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BASIC STATISTICS OF CANADA

THE LAND

Area (thousand sq. km)	9 976	Population of major cities (thousands, 2007)	
Agricultural area (2000, per cent of total area)	6.7	Montreal	3 696
		Toronto	5 510

THE PEOPLE

Population (2007)	32 934 166	Labour force (2007)	17 579 500
Number of inhabitants per sq. km	3.3	Employment in agriculture	337 125
Population, annual net natural increase (average 2002-2007)	112 419	Immigration (annual average 2002-2007)	241 566
Natural increase rate per 1 000 inhabitants (average 2002-2007)	3.5	Average annual increase in labour force (2002-2007, per cent)	1.5

THE PRODUCTION

GDP (million of Canadian dollars, 2007)	1 531 427	Origin of gross domestic product (2006, per cent of total)	
GDP per capita (Canadian dollars)	46 500	Agriculture, forestry and fishing	2.3
Gross fixed investment per capita (Canadian dollars)	10 365	Mining and quarrying	3.6
Gross fixed investment (per cent of GDP)	22.3	Manufacturing	15.8
		Construction	6.3
		Public administration	5.6
		Other	66.4

THE GOVERNMENT

Government current expenditure on goods and services (2007, per cent of GDP)	19.5	Composition of Parliament (January 23, 2006)	Number of seats	
Government gross fixed capital formation (2007, per cent of GDP)	2.8		House of Commons	Senate
Federal government current revenue (2007, per cent of GDP)	16.2	Conservative Party	124	22
Federal direct and guaranteed debt (2007, per cent of current expenditure)	171.2	Liberal Party	103	60
		Bloc Québécois	51	..
		New Democratic Party	29	1
		Independent	1	6
		Progressive Conservative	..	3

THE FOREIGN TRADE

Exports (2007)		Imports (2007)	
Exports of goods and services (per cent of GDP)	34.9	Imports of goods and services (per cent of GDP)	32.9
Main goods exports (per cent of total)		Main goods imports (per cent of total)	
Agricultural and fish products	7.4	Agricultural and fish products	6.1
Energy products	19.7	Energy products	8.8
Forestry products	6.2	Forestry products	0.7
Industrial goods and material	22.5	Industrial goods and material	20.5
Machinery and equipment	20.5	Machinery and equipment	28.1
Automotive products	16.7	Automotive products	19.2
Other goods	7.1	Other goods	16.6
Main customers (per cent of commodity exports)		Main suppliers (per cent of commodity imports)	
United States	79.0	United States	54.2
EU	7.8	European Union	12.1
Japan	2.0	Japan	3.8

THE CURRENCY

Monetary unit: Canadian dollar		Currency units per US\$	
		Year 2007	1.074

Executive summary

Canada's economic performance has been among the best in the OECD, as a sound policy framework has enabled the country to take advantage of strong global growth and soaring terms of trade. The economy has adapted well to recent shocks, as labour and capital have shifted rapidly from manufacturing towards the resource and service sectors, with strong net job increases. Overall supply has benefited from rising participation rates. Inflation has been held in check thanks to appropriate monetary policy settings. Budget surpluses have enabled major debt and tax reductions. More recently, though, activity has slowed sharply in response to the combination of the US downturn and stresses from the high Canadian dollar, as declining net exports have nearly offset still-strong domestic demand. Significant challenges also lie ahead. Demographic ageing will put a premium on longer working lifetimes and faster productivity gains, which have been relatively weak, to sustain per capita income growth and public finances. Sustainable growth also requires successfully addressing the problem of climate change, notably in the important energy sector.

