73	5.79	5.23	4.78	—
	Donglan County, Guangxi Autonomous Region	13.27	5.67	5.13	4.23	7.17	11.77
	Luocheng County, Guangxi Autonomous Region	9.33	2.06	2.12	3.17	2.15	5.80
Agriculture	Donglan County, Guangxi Autonomous Region	14.98	16.34	16.12	15.26	14.27	16.65

The proportion of small and medium rural enterprises, rural high and new technology enterprises and rural non state-owned economic enterprises in the gross amount of finance capital is on the low side and is by no means commensurate with their ratio in the composition of the social output value as a whole. That rural financial structural adjustment is lagging behind the changes to the rural economic structure is the chief problem currently confronting the Chinese rural financial structure.

– *The main channel of financing for rural economic activity and the lack of equilibrium in the rural financial structure itself*

The lack of equilibrium over wide areas of the Chinese countryside (in particular the centre and west) in the structure of rural financial institutions is quite marked. Not only has imbalance developed between banking and non-banking financial institutions, but also in many areas the rural credit co-operatives have a *de facto* monopoly in rural financial business dealings. State-owned commercial banks, other commercial banks, securities and insurance businesses are unable to function in these areas. The result is that there is only one main channel for rural economic activity. Financing in the rural financial market is represented, on the one hand, by the fact that indirect financing realised through financial institutions is extensive and, on the other, by the rapid growth of financing through informal financial channels.

– *The inappropriate results of industrial development policy*

Since reform and opening up of the economy has begun, the government has provided a powerful impetus to catch up and even overtake more developed countries in the area of economic development, so as to reduce the gap which separates them. The government has not only focused on investment in the import-substitution industry and export-oriented industry, but it has also implemented a comprehensive policy (pertaining to prices, revenues, tariffs and credit) tending to favour industry, and which actually discriminates against agriculture. Investment in agricultural scientific research and technological development, and in the agricultural means of production industry is insufficient. This has created an inadequate supply of agricultural means of production, so that the index for agricultural input prices exceeded the state agricultural commodities purchase price index for five years in the six years between 1994 and 1999 (Zhang Xiusheng, Chen Xianyong, 2002). This resulted in a rise in the cost of agricultural investment and an increase in the outflow of resources from the agricultural sector, leaving this sector enfeebled and lacking competitiveness. This lack of competitiveness meant that peasants were not able to repay long-term loans, which also explains why financial institutions were unwilling to issue loans. Thereafter, there was a large-scale upsurge in demand for credit from the rural credit market, and a gap appeared between the rural credit supply and demand.

4. Adjustment to China's agricultural credit policy within the framework of the WTO

Within the framework of the WTO, the development strategy for agriculture will undergo major transformations, from increasing production to increasing quality, from self-sufficiency to market competition, from labour intensity to a combination of labour intensity with capital and knowledge intensity, from dependence on traditional technology to a combination of traditional and modern technology and from a mode of growth dependent on the consumption of resources to the mode emphasising ecological protection and sustainable development. In the process of promoting the realisation of these transformations and by virtue of the WTO regulations on "green box" and "de minimis", it is necessary to adopt measures to lessen the impact of market liberalisation and to increase credit support for agriculture as appropriate. However, the key is the need to establish an agricultural credit support system which meets WTO regulations. To this end, it is necessary to make

some adjustments to China's agricultural credit policies in accordance with international regulations and market principles.

– *Redesign of the government-provided categories for "public financial products" and gradual implementation of the commercialisation of agricultural policy-related credit operations*

The scope of rural "private financial products" and "public financial products" should be clearly delineated and, to this end, adjustments should be made to arrangements in the corresponding rural financial organisational system. The Agricultural Development Bank of China should be reorganised as a specialised rural credit guarantee bank, providing credit guarantees under the project credit plan promoted by the government but not implementing a plan for subsidised loan projects.

In order to encourage agricultural development, the government must provide public financial products. The Agricultural Development Bank of China is a policy-oriented, state-owned agricultural credit institution. When it was established it was not allowed to operate as an independently viable financial institution. When the subsidised aid capital and government capital was channelled into the agricultural sector, it presented itself as the supplier of "public financial products". A credit rationing system was adopted. Either applications for loans could be only partly met at an established rate of interest or some received them while others were refused. As a government lending institution it was neither concerned about interest nor worried about the extent of risk in granting loans**.** These were granted in accordance with political decisions and interest. The merits of such loans were determined on the basis of whether or not they could satisfy the demand for capital within the scope of operations stipulated by the government, and not judged by the benefits brought about by the loan and its rate of return. In short, the Agricultural Development Bank of China lacked the drive of a commercial bank.

The Agricultural Bank of China and the rural credit co-operatives are financial institutions providing private financial products and also take on the provision of a good number of public financial products. When a financial organisation produces two types of financial products at the same time, the phenomenon of the externalisation of operational risk can easily appear through the public products. For example, if the Agricultural Bank is exposed to losses or risks in its commercial business activities, bad debts and doubtful debts may occur which are shifted onto the policy-oriented business which it conducts. Supplanting of private financial products by public ones may also occur. Since financial organisations are inseparably linked to the government to a large degree and government intervention causes infringement upon the supply of private financial products, it is inevitable that capital loaned to low-performance enterprises should cause many doubtful debts. Thirdly, the squeezing out of public financial products by private ones may occur. With the adoption of market principles in finance through reform, the autonomy of financial organisations gradually expands so that a large amount of financial resources flows out to some industrial departments and the speculative market. Capital for the purchase of farm products is misappropriated and embezzled, while "helping the rich and not helping the poor" with rural aid loans at discounted interest rates is the best evidence of this phenomenon. At the same time, undertaking the provision of public financial products becomes an unending plea to the government by agricultural financial institutions for subsidies.

These two types of financial products cannot be managed by one type of financial organisation. The theoretical basis for the separation of policy-oriented credit businesses from commercial ones also derives from this. The gradual commercialisation of the policy-oriented credit business operations, however, is beneficial for the sustained development of financial institutions conducting policy-oriented business and can create conditions under which the WTO's "green box" policy can be used. The reorganisation of the Agricultural Development Bank of China as a specialised agricultural

credit guarantee bank will provide credit guarantees under the project credit plan promoted by the government.

- *It is necessary to establish credit operations as the mainstay of rural financial institutions and release them from the obligations of providing "support for agriculture"*

China's rural financial institutions have always been under pressure to provide "support for agriculture". The very name "support for agriculture" signifies deliberate, capable and generous support mainly through credits for needed capital. Such credits should mainly take the form of subsidies, such as appropriations or outright grants, but is realised in practice through loans. There is some rationality in this institutional arrangement. In the first place, peasants are stimulated by the form of repayable financing and such opportunistic behaviour as dependency caused by subsidies is avoided. Secondly, when the government, with limited resources, cannot make transfers which are solely investments in areas with traditional agriculture, it can still partially resolve problems of shortage of investment capital in the countryside. However, contradictions between moral "support for agriculture" and profit-making "loans" arise: either the amount of support from loans is manifestly inadequate or support capital cannot be recovered. From this, a dilemma has arisen where system arrangements are concerned. The most effective method is therefore to establish credit operations as the mainstay of commercial, rural financial institutions, releasing them from the obligations of providing "support for agriculture" and allowing them to be freely engaged in credit activities. This will be of the utmost importance for rural credit co-operatives.

Encourage the spread of rural finance

Over the past fifty years, the Chinese government has used such non-market mechanisms as financial controls, limits on interest rates and credit rationing to manage rural financial departments. During the initial stages of rural economic development, "financial constraint" seemed to have some rationality because it could let the government control the allocation of resources while the market was in its infancy creating the conditions for the rural economy to take off. However, as the development of the rural economy quickened and the rural market system grew healthier by the day, the abuse of "financial constraint" became more apparent. The greatest abuse was that the benefits of financial institutions were not increased, thereby restricting the development of the financial departments and creating a bottleneck for the takeoff of the rural economy. The main measures to encourage the spread of rural finance are as follows:

- *The relaxation of agricultural financial market control and the gradual implementation of diversification*

During the past twenty years, there have been numerous examples of successful economic and financial liberalisation world-wide and the presence of financial systems based on the market has been promoted on a global scale. However, the market-oriented reforms of the Chinese financial sector are still far from complete. The process of implementing the undertaking by the Chinese government to enter global finance is based on the internationalisation of Chinese finance and financial liberalisation. It will undoubtedly also accelerate the transition of Chinese finance to market principles. In this process, it will be necessary to relax, as appropriate, restrictions on rural financial business and the rural financial market, to bring down entrance barriers into the rural financial market and to permit and support, as far as possible, the development of other forms of financial organisations. For example, the development of rural privately-run financial businesses should be encouraged and, in particular, new-style, standardised, co-operative financial organisations established by rural inhabitants on a

voluntary basis in order to gradually foster and bring into being an efficient, competitive, diversified system of rural financial organisations and institutions. "Efficient economic organisation is the key to economic growth. The development of an efficient economic organisation in Western Europe is the root cause of the rise of the West" (North, 1991). The establishment of a comprehensive rural financial organisation will, on the one hand, help break up the *de facto* monopolistic operations of rural credit co-operatives in many rural areas to bring about financial competition in the rural financial market, facilitate the improvement of financial services, further the mobilisation of savings resources and overcome low efficiency due to lack of competition. On the other hand, the scarcity in the supply of financial services brought about by the contraction by state-owned commercial financial institutions of their operational network in rural areas can be remedied[7].

– *In realising the diversification of rural financial institutions, the following should be considered*

First, small and medium financial institutions should be developed. High barriers to entry into Chinese financial markets remain with the monopoly of state-owned commercial banks in the banking operations market being most prominent while they continue to promote the development of state-owned enterprises as their own responsibility. Financial support for the development of small and medium enterprises, in particular for rural ones, is scarce. The perfection of the system of financial organisation and the development of financial institutions mainly for services to small and medium enterprises (especially rural enterprises) is of the utmost significance in encouraging the development of rural enterprises.

Secondly, the establishment of guidance centres for the development of small and medium rural enterprises, the creation of investment funds for the development of small and medium rural enterprises, credit guarantees for small and medium rural enterprises and venture capital for agricultural development will all promote the development of agriculture and the rural economy.

– *Gradual implementation of market principles in rural financial interest rates*

The introduction of market principles to interest rates is advantageous for the formation of equilibrium interest rates in the rural financial market and a gradual departure from the combined predicaments of low interest rates and low efficiency. Contrived low interest rates are not advantageous for the development of financial intermediaries. Since some people have received credit at low interest rates, others cannot and hence the market is split. As a result, it is difficult for resources to be allocated effectively. Since May 1996, The People's Bank of China has lowered eight times the interest rates on existing loans, the average cumulative reduction of the rate of interest on deposits has been 5.98 percentage points, the average cumulative reduction of the rate of interest on loans has been 6.92 percentage points and the cumulative fall in interest has reduced the net interest payments of enterprises by almost 300 billion yuan. The fall in interest has increased enterprise performance, sustained the development of a capital market, reduced national debt distribution costs and has had an important effect in creating investment, accelerating consumption and in inhibiting deflationary tendencies. It has also brought with it increased relaxation of capital supply in the money market. It is becoming easier to obtain loans for most rural economic activity and it is an intermediate support for the development of the rural economy and agriculture. However, when interest rates fall, the range of rural loans falls while that of industrial and commercial loans increases so that there is a tendency towards increasing the gap in the provision of industrial versus agricultural loans. Also, because of this

7. Between 1998 and 2001, state-owned commercial banks with independent capital withdrew 44 000 grass-roots institutions with a net reduction of 240 000 staff (http://www.pbc.gov.cn/news/news.html).

gap the benefit brought to the countryside and to industry and commerce by a fall in interest is uneven. The effect of a fall in interest on agricultural credit support is, in fact, a decrease which will result in the presence of new "reverse subsidies" (the countryside subsidising cities, and agriculture subsidising industry and commerce). The optimum method for eliminating these "reverse subsidies" is the transformation of interest according to market principles.

– *The method of direct support by the Central Bank to rural financial institutions should be gradually discontinued and replaced by the remortgaging method*

The *modus operandi* of the Central Bank in giving direct support to the agricultural credit operations by funding rural financial institutions with capital at low interest is a subsidy for these institutions. Not only does this go against the participation by other financial institutions through competition in the agricultural credit market, but it also distorts the latter's rates of interest which goes against the formation of equilibrium rates of interest in the agricultural credit market. Rural financial institutions should become the mainstay of the market together with other financial institutions of equal standing. Since rediscounting and remortgaging methods are adopted in order to implement Central Bank financing, rediscounting and remortgaging need to be transacted voluntarily on the basis of operational development and guidelines for funding agreed by the government and Central Bank and should not be carried out passively.

– *Inquiry into new methods of governmental support for agricultural credit*

The government provides public support for agriculture by means of credit. Government support can take many forms such as the provision of capital for planting seed, support for experimental projects and the establishment and completion of policy-oriented mechanisms to provide insurance cover for agriculture.

– *The establishment of an open rural financial market system*

The adoption of new higher productivity biological, chemical and mechanical technologies in the domain of agriculture not only greatly increases the efficiency of agriculture but also results in a great increase in the demand for loans. At the same time, the completion of regulations for the rural financial market and agricultural credit and the increase in agricultural loans has enormously accelerated the mobilisation of these new agricultural technologies and agricultural growth. To increase credit for agriculture and the countryside, the opportunity of the internationalisation and liberalisation of Chinese finance within the framework of the WTO should be taken in order to reform the rural financial market so that it changes from a restricted, informal, traditional financial system with local savings and loans to a comprehensive, nation-wide savings and credit system which will transform China's rural finance into to a modern, open financial system. Rural credit activities cannot depend only on existing rural financial institutions. The expansion of rural credit activity by more commercial and specialised banks, and foreign capital financial institutions should be encouraged and promoted.

– *Promote the innovation of a management system for rural credit co-operatives, foster market-oriented Chinese co-operative financial enterprises and promote increased operational efficiency by rural credit co-operatives*

It is commonly considered that innovations to the rural credit co-operatives should include innovation to the property rights system, operations and the organisational management system. The author believes that the management system should be part of such innovation. Under the theory of institutional changes, it is considered that effective organisation is the key to institutional changes and

that, whether or not an organisation is effective depends on whether it has the requisite capacity for technology, knowledge and learning to realise the goal of expanding the organisation. In the process of creating the organisation's capacity for innovation, the actions of "entrepreneurs" is of critical importance. Hence, in order to foster the capacity for innovation in co-operative financial organisations and to construct high-performance decision-making mechanisms, the managers of modern, market-led co-operative financial institutions are in general professional banking management operations specialists; the present co-operative financial organisations are managed by entrepreneurs. The managers of co-operative financial enterprises under administrative guidance, however, are appointed by the People's Bank acting as the representative of the government. Although this is a rationalised operational process which can ensure that an expert or even a specialist assumes the office of the manager of a co-operative financial enterprise, it results in his conduct being characterised differently in many ways from that of a market-driven co-operative financial entrepreneur. It cannot produce Chinese-style co-operative financial entrepreneurs in the Schumpeter sense[8] (He Guangwen, 2001b). The lack of true co-operative entrepreneurs is also an important cause of the low capacity for innovation in Chinese rural credit co-operatives and long-term, low-efficiency operations.

8. In the theory of innovation given in his *Theory of Economic Development*, Schumpeter considers that the impetus for innovation comes from entrepreneurs. They have the courage to take on risks and are a socially active class with a progressive spirit, initiating and promoting innovative activity. Entrepreneurs are different from capitalists and scientists. Capitalists are only concerned with the amount of yield on their investments while scientists are only concerned with technical inventions and discoveries. Entrepreneurs, however, are only concerned with new modes of production and the high performance and benefits which come with them. It should also be pointed out that profit is the reward for innovation by entrepreneurs.

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SESSION 4. MEASUREMENT OF AGRICULTURAL SUPPORT

HOW TO MEASURE THE LEVEL OF AGRICULTURAL SUPPORT: COMPARISON OF THE METHODOLOGIES APPLIED BY OECD AND WTO

By Dimitris Diakosavvas

Abstract

Agricultural support can be measured in a number of alternative ways. Since 1987, the OECD, in the context of monitoring and evaluating agricultural policies and agricultural policy reform, has calculated the level and composition of agricultural support in OECD Members and some non-OECD Members. In the context of the Uruguay Round negotiations and of implementing the domestic support reduction commitments of the Uruguay Round Agreement on Agriculture (URAA), another methodology of measuring domestic support was used. The OECD methodology disaggregates the Total Support Estimate (TSE) to agriculture into the Producer Support Estimate (PSE), Consumer Support Estimate (CSE) and General Services Support Estimate (GSSE) and applies implementation criteria for classifying policies into different categories. The methodology applied in the WTO distinguishes between domestic policies which were deemed i) not to, or only to a minimum extent, distort trade ("green box"); and ii) all other policies that distort trade (i.e., those with the most potential to distort trade as measured by the Aggregate Measurement of Support (AMS), "blue box" measures, de minimis, and special and differential treatment). The URAA provisions require countries to reduce agricultural support levels arising from those domestic policies which most unequivocally have the largest effects on production and trade based on the AMS indicator. The paper discusses and compares the methodologies applied by OECD and in WTO. It is argued that, given the different purposes for which the two methodologies were developed, their estimates of agricultural support are bound to differ and caution should be exercised. While the WTO methodology is a negotiating device, the OECD methodology provides a more comprehensive picture of the level and composition of agricultural support.

Introduction

In most OECD countries, agriculture is heavily supported relative to other sectors in the economy. In 2001, total transfers associated with agricultural policies in all OECD countries are estimated to have been around USD 311 billion, which is equivalent to 1.3% of total OECD GDP. Moreover, the categories of measures that potentially have the most production and trade-distorting effects, that is, market price support, payments based on output and input subsidies, together, accounted for more than three-quarters of support to producers (Legg, 2002). An understanding, therefore, of the levels, evolution and implications of agricultural support is a prerequisite in policy analysis.

Agricultural support policies are implemented by a wide array of often complex policy measures encompassing price supports, quantitative restrictions on outputs or inputs, budgetary payments, trade barriers such as tariffs and export subsidies, and subsidies on inputs. In order to provide a comprehensive view of agricultural support an overall summary measure is required. There is a large number of possible indicators which illuminate various aspects of policy effectiveness and the choice among such indicators depends on both practical considerations such as data availability and on the nature of the issues analysed.

The Producer Support Estimate (PSE) and related indicators, for example, have been used by the OECD as the principal policy indicators in monitoring and evaluating agricultural policy

developments. The OECD's PSE and related indicators provide measures of the level of support, and the degree of protection and market orientation of agricultural policies. The measurement and analysis of OECD support to agriculture have raised international awareness of the problems of trade-distorting support to OECD agriculture and their magnitude.

Quantification of the level of agricultural support and binding support levels played a prominent role and attracted much attention during the Uruguay Round negotiations. The complexity of agricultural policies has elicited interest in an all-encompassing measure of support and one all-embracing general constraint covering the combined effects of all agricultural policies, irrespective of their nature. The use of an aggregate support measure in multilateral negotiations is a significant departure from past experience. The Uruguay Round Agreement on Agriculture (URAA) differs from the previous Rounds in its recognition that trade problems have their roots in a wide range of domestic as well as trade policy instruments. This recognition signalled the need for a measurement device capable of capturing the broad spectrum of government interventions, without requiring as much information as many economic models. Extensive work at the OECD on PSE encouraged negotiators to find a formal role in the negotiations for an aggregate indicator of this type. The Aggregate Measurement of Support (AMS) indicator adopted to implement the URAA domestic support reduction commitments built on the concept of the PSE, as developed by FAO in the 1970s and later used and developed by OECD.

An analysis of these indicators conveys a useful tool for an assessment of the need for, and progress in, policy reform. Although these indicators do not measure, by themselves, the levels of the associated production, consumption and trade effects, they provide the necessary data and information for the quantification of such effects. The level, impact or effectiveness of agricultural support policies can be measured through the use of economic models and various assumptions to calculate policy-induced changes in production, prices, input use, production costs and producer incomes.

The paper mainly focuses on two indicators: the OECD PSE and the URAA AMS. It is structured as follows. First, the measurement of support in OECD is discussed and the concepts of PSE, of General Services Support Estimates and of Total Support Estimates are explained. Second, the measurement of domestic support in the URAA is presented, and the concepts of AMS, "green box" and "blue box" are explained. Third, the main differences between the two methodologies are outlined and an empirical comparison using results for the European Union, Japan and the United States is also provided. Finally, some conclusions are offered.

How is support to agriculture measured by OECD?

In the mid-80s, driven in part by negotiations taking place on agriculture in the Uruguay Round, the OECD began to quantify the levels of support to agriculture. The thrust of the OECD approach is that domestic support policies and trade measures are interlinked. It is explicitly recognised that trade is affected not only by direct border measures such as tariffs and export subsidies, but also by domestic support policies, which affect production and consumption of agricultural commodities to varying degrees. The estimates of support calculated provide comparable indicators of the level of support across OECD countries. During the Uruguay Round negotiations, these indicators provided indispensable background information for the negotiations. The URAA discipline on domestic support that was ultimately agreed is a variant of the OECD approach.

The OECD methodology divides total transfers associated with agricultural policies into three main categories: transfers to producers (PSE), transfers to consumers (CSE) and transfers to general services to the agricultural sector (GSSE).[1]

The ***Producer Support Estimate (PSE)*** is an indicator of the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm-gate level, arising from policy measures which support agriculture, regardless of their nature, objectives or impacts on farm production or income (OECD, 2002). It consists of market price support and various categories of budgetary payments to producers (See Annex for the definition of the various PSE budgetary payments).

The PSE is a static measure of support provided to agricultural producers in a given time period. It is measured net of producer contributions to help to finance a support policy (*e.g.* through a levy on production), but costs associated with import duties on inputs and costs associated with the implementation of policies and incurred by individual producers are not deducted.

The total absolute PSE monetary value depends on the size and structure of a country's agricultural sector, as well as on the monetary unit used. The PSE expressed in relation to the number of farmers or area of farmland is influenced by differences among countries in factor endowment and the number, type, and size of farm holdings. By contrast, when the PSE is expressed as a percentage of gross farm receipts (%PSE), it shows the amount of support to farmers, irrespective of the sectoral structure of a given country. For this reason, the %PSE is the most widely used indicator for comparisons of support across countries, commodities and time.

The ***Consumer Support Estimate (CSE)*** is an indicator of the annual monetary value of gross transfers to consumers of agricultural commodities, measured at the farm-gate level, arising from policy measures which support agriculture, regardless of their nature, objectives or impacts on consumption of farm products. It includes transfers from consumers to agricultural producers, transfers to the budget or to importers, or to both, on the share of consumption that is imported, net of transfers to consumers from taxpayers (*e.g.* food subsidies) and the producer contribution (as consumers of domestically produced crops) to the market price support on crops used in animal feed (excess feed cost). When negative, the CSE indicates transfers from consumers and measures the implicit tax on consumption associated with policies to the agricultural sector.

1. In 1999 the method of calculation was changed. Prior to 1999, the PSE was referred to as the Producer Subsidy Equivalent and the CSE as the Consumer Subsidy Equivalent.

Box 1. **Classification of policy measures according to the OECD methodology**

1) Producer Support Estimate (PSE) [**A + B**]
A. Market Price Support
B. Budgetary Payments
B.1 Payments based on output
B.2. Payments based on area planted/animal numbers
B.3. Payments based on historical entitlements
B.4 Payments based on input use
B.5 Payments based on input constraints
B.6. Payments based on overall farming income
B.7. Miscellaneous payments

2) General Services Support Estimate (GSSE) [**Sum of C.1 to C.7**]
C.1. Research and development
C.2 Agricultural schools
C.3 Inspection services
C.4 Infrastructure
C.5 Marketing and promotion
C.6 Public stockholding
C.7 Miscellaneous

3) ***Transfers to consumers from taxpayers***

4) Total Support Estimate (TSE) [**1 + 2 + 3**]

The ***General Services Support Estimate (GSSE)*** measures transfers to general services provided to agriculture collectively, arising from policy measures which support agriculture regardless of their nature, objectives and impacts on farm production, income, or consumption of farm products. Unlike the PSE and CSE transfers, these transfers are provided to agriculture generally and not received by producers or consumers individually. They do not directly affect farm receipts (revenue) or consumption expenditure, although they may affect production and consumption of agricultural commodities. They include payments for collective agri-environmental action and taxpayers' transfers for the following purposes: improvement of agricultural production (research and development); agricultural training and education (agricultural schools); control of quality and safety of food, agricultural inputs, and the environment (inspection services); improvement of off-farm collective infrastructures, including downstream and upstream industry (infrastructures); assistance in marketing and promotion (marketing and promotion); meeting the costs of depreciation and disposal of public storage of agricultural products (public stockholding); other general services that cannot be disagreggated and allocated to the above categories due, for example, to a lack of information (miscellaneous).

The ***Total Support Estimate (TSE)*** measures the overall cost of agricultural support financed by consumers and taxpayers net of import receipts. The TSE can be defined as the sum of: the transfers from consumers of agricultural commodities to agricultural producers net of producer financial contributions and the transfers from taxpayers to agricultural producers (PSE); the transfers from

taxpayers to general services provided to agriculture (GSSE); and the transfers from taxpayers to consumers of agricultural commodities (Box 1).[2]

How is support to agriculture measured in WTO?

Classification of policies

The Marrakech Accord, creating the World Trade Organisation (WTO) and including the URAA, was signed in April 1994. Implementation began during 1995. The URAA imposed disciplines on trade-distorting domestic policies as well as on trade policies, and new rules and commitments were established in the areas of market access, export competition and domestic support.

Domestic support as defined by WTO comprises Current Total Aggregate Measurement Support (AMS), plus "green box" measures, plus "blue box" measures, plus *de minimis* support under the Special and Differential Treatment category (Box 2).

The AMS is an indicator of the support associated with policies considered to have the greatest potential to affect production and trade. It is the yardstick used to implement the URAA domestic support reduction commitments. WTO Members are in compliance with their domestic support reduction commitments in any year in which Current Total AMS does not exceed the corresponding annual or final bound level specified in the Member's Schedule of commitments. It has product-specific AMS and non-product-specific AMS elements; however, the commitments themselves are not product-specific but sector-wide applying to Total AMS.[3]

Annex 3 of the URAA specifies the method of calculating the AMS. The AMS combines estimated support levels from all non-exempt policies for all commodities into one overall measure. It entails the calculation of a product-specific AMS for each basic agricultural product receiving market price support based on administered prices, non-exempt direct government payments to producers and other commodity-specific transfers plus non-commodity specific measures of support received by producers, such as capital, input, and insurance price subsidies. It also includes budgetary outlays and revenue foregone by governments. Both national and sub-national support are included, but specific agricultural levies or fees paid by producers are deducted. Similarly, support that is non-product specific is included in a non-product-specific AMS.

The AMS shall be calculated as close as practicable to the point of first sale of the basic agricultural product concerned. Measures directed at agricultural processors shall be included to the extent that such measures benefit the producers of the basic agricultural products.

Developed countries agreed to a 20% reduction in AMS to be achieved in six equal annual instalments from 1995, while developing countries agreed to a 13.3% reduction over a 10-year period and least developed countries agreed not to increase support beyond the base period level. The base period for Total AMS reductions is 1986-88, and a credit is allowed in respect of actions undertaken between

2. Alternatively, the TSE can be viewed as the sum of transfers to consumers, plus transfers from taxpayers, minus budget revenues.

3. This feature is considered as one of the main factors weakening the effectiveness of the domestic support discipline as countries can fulfil the overall AMS commitment, while increasing support for some individual commodities. In **Iceland**, for example, the Current Total AMS has declined by some 27% between the base period and 1997, while support to milk increased by 240%.

1986-88. As of July 2002, out of 144 WTO Members, thirty-four countries have agreed to reduce their trade-distorting domestic support as measured by the Total AMS (Table 1).[4] Among OECD countries, only **Turkey** does not have domestic support reduction commitments. This means that Turkey must not exceed the *de minimis* support level.

Box 2. **Classification of policy measures according to URAA**

1) **Aggregate Measurement of Support (Current Total AMS)** [**A + B**]
A. Market Price Support
B. Budgetary Payments
B.1 Product-Specific AMS: Non-exempt direct payments
B.2. Non-Product-Specific AMS: Non-product specific budgetary outlays

2) **Green Box** [**Sum of C.1 to C.13**]
C.1. General services (research and development pest and disease control, training, extension and advisory, inspection, infrastructure, marketing and promotion, other general services)
C.2 Public stockholding for food security purposes
C.3 Domestic food aid
C.4 Direct payments to producers
C.5 Decoupled income support
C.6 Government financial participation in income insurance and income safety-net programmes
C.7 Payments for relief from natural disasters
C.8 Structural adjustment assistance provided through producer retirement programmes
C.9 Structural adjustment assistance provided through resource retirement programmes
C.10 Structural adjustment assistance provided through investment aids
C.11 Payments under environmental programmes
C.12 Payments under regional assistance programmes
C.13 Other

3) **Blue Box** [**Sum of D.1 to D.3**]
D.1 Production-limiting payments based on fixed area and yields
D.2 Production-limiting payments made on 85% or less of the base level of production
D.3 Production-limiting livestock payments made on a fixed number of head

4) ***de minimis***

5) **Special and Differential Treatment – *"Development Programmes"*** [**Sum of E.1 to E.3**]
E.1 Measures to encourage agricultural and rural development that are an integral part of the development programme of developing countries (DCs)
E.2 Investment subsidies generally available to agriculture in DCs
E.3 Agricultural input subsidies generally available to low-income or resource-poor producers in DC

6) **Total Domestic Support (TDS)** [**1 + 2 + 3+ 4 + 5**][5]

4. For acceding countries, the base period to be used in the negotiations is normally the three most recent years for which data were available. In the case of **Bulgaria** it was agreed that the most recent period was not representative and a different period was taken as the base. Eight of the twelve new WTO Members commit themselves to keep domestic support which is subject to reduction at the *de minimis* levels, although in one case (**Latvia**) a time-bound transitional period was granted (WTO, 2000).