Monetary policy has room to manoeuvre in dealing with the growth slowdown, and tax relief is providing substantial support to the economy this year, but fiscal policy is constrained by declining surpluses in the short term and ageing liabilities in the longer term. The tightening in domestic credit – fallout from the US credit crisis – and prospects for slower growth have led to substantial monetary policy easing. In addition, the strong currency and easing demand for tradables are helping to neutralise commodity-price-induced inflation, increasing policy room for manoeuvre. The budget surplus is set to shrink on account of weaker growth and tax cuts. As rising health and other ageing costs are also looming, expenditures need to be controlled for debt to be kept on a downward path. Resolute fiscal policy – in particular through investing abroad more of the public revenue resulting from high oil prices – could help mitigate real exchange-rate appreciation.

Tax cuts have been a good use of budget surpluses, but there is plenty of scope left for efficiency-enhancing, revenue-neutral tax reform. Business tax competitiveness is being enhanced by deep cuts in taxes on corporate income and capital. Labour supply has been boosted by in-work tax credits. Yet, attractive opportunities for base broadening and shifting remain to be exploited and could enable still lower income tax rates. Remaining provincial retail sales taxes, penalising business inputs, should be converted to more efficient value added taxes, harmonised with the federal GST. Numerous tax breaks to traditional sectors and small firms should be phased out to unleash supply-side dynamism. To further improve capital allocation and build on recent initiatives, personal income should be taxed on a neutral consumption basis, with vertical equity achieved by targeting tax credits on vulnerable groups.

Oil-sands exploitation is booming but jeopardises environmental goals. As conventional oil and gas reserves decline, the industry has been switching its attention to extraction from the western oil sands. However, this requires large amounts of gas, land and water and leads to large rises in carbon emissions. Achieving post-Kyoto goals, while sustaining energy development, will require putting a price on all sources of carbon, as well as better technology. Market-based

solutions – such as the planned permit trading – will be critical: by internalising environmental costs they provide stronger incentives for energy efficiency and innovation. At the same time tax preferences to the oil and gas sector should continue to be reduced.

Canada has lost ground in the longer-term global trend toward liberalised farm sectors. While the federal government has been appropriately trying to free up marketing of western grains, it continues to coddle some other sectors with supply management. Dairy farmers in particular have enjoyed a quota system that has created enormous rents at the expense of consumers. Meanwhile, other farmers have been supported by a steady stream of federal and provincial budgetary support that is no doubt inducing dependency behaviour. Farmers also need to be given the right incentives to produce in an environmentally friendly manner. Most importantly, government support for bio-energy production needs to be reconsidered.

Assessment and recommendations

The economy has been remarkably strong in recent years

The Canadian economy has performed remarkably well for the past decade and a half. Real GDP growth has been robust, employment gains have been impressive, the unemployment rate has fallen to its lowest level in a generation, and positive terms-of-trade effects have combined with real per capita output growth to boost Canadian living standards. Furthermore, higher commodity prices have led to a rapid appreciation in the dollar back to around parity with its US counterpart, helping to discipline wage- and price-setting and meet the official inflation target. Domestic price inflation has also been held in check by expanding production capacity, thanks to rising female and older-worker labour-force participation, which has more than compensated for relatively weak productivity growth. However, high commodity prices and the resulting currency appreciation have been forcing rapid economic adjustments through industrial and regional employment shifts. Most signs point to orderly adjustment – even resource-poor regions have seen overall employment gains, despite substantial losses in manufacturing.

But it weakened toward the end of 2007

Most recently, the currency appreciation, together with the worldwide turmoil in credit markets and associated weakening in foreign demand, has caused a sharp drop in Canada's net exports, slowing growth to a crawl. Looking ahead, the US downturn is expected to continue to exert downward pressure on Canada's GDP growth through the trade and credit channels, but the economy should rebound somewhat in 2009. Risks are skewed to the downside and mostly derive from large uncertainties regarding the future path of the US economy and its currency and the extent of the financial-market correction that will ultimately occur there. In any case, it is likely that economic slack will open up, alleviating residual price pressures and holding inflation well below rates seen abroad. This will allow the Bank of Canada room to lower interest rates further, helping to return output to its potential level as quickly as possible.