5. It should be noted that the term "Total Domestic Support" is not an official WTO term.

Table 1. **Use of Total AMS commitments by country, 1995-2000 (%)**

Country	1995	1996	1997	1998	1999	2000
OECD countries						
Australia	27	26	25	23	13	45
Canada	15	12	11	17		
Czech Republic	7	11	7	7	31	37
European Union	64	67	68	65	69	
Hungary	51	27	30	267		
Iceland	79	71	74	178	100	103
Japan	73	72	71	18	18	
Korea	95	91	95	80	83	
Mexico	5	3	11	14		
New Zealand	0	0	0	0		
Norway	71	79	82	88	90	90
Poland	6	6	8	8	7	10
Slovak Republic	58	59	73	70	66	78
Switzerland	83	74	72	71		
United States	27	26	29	50		
Non OECD countries						
Argentina	144	100	100	100	100	
Brazil	28	35	30			
Bulgaria	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Chinese Taipei	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Colombia	15	1	4	3	2	
Costa Rica	0	0	0	0	9	
Croatia	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Cyprus	63	62	45	39	53	43
Israel	72	79	83	66	42	
Jordan	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Lithuania	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Moldova	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Morocco	12	32	12	17	24	
Papua New Guinea	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Slovenia	93	91	87	97	85	25
South Africa	67	82	97	38	38	
Thailand	72	60	79	78		
Tunisia	87	77	81	94	46	
Venezuela	42	26	36	17		

n.r. : notification is not required.

Note : The figures in this table represent notified Current Total AMS as a percentage of the Total AMS commitment levels for the respective implementation years.

Source : WTO (2000), *Domestic Support: Background Paper by the Secretariat,* G/AG/NG/S/1; Author's calculations based on country notifications to WTO.

The URAA specifies a number of measures that are excluded from domestic support reduction commitments. Policies fulfilling green box criteria need not be counted under Current Total AMS, though they have to be notified to the WTO. Further, if support is below a certain threshold a WTO Member is not required to include it in the calculation of its Total AMS or its reduction commitments.

More specifically, the *de minimis* provision refers to a) product-specific domestic support that does not exceed 5% (10% for developing countries) of the total value of production of basic agricultural product during the relevant year; and b) non-product-specific domestic support that does not exceed 5% (10% for developing countries) of the value of total agricultural production. When the *de minimis* provision is exceeded, support is included in the Current Total AMS and becomes subject to the reduction commitments.[6]

In addition, as a result of the1992 Blair House Accord between the European Union and the United States, production-linked support related to production-limiting policies is exempt from the disciplines if it is: a) based on fixed area and yields; or b) made on 85% or less of base production; or c) livestock payments are made on a fixed number of head. Domestic support meeting these criteria is known as "blue box" support.

To ensure that measures under the "green box" are not subject to challenge by rules that apply to non-agricultural subsidies, the URAA provided for the "Due Restraint" or "peace clause" provision. This provision specifies that domestic support measures that fully conform to the "green box" provisions are non-actionable and are exempt from a variety of actions, including the imposition of countervailing duties. However, all domestic support that conforms with commitments, including "blue box" payments under production-limiting programmes, is subject to the imposition of countervailing duties but is exempt from other GATT challenges as long as support does not exceed that decided during the 1992 marketing year. The "peace clause" expires at the end of 2003.

Developing countries, in addition to the exemption from disciplines for green and blue box policies, and *de minimis* exemption, received "special and differential" exemptions for certain inputs and investment subsidies. In particular, investment subsidies that are available to agriculture, and agricultural input subsidies generally available to low-income or resource-poor producers, are exempt from domestic support reduction. Further, it was recognised that measures to encourage agricultural and rural development are an integral part of the development programme of DCs. In addition, domestic support given to producers to encourage diversification away from illicit narcotic crops is exempt from domestic support reduction commitments.

A WTO Member shall not provide support in favour of domestic producers in excess of its commitments. Members who do not have a Total AMS commitment shall not provide support to agricultural producers in excess of *de minimis* levels.

Trends in and composition of domestic support

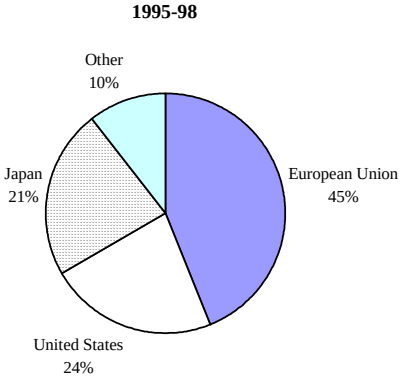
Average total domestic support in OECD countries notified under the URAA provisions (AMS, green box, blue box, *de minimis*, and special and differential treatment) amounted to around USD 234 billion in the 1986-88 base period. In 1995, total domestic support for OECD countries is estimated to have reached USD 278 billion, while in 1997 it declined by 11% and in 1998 by a further 10%, to USD 210 billion. As illustrated in Figure 1, domestic support is concentrated in three countries/regions (the **European Union**, **Japan**, and the **United States**), which account for 90% of total OECD domestic support.

The value of support subject to reduction commitments in OECD countries declined significantly in the first four years of URAA implementation. The average value of the 1995-98 Current Total AMS

6. The first marginal excess of support beyond the *de minimis* level immediately means that all support has to be included, thus causing a sudden jump in the amount of accountable AMS.

for the OECD, USD 100.5 billion, is equal to about 61% of the Total AMS level in the 1986-88 base period for these countries. Table 1 portrays the distribution of notified Current Total AMS as a percentage of the Total AMS for 1995 to 2000. It is evident that most countries have fulfilled their support reduction commitments by a large margin. In fact, in all OECD countries except **Korea**, the 1995 total AMS was already lower than the 2000 bound AMS level. However, **Hungary** and **Iceland** in 1998 and 2000 had problems in complying and their current total AMS exceeded their permitted levels. Of the non-OECD countries, only **Slovenia** (85%) was close to the limit on support in 1999.

Figure 1. **Domestic support, 1995-98**



Source: Author's calculations based on country notifications to WTO.

Comparisons of OECD and WTO methodologies

Relationship between PSE and AMS

From the previous discussion it is clear that the PSE and the AMS are closely related concepts. In fact the decision to seek a binding commitment in the area of domestic support in the URAA was, in part, the result of ongoing work in OECD. The main differences between the two measures are attributable to a number of factors, including differences in policy coverage, differences in the criteria used for classifying policies and methodological differences primarily pertaining to the measurement of market price support.

Policy coverage and classification criteria

- *OECD approach*

The OECD methodology covers all measures that support agriculture. In contrast, domestic support as defined by WTO only includes domestic subsidies and excludes support that is provided through border measures such as tariffs and export subsidies.

The *raison d'être* for measuring agricultural support in the OECD is to use the indicators for policy analysis. For this reason measures are grouped according to their implementation criteria, independently of their objectives and effects. The PSE is intended to measure the combined effects of all measures affecting agricultural producers individually. For a given policy measure, the ***implementation criteria*** are defined as the conditions under which the associated transfers are provided to farmers or the conditions of eligibility for the payment.

The general criterion to determine whether to include policy measures in the PSE, CSE or GSSE is if the measure provides transfers to agricultural producers individually (PSE), to (from) consumers of agricultural commodities individually (CSE), or to the general services provided to agriculture collectively (GSSE). Although transfers in the GSSE have in general the same objectives of the transfers in the PSE, they are implemented differently. Unlike the PSE, GSSE transfers do not depend on any individual farmer's decisions or actions to produce goods or services, or use factors of production, and do not affect farm receipts directly. Therefore, *ceteris paribus*, although GSSE transfers can in the long run contribute to improving or expanding the sector's production capacity of the country, their production, trade and farmers' income impacts are lower than those associated with PSE transfers.

- *WTO approach*

The incorporation of disciplines on domestic support is recognised as one of the major breakthroughs of the URAA insofar as it explicitly recognises the direct link between domestic agricultural policies and international trade. The GATT had traditionally concerned itself with trade measures and had not been involved in purely domestic production policies, except where these had a trade impact (Article XVI on Subsidies of GATT, 1994). The domestic support commitments were seen as essential in underpinning the reform process and in facilitating further progress in trade liberalisation.

The basic philosophy of the URAA on domestic support entails two types of commitments: one qualitative and the other quantitative. The qualitative commitment establishes a definition of domestic support policies which are not subject to reduction commitments, whilst the quantitative commitment establishes a detailed schedule for reduction under non-exempt policies.

A key aspect of the WTO domestic support reduction commitments was the distinction between domestic policies which were deemed *i)* not to, or only to a minimum extent to, distort trade ("green box"); and *ii)* all other policies, that is, those that distort trade ("amber measures", "blue box" measures and some other exempt measures). The provisions require countries to reduce agricultural support levels arising from those domestic policies which most unequivocally have the largest effects on production, such as administered prices, input subsidies and producer payments that are not accompanied by limitations on production.

The AMS is a narrower concept than the PSE and covers only domestic policies considered to be trade-distorting. The AMS excludes explicit trade policies such as export subsidies and import restrictions, even though trade policies can have the same effect on domestic prices as domestic policies covered by the AMS. In the PSE, the category of budgetary payments covers all measures which generate direct budgetary transfers to producers without altering consumer prices. The AMS exempts from the reduction commitments a large number of measures which are included in PSE. These include the exemptions from reduction commitments granted to production-limiting programmes (blue box) and green box measures. It also exempts certain trade-distorting policies (*e.g.* input subsidies) when the level of product-specific or non-product-specific domestic support falls below a specified *de minimis* level.

In fact, one of the main factors that enabled countries to reduce their AMS and meet their domestic support reduction commitments was through switching of domestic support policies from non-exempt to exempt categories. As shown in Table 2, around 60% of total support for the OECD countries as a whole has been excluded from reduction commitments over the 1995-98 period. A change of policy instrumentation, for example through eliminating administered prices but maintaining border protection, is another option for reducing the AMS without changing the aggregate economic effects of policies.

Table 2. **Composition of domestic support by country, 1995-98 (%)**

Country	Total Current AMS	Green Box	Blue Box	*de minimis*	S&D[1]
Australia	11	89	0	0	n.a.
Canada	21	51	0	28	n.a.
Czech Republic	21	79	0	0	n.a.
European Union	55	22	23	1	n.a.
Hungary	37	22	0	41	n.a.
Iceland	82	16	2	0	n.a.
Japan	48	51	0	1	n.a.
Korea	26	67	0	6	0
Mexico	30	58	0	0	12
New Zealand	0	100	0	0	n.a.
Norway	48	18	34	0	n.a.
Poland	28	72	0	0	n.a.
Slovak Republic	39	1	60	0	0
Switzerland	55	45	0	0	n.a.
United States	12	83	3	2	n.a.
OECD	41	46	12	1	0

Notes:
n.a. = not applicable
1. S&D: Special and Differential Treatment -- "Development Programmes".
Turkey: not included (no domestic support reduction commitments).

Source : Author's calculations based on country notifications to WTO.

Blue box payments were excluded from the AMS in the implementation period even though they were included in the base year. The premiums for suckler cows, and for beef and veal in the European Union, for example, were counted as AMS support for the base period and notified as blue box support from 1995 onwards. The most notable examples of blue box policies are the former **United States** deficiency payments and the **European Union** compensatory payments under the 1992 CAP reform. The **European Union** changed its policies after the base period, so as to substitute area payments for administered prices, with a very noticeable effect on the level of the Current Total AMS. These compensatory payments are made to producers for area sown to arable crops (grains,

oilseeds and protein crops).[7] Payments under such programmes are assuming importance where compensation is being provided to producers for reductions in administered prices (*e.g. Agenda 2000* CAP reforms). The blue box is a general provision and all countries have access to it. As of April 2002, blue box measures were notified by the **European Union (1995 to 1998), Norway** (1995 to 2000), **Slovak Republic** (1995, 1996, 1997 and 2000), while **Iceland** and the **United States** have notified using the provisions only in 1995, **Slovenia** in 2000, **Estonia** in 2000 and 2001, and **Japan** claimed blue box exemption for some support to rice in 1998 and 1999. The most frequently used blue box measure was production-limiting payments made on 85% or less of production in 1995 and payments based on fixed area and yield for the following three years. However, in value terms, production-limiting payments based on fixed area and yield were most important in all four implementation years. The main reason for the reduction in production-limiting payments made on 85% or less of the level of production is that the **United States** made use of blue box measures only in 1995.

Expenditures on blue box measures in comparison to the current total AMS vary among countries. Expenditures on blue box measures are high for the **European Union** (approximately half of the Current Total AMS over the 1995-98 period). **Norway**'s spending on blue box measures is also high relative to Current Total AMS expenditures, at approximately 70% for all four years. In 1995, blue box expenditures in the **United States** exceeded Current Total AMS.

Green box payments constitute the main category of domestic support in many OECD countries, but their share varies considerably across countries (Table 2). In **Australia**, **New Zealand**, **Poland** and the **United States**, green box measures accounted for more than 80% of total domestic support over the 1995-98 period. While in the base period, domestic support was dominated by AMS measures, during the implementation period AMS measures were declining and green box measures were increasing (OECD, 2001). Green box expenditures more than doubled in 1995 relative to the 1986-88 level. In particular, there have been significant increases in the green box expenditures of the **United States** and **Iceland**, both of which have notified that their blue box programmes have been replaced by green box measures.

The application of the *de minimis* provision has also led to the exclusion of measures which are potentially highly distorting. In OECD countries, the *de minimis* provision includes product-specific support as well as non-product-specific support, particularly input subsidies. In **Hungary**, the 1995 Current Total AMS was nil as all product-specific and non-product-specific support are *de minimis*, while in Canada *de minimis* support accounted for 30% of total support. In **Canada**, out of the twenty-two product categories with product-specific non-exempt direct payments, twenty products were exempt under the *de minimis* provision, as was the non-product-specific AMS. In the **United States** all non-product-specific AMS (*i.e.,* crop insurance, multi-year crop disaster payments, market loss assistance payments, state credit programmes, outlays for grazing livestock, water subsidies) is *de minimis*. Likewise, many input subsidies, which *a priori* are highly distorting, have been exempted from the AMS commitment (*e.g.* in the European Union, Hungary and United States).

Table 3 compares the OECD (PSE) and the WTO (blue and green box) classification of selected measures in the European Union, Japan and the United States. A salient feature of the table is that

7. **European Union** compensatory payments were established to compensate producers for the loss of income caused by the reduction of intervention, or support prices, after 1992. Payments are based on fixed, historical yield in each region, and the total area eligible to receive compensatory payments is also fixed. Producers with an area planted to arable crops sufficient to produce more than 92 tonnes of grain must set aside part of their area in order to receive compensatory payments.

several blue and green box measures in the WTO classification are included in the OECD PSE calculation mainly as payments based on inputs.

Table 3. **Classification of selected blue and green box policies in WTO and OECD**

Country	Policy	PSE	WTO Notifications
European Union	Per hectare compensatory payments for arable crops	Payments on limited area	Blue box
	Suckler cow, special and deseasonalisation premia; ewe and goat premia	Payments on limited animal numbers	Blue box
	Set-aside	Payments on constraints of fixed inputs	Green box: resource retirement programme
	Young farmers	Payments on use of variable inputs	Green box: investment aids
	Compensatory allowances in less favoured areas	Payments on limited area or animal numbers	Green box: regional assistance
	Afforestation	Payments on constraints on fixed inputs	Green box: environmental programmes
Japan	Irrigation, drainage, land consolidation	Payments on use of fixed inputs	Green box: general services
	Rice Farming Income Stabilisation Programme	Payments on limited output	Blue box
United States	Crop disaster payments	Payments on unlimited area	Green box: relief from natural disasters
	Production flexibility contract payments	Payments on historical support programmes	Green box: decoupled income support
	Conservation reserve programme	Payments on constraints on fixed inputs	Green box: resource retirement
	Farm credit, ownership, operating loans	Payments on variable and fixed inputs use	Green box: investment aids
	Emergency conservation programme	Payments on use of fixed inputs	Green box: environmental programmes
	Environmental quality incentive programme	Payments on constraints on a set of inputs	Green box: environmental programmes
	Wetland reserve programme	Payments on constraints of variable inputs	Green box: environmental programmes
	Livestock indemnity programme	Payments on unlimited animal numbers	Green box: relief from natural disasters

Source: OECD Secretariat.

Calculation of MPS

- *OECD approach*

In the PSE, MPS captures all policy measures that create a wedge between domestic market prices and border prices of a specific agricultural commodity, measured at the farm-gate level. The MPS includes the transfer to producers associated with both production for domestic use and export. It is measured by the price gap between current domestic prices and current reference prices applied to current unlimited production; or, where restrictions on output apply, to current limited production. The MPS is *net* of financial contributions from individual producers through producer levies on sales of the specific commodity, or penalties for not respecting regulations such as production quotas. In the case

of livestock production, it is net of the market price support on domestically produced coarse grains and oilseeds used as animal feed.

Market price support should be calculated for a country that has explicit market price support measures or has State (or monopoly) marketing structures that control the domestic market, or applies sanitary barriers. The method of calculating MPS varies depending on the country's trade position and the type of policies in place. For example, when only tariffs are used, the applied tariff rate average measures the price gap. If other policy measures such as import tariff quotas, public stockholding, sanitary barriers, or state-trading enterprises are also in place, then calculation of a price gap is more appropriate.[8]

Market price support is calculated for a number of commodities, and the MPS average for these commodities is then extrapolated to all commodities (*i.e.* to the total value of production of the whole agricultural sector) according to their share in the value of production. This method, even when consistently applied across countries, may over-estimate or under-estimate the MPS for particular countries. The larger the share of production covered by the MPS calculation, the smaller the risk of error. Thus, error can be reduced by increasing the commodities specifically covered by MPS calculations.[9]

- *WTO approach*

In the AMS, market price support does not measure actual price support for individual commodities. First, MPS is only calculated when domestic administered support prices exist. This implies that market price support which is provided only through border measures, but where there is no explicit domestic administered support price, is excluded. For example, the domestic producer price may well be above the world market price as a result of import duties and, if the country is an exporter, export subsidies. In measuring the PSE, this difference between the domestic producer price and the international market price would be included, along with any domestic subsidies which may be granted at the same time.

Second, while the PSE uses observed domestic prices and observed, actual external prices to measure the price gap, the AMS uses administered prices (*e.g.* intervention price for government buying-up activities or target price for deficiency payments) and a fixed external price (average 1986-88). The fixed external price is defined as the average f.o.b. unit value for the product concerned in a net-exporting country and the average c.i.f. unit value for the product in a net-importing country in the base period (1986-88). The fixed external reference price may be adjusted for quality differences.[10]

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8. Obviously, the accuracy of the calculation depends on the data quality and availability of the prices compared. Potential for error in the MPS calculation can arise from failing to compare "like with like". The prices are adjusted to take into account different marketing and geographical levels of the prices in order to compare "like with like".

9. To reduce potential error, efforts have been made to extend the MPS calculation to additional commodities for countries where MPS standard commodities represent less than 70% of the total value of agricultural production for the past three years.

10. In some cases, however, modified external reference prices have been used. In particular, external reference prices have been modified to adjust for inflation and for exchange rate movements. In other cases, the external reference price has been expressed in a different currency (*e.g.* SDR or USD) rather than national currency or a reference period different from 1986 to 1988 has been used. These factors affect the magnitude of the price gap. Noteworthy that while the URAA has provisions for Members to take into account excessive rates of inflation on a country's ability to meet its reduction

In contrast to the PSE, the AMS is, therefore, independent of changes in actual domestic market or world prices. With a constant domestic administrative, a fixed external reference price means that the MPS component of the AMS does not vary inversely with changes in world prices. If world commodity prices continue their secular decline over time, actual support will increase but AMS will not be affected as the reference prices used are fixed at their 1986-88 levels. Likewise, if world prices increase, actual support will fall but AMS will not be altered.

Delinkange of the Current Total AMS from fluctuations in international price and exchange rates was an important point of contention during the Uruguay Round negotiation process. It would seem to have been essential to get acceptance in GATT of the AMS indicator as many countries were reluctant to accept commitments based on a measure which is influenced by factors largely outside a country's control.

The exclusion of price support in cases where no administered price exists provides wide flexibility to governments in selecting policy instruments. It opens up the possibility of alleviating the domestic support commitment by eliminating the administered price for those products which had an administered price in the base period, whilst continuing to provide the same level of support through border measures, providing that the specific commitments on tariff bindings and export subsidy are not breached. This is exemplified by the re-instrumentation of Japan's rice policy where administered prices were eliminated, and hence the related AMS component, but without really affecting the level of domestic market prices.

Another issue that influences the estimation of market price support is the quantity of eligible production used. In the PSE, the price gap is multiplied by the total value of production, whilst in the AMS, the difference between the administered price and the external price is multiplied by the quantity of production eligible to receive the applied administered price. In most instances where administered prices are used, price support is not limited to a specific quantity, but is generally available to all production. In such cases eligible production is total production and not the quantity actually purchased by government. In a number of cases it appears that countries used actual government purchases. Sometimes a zero eligible production level is notified. In addition, AMS in some cases excludes the share of the raw material not used for the production of the products for which administered prices are set. For example, in the **European Union** the AMS for milk is based on butter and skimmed milk powder production and ignores the milk used in other products such as cheese, yoghurt and drinking milk.

Table 4 compares market price support estimates as calculated by the two approaches for the European Union, Japan and the United States over the 1986-88 base period and over the 1995-98 period. Further, the detailed calculations of measuring support with the two methods for these three countries is shown in Annex Table 4. Three main points are worth mentioning. First, notwithstanding differences in the calculation, both AMS and PSE results are dominated by market price support. Second, differences in market price support estimates between the PSE and the AMS are mainly due to commodity coverage. Thirdly, in general, the AMS method produces higher MPS estimates than the PSE. It is noteworthy that over the 1995-98 period for rice in **Japan,** the OECD method produces much higher MPS estimates than the method in WTO mainly because with the abolition of administrative prices in 1998, market price support has automatically become zero in the AMS.

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commitments, there are no established provisions for unilateral adjustments to external reference prices or other components of the AMS calculations.

Relationship between green box and GSSE

Notwithstanding their differences, the green box and the OECD General Services Support Estimate (GSSE) are closely related concepts. The GSSE includes measures that are not commodity specific and their effects on production and trade are indirect. Measures included in the green box are much less distorting than traditional forms of agricultural support provided through market, price and trade policies. Many of the green box policies fall under the heading of the provision of public goods or the pursuance of domestic development and growth policies.

Table 4. **Comparison of market price support estimates**

	1986-88		Difference	1995-98		Difference
	WTO[(1)]	OECD	WTO-OECD	WTO[(1)]	OECD	WTO-OECD
European Union (mill. Euro)						
Common wheat	8 144	6 176	1 968	2 877	495	2 382
Durum wheat	1 286	898	389	-220	56	-276
Barley	6 578	4 654	1 925	2 580	1 107	1 473
Maize	2 965	2 692	273	930	1 124	-194
Oats	470	293	177	12	255	-242
Rice	409	351	58	499	461	38
Sugar	5 608	2 784	2 824	5 759	2 324	3 435
Beef	18 072	11 986	6 086	13 662	9 994	3 669
All commodities	67 744	72 886	-5 142	26 779	56 970	-30 191
Japan (bill. Yen)						
Wheat	138	135	3	63	63	-1
Barley	50	51	-1	21	21	0
Rice	2 870	2 603	267	1 835	2 205	-370
Sugar	83	77	5	55	58	-3
Milk	119	567	-448	112	520	-408
Beef and veal	294	356	-62	102	206	-103
Pigmeat	498	283	215	293	258	35
All commodities	4 086	6 480	-2 394	2 502	4 565	-2 063
United States (mill. USD)						
Beef	158	258	-100	0	-3	3
Dairy	5 409	10 148	-4 739	4 539	9 823	-5 284
Sugar	1 041	1 030	11	1 046	822	224
Peanuts	347	n.c.	….	346	n.c.	….
All commodities	6 900	19 533	-12 633	5 931	16 355	-10 423

Note: 1. Before *de minimis.*

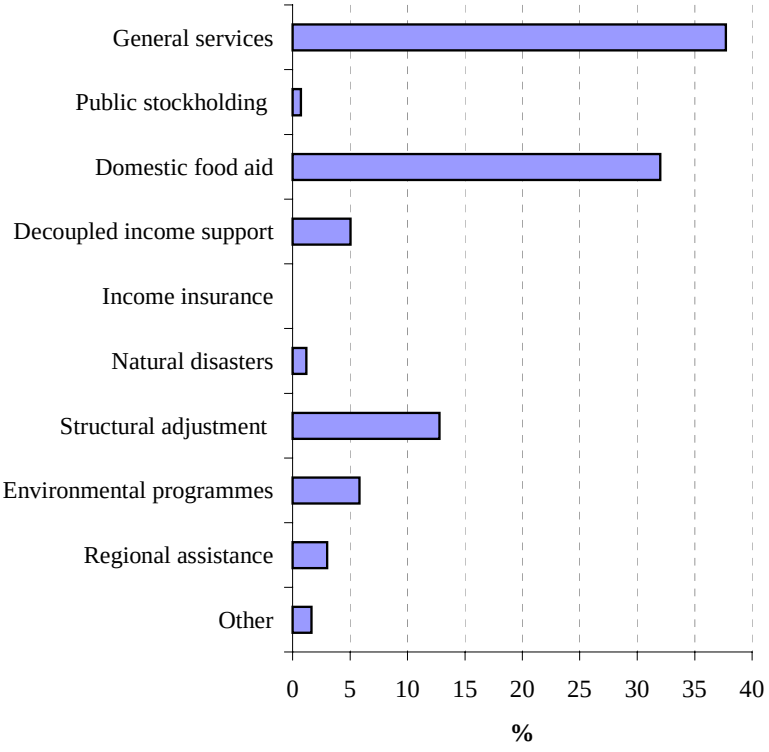
Source: Author's calculations based on OECD PSE database and country notifications to WTO.

Green box domestic support measures were exempted from domestic support discipline. Support measures in this category are considered to have no, or at most minimal, trade distortion effects or effects on production (Annex 2 of the URAA). Measures for which exemption is claimed must meet the following basic criteria: i) the support is provided through a publicly-funded government programme not involving transfers from consumers; and ii) the support does not have the effect of supporting producer prices. In addition, exempt support must meet the policy-specific criteria and conditions applying to the following categories of measures: general services (*e.g.* research, pest and disease control, inspection, training and extension, marketing and promotion, infrastructure), food security stocks, domestic food aid, decoupled income support, natural disaster relief, income insurance

and income safety-net programmes, environmental programmes, structural adjustment assistance programmes, and regional assistance.

On average, over the 1995-98 period, most of the expenditures on green box policies by OECD countries went for ***domestic food aid*** and ***general services*** (Figure 2). Expenditures on ***infrastructures*** was the single largest category of green box support, accounting for 33%. ***Domestic food aid*** expenditure was the second-most important green box category (25%), most of which was spent by the **United States**. The ***decoupled income support*** category accounted for only 5% of total green box expenditures for the OECD countries. These expenditures were notified by four countries: **Canada**, **Iceland, Switzerland** and the **United States**. ***Research and development*** expenditures were the most important green box category in **Australia** and **New Zealand**, although this category accounted for only 2% of the total OECD green box expenditures.

Figure 2. **Green box expenditures by category in OECD (percentage), 1995-98 (%)**



Source: Author's calculations based on country notifications to WTO.

Expenditures on ***environmental programmes*** were not the dominant category in any OECD country. They accounted for 5% of OECD green box expenditures, but their importance has been increasing over time. For example, in **Australia** the share of environmental programmes in total green box expenditures increased from 13% in 1995 to 27% in 1999, in the **European Union** from 15% in 1995 to 26% in 1998, and in **Switzerland** from 12% in 1995 to 28% in 1998. Notably, only Canada in 1996 has notified policies under ***the income insurance*** and ***income safety-net programmes***. ***Regional-programmes***, for OECD as a whole, accounted, on average, for less than 1% over the 1995-98 period. However, transparency in reporting sub-national support has come under increasing

scrutiny in the WTO Committee on Agriculture, particularly for the **European Community**, **Japan** and the **United States**.

To be eligible for inclusion in the green box, policies must be publicly funded, cannot provide price support, and should be non- or minimally trade-distorting. In addition, there are policy-specific criteria that programmes must meet.[11] However, the term "minimally trade-distorting" is not defined in the URAA.

The green box includes measures which it could be claimed provide an incentive to produce, thereby affecting production and trade. The most important among these are measures such as income insurance and income safety-net programmes, payments for relief from natural disasters, structural adjustment assistance, environmental and regional assistance programmes.

The URAA, for example, provides considerable scope to implement agri-environmental programmes which are linked to production or productive resources and the choice of environmental policy instruments may critically affect international comparative advantage. Eligibility for payments depends on the fulfilment of specific conditions, including conditions related to production methods or inputs. Further, measures relating to the environment can be classified as green box only if the payment is limited to the extra cost or loss of income involved in complying with the environmental requirements (paragraph 12 of Annex 2). Different agri-environmental policy measures could lead to similar environmental outcomes, but could lead to differing impacts on trade (OECD, 1998). A specific environmental objective can be achieved through a wide range of policy instruments providing either incentives or disincentives, but the effects on production, trade and the financial transfers involved depend on how the instruments are designed and implemented. For this reason, in the OECD methodology agri-environmental payments are classified in different categories according to their implementation criteria and not in a single category.

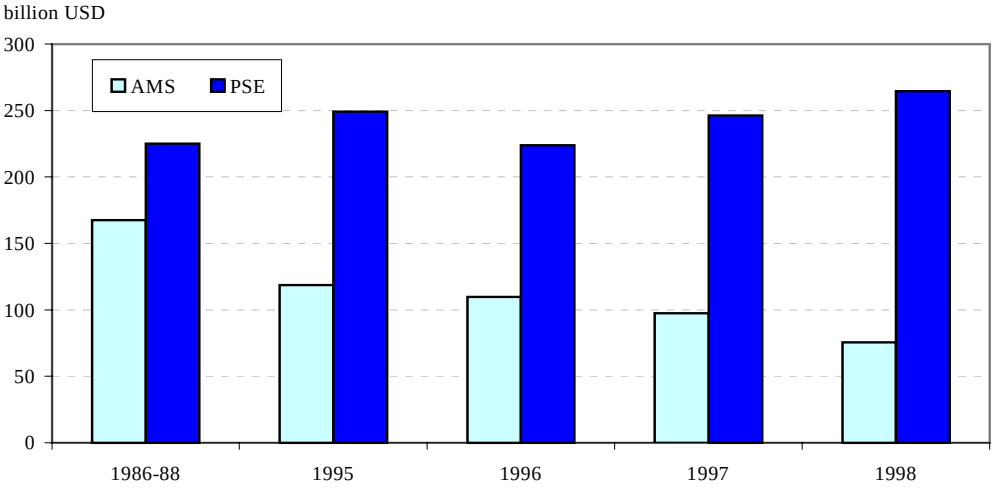
Figure 3 compares the results of OECD and WTO methodologies of measuring support as well as their main categories. Annex Table 1 illustrates the evolution of the OECD TSE and WTO Total Domestic Support (TDS) in the 1986-88 base period and over the 1995-98 period for the OECD countries; Annex Table 2 shows the evolution of the OECD PSE and of the Current Total AMS; and Annex Table 3 shows the evolution of OECD GSSE and Green Box measures.

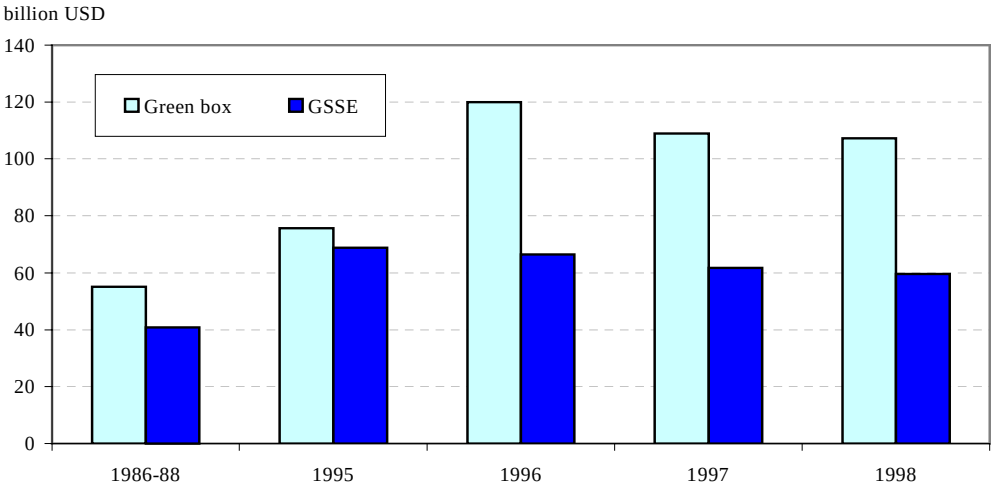
These tables indicate that the two methods of measuring agricultural support yield considerably different results. The WTO TDS is lower than TSE; the AMS is lower than the PSE, while green box expenditures are higher than GSSE expenditures. Moreover, in many instances, the differences are increasing over time.

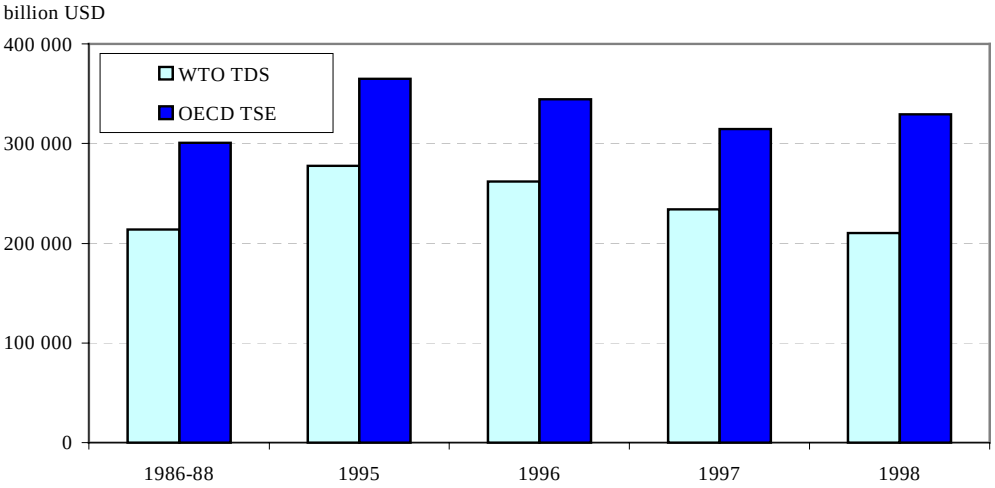
On average, for the OECD as a whole, the PSE was higher than the AMS estimates over the 1986-88 base period. The same pattern is observed over the URAA implementation period, with the PSE being higher than the AMS in almost all countries. Moreover, in many instances (*e.g.* **Australia**, **Canada**, the **Czech Republic**, **Japan**, **Korea**, **Mexico**, **New Zealand**, **Poland** and the **United States**) the difference between AMS and PSE estimates has become larger. For the OECD as a whole the difference between the AMS and the PSE significantly increased in 1998 mainly due to the sharp decline in Japan's Current Total AMS.

11. The detailed list and characteristics of measures which are exempt from the reduction commitments are given in Annex 2 of the URAA.

Figure 3. **Comparison of OECD and WTO methodologies**







Source: Author's calculations based on OECD PSE data base and Country notifications to WTO .

Country examples

European Union

The base period total AMS reported for the **European Union** is EUR 81.5 billion to have been reduced to a final bound level of EUR 67.2 billion by the year 2000. Current Total AMS is in the form of product-specific AMS. Non-product-specific AMS measures such as insurance and interest concessions account for less than 5% of the value of total agricultural production and are excluded under the *de minimis* provision. The Current Total AMS levels increased from 64% of the commitments in 1995 to 72% in 1998.

The 1992 CAP reform reduced support prices and increased reliance on direct payments linked to production-limiting programmes. Market price support to cereals, oilseeds and beef was reduced and direct payments based on historical regional yields, regional base area or fixed animal numbers were introduced.[12] These compensatory payments fall into the blue box category and are excluded from the Current Total AMS. Further, under the AGENDA 2000 reform of the CAP, direct payments to producers of arable crops, beef and dairy as well as rural development payments (farm investments, young farmers, early retirement, disadvantaged regions, areas with environmental restrictions and agri-environment measures) were notified by the European Commission as measures exempt from reduction commitments under Article 18:3. This change in policy stance is consistent with the URAA agreement in that it will exert less pressure on the AMS constraints and shift policies toward the blue box and green box. It could be noted that if these payments had been included in the Current Total AMS, the European Union would still have been within its limits, albeit by a small margin (*e.g.* by 3% in 1999).

The difference between the PSE and AMS estimates increased during the implementation period, and in 1997 and 1998 the Current Total AMS was around half of the PSE. The totality of the AMS is due to product-specific AMS, as the non-product specific AMS such as insurance subsidies and interest concessions fall within the *de minimis* provisions. The AMS excludes payments in the blue box in the implementation period. In the PSE, these payments are classified as payments based on area or animal numbers. Further, a number of policies which are classified in the green box such as compensatory allowances in less-favoured areas, afforestation and set-aside, are included in the PSE.

In both AMS and PSE results for the European Union, market price support is the predominant means of support. In general, the AMS market price support for individual commodities is higher than the PSE market price support, particularly in the 1986-88 base period. Nevertheless, as for the AMS market price support is only calculated for the cases where there are administered prices, the total amount of market price support estimated by the PSE is much higher than that of AMS over the 1995-98 URAA implementation period.

Japan

Japan's commitments in terms of its Total AMS require a reduction from the base period of JPY 4 966.1 billion to a final bound level in the year 2000 of JPY 3 972.9 billion. Japan has had to reform domestic support programmes to comply with AMS commitments by reducing budgetary payments to producers and lowering administered prices. New direct payments to rice farmers were

12. The share of market price support in PSE decreased from 86% in 1986-88 to 58% in 2001 (OECD, 2002).

introduced in 1997 and more emphasis has been put on budget measures for investments for structural and rural infrastructure purposes. In the first three implementation years, Current Total AMS levels were around three-quarters of the commitments, while in 1998 Current Total AMS fell to less than 20%. The change for rice from price support of JPY 2 315 billion to zero in 1998, due to the removal of administered support price, accounts for almost all of the 76% decline in Current Total AMS from JPY 3 170.8 billion in 1997 to only JPY 776.5 billion in 1998.

The AMS is commodity specific and more than 80% of support, both as measured by AMS and the PSE, is in the form of market price support. Non-product-specific AMS and agricultural insurance schemes, fall in the *de minimis* provision. Green box payments are dominated by payments on infrastructure services for agriculture and rural areas.

The divergence between AMS and PSE increased significantly in 1998 and 1999, where the Current Total AMS is only 12% of the PSE. The main reason for this is the change in the classification of rice policies in the AMS. Since 1998, market price support for rice was set to zero in the Current Total AMS and rice payments (*i.e.* Rice Farming Income Stabilisation Programme) were included in the blue box. It is noteworthy that these policies are classified as payments based on limited output in the PSE. The PSE and the AMS methods produce very similar MPS estimates for wheat, barley and sugar.

United States

The domestic support reduction commitment for the **United States** involves a reduction of Total AMS from the base period level of USD 23.9 billion to a final bound level of USD 19.1 billion at the end of the implementation period. Deficiency payments accounted for almost USD 10 billion during the base period and have been included in the base and final bound commitments. However, they are excluded from the Current Total AMS calculations because in 1995 they were notified in the blue box and then replaced by production flexibility programmes under the 1996 FAIR Act. Production flexibility programmes are notified as green box. Reforms under both the 1990 and 1996 Farm Acts have reduced the amount of budgetary payments included as part of the AMS and increased the amount attributed to the green box. As a result, US Current Total AMS was just over a quarter of the commitments during the 1995-97 period, but in 1998 it increased to 50%.

In 1998 and 1999, depressed market prices combined with various natural disasters resulted in dramatic increases in *ad hoc* emergency measures. These measures, which are mainly through payments based on historical support, include in 1998 USD 2.9 billion for market losses and USD 1.5 billion for crop losses due to natural disasters. In 1999, compensation for market losses rose to USD 5.5 billion, while natural disaster assistance was USD 1.2 billion. Payments for market losses were notified in the AMS as *de minimis*, whilst crop disaster payments were notified by the United States as a green box measure. Both of these payments are included in the PSE.

The difference between the PSE and the AMS increased, with the PSE being, on average, more than five times higher than the AMS during the 1995-98 period. The AMS is accounted for by four commodities (dairy, sugar, cotton and peanuts). Non-product-specific AMS and product-specific AMS for other commodities fall within the *de minimis* provision. Dairy accounts for more than 70% of the AMS and sugar for around 15%. Market price support accounts for almost half the agricultural support measured by the PSE. Dairy MPS based on PSE is almost two times higher than the MPS from AMS. This is mainly attributable to the large differences in prices used by the two methods. Payments based on historical entitlements, most of which are included in the green box, have increased as a result of the FAIR Act and substantial additional *pro rata* payments accorded since 1998. Payments based on input use are also important, accounting for about 15% of PSE.

Conclusions

There are fundamental differences in the concept and calculation of agricultural support between the methodologies used in the WTO for the implementation of domestic support discipline of the URAA and by OECD. The WTO measure and the OECD methodology have rather different objectives and, hence, are defined in very different ways. The OECD methodology is more comprehensive insofar as it covers all transfers associated with agricultural policies. Moreover, it distinguishes between those transfers that accrue to or are paid by producers, consumers and the sector as a whole, whatever their nature, impact or objective.

In contrast, in order to conform with the provisions of the URAA, measurement of support in the WTO is more narrowly defined. In particular, the AMS, although similar in concept to the PSE, has some unique characteristics. It was designed to focus attention on specific domestic policy measures and to place concrete limitations on the level of those domestic support policies deemed to be the most trade-distorting.

The precise definitions of price support, trade-distorting policies and exempt support are critical to the effectiveness of the URAA. The AMS covers only policies considered to be the most trade-distorting and excludes explicit trade policies covered by the PSE (export subsidies and import restrictions) because these policies are covered under the market access and export subsidy disciplines of the URAA. It also excludes many policies under the blue box, green box and *de minimis* exemptions which are included in the PSE. Policy-reinstrumentation through changes in the forms of support to exempt categories since the 1986-88 base period, in tandem with tariffication and export subsidy commitments, have enabled countries to meet their domestic support reduction commitments with modest reductions in support levels.

In contrast to the PSE, the AMS is not a measure of "current" benefits (costs) to agricultural producers. Although both indicators include MPS, there are fundamental differences in the way that MPS is calculated between the two methods. While in the PSE, MPS is calculated using current prices, in the AMS market price support is determined from the difference between domestic administered support prices and a fixed external price. Administered support prices are often poor proxies for actual producer prices and the constant external reference prices do not reflect actual world prices. The AMS is, therefore, independent of changes in domestic or world prices. Market price support, if properly measured to reflect the extent to which domestic farm prices exceed actual world prices, should provide a good yardstick of the effectiveness of agreed measures on market access and export subsidies.

Nevertheless, the OECD indicators of agricultural support are static measures and they do not themselves inform on what would happen in the absence of a given policy under scrutiny. The impact of policies on production, consumption, trade, income and the environment also depends on the mix of policies.

ANNEX

Definition of PSE payments

Payments based on output: Gross transfers from taxpayers to agricultural producers arising from policy measures based on current output of a specific agricultural commodity or a specific group of agricultural commodities. These include payments per tonne, per hectare or per animal on current unlimited production or limited production.

Payments based on area planted/animal numbers: Gross transfers from taxpayers to agricultural producers arising from policy measures based on current plantings, or number of animals, in respect of a specific agricultural commodity or a specific group of agricultural commodities. These payments include payment per hectare, or per head, to current unlimited, or limited area planted or animal numbers.

Payments based on historical entitlements: Gross transfers from taxpayers to agricultural producers arising from policy measures based on historical support, area, animal numbers or production of a specific agricultural commodity, or a specific group of agricultural commodities, without obligation to continue planting or producing such commodities. The measure includes payments based on historical plantings/animal numbers or production of such commodities and payments based on historical support programmes for such commodities.

Payments based on input use: Gross transfers from taxpayers to agricultural producers arising from policy measures based on the use of a specific fixed or variable input, or a specific group of inputs or factors of production. These include explicit, and implicit, payments affecting specific variable input costs, the cost of on-farm technical, sanitary and phytosanitary services or affecting specific fixed input costs, including investment costs.

Payments based on input constraints: Gross transfers from taxpayers to agricultural producers arising from policy measures based on constraints on the use of a specific fixed or variable input, or a specific group of inputs, through constraining the choice of production techniques. These payments are conditional on the application of certain constraints (reduction, replacement, or withdrawal) on the on-farm use of specific variable inputs or fixed inputs or based on constraints on the use of a set of farm inputs through constraining the choice of production techniques of marketed commodities for reducing negative externalities or remunerating farm inputs producing non-market goods and services.

Payments based on overall farming income: Transfers from taxpayers to agricultural producers arising from policy measures based on overall farming income (or revenue), without constraints or conditions to produce specific commodities, or to use specific fixed or variable inputs. These payments compensate for farm income fluctuations or losses or for guaranteeing a minimum income.

Miscellaneous payments: All transfers from taxpayers to agricultural producers that cannot be disaggregated and allocated to the other categories of transfers to producers.

Annex Table 1. **Evolution of WTO total support (TDS) and OECD total support estimate (TSE)**

Country	1986-88			1995			1996			1997			1998		
	WTO TDS (1)	OECD TSE (2)	(1)/(2) (%)	WTO TDS (1)	OECD TSE (2)	(1)/(2) (%)	WTO TDS (1)	OECD TSE (2)	(1)/(2) (%)	WTO TDS (1)	OECD TSE (2)	(1)/(2) (%)	WTO TDS (1)	OECD TSE (2)	(1)/(2) (%)
Australia	1 075	1 674	64	802	2 259	36	855	2 334	37	1 031	2 258	46	899	1 778	51
Canada	5 545	7 161	77	3 011	5 393	56	2 753	5 214	53	1 957	4 482	44	1 545	4 824	32
Czech	1 215	5 511	22	176	1 048	17	260	1 090	24	155	360	43	228	1 093	21
European Union	90 849	109 654	83	118 269	140 464	84	121 093	134 463	90	101 236	124 085	82	96 961	129 435	75
Hungary	1 137	3 383	34	271	842	32	0	807	…	0	452	…	0	1 234	…
Iceland	243	241	101	240	163	147	207	139	149	191	146	131	379	181	210
Japan	49 085	58 165	84	71 340	100 509	71	56 848	78 295	73	48 418	63 791	76	29 744	64 060	46
Korea	4 369	14 204	31	8 256	30 211	27	9 355	28 659	33	8 866	25 237	35	5 533	15 983	35
Mexico	9 599	1 287	746	2 718	183	1 487	1 970	3 209	61	2 713	5 728	47	2 831	5 638	50
New Zealand	567	580	98	133	255	52	140	242	58	143	252	57	118	173	68
Norway	1 794	2 977	60	3 315	3 124	106	3 390	3 011	113	3 051	2 819	108	3 003	2 867	105
Poland	4 160	18 691	22	691	2 140	32	776	2 874	27	3 175	2 253	141	3 260	3 799	86
Slovak	931	2 888	32	1 669	356	469	230	106	217	252	281	90	230	652	35
Switzerland	3 359	6 151	55	5 927	7 766	76	5 367	7 179	75	4 505	5 987	75	4 448	6 077	73
United States	40 000	68 540	58	60 925	70 470	86	58 876	76 978	76	58 294	76 503	76	60 941	91 663	66
Total	213 927	301 108	71	277 742	365 179	76	262 121	344 600	76	233 988	314 635	74	210 119	329 457	64

Notes:

Mexico: 1991 US dollars; n.a. = not available.

Source : OECD PSE Database; WTO notifications; Author's calculations.

Annex Table 2. **Evolution of AMS and PSE**

(billion USD)

Country	1986-88			1995			1996			1997			1998		
	AMS (1)	PSE (2)	(1)/(2) (%)	AMS (1)	PSE (2)	(1)/(2) (%)	AMS (1)	PSE (2)	(1)/(2) (%)	AMS (1)	PSE (2)	(1)/(2) (%)	AMS (1)	PSE (2)	(1)/(2) (%)
Australia	0.4	1.3	33	0.1	1.7	6	0.1	1.7	7	0.1	1.3	8	0.1	1.1	7
Canada	4.1	5.7	72	0.6	3.7	15	0.5	3.2	14	0.4	3.5	11	n.a.	3.7	…
Czech Republic	1.2	4.7	25	0.0	1.0	4	0.1	0.3	25	0.0	1.0	3	0.0	0.8	4
European Union	80.7	93.7	86	65.4	116.4	56	64.7	105.0	62	56.9	114.4	50	52.2	115.3	45
Hungary	0.9	3.0	30	0.2	0.7	24	n.a.	0.4	…	n.a.	1.1	…	n.a.	1.2	…
Iceland	0.2	0.2	107	0.2	0.1	154	0.2	0.1	123	0.1	0.2	93	0.3	0.2	212
Japan	33.8	49.5	68	37.3	59.5	63	30.6	48.4	63	26.2	47.6	55	5.9	53.8	11
Korea	2.1	12.1	17	2.7	23.4	12	2.4	20.2	12	2.0	12.6	16	1.1	18.3	6
Mexico	9.6	-0.3	…	0.5	1.5	31	0.3	4.0	8	1.1	4.1	26	1.3	4.5	28
New Zealand	0.2	0.5	44	0.0	0.1	0	0.0	0.1	0	0.0	0.1	0	0.0	0.1	0
Norway	2.1	2.6	79	1.5	2.7	56	1.6	2.6	63	1.5	2.6	56	1.4	2.5	57
Poland	4.2	2.7	153	0.3	2.6	10	0.2	2.0	11	0.3	3.6	8	0.3	2.6	12
Slovak Republic	0.9	2.4	37	0.2	0.0	513	0.2	0.2	101	0.2	0.6	41	0.2	0.4	56
Switzerland	3.4	5.1	66	3.6	5.7	63	3.0	4.9	60	2.4	5.0	47	2.3	4.9	46
United States	23.9	41.8	57	6.2	29.9	21	5.9	30.7	19	6.2	48.6	13	10.4	55.4	19
Total	167.6	225.0	74	118.8	249.1	48	109.8	223.9	49	97.5	246.2	40	75.5	264.9	29

Notes:

Mexico: 1991 US dollars; n.a. = not available.

Source : OECD PSE Database; Country notifications to WTO; Author's calculations.

Annex Table 3. **Green box expenditures and GSSE**

(billion USD)

Country	1986-88			1995			1996			1997			1998		
	Green box (1)	GSSE (2)	(1)/(2) (%)	Green box (1)	GSSE (2)	(1)/(2) (%)	Green box (1)	GSSE (2)	(1)/(2) (%)	Green box (1)	GSSE (2)	(1)/(2) (%)	Green box (1)	GSSE (2)	(1)/(2) (%)
Australia	0.7	0.4	168	0.7	0.6	119	0.7	0.6	125	0.9	0.6	161	0.8	0.5	164
Canada	1.3	1.5	87	1.5	1.4	113	1.5	1.5	97	0.9	1.3	68	0.9	1.3	66
Czech Republic	0.0	0.1	50	0.1	0.1	111	0.2	0.1	159	0.1	0.1	110	0.2	0.1	186
European Union	10.1	11.1	91	24.5	9.3	263	28.1	13.6	207	20.6	14.3	144	21.4	10.6	203
Hungary	0.3	0.1	303	0.1	0.1	110	n.a.	0.1	…	n.a.	0.1	…	n.a.	0.2	…
Iceland	0.0	0.0	165	0.0	0.0	183	0.0	0.0	299	0.0	0.0	225	0.0	0.0	210
Japan	15.0	8.8	171	33.7	24.6	137	25.9	18.6	140	21.9	15.2	145	22.9	16.3	140
Korea	2.2	2.0	107	5.2	4.6	113	6.4	5.1	127	6.1	4.7	131	3.8	3.1	125
Mexico	0.0	0.7	0	1.6	0.6	294	1.4	0.4	405	1.5	0.4	394	1.4	0.4	347
New Zealand	0.1	0.1	132	0.1	0.1	119	0.1	0.1	110	0.1	0.1	111	0.1	0.1	114
Norway	0.5	0.1	365	0.6	0.2	402	0.6	0.2	349	0.5	0.1	376	0.5	0.1	365
Poland	0.0	0.2	0	0.4	0.2	237	0.5	0.2	229	2.9	0.2	1172	3.0	0.2	1219
Slovak Republic	0.9	0.2	551	0.0	0.1	1	0.0	0.1	2	0.0	0.1	8	0.0	0.1	19
Switzerland	n.a.	0.4	…	2.3	0.5	453	2.4	0.5	503	2.1	0.4	532	2.2	0.4	574
United States	24.1	15.2	158	4.6	26.5	17	51.8	25.5	203	51.3	24.1	213	49.8	22.3	224
OECD	55.1	40.8	135	75.6	68.8	110	119.9	66.5	180	109.0	61.7	177	107.2	59.6	180

Notes:

Mexico: 1991 US dollars; n.a. = not available.

Source: Author's calculations.

Annex Table 4. **Support indicators: European Union, Japan and the United States**

	European Union (mill. Euro		**Japan** (bill. Yen)		**United States** (mill. USD)	
	1986-88	**1995-98**	**1986-88**	**1995-98**	**1986-88**	**1995-98**
A. OECD methodology						
1. Producer Support Estimate (PSE)	**84 998**	**95 711**	**7 227**	**6 420**	**41 839**	**33 002**
A. Market price support	*72 886*	*56 639*	*6 480*	*5 839*	*19 533*	*16 354*
B. Budgetary payments						
B.1. Payments based on output	4 502	2 963	221	168	2 919	1 250
B.2. Payments based on area planted/animal numbers	2 417	24 823	0	0	11 313	1 553
B.3. Payments based on historical entitlements	0	1 082	0	0	0	4 986
B.4. Payments based on input use	4 524	7 025	298	295	6 526	6 066
B.5. Payments based on input constraints	643	3 716	228	118	637	1 940
B.6. Payments based on overall farming income	0	1	0	0	912	854
B.7. Miscellaneous payments	26	-538	0	0	0	0
2. General Services Support Estimate (GSSE)	**10 040**	**9 984**	**1 267**	**2 077**	15 233	24 576
C.1. Research and development	1 042	1 352	46	73	1 457	2 030
C.2. Agricultural schools	93	654	29	29	0	0
C.3. Inspection services	156	218	8	10	384	583
C.4. Infrastructure	1 122	1 407	1 008	1 722	3 027	3 111
C.5. Marketing and promotion	2 950	4 383	22	28	9 266	17 287
C.6. Public stockholding	4 643	1 661	43	61	0	49
C.7. Miscellaneous	33	310	110	154	1 098	1 517
3. Transfers to consumers from taxpayers	**4 387**	**3 954**	-16	23	11 468	21 326
4. Total Support Estimate (TSE)	**99 424**	**109 650**	**8 478**	**8 519**	**68 540**	**78 904**
B. WTO Methodology						
	1986-88	**1995-98**	**1986-88**	**1995-98**	**1986-88**	**1995-98**
5. Aggregate Measurement of Support (Current Total AMS)	**73 530**	**49 478**	**4 966**	**2 694**	**22 245**	**6 513**
Market Price Support	*67 744*	*26 779*	*4 086*	*2 502*	*6 900*	*5 931*
6. Green Box [Sum of C.1 to C.12]	**9 233**	**19 561**	**2 205**	**2 910**	**26 150**	**49 733**
C.1. General services		5 505	1 622	2 447	4 738	6 726
C.2 Public stockholding for food security purposes		5	43	61	0	0
C.3 Domestic food aid		315	29	24	19 158	36 189
C.4 Direct payments to producers		0	0	0	0	0
C.5 Decoupled income support		202	0	0	0	4 283
C.6 Income insurance and income safety-net programmes		0	0	0	0	0
C.7 Payments for relief from natural disasters		303	64	63	1 388	457
C.8 Structural adjustment assistance provided through producer retirement programmes		622	99	98	0	0
C.9 Structural adjustment assistance provided through resource retirement programmes		828	19	3	532	1 722
C.10 Structural adjustment assistance provided through investment aids		5 468	116	98	132	88
C.11 Environmental programmes		3 915	213	116	202	269
C.12 Regional assistance programmes		2 398	0	0	0	0
7. Blue Box [Sum of D.1 to D.3]	**413**	**20 827**	**0**	**13**	**9 706**	**1 758**
D.1 Production-limiting payments based on fixed area and yields	0	16 252	0	0	0	0
D.2 Production-limiting payments made on 85% or less of the base level of production	0	0	0	13	9 706	1 758
D.3 Production-limiting livestock payments made on a fixed number of head	412	4 575	0	0	0	0
8. de minimis	***382***	***605***	***50***	***47***	***1 311***	***1 081***
9. Special and Differential Treatment	***0***	***0***	***0***	***0***	***0***	***0***
10. Total Domestic Support (TDS) [5 + 6 + 7 + 8 + 9]	**82 733**	**90 471**	**7 220**	**5 663**	**40 000**	**59 085**
11. TDS/TSE (%) [10/4]x100	**83**	**83**	**85**	66	**58**	**76**
12. AMS/PSE (%) [5/1] x 100	**87**	**52**	**69**	42	**53**	**21**
13. Green box/GSSE (%) [6/2]x100	**92**	**204**	**174**	140	**172**	**203**

Note : In the base period 1986-88, blue box payments were included in the AMS.
Source: OECD PSE database; country notifications to WTO.

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THE EVOLUTION OF AGRICULTURAL POLICIES IN OECD COUNTRIES AS REFLECTED BY THE LEVEL AND STRUCTURE OF AGRICULTURAL SUPPORT

By Wilfrid Legg

Abstract

The OECD has developed the Producer Support Estimate (PSE) and related indicators to monitor and evaluate the evolution of agricultural policies against the principles for agricultural policy reform first agreed by Ministers in 1987. The indicators, which are complemented with other relevant information, show that there has been modest progress in reforming agricultural policies in terms of the overall level of support and some shift to less distorting policy measures. However, progress in reform has been fragile and there is a wide variation across countries and commodities. The OECD indicators of support are transparent and robust tools in tracking policy developments, providing rankings among countries, commodities and through time that are consistent with qualitative information on policy developments. Within the framework of the PSE methodology, the indicators of the level and structure of support are regularly reviewed and refined and data improved so as to enhance their use as policy monitoring and evaluation tools. Ongoing developments in using the indicators and improving the availability of data have the potential to reinforce them as tools to evaluate progress in agricultural policy reform.

Introduction

In 1987 OECD Ministers agreed to a progressive reduction in agricultural support and a move towards policy measures that are less production and trade distorting in order to let the agricultural sector better respond to market signals. Ministers also recognised that governments need flexibility in the choice of policy measures and in the pace of reform, taking into account the diverse situations in OECD countries, and the need to address a range of policy goals. These principles have been regularly reiterated at subsequent Ministerial meetings and in 1998 OECD Agriculture Ministers outlined a set of shared goals for the agri-food sector, together with the principles (Annex 1) and operational criteria (Annex 2) for designing and implementing policy measures in the domestic and international context. Ministers noted in 1998 that "the challenge in pursuing the shared goals is to use a range of well-targeted policy measures and approaches which can ensure that the growing concerns regarding food safety, food security, environmental protection and the viability of rural areas are met in ways that maximise benefits, are most cost-efficient, and avoid distortion of production and trade."

The OECD has been monitoring and evaluating progress in agricultural policy reform in OECD countries each year since the 1987 Ministerial meeting. A substantial database and analytical capability has been accumulated in the OECD, which allows for an in-depth analysis of the evolution of policies as reflected in the level and structure of agricultural support.

This paper outlines the way in which the indicators of support are used as policy monitoring and evaluation tools, summarises the main trends in the evolution of OECD policies as reflected in the indicators, and notes some ongoing developments that have the potential to further improve the indicators as tools to evaluate progress in agricultural policy reform.

Indicators used to evaluate the evolution of agricultural policies

The OECD approach to monitoring and evaluating policy developments is based on first identifying the agricultural and related policies that are in place in a country, and then measuring the associated transfers (support) between producers, consumers and taxpayers with a view to evaluating the potential impacts of different policy instruments on production, consumption, trade, incomes and the environment. In this respect the Producer Support Estimate (PSE) and related indicators are the principal tools used, as follows[1]:

- Transfers associated with policies are measured and classified according to how the policies are *implemented*. In other words, the classification is made according to the criteria or conditions under which the transfers are made, and not by policy objective or impact.

- Changes in the level of support are analysed through a *decomposition* exercise, by which the contribution of the various types of policy measures, world prices and exchange rates to the change are estimated.

- Policies are *evaluated* against the criteria for policy reform by using the data on the level, classification and decomposition of the transfers to determine the extent to which there has been a reduction in support and a move towards policy measures that are less production and trade distorting. (Further *quantitative analysis* of the impacts of policies is undertaken through the Policy Evaluation Matrix (PEM) framework, explained in the paper by Jésus Anton).