The key challenge is to continue adjusting smoothly to global shocks, while raising productivity growth and curtailing GHG emissions

Policy-makers are struggling with an unprecedented series of global shocks and risks. Oil, food and other commodity prices have increased almost uninterrupted for the past five years – mainly reflecting rising global demand rather than temporary supply disruptions as in the past. As a commodity exporter Canada can easily learn to live with a quasi-permanent high oil price – but it must also adjust to the corresponding downside of a strong Canadian dollar and a weaker US economy. Meanwhile, demographic ageing is underway, implying that employment – up to now a mainstay of growth – will be shifting into a lower gear while pressures on age-related public spending will build. At the same time climate-change risks have intensified; Canada’s oil-sands sector, a fast growing emitter of GHGs, faces the uncertain costs of planned abatement policies, as do other investors. Three key structural challenges, roughly corresponding to the short-, medium- and long-term policy horizons, emerge:

- The structural shift provoked in part by the terms-of-trade shock may be one of unparalleled magnitude in Canada’s modern history. It must continue to be managed in a sustainable way, notably to prevent excessive crowding out of exposed sectors like manufacturing and forestry by other natural resource production and the public sector as they benefit from oil and other commodity price windfalls.
- While greater labour-force participation, especially of marginal groups, longer working lives and immigration can still be of use in boosting labour supply, the *looming rise in the old-age dependency ratio* means that the onus will increasingly be on higher productivity growth to maintain rising living standards and sustainable public finances.
- *Climate change* and Canada’s commitment to joint global action in fighting it requires a switch to a model of sustainable development, *i.e.* much less energy-intensive consumption and production patterns, notably in the energy sector itself.

Monetary policy has changed direction

Up to and through most of 2007, monetary policymakers were primarily concerned with domestic inflationary pressures arising from rising commodity prices, strong domestic demand and tight labour markets. By the end of 2007, however, emphasis had shifted to managing Canada’s response to the global financial market turmoil, the associated tighter domestic credit conditions and to concerns about a slowing US economy, which led to substantial monetary policy easing. *The main immediate challenge for monetary policy is to design the appropriate policy stance to keep inflation on target as the Canadian economy reacts to the US slowdown and global financial market turbulence. This may well involve some further easing. But when credit conditions return to more normal levels and the economy starts to recover, interest rates will need to increase. Regulators should also be reviewing whether steps need to be taken to ensure that institutional incentives in the financial sector are appropriate. Longer-term, research is ongoing at the Bank of Canada and elsewhere to assess whether it should switch to a lower inflation target and/or to price-level-path targeting. As the Bank has stated, the research would need to uncover compelling evidence in favour of a change to alter a regime that has proven successful.*

Financial markets should be modernised

Further efforts by the Bank and other regulators are desirable to improve transparency, flexibility and competition in Canadian financial markets. The current diversity of regulations – for example, each province has its own securities regulator – makes it difficult to maximise efficiency, and increases the risk that firms will choose to issue securities in other countries. *A single regulator would eliminate the inefficiencies created by the limited enforcement authority of individual provincial agencies.* Also, the impact on economic growth from reducing competition-restraining regulation in the banking sector could be significant. *It is now time, ten years after the first merger proposals were blocked by government, to welcome competition in financial markets by allowing Canada's leading financial institutions to become global players by lifting the ban.*

Governments' fiscal position remains solid but exposed to negative risks

Canada's fiscal situation has improved significantly since the mid-1990s, as deficits were turned into surpluses and Canada's public debt burden declined from the second highest to the lowest among G7 countries. This, combined with lower interest rates, has reduced debt-service costs substantially over the past decade. Government's size relative to the economy has shrunk, as shown by lower revenue, spending and net debt relative to GDP. However, current primary expenditures as a share of GDP have risen slightly since 2000. Over the next few years the combination of recent sizeable tax cuts and lower economic growth will eat into budget surpluses, raising the prospect of renewed small general government deficits, especially if lower commodity prices were to pare tax payments by the resources sector.