It should be noted that the PSE methodology is based on the fundamental economic principle of opportunity cost. In particular, in calculating market price support the reference points against which domestic prices are measured are the appropriate world (border) prices for that commodity. Essentially the PSE calculations are indicators of the costs of support, within a comparative static framework. It should be noted that the application of the PSE and related indicators is constantly evolving – in terms of policy coverage, data availability and the use of the indicators as a tool of policy evaluation.

The overall, country-wide indicator is the ***total support estimate (TSE)***, which measures the annual monetary value of all transfers from consumers and taxpayers to the *agricultural sector* as a whole arising from policy measures that support producers (PSE), the agricultural sector as a whole (GSSE), and consumer food subsidies. When expressed as a percentage of GDP, the %TSE is an indicator of the share of national income used to support agriculture and thus, in a broad sense, can inform the analysis of the *burden of overall support* to the agricultural sector on the economy. Changes in the size of the agricultural sector, the growth of the economy, and in support associated with agricultural support, will all impact over time on the %TSE. Similarly, differences in those factors are important in interpreting comparisons of the %TSE across countries.

The main component of the TSE is the ***producer support estimate (PSE)*** indicator, which measures the annual monetary value of all transfers from taxpayers and consumers to *agricultural producers* arising from policy measures that support agriculture. When expressed as a percentage of gross farm receipts, the %PSE is an indicator of the share of farm receipts generated by the budgetary and consumer transfers associated with agricultural policies irrespective of the extent to which farm

1. A full explanation of these relative impacts, the concepts, methodology, interpretation and guidelines for the use of the OECD support indicators in policy evaluation can be found in OECD (2002) *Methodology for the measurement of support and use in policy evaluation*.

household income is actually raised as a result of the transfer.[2] Appropriately interpreted, the %PSE can inform the analysis of the *incentive to allocate resources* in the agricultural sector.

Within the PSE, policy measures are classified in terms of how policies are implemented. This ***composition of support*** allows a ranking of categories of PSE measures according to their potential impacts on production and input use, consumption, trade, income and the environment. ***Market price support*** (which creates a wedge between farm commodity prices received by domestic producers and paid by consumers, and those in the world market); ***output payments*** (which create a wedge between farm commodity prices received by domestic producers, and those paid by consumers in the domestic and world markets); and ***input subsidies*** (which create a wedge between prices paid by agricultural producers and those paid by other producers for inputs including interest and tax concessions) are the policy measures that are most closely linked to production and therefore most strongly distort agricultural markets. However, it should be stressed that other categories of measures, although less directly linked to production in terms of their *implementation*, will have varying *impacts* on production, depending on the factors outlined in the paper by Jésus Anton. When expressed as a share of gross farm receipts these categories of support, in a broad sense, can inform the analysis of the *incentives to produce* arising from policies and the degree of production distortion.

The ***consumer support estimate (CSE)*** is an indicator that measures the annual monetary value of transfers to (from) consumers of agricultural commodities, measured at the farm-gate level, arising from policy measures that support agriculture (thus reflecting the price wedge due to market price support to producers), as well as consumer food subsidies. When expressed as a percentage of the value of consumer expenditure at the farm gate, the %CSE measures the implicit tax (if negative) or subsidy (if positive) on consumers due to agricultural policies, from higher prices and consumer charges or subsidies that lower prices to consumers.

Two other indicators derived from the PSE database complete the tool kit used in policy evaluation: the producer Nominal Protection Coefficient (NPC), which is a measure of ***market protection*** defined as the ratio between the average price received by producers and the world price; and the producer Nominal Assistance Coefficient (NAC), which is a measure of ***market orientation*** defined in terms of the ratio between actual farm receipts including support and production valued at world prices without support.

Evolution of OECD agricultural policies as shown by the support indicators[3]

In this section the evolution of OECD agricultural policies as shown by key data on the OECD indicators of support is summarised.

Graph 1 compares the support to the agricultural sector as measured by the **%TSE** by OECD country between 1986-88 and 1999-2001. For the OECD as a whole, the TSE amounted to USD 311 billion (EUR 347 billion) or 1.3% of GDP (%TSE) in 2001, compared to an average of 2.3% in the 1986-1988 period. This indicates that the burden of agricultural support policies on the OECD as a whole has decreased. In most countries the %TSE has decreased and in 1999-2001 the %TSE ranged

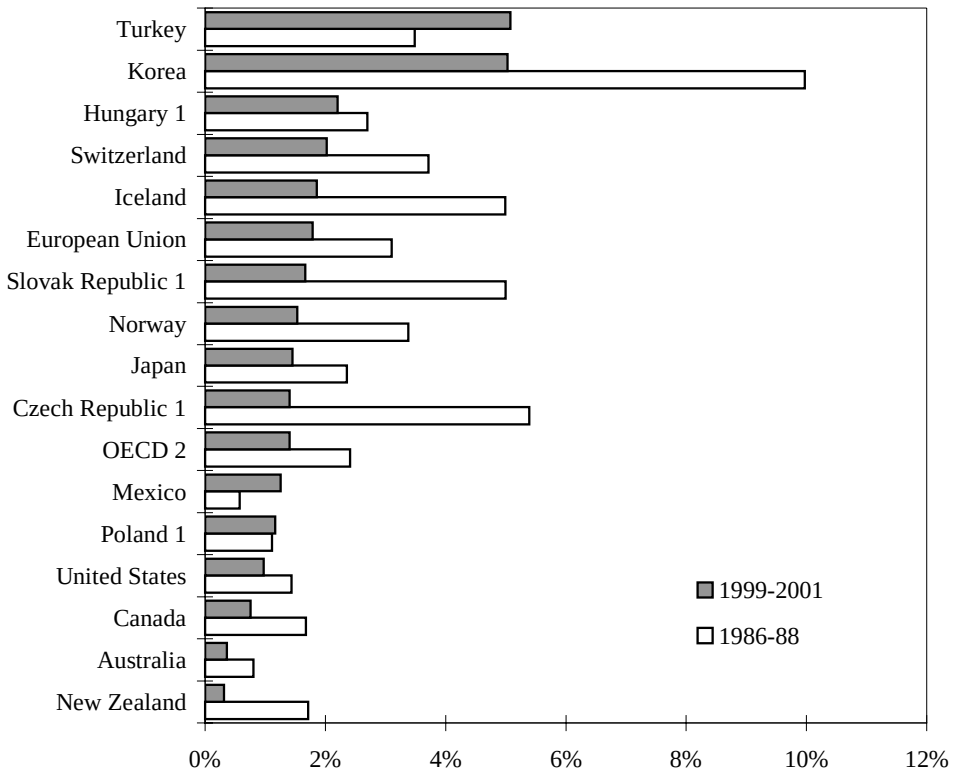
2. OECD analysis shows that for the most production linked support (market price support, output payments and input subsidies) only about a quarter of the transfers end up as additional net income for farm households. For area payments, which perform best in terms of transfer efficiency among the measures studied, about half of the payment ends up as additional net income for farm households.

3. This section draws on (OECD, June 2002) *Agricultural Policies in OECD Countries: Monitoring and Evaluation 2002*. The detailed PSE database is available as a CD ROM in July 2002.

from 0.3% in New Zealand to over 4% in Korea and Turkey. The variations across countries and time reflect three factors: the size and evolution of the agricultural sector in relation to the economy, the size and growth in the overall economy, and the level of support to agriculture. For example, Turkey has a large agricultural sector in a relatively poor economy and hence even though support as measured by the %PSE is below the OECD average the %TSE is high. Switzerland has a small agricultural sector in a relatively rich economy but with a high level of support its %TSE is also relatively high. And New Zealand has a large agricultural sector in a moderately rich economy but has a very low level of support.

Graph 1. **Total Support Estimate by country**

(% of GDP)



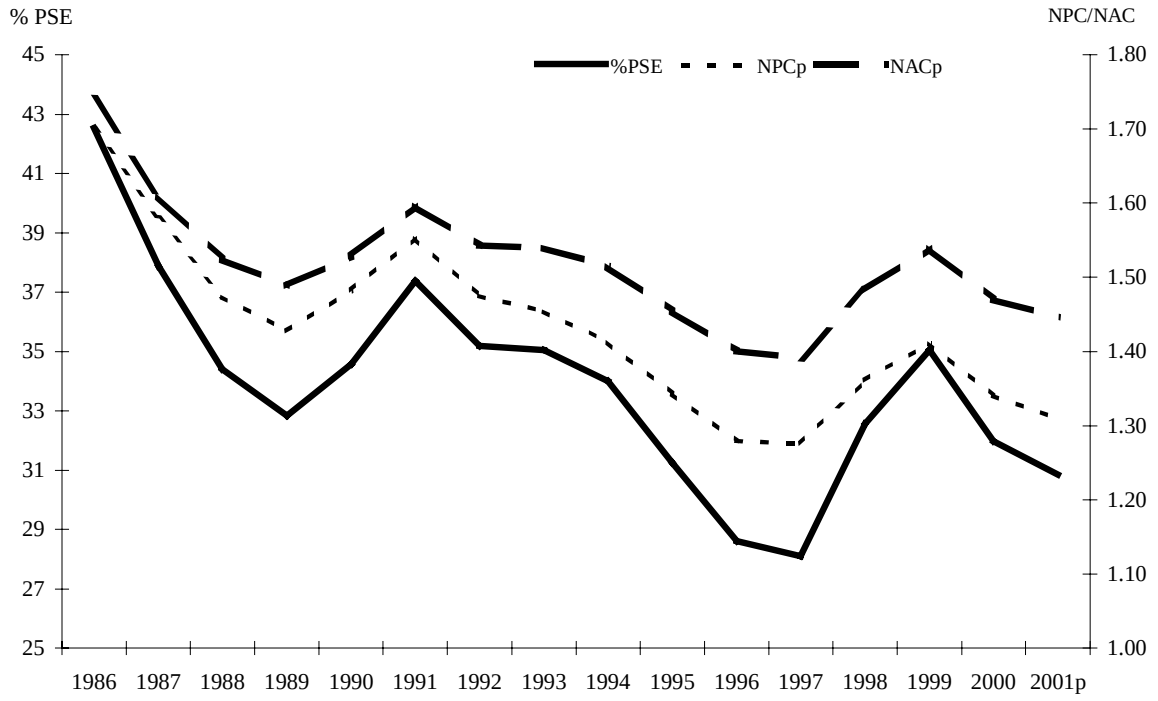
Notes:
Countries are ranked according to 1999-2001 levels.
1. For the Czech Republic, Hungary, Poland and the Slovak Republic, 1986-88 refers to 1991-93.
2. For 1986-88, the Czech Republic, Hungary, Poland and Slovak Republic are excluded.
Source: OECD, PSE/CSE database, 2002.

Graph 2 shows the evolution since 1986 for the OECD as a whole of support to producers as measured by the **%PSE**, the rate of protection to producers as measured by the **NPC**, and the rate of assistance to producers as measured by the **NAC**. Overall, policy developments were characterised by some reduction in support (but erratically year-on-year), and some movement towards greater market orientation and lower support and protection. Between 1986 and 2001, the %PSE fell by over

10 percentage points to 31% a trend mirrored by the NAC. A more significant reduction occurred in the NPC. While domestic producer prices were on average around 60% above those on world markets in 1986, they had fallen to around 30% by 2001. However, the level of support and the degrees of market protection and market orientation still remain above the lowest levels, which were reached in 1997. In interpreting these data, two points should be stressed. First, there were sharp increases in these indicators in the early and late 1990s as domestic producer prices in many OECD countries did not decrease as fast as falling world prices because of market price support policies in place and because of additional budgetary assistance in the late 1990s. Second, the overall OECD trends conceal a wide variation across countries and commodities.

Graph 2. **Evolution of Producer Support Estimate, Nominal Protection Coefficient and Nominal Assistance Coefficient**

(1986-2001)

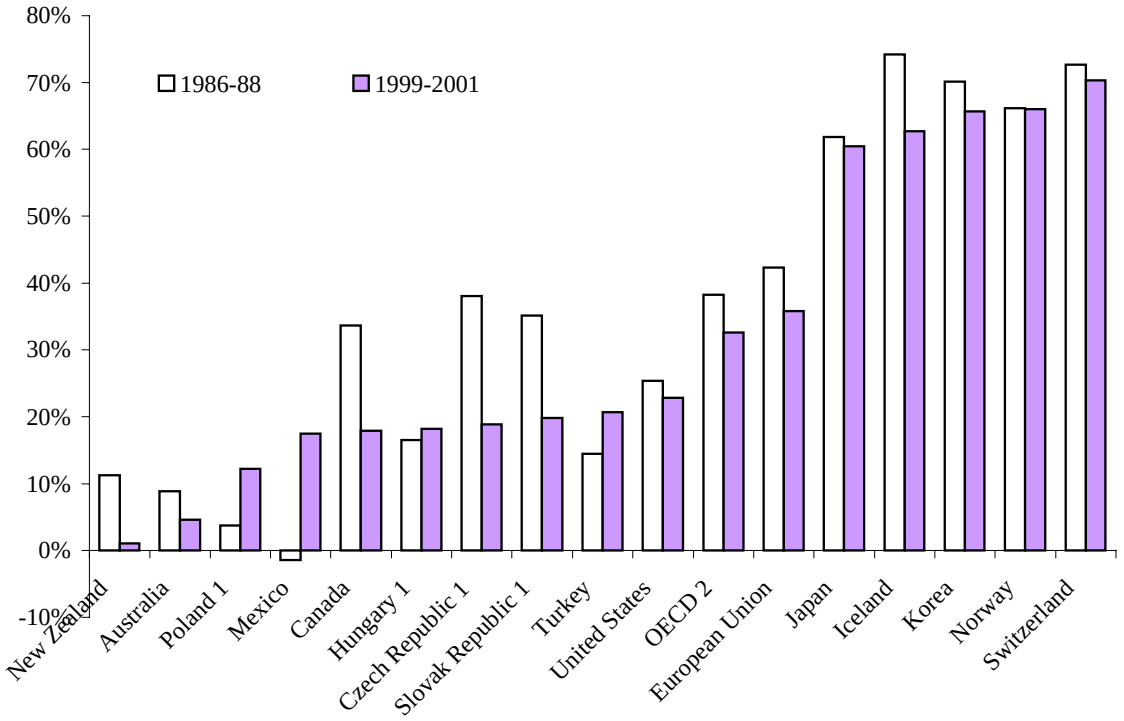


Source: OECD, PSE/CSE database, 2002.

Graph 3 compares the support to producers for individual OECD countries, as measured by the **%PSE** between 1986-88 and 1999-2001. In virtually all countries the %PSE has fallen over this period, but with wide variations. Moreover, there has been little change in the ranking of countries in terms of the level of the %PSE over the period: Switzerland, Norway, Korea, Iceland and Japan have remained with the highest %PSEs, while New Zealand and Australia have consistently recorded the lowest %PSEs. Agricultural policies have a significant influence on the allocation of resources in some OECD countries.

Graph 3. **Producer Support Estimate by country**

(% of value of gross farm receipts)

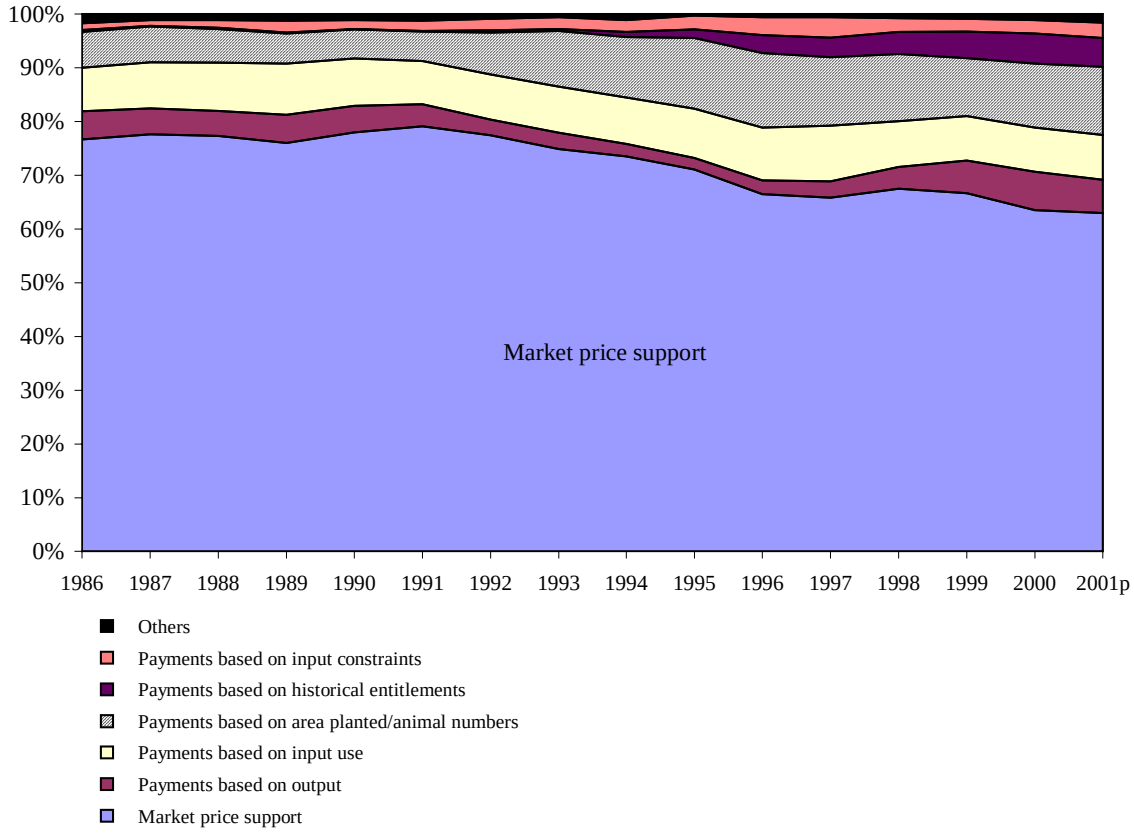


Notes:
Countries are ranked according to 1999-2001 levels.
1. For the Czech Republic, Hungary, Poland and Slovak Republic 1986-88 is replaced by 1991-93.
2. For 1986-88, the Czech Republic, Hungary, Poland and Slovak Republic are excluded.
Source: OECD, PSE/CSE database, 2002.

Graph 4 shows how the **composition of support** has evolved over the period since 1986. The graph shows that there has been a modest shift away from the most production and trade distorting policy measures (market price support, output payments, and input subsidies). Nevertheless, although these three types of policy measures made up 91% of support to producers in 1986-88 on average, they still accounted for 78% in 1999-2001, with market price support still providing two-thirds of producer support in 1999-2001.

Graph 4. **Composition of Producer Support Estimate for the OECD**

(1986-2001)

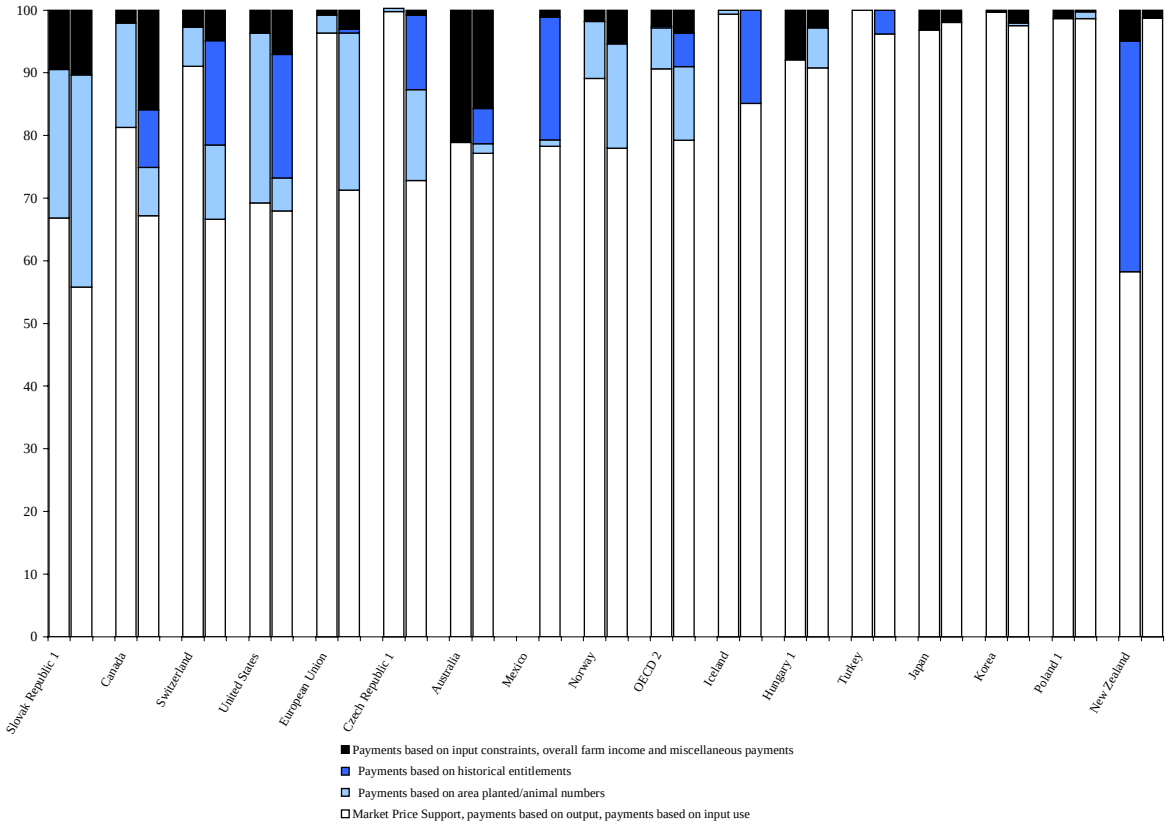


Source: OECD, PSE/CSE database, 2002.

Moreover, the trends in the shift in support to less distorting policy measures over the period since the mid-1980s has been variable across OECD countries, as shown by Graph 5. Of the OECD countries with levels of producer support above the OECD average, significant shifts have occurred in the Czech Republic, European Union, Iceland, Norway and Switzerland but hardly any shift has occurred in Korea and Japan.

Graph 5. **Composition of Producer Support Estimate by country**

1986-88 and 1999-2001 (Percentage share in PSE)

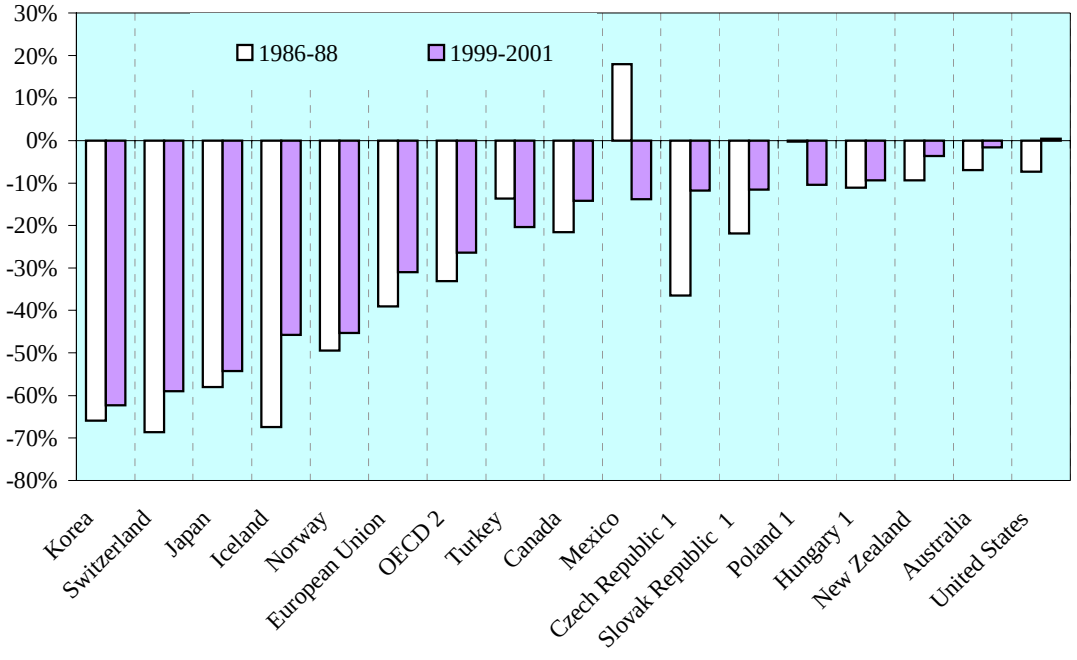


Notes:
Countries are ranked according to the 1999-2001 share of market price support, payments based on output and payments based on input use in the PSE.
1. For the Czech Republic, Hungary, Poland and Slovak Republic 1986-88 is replaced by 1991-93.
2. For 1986-88, the Czech Republic, Hungary, Poland and Slovak Republic are excluded.
Source: OECD, PSE/CSE database, 2002.

Graph 6 shows the cost to consumers of agricultural policies, as measured by the **%CSE**. The main point to note is that the %CSE is broadly the mirror image of the market price support element of the PSE. Thus, in Korea, Switzerland, Japan and Iceland the implicit tax on consumers is highest, with over 60% of total consumption expenditure on agricultural commodities representing a transfer to producers. It is lowest in Australia and New Zealand – and in the United States due to food subsidies to poor consumers that offset the implicit taxation of market price support. Moreover, the shift away from market price support is reflected in the decrease in the %CSE from 33% on average in 1986-88 to 24% in 1999-2001 for the OECD as a whole.

Graph 6. **Consumer Support Estimate by country**

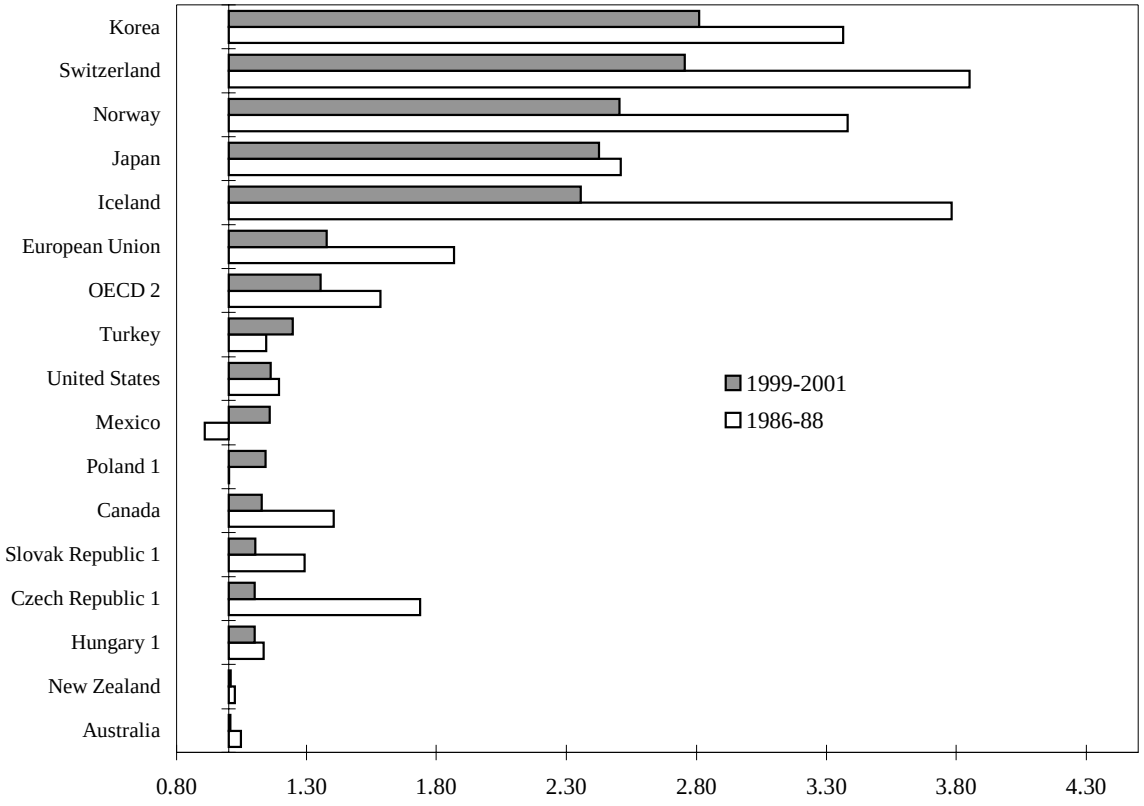
(Percentage of consumption expenditure at farm gate)



Notes:
Countries are ranked according to 1999-2001 levels. A negative percentage CSE is an implicit tax on consumption.
1. For the Czech Republic, Hungary, Poland and Slovak Republic 1986-88 is replaced by 1991-93.
2. For 1986-88, the Czech Republic, Hungary, Poland and Slovak Republic are excluded.
Source: OECD, PSE/CSE database, 2002.

Graph 7 shows the wedge between domestic producer prices and world prices, as measured by the **nominal rate of protection** (NPC). The producer NPC shows that market protection has decreased as domestic prices were on average 31% above the world price in 1999-2001, while they were 58% higher in 1986-1988. However, in the countries with the highest support – Korea, Switzerland, Norway and Iceland domestic prices were around 150% more than on world markets. In addition, market protection continues to be regressive as it mainly benefits large farms, impacts most strongly on low-income consumers for whom food constitutes a larger share of their total household expenditure, and restricts access of agricultural inputs from developing countries to OECD markets.

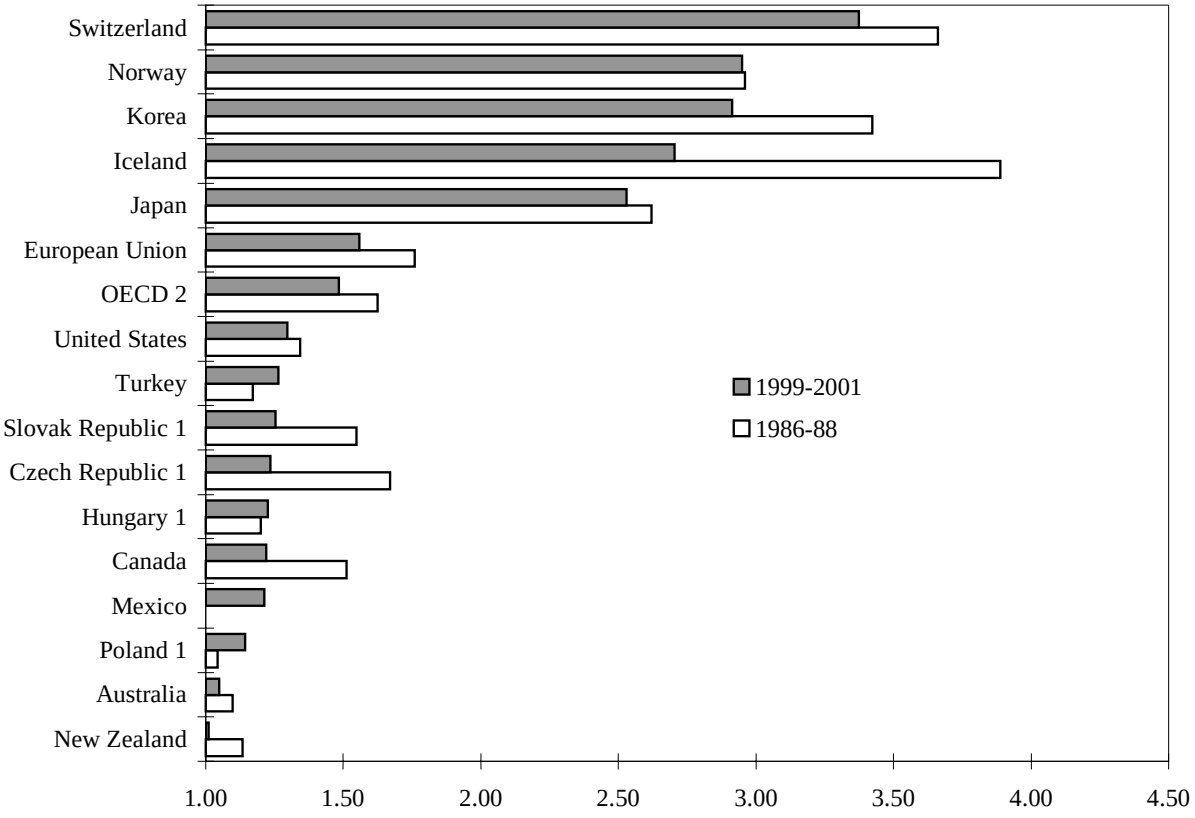
Graph 7. **Producer Nominal Protection Coefficient by country**



Notes:
Countries are ranked according to 1999-2001 levels.
1. For the Czech Republic, Hungary, Poland and Slovak Republic 1986-88 is replaced by 1991-93.
2. For 1986-88, the Czech Republic, Hungary, Poland and Slovak Republic are excluded.
Source: OECD, PSE/CSE database.

Graph 8 shows an indicator of the degree of market orientation as measured by the **nominal rate of assistance** (NAC). This illustrates that total farm receipts in 1999-2001 were on average 45% higher than they would be if entirely generated at world market prices without any support, compared with 62% in 1986-88. But again, in the highest supported countries farm receipts were around twice what they would otherwise be at world prices without support. Conversely, in Australia and New Zealand farm receipts were less than 5% higher because of government support policies.

Graph 8. **Producer Nominal Assistance Coefficient by country**

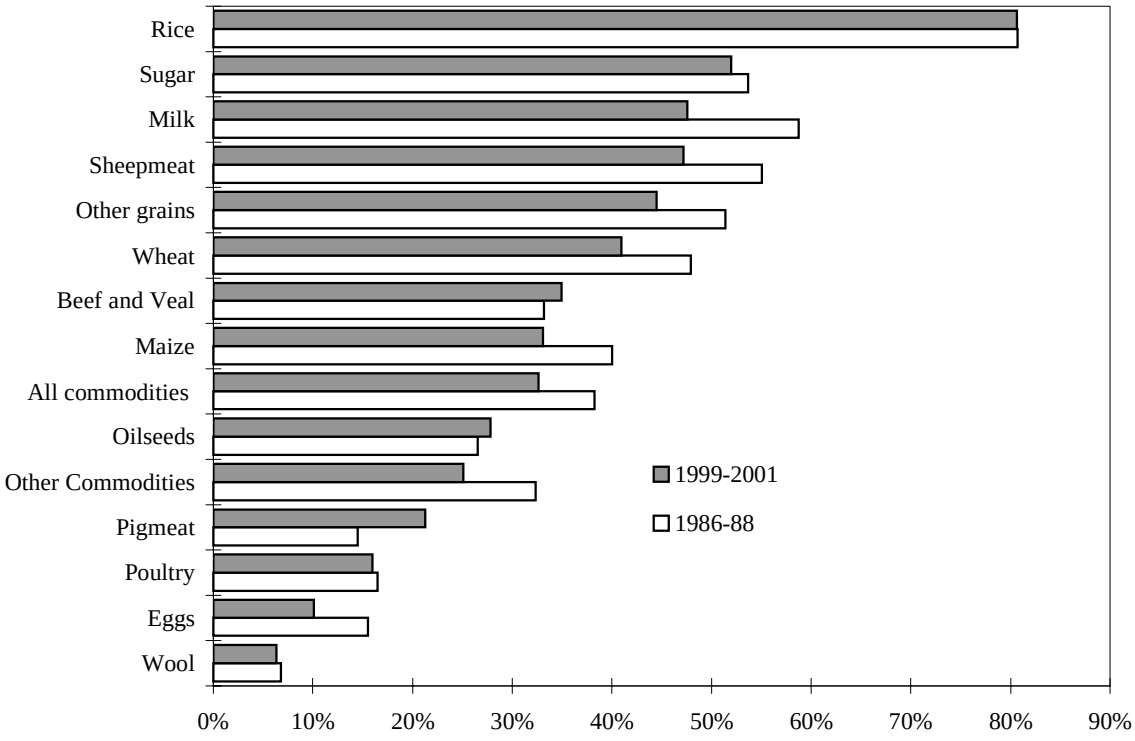


Notes:
Countries are ranked according to 1999-2001 levels.
1. For the Czech Republic, Hungary, Poland and Slovak Republic 1986-88 is replaced by 1991-93.
2. For 1986-88, the Czech Republic, Hungary, Poland and Slovak Republic are excluded.
Source: OECD, PSE/CSE database.

If we turn to the indicators for commodities, there is a wide variation in support as measured by the PSE, as shown in Graph 9. Rice, sugar, milk and sheepmeat have consistently been those with the heaviest support, while pigmeat, poultry, eggs and wool have been the least supported. The nominal protection coefficients show that prices received by producers and those paid by consumers were, on average in 1999-2001, around twice the world market prices for sugar and milk, and about five times higher for rice. This indicates that support policies are having an impact on the allocation of resources not only between the agricultural sector and other sectors of the economy but also within the agricultural sector itself.

Graph 9. **Producer Support Estimate by commodity**

(OECD average as % of value of gross farm receipts)

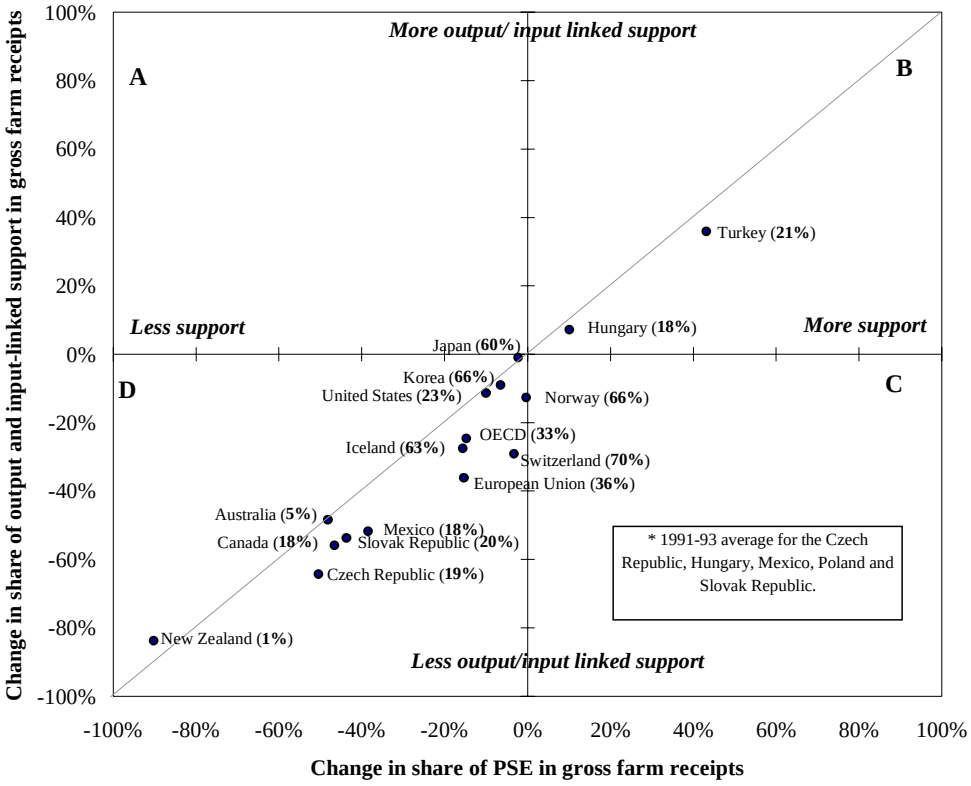


Note: Products are ranked according to 1999-2001 levels.
Source: OECD, PSE/CSE database, 2002.

The indicators outlined above can be brought together to illustrate the extent of reform – in terms of the changes in both the overall level of support and in the most distorting policy measures. Graph 10 shows combinations of changes in the share of producer support and the share of the most distorting forms of support in gross farm receipts, by country, between 1986-88 and 1999-2001. The diagonal line shows a constant share of distorting forms of support in the PSE. Countries located in the upper right-hand quadrant have experienced an increase in both the level of support (as measured by the %PSE) and in the most distorting forms of support between the two periods *i.e.* negative progress in reform. Those in the lower left-hand quadrant demonstrate varying degrees of progress in reform. Countries located around the point where the axes cross show little progress in reform. Thus, for example, the graph illustrates the significant progress in reform in New Zealand and little progress is shown in Japan. While Japan and Switzerland both have high levels of %PSE, progress in shifting to less distorting forms of support is clearly evident for the latter country. While progress in reform has been less in the US than the EU over the period, the %PSE remains 50% higher in the EU.

Graph 10. **Changes in %PSE and in the share of output and input support in gross farm receipts by country: 1986-88* to 1999-2001**

(%PSE for 1999-2001 in brackets)



Note: Poland could not be represented on the scale used for the graph but it would appear in Quadrant A, above the diagonal line.
Source: OECD PSE/CSE database, 2002.

A brief summary

The indicators presented in this paper show the progress of agricultural policy reform in terms of changes since the mid-1980s in overall levels and composition of support, as measured by the PSE methodology. The indicators are robust in that they are consistent with the qualitative information on policy developments. For example, in 1984 New Zealand decided to radically reform its economic policies, which included the large scale removal of agricultural subsidies; in 1992 the European Union started to implement the "McSharry reforms" to shift support to measures less linked to production, reinforced by the Agenda 2000 reforms; in 1996 the FAIR Act in the United States focused support on historical not current production; and in 1995 the Uruguay Round Agricultural Agreement started to be implemented under the WTO. All of these policy developments had implications for the level and composition of support, which are shown by changes in the PSE and associated indicators. But the lack of sufficient reform is also evident – notably in Japan, Korea and Norway – as are the deviations from reform, for example in recent years with the regular payments of emergency assistance in the US, and the widespread resistance to reform in the sugar, dairy and rice sectors in many OECD countries. Moreover, because of border measures the transmission of world market signals in many OECD countries is impeded, so changes in market conditions and exchange rates are not fully transmitted to domestic markets and this is reflected in the year-on-year variability of the support indicators. In recent years, the overall OECD assessment on agricultural policy reform has recognised that some progress has been made, but it varies considerably across countries and commodities, is too slow, insufficient and fragile and more needs to be done.

It should be stressed that while the indicators of support discussed in this paper are the main tools to objectively and consistently evaluate policies in a transparent manner, the qualitative information on the nature of the policies collected in parallel with the data used for calculating support and interpreted in the context of assessing the composition of support, is an equally important component of policy evaluation. Moreover, the indicators of support are complemented with other qualitative and quantitative information. For example, information on regulations (important in the areas of food safety and the environment), indicators on the environmental performance of agriculture, initiatives regarding rural development, multilateral and regional trade agreements, research, education and training, are all important to consider in understanding policy developments and the impacts of support measures on production, trade and the environment.

Improving the indicators

Within the framework of the PSE methodology, the indicators of agricultural support, their interpretation and presentation are constantly evolving, to reflect the changing policy measures in place in OECD countries, data availability and the needs for using the indicators in policy analysis. In particular, the classification of policy measures was refined in 1999 to better reflect the way in which policies were implemented. Furthermore, the commodity coverage for calculating market price support has increased so that currently nearly 70% of agricultural production is covered by the calculations for the OECD as a whole. Progress has also been made in improving data availability on prices and policy measures, at both the national and sub-national levels, but this still remains a challenge. Improvements in the decomposition analysis are underway to enhance the understanding of what factors account for changes in support.

Taking account of externalities (whether harmful or beneficial) is an issue of public interest, in so far as the failure to do so can lead to a sub-optimal allocation of resources to maximise social welfare, and policies are increasingly being implemented to deal with this issue. But only where such actions involve transfers to producers should they be accounted for in the PSE. To estimate (which is often

difficult) the value of non-internalised externalities and adjust the PSE accordingly would render meaningless the concept of the %PSE.

As well as improving the availability of data, areas in which efforts are underway (or planned) to enhance the indicators of support and their interpretation include: a better understanding of how environmental and rural development policy measures that affect agriculture are implemented, including those at the sub-national level; a closer examination of the links between policy objectives and the associated support; and refining the measurement of the dynamic nature of market orientation, in particular regarding the degree of price transmission between the world and domestic markets.

Annex 1. POLICY PRINCIPLES

OECD Agriculture Ministers in 1998 adopted a set of policy principles, building on the policy reform principles agreed by OECD Ministers in 1987. These principles stress the need to:*

- pursue agricultural policy reform in accordance with Article 20 of the Uruguay Round Agreement on agriculture and the commitment to undertake further negotiations as foreseen in that article and to the long-term goal of domestic and international policy reform to allow for a greater influence of market signals;
- address the problem of additional trade barriers, emerging trade issues and discipline on export restrictions and export credits;
- strengthen world food security;
- promote innovative policies that facilitate responsiveness to market conditions by agricultural producers;
- facilitate improvement in the structures of the agriculture and agro-food sectors;
- enhance the contribution of the agro-food sector to the viability of the rural economy;
- take actions to ensure the protection of the environment and sustainable management of natural resources in agriculture;
- take account of consumer concerns;
- encourage increased innovation, economic efficiency, and sustainability of agro-food systems;
- preserve and strengthen the multifunctional role of agriculture.

Annex 2. OPERATIONAL CRITERIA

OECD Agriculture Ministers in 1998 agreed that policy measures should seek to meet a number of operational criteria, to apply in both the domestic and the international contexts, which should be:*

- ***transparent****:* having easily identifiable policy objectives, costs, benefits and beneficiaries;
- ***targeted***: to specific outcomes and as far as possible decoupled;
- ***tailored****:* providing transfers no greater than necessary to achieve clearly identified outcomes;
- ***flexible***: reflecting the diversity of agricultural situations, be able to respond to changing objectives and priorities, and applicable to the time period needed for the specific outcome to be achieved;
- ***equitable***: taking into account the effects of the distribution of support between sectors, farmers and regions.

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* The full text from the relevant Ministerial Communiqués can be found at: http://www.oecd.org//agr/ministerial/commune.htm.

THE MEASUREMENT OF THE LEVEL OF SUPPORT IN SELECTED NON-OECD COUNTRIES

By Olga Melyukhina

Abstract

Since the beginning of the 1990s, the OECD has been progressively applying its PSE/CSE analysis to transition economies. This paper presents the PSE/CSE estimates for seven monitored countries, Bulgaria, Estonia, Latvia, Lithuania, Romania, Russia, and Slovenia. It then focuses on the practical aspects of estimating support, including the comparison of domestic and international prices, measurement of budgetary transfers, and calculation of country aggregates. For each aspect, an attempt is made to present the basic methodological approach and to highlight empirical estimation issues relating to transition economies. Finally, some aspects related to the interpretation of support estimates for transition economies are discussed. PSEs/CSEs have proved to be useful tools for monitoring developments in the agricultural sectors of non-OECD economies. These measures help explain the scale of agricultural market distortions and the cost of these distortions to consumers and taxpayers. PSEs/CSEs are indicative of the need for reform and areas where it is critical. However, the PSE needs to be complemented by other analytical instruments, in particular those estimating the various effects of policies applied.

Introduction

Since the beginning of the 1990s, the OECD has been progressively applying Producer Support Estimate/Consumer Support Estimate (PSE/CSE) analysis to transition economies. Political developments in the central and eastern European countries (CEECs) and the Former Soviet Union opened the way to market transformation and closer integration of these countries into the world economy. This raised interest in the process of reforms in the region and potential implications for OECD countries. In 1994 the OECD released its first comprehensive Agricultural Policy Review for Hungary. Similar studies followed on Poland (1995), the Czech Republic (1995), Estonia (1996), Latvia (1996), Lithuania (1996), the Slovak Republic (1997), Russia (1998), Romania (2000), Bulgaria (2000), and Slovenia (2001)[1]. PSE/CSE estimates were an important component of these studies. Estimation of PSEs/CSEs is based on a comprehensive inventory of agricultural policies. Such an identification and classification exercise is in itself a valuable contribution to policy analysis. Second, PSEs/CSEs provide a quantitative evaluation of policies based on a technique that is relatively simple and can be carried out on an annual basis. Third, PSEs/CSEs, representing aggregate tariff-equivalent measures of diverse policies, are well suited to cross-country comparisons (Cahill and Legg 1989/1990). Undertaken initially as part of one-time Agricultural Policy Reviews, PSE/CSE estimates were then updated each year. As with OECD Member countries, PSE/CSE analysis has become an important feature of the annual monitoring of agricultural policies in several non-OECD economies.

This paper discusses the OECD experience of measuring PSEs/CSEs for non-OECD transition economies. It begins with the presentation of the PSE/CSE results for seven monitored countries,

1. Four of these countries have become OECD Members: the Czech Republic in 1995, Hungary in 1996, Poland in 1996, and the Slovak Republic in 2000.

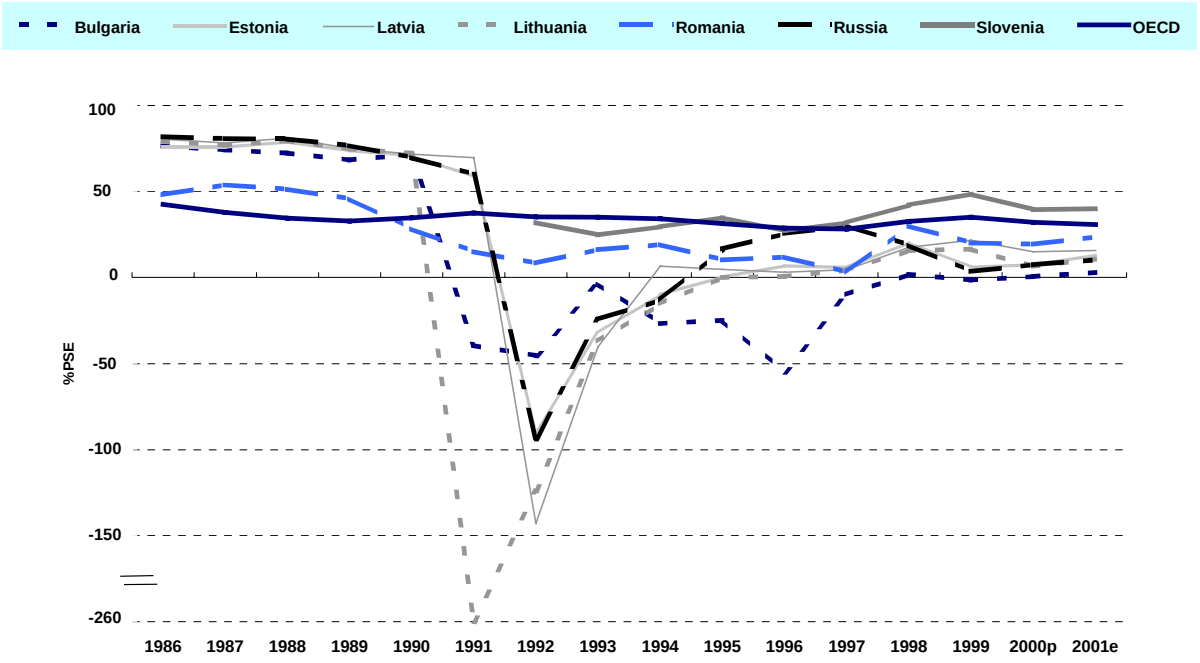
Bulgaria, Estonia, Latvia, Lithuania, Romania, Russia, and Slovenia. It then deals with the empirical aspects of estimating support, including the comparison of domestic and external prices, measurement of direct budgetary transfers, and calculation of country (aggregate) indicators. For each of these aspects, an attempt is made to present the basic methodological approach and to highlight specific empirical issues of measurement of support for transition economies[2]. Finally, some issues related to the interpretation of PSE/CSE estimates for transition economies are discussed.

The paper is intended to stimulate the discussion on the advantages and limitations of applying PSE/CSE analysis in China. The PSE/CSE methodology has already attracted the interest of Western and Chinese researchers, who have produced their independent estimates and insights into the application of this type of analysis to the Chinese economy (see paper by Tian *et al.*). The accumulated OECD experience of measuring support for transition economies may also be helpful for understanding the potential of PSE/CSE analysis in China.

Trends in agricultural support in non-OECD transition countries between 1986 and 2001

The PSE/CSE estimates covering the period from the mid-1980s to 2001, demonstrate a general pattern of support in non-OECD transition countries: (i) a phase of very high support under the planned system (over 70% for the majority of analysed countries); (ii) a strong negative swing in support at the beginning of the transition period between 1991 and 1994; and (iii) modestly positive and moderately fluctuating PSEs between 1995 and 2001 (Figure 1).

Figure 1. **Percentage PSEs by country and OECD average, 1986-2001**



Source: OECD PSE/CSE database.

2. For definitions and composition of OECD's PSE/CSE and related indicators see papers by Diakosavvas and by Legg. For a comprehensive explanation of OECD methodology see OECD 2001b.

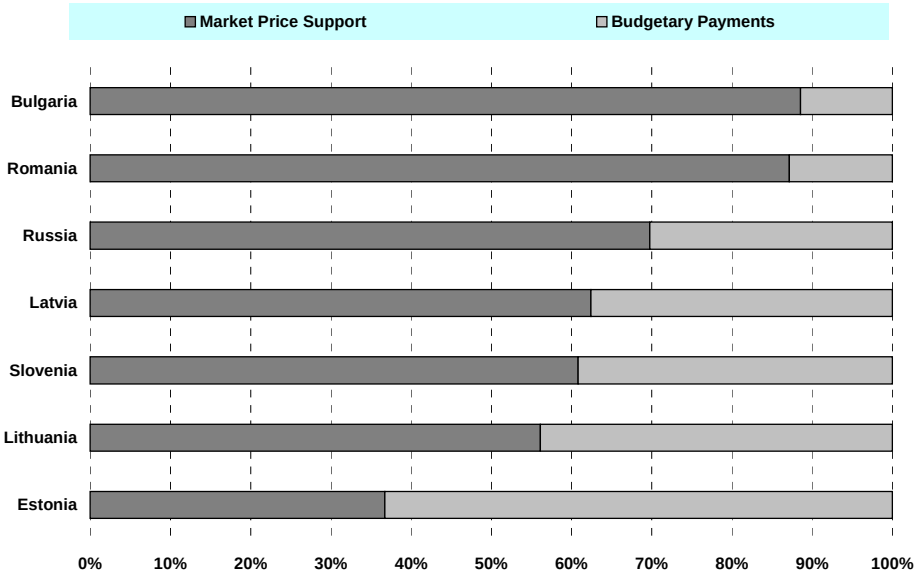
In general, the estimates for the pre-transition period reflect the significant isolation of domestic producers from international markets under the planned economy. High administered producer prices, large budgetary transfers, and exchange rate controls, all contributed to the high pre-transition PSE estimates. Economic liberalisation at the beginning of the 1990s, brought about significant falls in relative agricultural prices and a drastic reduction in budgetary support. This period was also marked by strong macroeconomic shifts, leading to substantial weakening of the exchange rates in the monitored countries. Altogether, this caused a sharp fall in PSEs. The negative trends of the early transition were reversed in the mid-1990s, with the result that PSEs recovered to positive levels during the second half of the decade. However, in the majority of non-OECD countries, the support remained well below its pre-transition level, and below the OECD average. The estimates for 2001 indicate that PSEs ranged from 3% in Bulgaria to 24% in Romania compared to the OECD average of 31%. In the four OECD-Member transition economies support was within the same modest range (Box 1). Out of all monitored transition countries, both OECD and non-OECD, Slovenia represents a special case, with PSE at 40% exceeding the EU and OECD averages. It is worth noting that since the mid-1990s, the annual PSE variations have become relatively moderate reflecting partly a greater integration of the monitored countries with world markets, as well as their relatively more stable macroeconomic environment (see Annex Table 1 and OECD 2002a).

The composition of PSEs indicates that Market Price Support and input subsidies constitute the core of transfers to (from) producers in non-OECD economies. Thus, in 2001 Market Price Support (MPS) accounted for over one half of the total PSE in Latvia, Lithuania, Russia and Slovenia, reaching as high as 87% in Romania and 89% in Bulgaria (Figure 2). Only in Estonia, with its liberal domestic market and border regime, does the MPS contribute a relatively small share to the total PSE (37%) (OECD 2002a).

The budgetary component of the PSE in most countries was dominated by input payments (Figure 3). These are particularly important in Russia and Bulgaria, accounting for 66% and 73% of total direct budgetary payments respectively[3]. While input subsidies continue to be the most important component of support in the majority of monitored countries, a substantial shift to area and headage payments can be observed in recent years. Six out of the seven monitored countries are candidates for accession to the European Union. The increased use of area and headage payments largely reflects the process of the alignment of domestic policies in these candidate countries with the Common Agricultural Policy of the European Union.

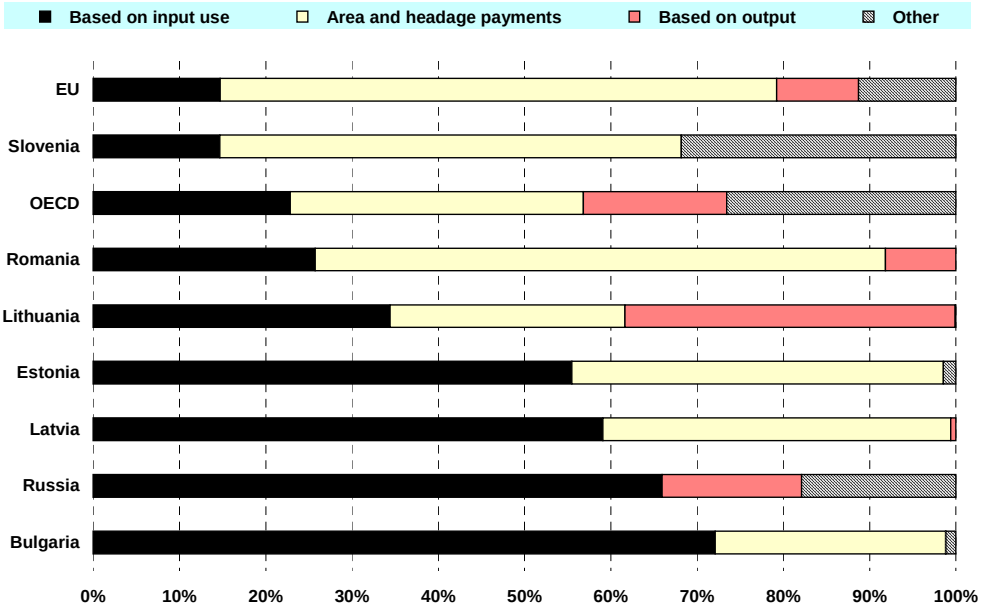
3. In some cases, *e.g.* in Russia and Romania, sizeable amounts of input assistance were provided in the form of debt forgiveness.

Figure 2. **Composition of PSEs by country in 2001**



Source: OECD PSE/CSE database.

Figure 3. **Composition of budgetary payments to producers in 2001**

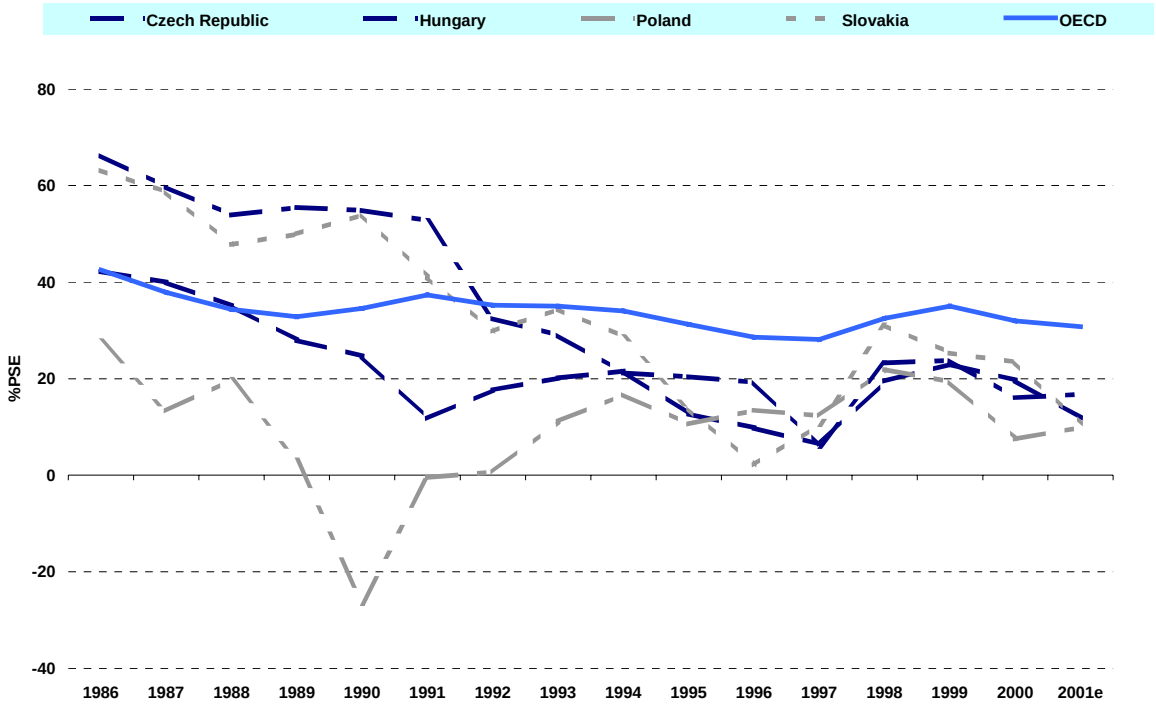


Note: Other payments include payments based on historical entitlements, on input constraints, on overall farming income and miscellaneous payments.
Source: OECD PSE/CSE database.