Governments should slow down their spending growth and strengthen expenditure-control mechanisms

Over the last decade, the federal government and almost all its provincial and territorial counterparts have underestimated revenue on average and have reacted by a combination of debt reduction, tax cuts and spending beyond levels announced at budget time. However, it is unlikely that recent growth rates in public expenditures are sustainable. *Given the likelihood that the current slowdown in economic activity will curtail future favourable revenue surprises, all levels of government should avoid spending beyond originally budgeted levels. Furthermore, with the imminence of ageing pressures on spending, budgets should be subjected to serious continuing expenditure reviews. The major areas for the federal government to focus on are the level of subsidies, especially in agriculture (see below), but also transfers to lower levels of government. For their part, the provinces should redouble their efforts to ensure their spending is efficient, notably in health care.*

Despite its relatively enviable fiscal position, Canada faces the same long-term fiscal challenges related to population ageing seen in other OECD countries. The old-age dependency ratio is expected to more than double over the next 50 years, putting significant pressure on public spending mainly through rising health-care expenditures,

since the earnings-based public pension system has now largely been put on a sustainable footing. *Among the policies that could help alleviate the problem are: more rigorous spending controls; programme and financing reforms aimed at improving the efficiency of public expenditures, especially in health care; faster debt reduction; shifting provinces' taxation to more efficient bases; and, above all, growth-friendly policies to help future generations afford the rising costs of government programmes.*

Growth-enhancing tax reform should continue, even if surpluses are limited in the short run

Making good use of sizeable budget surpluses has been a key policy issue in Canada, and governments have appropriately used them as a justification for tax cuts. Whereas debt reduction contributes to fiscal sustainability by pre-funding implicit demographic liabilities, tax cuts may serve the same purpose indirectly: lowering taxes can improve incentives to work, save and invest, thereby boosting labour supply, productivity and growth, and expanding the tax base to recoup part of the revenue lost while significantly improving long-run welfare. Given the economic outlook, there is no fiscal room for further net tax cuts over the next few years, but plenty of broadly revenue-neutral, growth-enhancing reforms could still be made in both the business and personal income tax systems.

One priority should be to broaden the business tax base and lower tax rates on capital further

Marginal effective tax rates on business investment have been cut sharply in recent budgets: the federal corporate rate is being reduced by a third and the federal capital tax (an inefficient tax on wealth) eliminated. Most provinces are also phasing out their capital taxes, in part in response to federal incentives. But more could still be done. Businesses in some provinces pay retail sales taxes on inputs, penalising investment. A variety of permanent preferences in the tax code divert resource flows away from their most productive uses toward tax-favoured ends, notably in “traditional” sectors like manufacturing, natural resources and agriculture to the detriment of market services sectors that have been some of the key sources of recent US productivity growth. Small Canadian-owned firms are also unduly advantaged, which may discourage them from growing and becoming more productive. *Given the need to raise productivity growth, revenue-neutral tax reforms to reduce distortions inherent in the current tax system should now be pursued. The top priority is to convert retail sales taxes in the five provinces that still have them to a harmonised VAT, whose broader base (including non-financial services) would offset lost provincial revenues from retail sales taxes on business inputs. As well, accelerated capital cost allowances in manufacturing should not be renewed when they expire in 2011, existing generous deductions for mining and other resource activities should be removed, and the general corporate income tax rate should be lowered to the level of the small business rate, with base-broadening measures largely paying for the statutory corporate income tax cut.*