Box 1. **Agricultural support in OECD-Member transition economies**

Four transition economies, the Czech Republic, Hungary, Poland and the Slovak Republic are currently Members of the OECD. Like all other transition economies, these OECD Members have been undergoing a similar process of macroeconomic and structural reforms, and similar basic factors have been shaping the evolution of support in these four countries. Therefore, the PSE trends in the Czech Republic, Hungary, Poland and the Slovak Republic generally exhibit the same pattern as in the non-OECD transition countries: high support before the transition, a reduction in the late 1980s and the first half of the 1990s, followed by some pick-up in 1998-1999, and a slight decline in the most recent years (Box Figure 1). Similar to the seven non-OECD countries, the PSE level during the transition was well below its level under the planned system, as well as below the OECD average. In 2001, PSEs were estimated at 17% for the Czech Republic, 12% for Hungary, 10% for Poland, and 11% for Slovakia. These estimates compare with an OECD average of 31% (see Annex Table 1). Market price support comprised about two thirds of total producer support in Poland in 1999-2001, slightly over one half in the Czech Republic and slightly less than one half in Hungary; only in the Slovak Republic was this share relatively low at 15%.

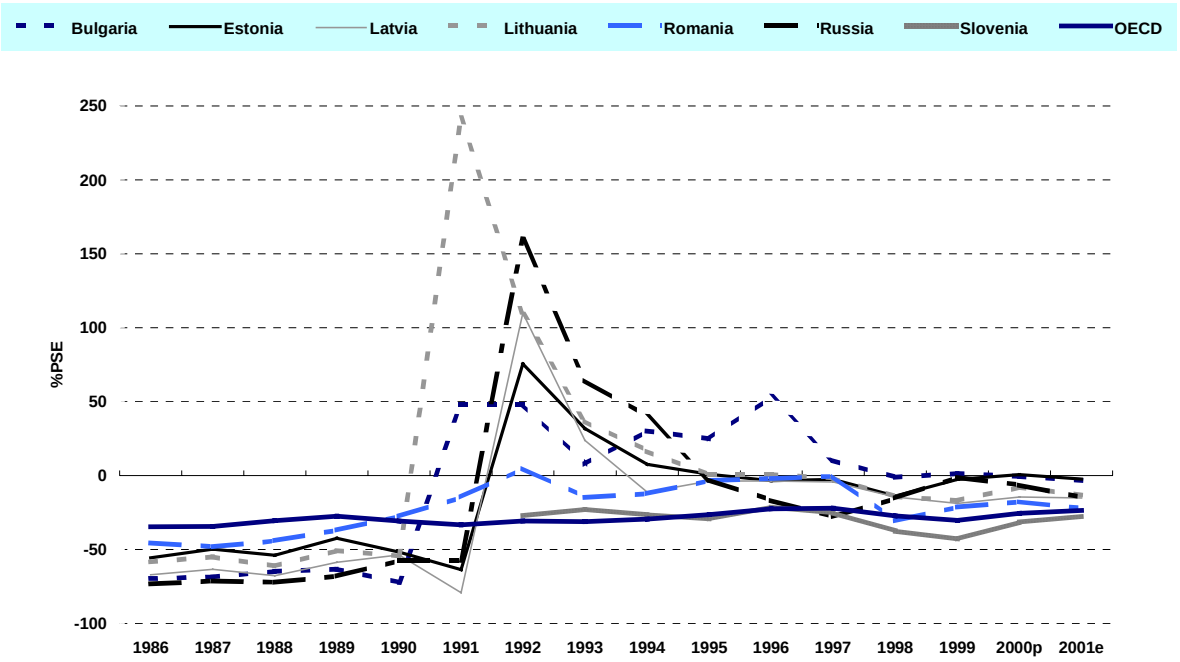
Box Figure 1. **Percentage PSEs for the four OECD transition economies and OECD average, 1986-2001**



Source: OECD PSE/CSE database.

The Consumer Support Estimate (CSE), a PSE-coupled indicator measuring the cost of producer support to consumers of agricultural products[4], generally mirrored the PSEs (Figure 4). This means that substantial producer support during the period of the centrally planned economy translated into an implicit tax on consumers[5]. The situation radically reversed itself in the early transition years, with positive CSEs indicating that consumers were implicitly subsidised during this period. Starting from the mid-1990s, the pre-transition situation has been restored, however, with consumer taxation much lower than during the central planning years.

Figure 4. **Percentage CSEs by country and OECD average, 1986-2001**



Source: OECD PSE/CSE database.

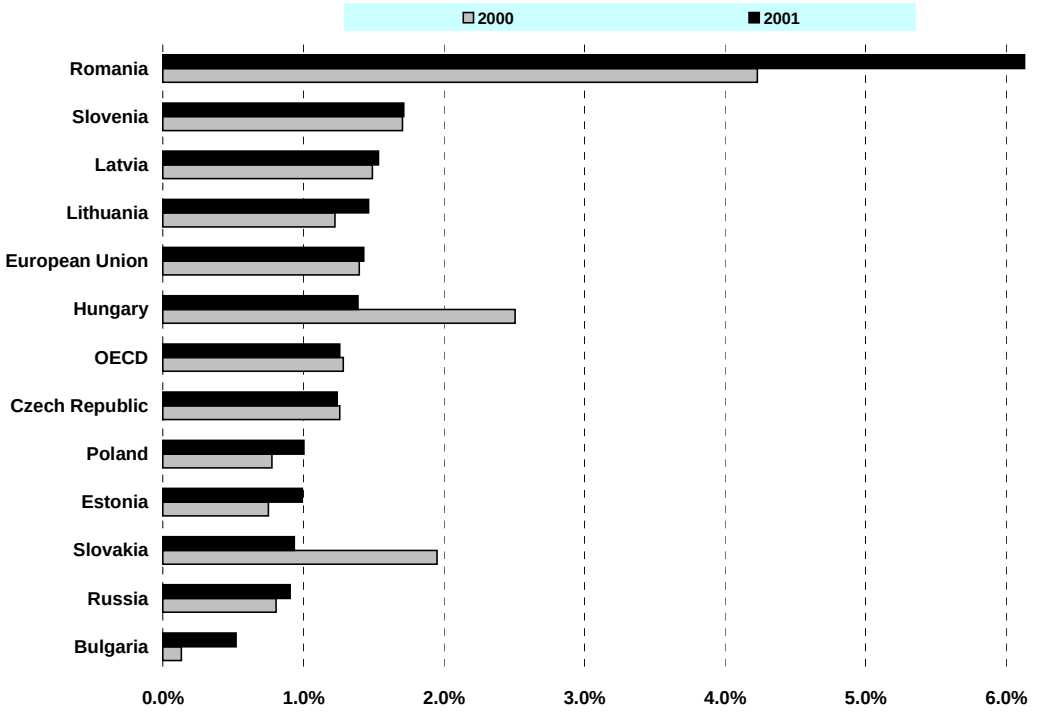
The Total Support Estimate (TSE), a broader indicator of support, complements the PSEs/CSEs. The TSE is the sum of transfers to agricultural producers (the PSE), expenditure for general services (GSSE), and direct budgetary subsidies to consumers. Expressed as a percentage of GDP, the TSE indicates the burden that support to the agricultural sector places on the overall economy. In 2001, the percentage TSE in four of the monitored non-OECD countries remained above the OECD average of 1.3%, with Romania having the highest level of all monitored non-OECD countries (6.1% of its GDP). Among non-OECD countries, only in Russia, Bulgaria and Estonia were TSEs below the OECD average (Figure 4).

4. In the OECD methodology the consumer is understood as the first stage buyer of agricultural products.

5. However, in many monitored countries governments provided subsidies to consumers to reduce this implicit taxation. Thus, grain elevators/milling plants, milk and meat processors received direct budgetary compensation, which served as the principal instrument of maintaining high agricultural producer and low food prices.

Figure 5. **Total Support Estimate by country and OECD average in 2000-2001**

in % of GDP



Source: OECD PSE/CSE database.

A comparison of the PSE and TSE levels in transition countries with the OECD averages suggests that less support to producers is provided in transition economies. This is in particular indicated by lower levels of percentage PSEs in these countries. But at the same time higher shares of total support in relation to GDP mean that this support places a heavier burden on transition economies than in many OECD countries. This burden grows with the share of agriculture in GDP. Romania, a country with one of the largest weights of agriculture in GDP among the CEECs (11% in 2001), has the highest burden of all. Producer support (percentage PSE) roughly within the range of other CEECs costs Romania more as a share of its national economy than any of these countries and more than four-fold what it costs OECD countries.

PSE measurement issues

As shown in Figure 2, PSE measures two types of transfers to producers. The first, *Market Price Support* (MPS), is provided to producers through market prices. MPS transfers emerge when domestic prices for given agricultural products deviate from the world prices for equivalent products. This price wedge occurs as a result of various government interventions, for example border measures, domestic price support (control), marketing regulations (restrictions), subsidised export, etc. In transition countries factors other than current government intervention may also have a strong impact on the price gap, as discussed later. The second component of the PSE is *budgetary payments to producers*. These transfers take either the form of actual payments to producers, or represent the budgetary loss

(*i.e.* forgiveness of debt on credit provided from the government resources) or budgetary income foregone (*i.e.* resulting from tax benefits granted to agricultural producers). The detailed classification of PSE transfers and the underlying policy measures are presented in the paper by Diakosavvas (see Box 1 of his paper: Category A. corresponds to the Market Price Support and categories B.1 to B.7 encompass various types of direct budgetary payments to producers).

Estimating Market Price Support

This is likely the most challenging task of the PSE calculation, first of all due to the high weight of price transfers in the total measured support in the monitored countries. Secondly, because the price gap captures the impacts of various non-transparent or ad hoc actions of the government affecting agricultural prices. This point is essential for some transition countries, where the rapid evolution of macroeconomic and agricultural policy frameworks has often been associated with recourse to ad hoc interventions, various exemptions and special treatments within the formal regimes (*e.g.*, trade tariff schedules), non-transparent administrative controls of commodity flows, etc. Finally, price gap estimation is challenging because it is quite data-demanding. It requires producer price data of reasonably good quality, as well as specific background information on individual commodities, namely, the linkages between primary, domestic wholesale and international markets, handling, processing margins and transportation costs.

i) Choice of a reference price

The measurement of price transfers requires an understanding of the opportunity cost of the country's domestic production. In the case of a country that is a net exporter of a given product the opportunity cost would be the export price of the product; in the case of a net import, it would be the import price of the commodity in question. Therefore, as an initial step of domestic-to-international price comparison, an analysis of a country's position vis-à-vis international markets is needed. For transition economies, this task has sometimes been complicated by the instability of their trade patterns during the past decade. A broader analysis of a country's production and consumption conditions has often been needed to make a judgement on the most representative type of interaction with external markets and the underlying opportunity cost.

Once the question on whether to adopt an import or an export as a benchmark for comparison is answered, the appropriate import/export price has to be selected. The first approach at hand would be to use prices reported by national trade statistics (average import/export unit values[6] or specific prices for major trading partners). However for transition countries, this can rarely be considered the first-best choice. National data usually suffer from inconsistencies. All monitored countries went through a profound transformation from state monopoly to private trade. Trade registration systems and statistical methodologies have been changing as well. Hence, the national trade data for the pre- and early transition periods and most recent years are often poorly comparable. Secondly, the reported trade values are sometimes distorted due to barter trade, inter-governmental debt settlement agreements, food aid, etc. The OECD practice, therefore, has been to use the trade data for developed market economies, representing the major partners of monitored non-OECD countries. An additional practical consideration in favour of this approach relates to substantial time lags in the release of the

6. Import unit value is calculated as the total c.i.f. import value of a given commodity divided by the total volume of imports of the respective commodity, export unit value is calculated similarly, based on total f.o.b. export value and the corresponding exported volume.

national trade statistics in non-OECD countries. With such delays the usual timeliness of annual OECD policy monitoring would have become problematic.

For all seven monitored non-OECD economies a common set of international reference prices is currently applied. For the majority of PSE products, EU export f.o.b. unit values in extra-EU trade are used. The same prices are applied for calculation of the European Union's own PSEs and those of some neighbouring countries. For milk, a New Zealand farm gate price is applied as an international reference, according to a procedure uniform for all OECD Member countries. The choice of EU prices for almost all products is explained by a number of reasons. The monitored CEECs and Russia are net food importers of the majority of PSE products. The European Union is the main trader in the region, and the principal trading partner of the monitored countries. Hence, its export prices are a reasonable indicator of the opportunity cost for these countries' domestic production. For the six monitored CEECs, which are all in the process of accession to the European Union, EU prices take on additional significance as a benchmark for their future competitive position within the Union.

ii) Price adjustments for farm-gate comparison

According to the OECD methodology, the price gap is measured at the farm-gate level. To be an adequate estimate of the opportunity cost for domestically produced commodities at the farm-gate level, the external (import or export) reference price should be adjusted for the relevant transportation and handling, as well as marketing costs. The reference price should also be comparable with the domestic price in terms of quality.

The way the external price is adjusted for *transportation and handling costs* depends on whether the product is importable or exportable. In the case of an *import*, the reference price should include: (i) international transportation and other costs involved to transfer the product to the border of the importing country (corresponding to c.i.f. import price); and (ii) costs of transferring the product from the border to an internal wholesale market. The next step would be to subtract from this adjusted c.i.f. price the transportation and handling costs involved in bringing the product from the farm to a wholesale market. This second step is necessary to express the import reference price (measured at the wholesale market level) in a farm-gate equivalent. In the case of an *export*, a country's f.o.b. export price would be the most appropriate reference. However, the f.o.b. price includes all costs of transferring the product from the farm-gate to a border-port through which domestic products are shipped abroad. Therefore, to represent a farm-gate equivalent, an f.o.b. export price has to be adjusted downwards to exclude all these internal transportation and handling costs.

In addition to transportation and handling costs, *i.e.* charges related to the spatial movement of a product, there is another source of value added, which has to be considered in adjusting the external reference price. This is what are called here *marketing costs*, *i.e.* costs of transforming primary farm products into marketable ones. To be traded, a farm product needs to be processed (*e.g.*, animals), packed, in some cases, stored, etc. In other words, a value is added between the farm gate and the market. This means that the external (c.i.f. or f.o.b.) price, as measured at the level of the wholesale market, would overstate the farm-level opportunity cost, because this wholesale price is assumed to include charges needed to make the product marketable. To be expressed in a farm-gate equivalent, the external reference price should be net of these costs as well. Therefore, calculation of domestic-to-international price gaps requires information on respective marketing margins. Processing and wholesale trade sector statistics (*e.g.*, the reported processor and wholesale prices), available ad hoc market studies, as well as information from professional associations might be helpful in

estimating the appropriate marketing spreads. The errors in such value-added adjustments can be minimised by selecting external reference prices for products that are as little transformed as possible[7].

Finally, the compared prices should be harmonised in terms of product *quality*, which relates to such product attributes as size, colour, moisture level, protein, or fat, or oil content, degree of impurities, bacterial pollution, etc. Among other factors, these determine the commodity prices and cause price differences. Adjustment of prices for quality may not be a particularly serious problem for a net exporter, as the f.o.b. price generally reflects the characteristics of the commodity produced domestically. However, in the case of a net importer, quality differences between domestic and purchased products may be substantial (OECD 2001b). A quality correction should then be carried out for the external price. This is particularly relevant for transition economies, where the quality of domestic production is generally lower compared to equivalent imported products, reflecting less advanced agricultural technologies, under-development of agro-business services, as well as imperfections in quality regulations and their enforcement.

The estimation of the price gap at the farm-gate level, therefore, involves a series of adjustments to external prices. This exercise can be summarised as follows (adapted from Tsakok 1990)[8]:

The case of an importable product:

Adjusted import c.i.f. price, inclusive of the cost of insurance and freight	=	Observed border price	+	Transportation and handling costs from border to internal wholesale market	-	Transportation and handling costs from farm to wholesale market	-	Marketing costs from farm to wholesale market

The case of an exportable product:

Adjusted export f.o.b. price	=	Observed border price	-	Transportation and handling costs from internal wholesale market to border	-	Transportation and handling costs from farm to wholesale market	-	Marketing costs from farm to wholesale market

As seen from the above, calculation of the protection at the farm-gate level requires a good understanding of domestic commodity markets and product-specific marketing systems. This calculation is also conditional on the availability of information on technical coefficients, marketing margins, transportation and handling costs. This partly explains why estimation of

7. To illustrate, an export price for salami as a reference price for pork would create considerable problems in identifying the technical and value-added coefficients involved between the farm gate and the highly processed product. The same problem would arise in using an external price for flour to measure the price gap for milling wheat. The errors in such a procedure are likely to be very large. It is for this reason that for meats generally external reference prices for a carcass with minimal processing are preferred, while for grains an external price for the grain in its rawest form is preferred (OECD 1988).

8. For a more detailed discussion on adjustment of external reference prices for measuring the price distortions at the farm gate, see Tsakok (1990), Colman (1995), and OECD (2001b); Tomek and Robinson (1981) provide an in-depth analysis of spatial, value-added and quality price differences.

domestic-to-international price gaps is the most challenging component of PSE calculations. The challenge is particularly acute for transition economies, where consistent data series of this kind are rarely available and the quality of the existing information is limited. An additional difficulty is associated with relatively broad commodity coverage adopted for analysis (12-14 individual products per monitored country) and the relatively high periodicity of calculations. This implies that, quite often, assumptions have to be used. In this connection, it is helpful to bear in mind that in the formula for calculating the price gap, various adjustments to the reference price offset each other. Therefore, instead of doing all the adjustments, an expert estimate could be made as to what extent the mark-ups to the reference price are cancelled by the mark-downs, and what would be the "net" correction. This approach is currently applied in adjustments to reference prices in calculations for non-OECD countries. In particular, it is assumed that the difference between (i) the mark-up to EU f.o.b. export prices[9] for international and internal transport and handling costs and (ii) the mark-down for internal transportation and handling costs and quality correction, is not significant and can be ignored. The remaining iteration is therefore, adjusting the reference price for marketing costs between farm and the wholesale market[10]. An estimation error is certainly involved with this approach. However, this seems to be the most pragmatic solution given the insufficiency of information for comprehensive adjustments. At the same time, this is complemented by continuous efforts to improve the quality of the data and reduce the estimation errors.

iii) Impediments to price transmission under the transition

Adjustments to the external reference price are needed to ensure that all differentials, which are due to quality variations, marketing and transportation costs, are eliminated from the gap between the two prices. Once these differentials are eliminated from the price gap, the remaining wedge is theoretically the result of government interventions preventing market forces from arbitraging away the price differences between domestic and external markets[11]. In transition countries, however, particular impediments to the transmission of world prices onto domestic markets can arise from market imperfections. The latter are in many cases due to the "immaturity" of markets during the transition.

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9. It should be noted again, in calculations for non-OECD countries, EU f.o.b. export prices are used as reference prices for the majority of products.

10. The following formula helps to illustrate this assumption:

$$\Delta P = Pd - [Pw + (Ti + Td1) - (Td2 + \Delta q) - M]$$

where:
ΔP - price gap at the farm-gate level;
Pd - domestic farm gate price;
Pw - EU f.o.b. export price;
Ti - international transportation and handling cost;
Td1 - cost of transferring the imported product from border to internal wholesale market;
Td2 - cost of transferring domestic product from farm to wholesale market;
M - marketing (processing, packaging, storage, etc.) margin between farm and wholesale market;
Δq - quality differential;

It is assumed that $(Ti + Td1) - (Td2 + \Delta q) \approx 0$, then

$$\Delta P = Pd - (Pw - M)$$

11. "Theoretically" in particular means assuming a competitive market structure and that market agents can absorb information, make and implement new contractual arrangements in response to changed prices either immediately or within a short period of time.

Economies, which begin their transformation from a centrally planned to a market system, suffer natural market deficiencies, particularly at the onset of reforms. All post-socialist countries inherited an underdeveloped physical and institutional infrastructure. Even those countries that can be considered as the most advanced in the group are far behind the mature market economies in terms of the development of transportation, storage and communication networks. Market information systems and new financial infrastructure are in the process of being established; these services are as yet scarce and expensive. Additional costs and risks are linked with the imperfect regulatory framework and weak contract enforcement mechanisms.

Such infrastructural and institutional deficiencies are an inevitable feature of post-socialist economies, which some analysts called a "systemic legacy" (Liefert *et al.*, 1996), "shortage of arbitraging entrepreneurs and capital", "isolation" and "fragmentation" of markets, etc. This "legacy" prevents economic agents from responding effectively to market signals and benefiting from price differences between domestic and international markets. In other words, exporting/importing potential and supporting institutions in transition countries are sometimes too weak to bring quick price adjustments. The existence of a large subsistence sector in some transition economies is an additional cause limiting price adjustments. The loose linkage of a considerable part of domestic production and consumption with the markets curbs the responsiveness of market supply and demand.

These institutional and structural deficiencies therefore contribute to the gap between internal and external prices. There is an apparent policy aspect to this. At the beginning of the transition these effects could be interpreted as the inertia of the past economic system with its policies, and in more recent years as the failure of current policies to induce efficient market institutions as well as shifts to a more commercially oriented agriculture. This suggests that the "support" (or "taxation") measured for transition economies may imply a wider "definition of 'policy' to embrace what might be described as 'policy failure' as far as its impacts on producers are concerned" (Harley 1996).

iv) Exchange rate sensitivity

Where a price gap is used in estimating the market price support component of the PSE, the reference price (*i.e.* world market price) has to be converted into domestic currency before it can be compared with the domestic price, and the exchange rate is introduced into the calculations. In these cases, exchange rate movements can affect the PSE, and it is important to consider the interplay between exchange rate variations, agricultural policies and market factors. In the model of an ideally functioning market economy, where the law of one price holds (*i.e.* arbitrage eliminates price differences between locations except for transaction costs), and *in the absence of agricultural policies* that alter the prices farmers receive for their output or pay for their inputs, the domestic market price is identical with the world market price (except for transaction costs). Hence all changes in the world market price, expressed in domestic currency, are directly reflected in the domestic price, regardless of whether it is the world market price in foreign currency or the exchange rate that has changed. In this case, the gap between the domestic and world prices is zero and not affected by exchange rate variations. *With an agricultural policy* that insulates the domestic price against changes in the world market price, a non-zero price gap is measured, and its level changes with variations in both the world market price in foreign currency and the exchange rate[12]. In this situation it would not be correct to interpret the PSE change that is related to a movement in the exchange rate as being a result of currency developments. This is a result of an agricultural policy that has shielded the domestic market

12. Similarly, the support associated with other price-related policy measures, such as deficiency payments and certain types of input subsidies, will also be affected by exchange rate changes.

against influences originating in the world market, and hence the respective change in PSE is interpreted as an effect of agricultural policy.

In the real world, on many markets the law of one price does not hold perfectly, and hence there may be price gaps between domestic and world markets even in the absence of specific agricultural policies that create price wedges. As noted above, this has to be considered when interpreting the price-related component of PSEs. In the context of currency developments, it may be the case that the policy-independent element of the price gap varies with variations in the exchange rate. For example, lags in market response due to adjustment processes may mean that it takes time for domestic prices to respond to a change in the world market price (resulting from either a price change in foreign currency or a variation in the exchange rate). In some non-OECD economies, such lags in market response (and other factors with a similar effect) have been rather pronounced, particularly in the years of sharp exchange rate adjustments. In these cases, a variation in the exchange rate may result in a change in the price gap even where applied agricultural measures do not shield the domestic market from international price movements.[13] Ideally, this effect should be filtered out before the price-related component of the PSE is measured. In most cases, though, this may not be possible because of lack of relevant information. The PSE calculated will then be affected by exchange rate variations over and above the pure effects of agricultural measures applied, and the interpretation of the results should carefully keep this in mind.

The above discussion concerned the impacts of *variations* in exchange rate. A different, though related, issue arises when absolute *levels* of the exchange rate are considered. In particular, this concerns the case of a misaligned exchange rate, *i.e.* an exchange rate not representing an equilibrium regarding overall macroeconomic conditions[14]. Again, this situation may be particularly relevant in some non-OECD economies. A disequilibrium in the exchange rate imposes a burden on, or provides a benefit to, domestic producers of tradable products. Sector-specific policies, such as market and trade policies in agriculture, may to some extent counteract (or amplify) that effect of macroeconomic factors on the specific sector concerned. This is a reason why in a number of cases analysts have used adjusted (shadow) exchange rates when measuring nominal rates of protection or other policy indicators. In the past, the OECD Secretariat, too, has in some cases computed PSEs on the basis of adjusted exchange rates for non-OECD countries. However, this exercise involved a high degree of discretion, with the results being highly sensitive to a the chosen adjustment approach. It has thus been decided to use nominal (official) exchange rates in PSE calculations for non-OECD economies. This made calculations more transparent and avoided the discretion linked with the selection of the shadow rate and the adjustment technique. With this approach, the market price support component of the PSE has, then, to be interpreted as indicating the full effect of the relevant agricultural policies, irrespective of whether they were (explicitly or implicitly) designed to counteract or amplify any exchange rate misalignment.

Macroeconomic instability and significant variations in the exchange rate, often including deviations from the longer-run equilibrium, have been typical for non-OECD countries, particularly during the pre-transition and early transition period. In some monitored countries considerable exchange rate distortions persisted until the late 1990s, leading to another wave of sharp adjustments. Thus, a

13. A lag in market response may to a certain extent be a result of indirect government policies (or a lack of appropriate policies). For example, poor transport infrastructure may hamper the pass-through of international price signals. This may be particularly relevant in transition economies.

14. The extent to which exchange rate is misaligned can change over time, and pronounced exchange rate fluctuations can be interpreted as variable degrees of misalignment. From that perspective, misalignment can have a level component as well as a variable component.

substantial devaluation of the national currency took place in Bulgaria in 1996, in Romania in 1997, and in Russia in 1998. In cases like these, it is necessary to interpret with caution the annual changes in the market price support components of PSEs. In such periods the evolution of the measured market price support may be driven more by the impacts coming from the overall economic environment and lagged market adjustment than by agricultural policies as such. One way of gaining an impression of the importance of exchange rate variations in such cases is provided by the PSE decomposition procedure. This allows measurement and presentation of the contribution of annual variations in different PSE components, including the exchange rate, to the overall annual PSE change (OECD 2001a, OECD 2001b).

Estimating budgetary payments to producers[15]

i) Inventory and classification of budgetary payments

Estimation of budgetary payments, first of all, involves a thorough inventory of the existing budgetary support to agricultural producers. The next important task is the classification of budgetary payments, which has been adopted by the OECD to facilitate the policy analysis and carry it out in a consistent way across countries and over time. According to OECD methodology, all budgetary assistance to producers is divided into seven groups (See Box 1 and Annex Table 1 contained in paper by Diakosavvas). The groups are defined by the implementation criteria, or "the conditions under which the associated transfers are provided to farmers or the conditions of eligibility for the payment" (OECD 2001b).

It is important to ensure that there is no double counting or over counting of the budgetary component of the PSE. An example of double counting could be an inclusion in the budgetary part of the PSE of outlays on price regulation, *e.g.* funds allocated for government purchases on agricultural markets. These expenditures condition market price formation and their impact is already captured in the MPS component. Over counting could occur when certain allocations provided to the agricultural sector as a whole (general services), but not to producers individually, are included in the PSE.

Therefore, to measure and classify budgetary payments, knowledge as precise as possible is needed of the implementation of each measure. For some non-OECD countries this task can sometimes be quite challenging due to recourse to ad hoc measures and lack of transparency, as well as changeable and not so clearly defined support procedures.

Attention should be paid to capturing not only budgetary support in the form of actual payments to producers, but also various types of budgetary assistance not associated with actual payments. These types of assistance should also be identified, quantified and accounted for in the producer support. The incidence of such support is high in transition economies. One illustrative example is the practice of agricultural debt forgiveness. In the first half of the 1990s, the governments of Russia and Romania were writing off or rescheduling large amounts of overdue government credits given to producers, a measure, which in effect meant a loss to the budget. In 1995 such forgiven debt equalled about 7% of actual budgetary expenditure for agriculture in Romania, and almost 30% in Russia. Budget revenue forgone is another example of budgetary support not linked with actual payments. In 2001 agricultural debt restructuring was implemented in Russia once again. This time it concerned mostly fiscal arrears of agricultural producers, and therefore, took the form of the budgetary revenue foregone. Another

15. For a discussion of budgetary payments in the PSE and General Services Support Estimate see paper by Diakosavvas.

example of budgetary revenue foregone is linked with tax preferences granted specifically to agricultural producers. Preferential taxation of agriculture is widespread in non-OECD countries, where farmers enjoy exemptions or lower rates on profit or income tax, real estate tax, etc.

Controlled (*i.e.* reduced) prices for various agricultural inputs and services should also be regarded as an important type of support, although this form of assistance does not fall strictly under the term "budgetary" transfer. The examples in the monitored non-OECD countries include preferential prices for energy, fertilisers, irrigation, transportation, and some other inputs. Sometimes, the implicit subsidy arising from these discount prices can be quite substantial. For example in Russia the assistance related to lower electricity tariffs for agriculture was estimated at about 10% of total budgetary component of the PSE during 1992-2000.

ii) Allocation to individual products

The calculation of product-specific PSEs poses an additional task with respect to budgetary transfers. Budgetary support needs to be allocated to individual products. When budgetary payments are reported for specific commodities, the procedure is straightforward. However, some types of transfers, for example, subsidies arising from preferential taxation or capital grants of a general character, relate to a range of products. In this case one has to adopt some principle for the allocation of the total subsidy to individual commodities. This would depend on the way each measure is implemented and to which commodities it might apply. If no specific basis for allocation can be identified, the subsidy can be distributed according to the share of each commodity in the total value of agricultural production.

Issues arising in the calculation of the country PSE

The set of OECD support indicators comprise the overall PSE monetary value, *total PSE*, for a given country. The total PSE is an absolute indicator, and its value depends on the size and the structure of a country's agricultural sector, as well as the monetary unit used. Total PSE can be expressed as a percentage of gross farm receipts, giving a *percentage PSE*[16]. As the latter is a relative indicator, it is suitable for comparison of support across countries, commodities and time. Some specific issues arising in the calculation of these aggregate indicators are discussed below.

i) Total Market Price Support: extrapolation method and commodity coverage

Total PSE represents the sum of total MPS and the aggregate budgetary transfers provided to agricultural producers. Budgetary data included in the calculation of the total PSE cover all agricultural production (*i.e.* relate to all products) and are used as such. The calculation of total MPS, however, consists of three steps. First, MPS is estimated for individual products. The latter represent the set of "MPS commodities", comprising the principal agricultural products in the non-OECD countries[17]. Secondly, product-specific MPS results are summed up into an aggregate for MPS commodities. And, finally, this aggregate for MPS commodities is "grossed up" to all products based

16. Total PSEs and percentage PSEs are also calculated for individual products.

17. Typically, wheat, maize, other grains, oilseeds, sugar, milk, beef and veal, pigmeat, poultrymeat, and eggs are included in the set of MPS commodities in the monitored countries.

on the share of MPS commodities in the total value of production[18]. This final step is called the MPS extrapolation procedure, according to which the average MPS for "other" products (*i.e.* those not included in the set of MPS commodities) is assumed to be equal to the average for MPS commodities. This assumption certainly introduces an estimation error. Its scale depends on the share of agricultural production covered by the MPS commodities, as well as the potential difference between the average for MPS commodities and that for "other" products. However, given the fact that "other" commodities (horticultural crops, tobacco, etc.) are usually protected, for example, through border measures, admitting a zero MPS for these products would mean underestimating total support. The error associated with the extrapolation method could be reduced by increasing the number of individual products included in the list of MPS commodities. Therefore, calculation of total support indicators should be based on a careful identification of the set of representative commodities and ensuring that this set covers sufficiently the country's overall agricultural production.

ii) Percentage PSE

As discussed above, the percentage PSE is the ratio of total transfers to producers to the gross farm receipts (measured as the value of agricultural production plus budgetary transfers)[19]. Therefore, the accuracy of this estimate depends not only on the estimated size of transfers to producers (the nominator), but also on the accuracy of the denominator, in particular, the value of agricultural production. The latter would broadly correspond to a category of Gross Agricultural Output (GAO) reported by the official statistics. However, the use of the official GAO values for calculating a country percentage PSE in some cases (for example, Russia, Romania, Bulgaria) appears to be problematic. The difficulty is linked to the fact that non-marketed part of production (on-farm consumption) is evaluated at some shadow prices, which often differ substantially from market prices. Consequently, the GAO estimation using the shadow prices for valuing certain parts of the overall production distorts its market value. In such cases, adjustments are necessary to official GAO so that the agricultural output value used to estimate the percentage PSE would reflect its market cost as accurately as possible. Such an adjustment is also important to ensure the consistency between the nominator and the denominator of this indicator, in particular, the total MPS. In fact, for every given product the MPS is calculated as the unit MPS multiplied by the total volume of production of this commodity. This means that for the estimation of commodity-specific and total MPS all output is valued at market prices.

18. Algebraically, this procedure can be expressed as MPSt = MPScc /k , where MPSt - total MPS, MPScc - aggregate for MPS commodities, k - share of MPS commodities in total value of production.

19. In algebraic form the percentage PSE is expressed as: %PSE = PSE/(VP + PP) * 100, where PSE is the total PSE value, VP - value of production at producer prices, and PP - budgetary payments to producers.

Conclusions

Estimation of PSEs/CSEs for non-OECD transition economies is based on the conventional OECD methodology. However, transition countries have undergone periods of sharp macroeconomic adjustments, and suffer from inherited structural and institutional deficiencies. This suggests that in many of these countries applied agricultural measures are clearly not the only important source of transfers to (from) producers. The latter are also due to the substantial structural and institutional impediments to transmission between external and domestic markets. These impediments, however, have a strong policy component and are largely attributed to the legacy of the past command economy policies or, in a more recent period, to the failure of current policies to induce efficient market institutions. As transition countries progress towards a more stable macroeconomic environment and developed market institutions, the measured support would to a much smaller degree incorporate the effects of imperfect price transmission. Although the markets and market institutions are not yet sufficiently developed, it is clear that during the past decade all transition countries have shifted fundamentally away from the planned economy legacy and this process is expected to carry on. It is also evident that the speed of market reforms has been, and will continue to be, uneven between transition economies. These differences in the pace of market transformation should also be borne in mind when interpreting and comparing the agricultural support estimates across the transition countries and across their commodity sectors.

PSEs/CSEs being "flexible, reasonably comprehensive, easily explained measures" (Josling and Tangermann 1989), have proved to be useful tools for monitoring the overall developments in the agricultural sectors of non-OECD economies. These estimates help provide an understanding of the scale of agricultural market distortions and the cost of these distortions to food consumers and taxpayers. PSEs/CSEs are indicative of the need for reform and the critical areas in which reforms should focus. This is particularly relevant for transition countries, which are fundamentally reforming their agro-food sectors and continuously developing their reform agendas.

Like any indicator, the PSE cannot answer all questions. Most importantly, it cannot be regarded as a measure of producer incomes. While quantifying monetary transfers to producers from consumers and taxpayers, the PSE, does not measure what effect these transfers have on farmers' incomes. Some part of this transfer would be offset by the loss in producer income due to inefficiencies in resource use induced by the support; some part would be retained by other agents, *e.g.* input suppliers; some part would be lost as an administration cost. The linkages between the transfers to producers as measured by PSEs, and producer incomes, are therefore quite complex. The policy effects are especially difficult to estimate in transition and developing economies due to specific and evolving institutional and structural properties of their agro-food sectors. It is therefore important to complement PSEs by other analytical instruments, in particular, economic models that capture the diverse interactions in the economy and help explain the various effects of policies applied. The OECD applies such a combined approach, complementing its PSE/CSE analysis with studies on transfer efficiency and the decoupling of agricultural policies. This type of analysis has been so far done for the Member countries but could potentially be extended to transition and developing countries.

Annex Table 1. **Estimates of support to agriculture by country, 1991-2001**

	Units	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000e	2001p
Bulgaria												
PSE	mn BGL	-17	-23	-2	-26	-41	-188	-489	96	-68	23	141
	mn USD	-957	-997	-82	-482	-618	-1055	-291	54	-37	11	64
GSSE	mn USD	31	28	68	23	22	13	11	4	6	5	5
TSE	mn USD	-925	-961	-10	-457	-586	-1042	-280	58	-32	16	69
	% GDP	-11.8	-11.2	-0.1	-4.7	-4.5	-10.6	-2.7	0.5	-0.3	0.1	0.5
Percentage PSE	**%**	**-40**	**-45**	**-4**	**-27**	**-25**	**-55**	**-10**	**2**	**-2**	**1**	**3**
Producer NPC		**0.66**	**0.64**	**0.93**	**0.73**	**0.74**	**0.61**	**0.91**	**1.01**	**0.95**	**1.00**	**1.02**
Producer NAC		**0.72**	**0.69**	**0.96**	**0.79**	**0.80**	**0.65**	**0.91**	**1.02**	**0.98**	**1.01**	**1.03**
Estonia												
PSE	mn EEK[1]	2 977	-3 196	-1 504	-557	14	485	433	1 432	372	481	833
	mn USD	1 707	-265	-114	-43	1	40	31	102	25	28	48
GSSE	mn USD	34	6	10	10	18	13	11	13	13	9	6
TSE	mn USD	1 790	-254	-104	-32	19	54	42	115	38	37	54
	% GDP	n.c.	-23.3	-6.2	-1.4	0.5	1.2	0.9	2.2	0.7	0.7	1.0
Percentage PSE	**%**	**59**	**-89**	**-32**	**-10**	**0**	**7**	**6**	**20**	**6**	**7**	**13**
Producer NPC		**4.32**	**0.51**	**0.74**	**0.89**	**1.01**	**1.07**	**1.07**	**1.19**	**0.99**	**0.99**	**1.03**
Producer NAC		**2.42**	**0.53**	**0.76**	**0.91**	**1.00**	**1.07**	**1.06**	**1.25**	**1.07**	**1.08**	**1.15**
Latvia												
PSE	mn LVL[2]	6 487	-93 321	-153	24	19	12	19	72	64	46	54
	mn USD	11 184	-686	-226	43	37	22	32	121	109	76	86
GSSE	mn USD	1 666	7	6	11	17	13	10	19	32	31	29
TSE	mn USD	13 508	-679	-220	53	53	35	42	140	141	106	115
	% GDP	n.c.	n.c.	-10.2	1.5	1.2	0.7	0.7	2.3	2.1	1.5	1.5
Percentage PSE	**%**	**70**	**-143**	**-40**	**7**	**5**	**3**	**5**	**20**	**22**	**15**	**16**
Producer NPC		**12.71**	**0.39**	**0.69**	**1.04**	**1.01**	**1.01**	**1.04**	**1.18**	**1.21**	**1.13**	**1.11**
Producer NAC		**3.28**	**0.41**	**0.71**	**1.07**	**1.05**	**1.03**	**1.05**	**1.24**	**1.28**	**1.18**	**1.19**
Lithuania												
PSE	mn LTL[3]	-31 937	-120 631	-1 456	-607	1	45	288	1 007	885	314	547
	mn USD	-918	-733	-335	-153	0	11	72	252	221	79	137
GSSE	mn USD	10	13	18	40	43	52	60	51	52	54	37
TSE	mn USD	-907	-720	-317	-112	43	63	132	305	276	138	174
	% GDP	n.c.	-37.4	-11.9	-2.6	0.7	0.8	1.4	2.8	2.6	1.2	1.5
Percentage PSE	**%**	**-262**	**-124**	**-37**	**-15**	**0**	**1**	**4**	**16**	**16**	**6**	**11**
Producer NPC		**0.25**	**0.42**	**0.71**	**0.81**	**0.98**	**0.98**	**1.04**	**1.19**	**1.25**	**1.06**	**1.10**
Producer NAC		**0.28**	**0.45**	**0.73**	**0.87**	**1.00**	**1.01**	**1.04**	**1.19**	**1.20**	**1.07**	**1.12**
Romania												
PSE	bn ROL	114	184	1 234	3 427	2 557	4 499	2 626	31 050	26 235	31 103	65 999
	mn USD	1 490	598	1 624	2 070	1 258	1 459	366	3 498	1 711	1 433	2 270
GSSE	mn USD	212	105	148	157	245	138	147	194	126	122	73
TSE	mn USD	1 853	1 218	2 163	2 412	1 877	1 986	585	3 693	1 837	1 555	2 344
	% GDP	6.4	6.2	8.2	8.0	5.3	5.6	1.7	8.8	5.2	4.2	6.1
Percentage PSE	**%**	**15**	**8**	**16**	**19**	**10**	**12**	**3**	**30**	**20**	**19**	**24**
Producer NPC		**1.23**	**1.03**	**1.30**	**1.18**	**1.04**	**1.05**	**1.01**	**1.40**	**1.29**	**1.26**	**1.32**
Producer NAC		**1.18**	**1.09**	**1.19**	**1.24**	**1.11**	**1.13**	**1.03**	**1.43**	**1.25**	**1.24**	**1.31**
Russia												
PSE	mn RUR	153	-2 788	-5 248	-7 308	29 283	63 008	78 267	50 409	19 526	47 168	72 051
	mn USD	87 726	-14 486	-5 631	-3 316	6 430	12 297	13 529	5 192	793	1 677	2 468
GSSE	mn USD	4 802	380	620	1 003	788	762	3 979	469	442	411	334
TSE	mn USD	124 547	-13 721	-4 594	-2 114	7 218	13 058	17 508	5 662	1 235	2 087	2 801
	% GDP	n.c.	-13.9	-2.5	-0.8	2.1	3.0	3.9	2.0	0.6	0.8	0.9
Percentage PSE	**%**	**60**	**-94**	**-24**	**-13**	**17**	**26**	**30**	**19**	**4**	**8**	**10**
Producer NPC		**3.88**	**0.40**	**0.61**	**0.71**	**1.02**	**1.19**	**1.34**	**1.15**	**0.96**	**1.00**	**1.03**
Producer NAC		**2.50**	**0.52**	**0.80**	**0.88**	**1.20**	**1.34**	**1.43**	**1.23**	**1.04**	**1.08**	**1.11**
Slovenia												
PSE	mn SIT	n.c.	19 858	18 979	27 995	38 537	35 275	43 304	59 946	68 829	62 574	70 949
	mn USD	n.c.	189	143	184	252	208	240	322	355	305	327
GSSE	mn USD	n.c.	263	184	237	349	284	304	397	418	312	323
TSE	mn USD	n.c.	203	158	200	270	227	269	354	393	338	361
	% GDP	n.c.	2.1	1.5	1.6	1.9	1.5	1.7	2.0	2.2	1.7	1.7
Percentage PSE	**%**	**n.c.**	**32**	**25**	**29**	**35**	**27**	**32**	**42**	**49**	**39**	**40**
Producer NPC		**n.c.**	**1.47**	**1.37**	**1.45**	**1.51**	**1.34**	**1.40**	**1.68**	**1.86**	**1.52**	**1.47**
Producer NAC		**n.c.**	**1.47**	**1.33**	**1.42**	**1.53**	**1.37**	**1.47**	**1.73**	**1.94**	**1.65**	**1.67**

Annex Table 1. **Estimates of support to agriculture by country, 1991-2001** *(continued)*

	Units	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001p
Czech Republic												
PSE	mn CZK	69 946	38 986	36 637	25 093	24 656	26 221	7 937	31 890	29 348	20 567	22 248
	mn USD	2 373	1 379	1 257	872	929	966	250	988	849	532	585
GSSE	mn USD	36	35	35	116	119	124	110	106	104	105	101
TSE	mn USD	2 409	1 414	1 292	988	1 048	1 090	360	1 093	953	638	689
	% GDP	8.7	4.4	3.6	2.4	2.0	1.9	0.7	1.9	1.7	1.3	1.2
Percentage PSE	**%**	**53**	**32**	**29**	**21**	**20**	**19**	**6**	**23**	**24**	**16**	**17**
Producer NPC		**2.30**	**1.48**	**1.43**	**1.24**	**1.13**	**1.12**	**0.99**	**1.24**	**1.18**	**1.06**	**1.06**
Producer NAC		**2.12**	**1.48**	**1.41**	**1.27**	**1.26**	**1.24**	**1.06**	**1.30**	**1.31**	**1.19**	**1.20**
Hungary												
PSE	mn HUF	54 683	73 479	92 963	124 115	93 832	104 533	67 195	227 638	272 819	257 393	166 272
	mn USD	731	930	1 011	1 181	746	685	360	1 062	1 151	912	580
GSSE	mn USD	73	84	87	90	95	122	92	171	235	226	128
TSE	mn USD	851	1 014	1 099	1 270	842	807	452	1 234	1 390	1 143	708
	% GDP	2.5	2.7	2.8	3.0	1.9	1.8	1.0	2.6	2.9	2.5	1.4
Percentage PSE	**%**	**12**	**18**	**20**	**22**	**13**	**10**	**6**	**19**	**23**	**20**	**12**
Producer NPC		**1.06**	**1.11**	**1.24**	**1.20**	**1.03**	**1.01**	**0.95**	**1.11**	**1.17**	**1.12**	**1.01**
Producer NAC		**1.13**	**1.21**	**1.25**	**1.28**	**1.15**	**1.11**	**1.07**	**1.24**	**1.30**	**1.25**	**1.13**
Poland												
PSE	mn PLN	-59	117	2 819	5 097	4 736	7 088	6 566	12 404	10 245	4 335	5 928
	mn USD	-56	86	1 554	2 243	1 953	2 629	2 004	3 552	2 584	997	1 447
GSSE	mn USD	250	247	235	212	184	240	246	243	193	222	345
TSE	mn USD	198	335	1 791	2 457	2 140	2 874	2 253	3 799	2 782	1 224	1 797
	% GDP	0.3	0.4	2.1	2.5	1.7	2.0	1.6	2.4	1.8	0.8	1.0
Percentage PSE	**%**	**-1**	**1**	**11**	**17**	**11**	**13**	**12**	**22**	**19**	**7**	**10**
Producer NPC		**0.91**	**0.97**	**1.12**	**1.17**	**1.09**	**1.19**	**1.15**	**1.31**	**1.24**	**1.11**	**1.07**
Producer NAC		**0.99**	**1.01**	**1.13**	**1.20**	**1.12**	**1.16**	**1.14**	**1.28**	**1.24**	**1.08**	**1.11**
Slovakia												
PSE	mn SKK	24 755	15 884	17 918	16 782	8 585	1 428	7 610	20 980	16 078	15 492	7 319
	mn USD	840	562	623	524	289	47	226	595	389	335	151
GSSE	mn USD	89	71	54	62	67	59	55	56	48	39	34
TSE	mn USD	929	633	677	586	356	106	281	652	437	374	186
	% GDP	n.c.	n.c.	5.0	4.0	1.9	0.5	1.4	3.1	2.2	1.9	0.9
Percentage PSE	**%**	**41**	**30**	**34**	**29**	**14**	**2**	**11**	**31**	**25**	**23**	**11**
Producer NPC		**1.41**	**1.18**	**1.29**	**1.24**	**1.09**	**0.97**	**1.02**	**1.26**	**1.20**	**1.11**	**1.01**
Producer NAC		**1.70**	**1.42**	**1.53**	**1.40**	**1.16**	**1.02**	**1.12**	**1.45**	**1.34**	**1.31**	**1.12**
European Union												
PSE	mn Euro	113 165	95 487	95 190	94 761	96 123	91 727	92 664	102 330	108 241	97 244	103 937
	mn USD	139 873	123 578	111 497	112 400	125 659	116 435	105 016	114 447	115 330	89 617	93 083
GSSE	mn USD	18 232	18 780	11 362	11 417	9 349	13 596	14 307	10 569	10 346	9 193	9 017
TSE	mn USD	164 216	149 202	129 205	129 480	140 464	134 463	124 085	129 435	129 857	102 403	105 624
	% GDP	2.3	1.9	1.8	1.7	1.8	1.6	1.6	1.6	1.6	1.4	1.4
Percentage PSE	**%**	**44**	**38**	**37**	**35**	**35**	**32**	**32**	**36**	**39**	**34**	**35**
Producer NPC		**1.81**	**1.56**	**1.48**	**1.39**	**1.36**	**1.27**	**1.29**	**1.40**	**1.47**	**1.33**	**1.33**
Producer NAC		**1.78**	**1.62**	**1.59**	**1.54**	**1.53**	**1.46**	**1.47**	**1.57**	**1.63**	**1.51**	**1.54**
OECD												
PSE	mn USD	291 792	279 671	273 941	282 231	271 176	254 088	231 796	256 704	272 563	241 599	230 744
GSSE	mn USD	65 768	69 308	67 432	66 510	70 770	68 904	64 163	59 595	57 448	53 943	53 838
TSE	mn USD	383 018	377 638	370 920	378 260	371 098	351 940	325 041	343 826	356 629	321 104	310 959
	% GDP	2.0	1.8	1.8	1.7	1.6	1.5	1.4	1.5	1.4	1.3	1.3
Percentage PSE	**%**	**37**	**35**	**35**	**34**	**31**	**29**	**28**	**33**	**35**	**32**	**31**
Producer NPC		**1.55**	**1.48**	**1.45**	**1.41**	**1.34**	**1.28**	**1.28**	**1.36**	**1.41**	**1.34**	**1.31**
Producer NAC		**1.60**	**1.54**	**1.54**	**1.52**	**1.45**	**1.40**	**1.39**	**1.48**	**1.54**	**1.47**	**1.45**

p: provisional; e: estimate; n.c.: not calculated.

1. Rubles for 1991.

2. Rubles for 1991 and 1992.

3. Rubles for 1991.

Source: OECD, PSE/CSE database.

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EXPERIENCE AND ISSUES IN MEASURING THE LEVEL OF AGRICULTURAL SUPPORT IN CHINA

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(Paper presented by Wei-Ming Tian)

Abstract

Measuring the level of agricultural support in China is complicated not only by the lack of adequate data and policy information, but also by the prevalence of the semi-subsistent agricultural economy and rent-seeking behaviour of many policy-implementing bodies. Due to such complications, this paper argues that measurement of the level of support may be inaccurate if OECD's support methodology is applied to the case of China. Hence, in this paper, we propose some modifications to the OECD approach in measuring support in China. Using the revised methodology, some major indicators of support for the period of 1990 to 2000 are calculated and compared with the standard OECD treatment. Our results suggest that disregarding semi-subsistence by rural households tends to exaggerate policy-related income transfers. Such effects can be substantial for developing countries, which are commonly characterised by their large agrarian economies. Leakage of policy benefits to rent-seekers is likely to be significant as well due to weak social institutions in such countries. Consequently, support to agriculture in developing countries is often overstated, which is the case in China in recent years.

Introduction

How to measure the level of support to agriculture has been an important issue in trade negotiations and monitoring reductions in agricultural support. Various measures have been proposed since the 1980s, such as nominal and effective rates of assistance (IAC 1985), producer and consumer subsidy equivalents (OECD 1987),[1] and the aggregate measure of support adopted during the Uruguay Round trade negotiations. These indicators have been widely used by academics and policy makers in describing the level and structure of support to agriculture under different policy regimes across countries.

These approaches, however, have been developed primarily on the basis of well-developed market economies. When applied to countries where the rural economy is characterised by a significant degree of subsistence, one critical issue arises as to whether such commonly used methodologies can derive reliable estimates of support. This issue has important implications not only for designing appropriate agricultural policies by developing countries, but also for the ongoing international trade policy negotiations under the WTO.

Using China as a case study, in this paper we address issues related to measurements of policy support to agriculture in developing countries. The second section briefly reviews earlier studies that attempted to measure China's support to agriculture. The third section discusses issues related to measuring support when applying OECD's methodology to the case of China, based on proposed modifications. In the fourth section, China's PSEs for major commodities during the period of 1990-2000 are

1. OECD revised its method of classifying support to agricultural producers in 1998 and, reflecting the nature of the OECD support measurements, changed the names of the indicators to Producer Support Estimate and Consumer Support Estimate (OECD 2001b).

estimated and the effects of different estimation treatments with regard to on-farm consumption are compared. The last section offers some concluding comments.

China's experience in measuring the level of support

The work of estimating China's support to agriculture was initiated in the late 1980s when the Uruguay Round was under way. In 1987 China applied to the GATT to restore its membership and participated in the Uruguay Round as an observer. At that time, the significant effects of China's rural reforms drew wide attention around the world. Consequently, evaluations of China's agricultural policies attracted much interest.

Starting in 1987, the Bureau of Agricultural Economics in Australia and the Institute of Agricultural Economics of the Chinese Academy of Agricultural Sciences undertook a joint study on China's agricultural policy reforms. Under this project, China's PSEs and CSEs in 1986 were estimated (Gunasekera *et al.* 1991; Tian *et al.* 1992). With a comprehensive coverage of the major policy measures, this study revealed that China's agricultural policies presented a pattern of taxing agriculture and subsidising consumers, which has been a common phenomenon in developing countries.

Similar studies were also carried out by the USDA (Webb 1989 and 1992; USDA 1995). Webb (1992) estimated China's PSEs and CSEs for rice and wheat in 1989 based on simple assumptions concerning the distortions caused by policy. The results indicated that the levels and even signs of the calculated PSEs and CSEs were highly sensitive to the reference prices chosen.

Some other Chinese researchers have also more recently conducted studies on China's PSEs and CSEs. The Research Team on GATT and China's Agricultural Development (1993) estimated China's total PSE for the period of 1985-90. Similar work was done by Cheng (1993), which covered the period 1982-1990. Zhu, Wan and Liu (1997) estimated the PSEs of 13 agricultural products in 1993-94. In terms of methodology, this study explicitly took into account the two-tier price scheme for certain products and non-tax levies and charges borne by farmers. Cheng (2001) renewed his estimates of PSEs and extended the period of coverage to 1997. Recently, Zhang (2001) estimated China's PSEs and CSEs for 10 commodities for the period 1990-99 following the OECD's methodology in her doctorate thesis. While these studies commonly found that China's agriculture was taxed, the results present notable variations. This is understandable as different researchers often have access to different data and information and use different assumptions.

In summary, studies on China's support to agriculture undertaken by overseas researchers tend to be restricted by data and information. As a result, the researchers had to simplify the analytical framework by making restrictive, sometimes unrealistic, assumptions. In contrast, Chinese researchers have better access to data and information and are able to deal with more comprehensive policy issues in their studies. Nonetheless, few of the earlier studies have given attention to the issue as to whether the currently commonly accepted OECD PSE/CSE methodology is appropriate when applied to China. We will discuss this issue in the next section.

Methodological issues in measuring support to agriculture

OECD's approach

In the current OECD classification of total transfers associated with agricultural policies (TSE), the policy measures are grouped into three main categories: (1) transfers to producers individually (PSE), (2) transfers to consumers individually (CSE), and (3) transfers to general services to agriculture collectively (GSSE). These indicators show the level and structure of support to agriculture due to policies. Detailed explanations of the approach can be found in OECD (2001b) and the recent measurements for OECD member countries are presented in its annual report: *Agricultural Policies in OECD Countries: Monitoring and Evaluation* (OECD 2001a).

As defined by OECD (2001b), the PSE measures the annual monetary value of gross transfers from consumers and taxpayers to support agricultural producers while the CSE measures the annual monetary value of gross transfers to (from) first stage consumers of agricultural commodities. Overall, in the OECD area, market price support schemes provide the major share of support, which has the greatest effect on the sign and magnitude of the PSE and CSE. Market price support (MPS) is the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm-gate level (OECD 2001a, p. 152). As well as MPS, the PSE and CSE also include direct and indirect payments and other subsidies to producers (consumers) through fiscally funded policy programmes.

The GSSE measures the annual monetary value of gross transfers to general services provided to agriculture collectively as a result of policy. The GSSE covers various services, such as R&D, agricultural education, inspections, infrastructure, marketing and promotion and public stockholding. These measures have no direct effect on producer prices.

The PSE can be expressed as the percentage of gross farm receipts(%PSE) and the percentage of the value of consumption at the farm gate (%CSE). The producer and consumer nominal assistance coefficients (NAC), can be derived from the PSE and CSE calculations. There is one major difference between %PSE and the producer NAC (also between %CSE and the consumer NAC). That is, the denominator of %PSE is the value of gross receipts at farm-gate prices plus budgetary support, while for the NAC the denominator is the value of total gross farm receipts at world market prices, without support. For the purpose of comparison among different countries or different commodities, the %PSE and %CSE and producer and consumer NAC indicators are more appropriate, rather than absolute monetary levels.

The classification of policy measures included in PSE is based on two key assumptions. First, policies are classified according to how they are implemented, so policies within a given category have the same eligibility criteria, with the same potential impacts on production and consumption and trade. Second, the relative importance of the potential impacts of a policy measure on production, consumption and trade depend primarily on the degree to which the measure is linked to a specific commodity or input necessary to produce the commodity, and the degree of production and consumption responsiveness.

Analytical framework in the case of China

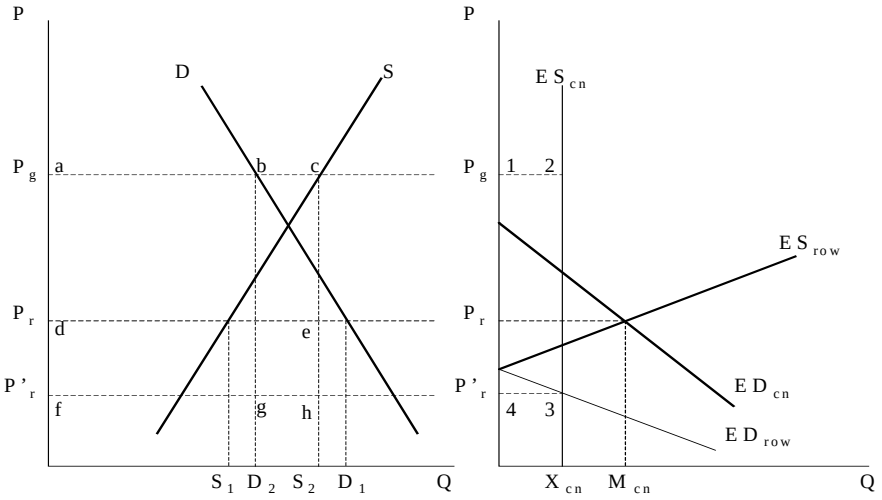
Empirical measurement of China's PSEs and CSEs faces a number of difficulties. While accessibility to needed data and information is certainly a major constraint, insufficient knowledge on how China's agricultural market functions and how the policies are implemented should not be overlooked. China has been undergoing a transition from a planning economy towards a market economy, during which rapid switches of policy directions occurred time and again as the government responded to changing socio-economic situations. In reality, not all of the policy changes have been announced publicly and their implementation has not been well documented. Many policies were designed with good intentions, but could not be properly implemented due to institutional failure. This makes it difficult to use recorded government programmes and associated fiscal outlays as a basis for the estimation of support.

Grain policies and marketing arrangements are unique as well as being the most important in the context of China's agricultural policies. The government has continuously intervened in the grain market with various policy measures, which have not always been mutually consistent. There often exist multiple forms of prices, each being determined by a unique mechanism. We take the grain market in the late 1990s as an example and use graphical method to analyse the policy-induced transfer of income.

The major policy instrument for the Chinese government to support grain production since the late 1990s has been guaranteed procurement at the state-set floor prices. Figure 1 depicts the situation when the market functions normally. The curves D and S in the left panel represent China's demand and supply. Assume that the rest of the world (ROW) supplies low-cost grains as represented by the excessive supply curve ES_{row}. Without policy intervention, China's trade position is reflected by curve ED_{cn} in the right panel, which intercepts ES_{row} at price P_r. At this price, farmers produce S_1 and consumers buy D_1, leaving China as an importer of imports equal to D_1-S_1 (or M_{cn} in the right panel). When the government institutes a price support scheme and sets a floor price at P_g, domestic supply increases to S_2 while demand declines to D_2, turning China into a surplus supplier. If this scheme was effective, the state grain marketing enterprises (SGMEs) should purchase all supply (S_2) and then sell D_2 to domestic consumers in the same year at price P_g. The remaining part S_2-D_2 has to be sold in the world market with export subsidies at the prevailing world price or kept in state reserves for later sale. In the former case, China exports X_{cn} (or S_2-D_2) and – in this case - the world price is depressed to P'_r as a consequence.

When using observed prices to measure PSEs, the transfer to producers via *Market Price Support* is measured by the area *achf* = $(P_g\text{-}P'_r)\bullet S_2$, which is significantly larger than the normally assumed small country case (area *aced* = $(P_g\text{-}P_r)\bullet S_2$). The total transfers to producers by market price support policy consists of that from consumers (area *abgf* = $(P_g\text{-}P'_r)\bullet D_2$) and from taxpayers (area *bchg* = $(P_g\text{-}P'_r)\bullet(S_2\text{-}D_2)$), which equals the export subsidy (or area *1234* = $X_{cn}\bullet(P_g\text{-}P'_r)$ in the right panel). It is clear that this approach results in higher PSE estimates than the case with the small country assumption.

Figure 1. **Effects of market support policy under a competitive market**



However, China's grain market is not a competitive market. While SGMEs try to maximise their own benefits by capitalising on reform measures, they are nevertheless continuously assigned by the government to implement grain policies. Under such arrangements, each SGME is in fact allowed to act as a monopsony in local producer markets. On the other hand, SGMEs as a whole can also exercise certain monopolistic power in the consumer market by requiring the national government to restrict imports and subsidise exports (or reserves). Thus, although competition exists to some extent between SGMEs with non-SGME firms and among SGMEs in the consumer market, SGMEs are able to sell products at prices higher than that in the world market. It is noted that, however, officially SGMEs are not allowed to freely pursue maximum profit. They can do so only within the constraints set by the government, and their operations must comply with government requirements, although how they act may be a completely different matter in reality.

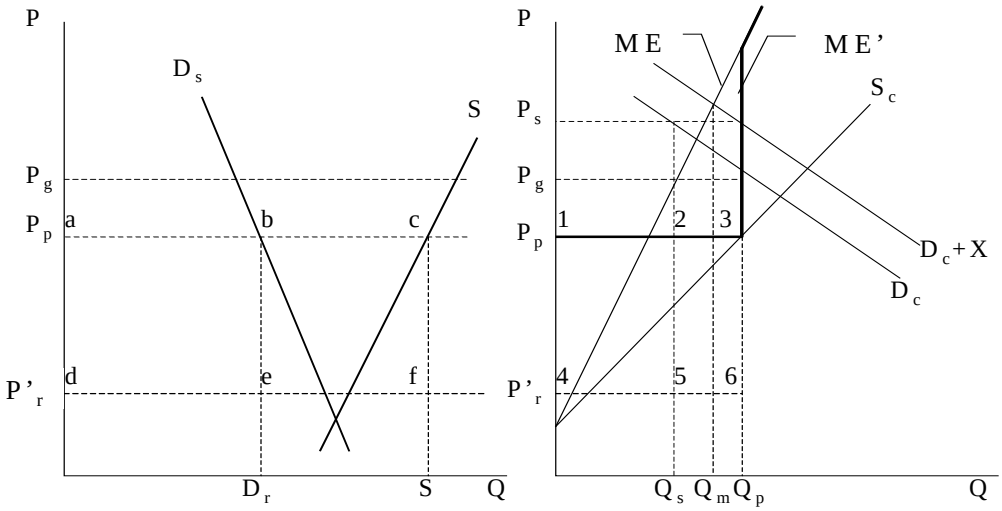
Figure 2 gives a visual presentation of SGMEs' behaviour under China's policy and institutional context. Differing from Figure 1, here we directly use the distorted reference price P'_r as a benchmark and the left and right panels represent the rural and urban markets, respectively. The purpose of this depiction is to separate the policy effects on urban consumers and rural producers by taking into account the fact that a significant proportion of grain products is consumed on farm. For simplicity, we assume that SGMEs exercise market power only on the producer side, while the government responds to SMGEs' requirements by prohibiting imports and subsidising exports of the entire surplus (the same amount as X_{cn} in Figure 1).

In the left panel, the curve D_s shows rural subsistence demand and S shows the total supply, from which the supply curve to the urban market S_c is derived, as shown in the right panel. The demand by urban consumers is represented by the curve D_c in the right panel. D_c+X, is the total demand curve (urban demand plus exports).

The curve *ME* in the right panel shows the marginal expense incurred when SGMEs make purchases. If SGMEs are allowed to freely take the advantage of their monopolistic position without facing competition from imported products, maximum profit is obtained by supplying a quantity Q_m, at which the *ME* curve intersects the total demand curve. Under such a situation, SGMEs are able to charge

consumers a higher price and pay the farmers a lower price (for simplicity, neither is shown in the figure), thus obtaining a monopolistic rent.

Figure 2. **Effects of market support policy under a monopolistic market**



However, such a scenario is inconsistent with government objectives. In reality, if urban consumers complain that the prices are too high, the government may respond by increasing imports, resulting in a decline of SGMEs' market power. Similarly, if the government discerns that SGMEs do not comply with the state-set procurement prices, it may discipline SGMEs. Thus, price determination by SGMEs becomes a subtle strategic game with the government. SGMEs may try out repeatedly the range of prices that can be tolerated by the government and the public and choose the prices accordingly. Assume P_p is the minimum price tolerable by the government. With this floor price, SGME's marginal expense curve becomes kinked (shown by *ME'* in the right panel). The new equilibrium is reached with a supply of Q_p and urban market sales of Q_s at price P_s.

Three important observations stand out from Figure 2. First, the income transfer to producers is smaller than the case when P_g is the effective price. Second, while the transfer of income to producers is the area *acfd* ($= (P_p\text{-}P'_r)\bullet S$) if the standard PSE method is used, the area *abed* is in fact nullified because this part of the transfer is only nominal. Only the transfers from urban consumers (area *1254*) and from taxpayers (area *2365*) bring rural producers real benefits. Third, both consumers and taxpayers transfer income to SGMEs, which becomes a dead-weight loss to the economy.

The above situation is possible due to several reasons. First, starting from 1996, the national government changed the floor prices from fixed prices to reference prices and allowed provincial governments to make adjustment within specified ranges in line with local market conditions (MOA 2001a). Second, SGMEs, by exercising arbitrary quality determination and intentional delay, can create a condition that forces a large number of farmers to sell their produce at lower prices to them because searching for alternative market opportunities could be very costly for the farmers considering that many of them have only small amounts of products to sell. Third, under the arrangement that the expenses needed for maintaining guaranteed procurement are shared between national and local governments, local governments in grain-producing regions are unwilling and also often unable to provide funds to subsidise grain procurement and thus connive with SGMEs to depress

price and to limit quantity of purchase. Fourth, many fees and charges that are used to finance local government activities are also collected when producers deliver their grains to SGMEs. As a result, the policy support benefits meant for grain producers are significantly eroded.

Figure 2 indicates that SGMEs are able to earn a profit by requesting the government to limit imports and subsidise exports and by exploiting producers. In addition, SGMEs can also benefit themselves by inflating operational costs, so as to ask for more subsidy from the government, which can then be used as staff welfare or for personal gains of the managers. Some local governments may even collude with local SGMEs in obtaining fiscal subsidies from higher government levels and loans from the state policy bank.

In summary, the above discussion highlights that the estimates of PSEs and CSEs can be significantly affected by any or all of the following three aspects. (1) The calculation based on observed world prices may lead to overestimates of transfer to producers via market price support. (2) The nullified transfer is likely to be large in China, as well as in other developing countries where the share of on-farm food consumption is large. (3) Due to rent seeking and leakages, policy benefits to rural people are often smaller than the officially announced supports.

Estimates of China's support to agriculture

Policy coverage and treatments

China's agricultural policies in the 1990s were complex. Table 1 summarises the categorisations used in this study. Due to unavailability of some data, not all items could be estimated with confidence and thus some items were not covered. Two special treatments are adopted to take into account the methodological issues raised above:

- PSEs are calculated using both total output and marketed output, which allows evaluating how the real transfer differs from the apparent transfer due to on-farm consumption.

- Agricultural taxes are treated as negative support to producers in item *B* while an equal amount of value is recorded in item *O* as government revenue forgone.

The discussions below deal only with estimates of PSEs and NACs for individual commodities and GSSE for all products covered.

Table 1. **Categorisation of China's agricultural policy measures**

OECD Code	Description	Policy instrument in China
I.	**Producer support estimate**	*Sum of A to H*
A.	Market price support	Border policies and state intervention in domestic product markets
B.	Payments based on output	Agricultural taxes (expressed as a negative value)
C.	Payment based on area planted or animal numbers	None
D.	Payment based on historical entitlement	None
E.	Payment based on input use	Border policies and state intervention in domestic farm input markets
F.	Payment based on input constraints	None
G.	Payment based on overall farming income	Rural financial relief
H.	Miscellaneous payments	Fiscal outlays for agricultural development programmes
II.	**General services support estimate**	*Sum of I to O*
I.	Research and development	Fiscal outlay for agricultural research
J.	Agricultural schools	Not included
K.	Inspection services	Not included
L.	Infrastructure	Fiscal outlay for rural infrastructure
M.	Marketing and promotion	Not included
N.	Public stockholding	State reserves of grains and cotton
O.	Miscellaneous	Agricultural taxes (+) and budget for agriculture related institutions

Sources of data

While data availability has improved notably in China, their accuracy remains a concern. In addition, frequent changes in statistical concepts and data collection and processing procedures complicate data compatibility. Some critical data needed to estimate the level of support are still unreleased. Often researchers have dealt with such data deficiencies by using whatever data and information were available, with some assumptions considered appropriate, or using alternative data and information.

When calculating PSEs and GSSEs, four types of key data are required: (1) producer prices; (2) reference prices; (3) market supply, demand and trade; and (4) fiscal expenditures on policy programmes. In this study, producer prices of outputs are derived primarily from China's farm production cost survey (State Planning Commission 2000) on the basis that it provides compatible time series of data and it presents what farmers actually received when they made sales. Prices of farm inputs are derived from information collected under the rural social-economic survey by the Research Centre of Rural Economy (OFROV 2001) in combination with other data sources, such as *China Statistical Yearbook* (NSB 2001).

Reference prices are derived mainly from China customs statistics (China Customs Administration 2000). China's trade positions for several commodities changed frequently during the 1990s, such as for rice, corn, cotton and soybeans. For simplicity, reference prices are represented by

unit import values when China was a net importer and unit export values when China was a net exporter. Prices from the FAO (2001) and the World Bank (2001) are used as a check for some highly suspicious data. These unit values are converted into RMB at the swap market exchange rate before 1994 and the official exchange rate thereafter. Border prices are then adjusted to the comparable farm gate prices.

Market supply, demand and trade statistics are obtained from several sources, including *China Statistical Yearbook* (NSB 2001*)*, *China Agricultural Statistical Information* (MOA 2001b), *China Customs Statistics* (China Customs Administration, 2000), FAO statistical database (FAO 2001), and USDA PS&D database (USDA 2001). The shares of commodities marketed are derived from OFROV (2001) and NSB (2001).

Government fiscal information is reported in *China Statistical Yearbook* (NSB 2001) and *China Financial Statistical Yearbook* (NSB 2000*)*. The *China Agricultural Development Report* (MOA 2001a) provides useful policy information.

Several issues remain unsolved. The first is whether there are income transfers associated with primary factors (*e.g.* land, water etc.), for which the markets are non-existent or ineffective. The present study does not deal with this issue. The second is whether non-tax fees, charges and contributions in the form of workdays paid by farmers should be included in calculating transfers through fiscal instruments. Although the share of agricultural taxes to agricultural GDP is lower than that of other sectors, the above non-tax burdens have been high. In this study, we have simply assumed that the overall burden on agriculture is the same as other sectors and thus there is no tax discrimination. The third is how significant the "leakages" in government-funded agricultural programmes are. Past experiences suggest that such leakages are often large in agriculture-based regions. However, due to lack of information, this factor was not taken into account in our estimation.

Results

Table 2 reports the estimates of China's PSEs for all commodities covered in this study using the method we proposed. The results show that Chinese agriculture was not supported at all during the 1990s. In fact, in all the years covered, the PSEs were constantly negative, although the absolute values tended to decline over time. The findings from this study are largely in agreement with those of previous studies (*e.g.*, Cheng 2001; Zhu, Wan and Liu 1996).

It is also observed from our results that there is a general, though not always stable, trend of decline in the market price support component, indicating that China has tended to remove those distorting policies that tax agriculture. The producer NAC has been closer to parity since the mid 1990s, suggesting that China's agricultural policy reforms have moved in a direction towards greater market orientation. However, there were occasional disruptions in the course of market-oriented reforms, *e.g.*, the changes in grain marketing policy introduced in 1997.

The results also reveal that the GSSE grew steadily. However, it must be noted that the major factor that drives up the GSSE is public stockholding, which rose drastically in recent years. It is this component that is associated with the heavy dead-weight loss in farm support policies in China. In contrast, the fiscal funding for agricultural R&D and infrastructure remained low.

Table 2. **Estimates of support to the agricultural sector**

Unit: billion RMB

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000p
Total value of production (at farm gate)	456	471	507	649	1 067	1 352	1 480	1 482	1 406	1 198	1 135
Of which: marketed domestic product	260	275	293	372	626	783	859	892	839	708	697
Total value of consumption (at farm gate)	460	471	502	635	1 057	1 386	1 498	1 489	1 401	1 204	1 122
Producer Support Estimate											
Market price support	-108	-97	-140	-106	-86	-30	-7	-33	-69	-18	-21
Payments based on output	-6	-6	-8	-9	-16	-20	-26	-28	-28	-30	-33
Payments based on area /animal numbers	0	0	0	0	0	0	0	0	0	0	0
Payments based on historical entitlements	0	0	0	0	0	0	0	0	0	0	0
Payments based on input use	4	8	11	8	-3	1	-3	-4	-8	-7	-6
Payments based on input constraints	0	0	0	0	0	0	0	0	0	0	0
Payments based on overall farming income	1	2	1	1	2	2	3	3	4	3	4
Miscellaneous payments	9	9	10	13	15	15	18	20	21	23	26
Total	-101	-84	-125	-94	-88	-32	-14	-42	-80	-29	-31
Percentage PSE	-22	-17	-24	-14	-8	-2	-1	-3	-6	-2	-3
Producer NAC	0.68	0.72	0.64	0.75	0.90	0.98	0.96	1.00	0.97	1.00	0.99
General Services Support Estimate											
Research and development	0	0	0	0	0	0	0	0	1	1	1
Agricultural schools	-1	0	0	0	0	0	0	0	0	0	0
Inspection services	0	0	0	0	0	0	0	0	0	0	0
Infrastructure	2	3	3	3	4	4	5	6	16	13	13
Marketing and promotion	0	0	0	0	0	0	0	0	0	0	0
Public stockholding	19	20	18	19	16	17	22	31	45	42	65
Miscellaneous	10	10	13	14	22	27	35	38	39	41	46
Total	31	33	34	36	43	48	62	75	101	96	124

Note: p. Preliminary estimates.

The level of support to different products varies. Table 3 presents the PSEs and NACs for individual commodities. In most years, wheat has been supported but rice is taxed. Corn was taxed heavily in the early 1990s, but the PSEs turned positive in the later 1990s. The results given in Table 3 confirm that, although major food cereals have been given support since 1995 (in particular the government set the procurement prices higher than the world market ones and allocated a large amount of fiscal funds to subsidise exports and reserves), the actual benefits accruing to producers was not large, especially in recent years. On the surface, this seems to be contradictory to the new grain policies, which were specially designed to protect the income of grain producers. In fact, this largely reflects the reality. As noted above, the current institutional arrangements make the guaranteed price scheme ineffective. That is why, although the contract prices and floor prices were higher than the prevailing world market prices, farmers still could not benefit much from this.

The PSEs for oilseeds show two distinct patterns. While soybeans and rapeseed received support in most years, the contrary was true for peanuts and sesame[2]. China is a major producer of all these oil

2. Soybeans are still accounted for as grain crops in China's official statistics.

crops. However, China's comparative advantages in soybeans and rapeseed have tended to decline in recent years for two reasons: (1) changes in its own resource endowment, and (2) high support provided by major exporting countries. Starting from 1996, China's soybean trade turned from net export into net import and the volume of imports in 2000 and 2001 was as high as over 10 million tonnes. Although this sharp increase of imports is driven mainly by domestic demand increasing rather than supply shrinking, the government was concerned about this situation and took measures accordingly. The case for rapeseed is similar to soybeans but less severe. In contrast, peanuts and sesame are two of China's traditional export products, for which China still has comparative advantages over major competitors and thus the negative support to peanuts and sesame remain unchanged.

Being the largest exporter of textile products in the world, China needs to ensure an adequate supply of cotton at reasonable prices. However, market price support policy has not always worked to achieve this end. Cotton marketing and pricing were placed under stringent government control throughout the period before 1999, when the Chinese government deregulated the cotton market. The government adjusted procurement prices based on the market situation not only frequently, but also often with large margins. Nonetheless, the producer price was still constantly lower than the reference price except for 2000, resulting in negative PSEs.

Policy intervention in sugar production was significantly weakened during the 1990s. However, since both sugar cane and sugar-beet production are concentrated in a few regions where local economies and rural incomes have a high reliance on such crops, regional governments have taken some measures to encourage their production. Overall, sugar crop producers did not receive much support in the 1990s. However, the trend is clear that the discriminatory effects due to the policy scheme disappeared.

All of the animal products seem to have been taxed relatively heavily in most years. Generally, the negative PSEs for ruminant animals are mainly caused by the low domestic prices of the products. In addition, the negative PSEs for pork (pig meat), poultry meat and eggs have also been caused by unfavourable feed prices since 1993.

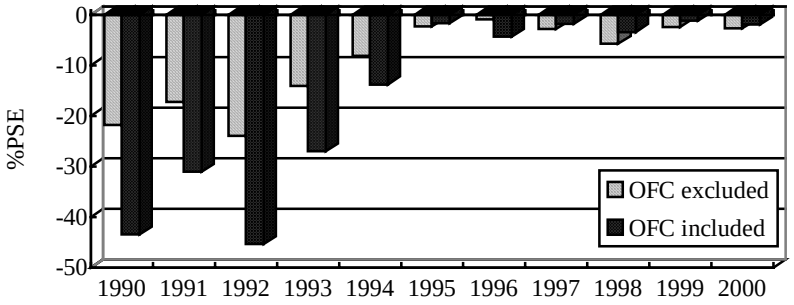
In general, the PSEs obtained for individual commodities in this study show a similar pattern to what was found in the earlier studies (*e.g.*, Cheng 2001; Zhu, Wan and Liu 1996). However, there are two important new findings from the present study: (1) the PSEs are lower when on-farm consumption is excluded from calculating market price support; and (2) the percentage PSEs tend to approach zero in recent years for almost all products.

Table 3. **Producer Support Estimates by commodity**

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000p
Rice											
Percentage PSE	-26	-13	-21	-5	-12	4	-9	-3	0	-5	-1
Producer NAC	0.85	0.91	0.87	0.96	0.91	1.04	0.93	0.97	1.00	0.95	0.99
Wheat											
Percentage PSE	-8	4	-2	-9	3	4	4	7	6	7	1
Producer NAC	0.94	1.04	0.98	0.93	1.03	1.05	1.05	1.09	1.08	1.09	1.01
Corn											
Percentage PSE	-19	-14	-23	-16	6	1	-11	5	9	4	0
Producer NAC	0.86	0.89	0.85	0.88	1.06	1.01	0.91	1.06	1.11	1.04	1.00
Soybean											
Percentage PSE	-4	6	16	14	-1	13	11	11	3	7	10
Producer NAC	0.97	1.06	1.21	1.18	0.99	1.17	1.13	1.13	1.04	1.08	1.12
Rapeseed											
Percentage PSE	-1	6	-14	-2	7	8	29	3	5	6	2
Producer NAC	0.99	1.06	0.88	0.98	1.08	1.10	1.49	1.03	1.06	1.06	1.02
Peanut											
Percentage PSE	-30	-59	-32	-27	-8	-7	-12	-15	-26	-12	-9
Producer NAC	0.80	0.71	0.79	0.82	0.93	0.94	0.90	0.88	0.82	0.90	0.92
Sesame											
Percentage PSE	-18	0	-32	-11	5	-8	-11	-13	-22	-17	-23
Producer NAC	0.86	1.00	0.79	0.91	1.06	0.93	0.91	0.89	0.83	0.86	0.82
Cotton											
Percentage PSE	-26	-25	-53	-23	-18	-1	-2	-1	-12	-12	14
Producer NAC	0.81	0.81	0.68	0.82	0.85	0.99	0.98	0.99	0.90	0.90	1.17
Sugar											
Percentage PSE	-38	-4	-67	-78	-10	2	1	7	-4	8	3
Producer NAC	0.73	0.96	0.62	0.58	0.91	1.02	1.01	1.08	0.96	1.08	1.03
Pork											
Percentage PSE	-39	-39	-40	-15	-11	0	6	-6	-21	-8	-14
Producer NAC	0.76	0.75	0.76	0.89	0.90	1.00	1.06	0.94	0.82	0.92	0.88
Beef											
Percentage PSE	-38	-39	-49	-49	7	0	-4	-12	-11	7	16
Producer NAC	0.75	0.75	0.71	0.71	1.08	1.00	0.96	0.89	0.90	1.07	1.20
Mutton											
Percentage PSE	-17	-12	-20	-29	-15	-12	-11	-14	3	9	9
Producer NAC	0.87	0.91	0.86	0.82	0.88	0.90	0.91	0.89	1.04	1.11	1.11
Poultry meat											
Percentage PSE	-9	-19	-19	-31	-11	-25	-6	-13	-4	-8	2
Producer NAC	0.92	0.85	0.86	0.79	0.90	0.81	0.95	0.89	0.96	0.93	1.02
Eggs											
Percentage PSE	4	2	-8	-16	-24	-30	5	-4	2	1	-5
Producer NAC	1.04	1.02	0.94	0.89	0.82	0.80	1.05	0.96	1.03	1.01	0.96

Figure 3 clearly shows the effect of excluding on-farm consumption from the %PSE calculations. For the period covered in this study, the value of marketed products accounted for about 60% of the total output value. Thus, when on-farm consumption is excluded from calculating income transfers, the total value of market support, the *%PSE* and *NACp*, all become smaller. For instance, the %PSE declined from 43.5% to 21.8% for 1990 after income transfers associated with on-farm consumption were excluded.

Figure 3. **Effects of on-farm consumption (OFC) on PSE calculation**



Hence, how to treat on-farm consumption has an important impact on the size of estimated PSEs and subsequently has important policy implications. The primary purpose in estimating the level of support is to monitor and evaluate the effects of agricultural policies. When semi-subsistence is not taken into account in calculating indicators like PSEs and AMS, the results may not only exaggerate the size of income transfers to producers, but also fail to show the effects of policies that target the promotion of greater commercialisation[3]. This has become a debatable issue with regard to whether "eligible production" refers to marketed output as against total output for the purpose of determining *de minimis* AMS support under the WTO Agreement on Agriculture (FAO 2000 pp. 11-12). Potentially, if *de minimis* AMS support uses total output as a base, a country with 50% of production being marketed could in theory double its level of support to agriculture, which may have serious ramifications on agricultural and trade policy reforms at both the national and international levels.

Conclusions

This paper discussed some methodological issues in measuring the level of support to agriculture. Based on the Chinese experience, it is postulated that the application of the standard OECD method designed for developed market economies may over-estimate the level of agricultural support/taxation in developing countries whose rural economy is dominated by semi-subsistence. Using the OECD method with and without modifications, the PSEs for China are then estimated for the period of 1990-2000. The empirical results provide support to our proposition.

3. For instance, in the case that prices are unchanged but the marketed share of production rises, the PSE will remain at the same level if the calculation is based on total production; otherwise it will change if the calculation is based on marketed products.

Four important observations emerged from our study:

- China's agriculture as a whole did not receive policy support in the 1990s;
- Policy support was strengthened over time primarily by removing discriminatory policies;
- The level of market price support was the major element determining the level of support; and
- The level of support tends to be higher for those commodities whose world prices were distorted and for which China lacks comparative advantage and is likely to import large amounts without support.

Overall, Chinese agriculture is currently receiving little support from policies. The actual size of PSEs and the pattern of changes in PSEs present a striking contrast with those in most OECD Member countries, whose PSEs are significantly higher and have in fact increased in recent years in some countries (OECD 2001a). However, the recent policy reforms tend to suggest that China's support to agriculture may be increasing. This can be easily understood considering international experiences. As a country with the largest rural population in the world, China has to ensure its rural economic growth in order to maintain social stability. Recognising the fact that rural labourers generally lack appropriate skills for non-farm work, in the short term some assistance to agriculture is necessary to alleviate problems resulting from unavoidable structural adjustments due to WTO accession (College of Economics and Management 1999). However, how and to what extent China may support its agriculture in the future remains to be seen. Therefore, China is now at a crossroads in choosing its future agricultural policies. It is important for China not to follow the practices adopted by many developed economies where agriculture is heavily supported. However, to achieve this end, major developed economies should reduce their support to agriculture.

Our study also suggests that the leakages of market price support have been very large in China. This could be the case in other developing countries as well. Thus, this factor should be taken into consideration when estimating PSEs and CSEs for developing countries. In addition, when designing future agricultural supporting policies, the costs of policy implementation should also be taken into account. For example, decoupled income payments are theoretically sound and can be effective in developed countries. However, implementation of such measures requires appropriate institutional arrangements, which do not yet seem to exist or function well in many developing or transitional economies. In contrast, border policies are relatively transparent and easy to manage. Thus, while institutional reforms should be accelerated in developing countries, flexibility in choosing policy measures should also be allowed in WTO agreements and be chosen according to the criteria of minimum trade-distortion in conjunction with the principle of cost-effectiveness.

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ANNEX

Agenda

WORKSHOP ON AGRICULTURAL POLICY ADJUSTMENTS IN CHINA AFTER WTO ACCESSION

30-31 May 2002, Beijing, China

Thursday, 30 May 2002

9:00-9:30 **Opening of the meeting**

Chair: Mr. FAN Xiaojian, Vice-Minister, Ministry of Agriculture (MoA), China

Keynote speech	Mr. DU Qinglin, Minister of MoA, China
Keynote speech	Mr. Herwig Schlögl, Deputy Secretary-General, OECD
Opening address: Agricultural policy in OECD countries	Mr. Ken Ash, Deputy Director, AGR/OECD

9:30-9:45 ***Tea/coffee break***

<u>Session 1</u>: Agricultural policy framework in China: practice and methods of analysis

Chair: Mr. DU Ying, Director-General of SDPC, China

9:45-11:15 **Presentations**

Agricultural policy adjustment in China after WTO accession	Mr. LIU Zhenwei, Director-General, MoA, China
The role of agricultural and other policies in raising rural incomes in China	Mr. Andrzej Kwiecinski, OECD; Mr. LI Xiande, INRA, France
China's WTO accession and its agricultural policy reform	Mr. CHEN Xiwen, DRC, China
Trade distortions and transfer efficiency of agricultural support measures	Mr. Jesús Antón, OECD

11:15-11:35 **Discussants**: Mr. ZHANG Xiaoshan, Director, Rural Development Institute, CASS, China; Mr. Brad Gilmour, Agriculture and Agri-Food, Canada.

11:35-12:45 **General discussion**

12:45-14:15 ***Lunch break***

Session 2: Market price support policies

Chair: Mr. Gérard Viatte, Special Advisor to FAO

14:15-15:45	**Presentations**	
	Changes in China's price and marketing systems for primary agricultural commodities	Mr. SONG Hongyuan, RCRE, China
	Agricultural protection and regional market integration in China: the impact of China's WTO membership on the agricultural sector	Mr. HUANG Jikun, CCAP, China
	Managing tariff quotas for grains in China: possible effects on imports and domestic prices	Mr. Harry de Gorter, Cornell University, USA; Ms. LIU Jianwen, MoA, China
	Increasing rural incomes in China: policy reforms in the spirit of the Household Responsibility System	Mr. Bryan Lohmar, ERS/USDA, USA
15:45-16:00	***Tea/coffee break***	
16:00-16:30	**Discussants**: Mr. Soares Pacheco, European Union; Mr. LU Feng, China Centre of Economic Research, Beijing University, China; Mr. Wilfrid Legg, OECD.	
16:30-18:00	**General discussion**	
18:00	**Official banquet hosted by Mr. FAN Xiaojian, Vice-Minister of MoA, China**	

Friday, 31 May 2002

Session 3: Budgetary support policies

Chair: Mr. TANG Zhengping, Director-General, MoA, China

9:00-10:30	**Presentations**	
	On the policy of agricultural financial support in China	Mr. SU Ming, Director, Financial Research Institute, Ministry of Finance, China
	"Peasant burden": taxes and levies imposed on Chinese farmers	Mr. Claude Aubert, INRA, France; Mr. LI Xiande, INRA, France
	Agricultural infrastructure support policy in China	Mr. DU Ying, Director-General, NDPC, China

	Agricultural credit policy in China: measurements, effects and adjustment	Mr. HE Guangwen, China Agricultural University, China

10:30-10:45 ***Tea/coffee break***

10:45-11:15 **Discussants**: Mr. TANG Renjian, Leading Group for Finance and Economy, China; Ms. Alexandra Trzeciak-Duval, OECD; Mr. Francis Tuan, ERS/USDA, USA.

11:15-12:00 **General discussion**

12:00-13:30 ***Lunch break***

<u>Session 4</u>: Measurement of agricultural support

Chair: Mr. Ken Ash, Deputy Director, AGR/OECD

13:30-15:00 **Presentations**

How to measure the level of agricultural support: comparison of the methodologies applied by OECD and WTO	Mr. Dimitris Diakosavvas, OECD
The evolution of agricultural policies in OECD countries as reflected by the level and structure of agricultural support	Mr. Wilfrid Legg, OECD
The measurement of the level of support in selected non-OECD countries	Ms. Olga Melyukhina, OECD
Experience and issues in measuring the level of agricultural support in China	Mr. TIAN Weiming, China Agricultural University, China

15:00-15:15 ***Tea/coffee break***

15:15-15:45 **Discussants**: Mr. Lars Brink, Agriculture and Agri-Food, Canada; Mr. CHENG Guoqiang, DRC, China; Mr. Harry de Gorter, Cornell University, USA.

15:45-17:00 **General discussion**

17:00-18:00 **General conclusions**

Chair: Mr. ZHANG Hongyu, Deputy Director-General, MoA, China

Mr. LIU Zhenwei, Director-General, MoA, China
Ms. Alexandra Trzeciak-Duval, OECD

WORKSHOP ON AGRICULTURAL POLICY ADJUSTMENTS IN CHINA AFTER WTO ACCESSION
30-31 May 2002, Beijing, China

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