Marginal tax rates on personal incomes should also be smoothed

Recent years' tax/benefit reforms have helped lower-income families, but they have also inadvertently produced higher marginal effective tax rates as refundable tax credits or cash benefits are withdrawn with higher earned income. This reduces work incentives for groups whose labour will be needed so as to counteract ageing and present labour shortages in the booming areas. Low-income retirees face similarly high marginal effective tax rates (METRs) due to the claw-back of their old-age cash benefit as taxable pension savings are withdrawn, reducing their incentive to save for retirement, although the newly announced Tax Free Savings Account should help to alleviate this problem. High METRs due to benefit withdrawals continue up to middle incomes. The top marginal tax rate has been reduced but is still the second highest in the G7. These factors inhibit longer working hours, and efforts to achieve upward mobility and pursue higher education, all of which are necessary to raise labour utilisation further and reverse declining multifactor productivity growth. *Hence, high METRs should be reduced by earlier but more gradual benefit phase-outs, eliminating "middle-class welfare benefits", and by better co-ordination of federal and provincial tax/benefit systems, or through broad-based tax reductions.*

A shift toward consumption-based taxation is warranted

The generous but still partial alleviation of taxes on personal capital income is designed to improve savings incentives but also misallocates capital, as post-tax rates of return on marginal, non-tax-sheltered savings are low. Moving toward consumption-based taxation (by eliminating taxation of the normal return to all savings) may be politically difficult because expected efficiency increases come at a cost: large gains to rich savers against losses to the non-saving poor insofar as consumption taxes are raised to cover the resulting revenue shortfall. Nonetheless Canada has already taken significant steps in this direction and is well positioned to go further since two-thirds of Canadian individuals already hold all their financial assets in tax-efficient savings vehicles. With the recent introduction of the Tax-Free Savings Account, this proportion is expected to increase over time to 90%. Hence, revenue losses and the resulting increase in consumption taxes should be modest. Another reason is that Canada does not allow mortgage interest deductibility on primary residences, which would be incompatible with consumption-based taxation and very difficult to remove once in place. *Thus, present tax preferences to certain savings vehicles should be extended to all forms by taxing personal income on a consumption basis. Any revenue shortfalls, including those needed to pay for desirable cuts in the top marginal tax rate on personal income, should come from increases in efficient tax bases. These would include environmental taxes at all levels of government, property tax and user fees for various public services, and provincial VATs (once all have converted their retail sales taxes). VATs should have as large a base as possible so as to keep rates as low as possible. Exemptions are costly, benefit the rich as well as the poor, and are an inferior way to enhance equity relative to increasing low-income credits. As such, the current GST exemptions for basic groceries should be eliminated and the adverse distributional consequences neutralized by boosting the GST tax credit. Municipal property taxes should be increased for households and reduced for firms, with net tax increases allowing reductions in provincial transfers and hence further provincial income-tax reductions.*

The energy sector is bumping up against supply constraints

The energy sector has been growing at a fast pace, as higher prices, topped up by generous tax incentives, have caused profits and investments to soar. With shrinking conventional oil and gas production, the focus of activity has shifted toward non-conventional sources, mainly the vast oil-sands reserves located in the province of Alberta. Its rapid pace of development has bumped up against infrastructure bottlenecks and created labour shortages. The provincial government, flush with oil revenues, is greatly stepping up its infrastructure spending, the cost of which has recently increased at a rapid pace. Wage increases have picked up sharply to draw workers from the rest of Canada and abroad, in turn putting pressure on housing, consumer prices and public services. Despite comparatively high inter-provincial labour mobility, it is insufficient to cope with Alberta's pressing needs, and shortages of various skills are acute. *Employment insurance should be harmonised across low and high unemployment regions to foster migration towards the former. Barriers to inter-provincial trade should be torn down, especially those that hinder mutual recognition of professional credentials (notably in the building trades). Participation of all marginal population groups should be encouraged by tax/benefit, education and training policies. The move by the federal and several provincial governments to the public-private partnership model for some infrastructure projects can help to ensure their efficient building and operation so long as they are carefully designed and risks transparently allocated.*

Sustainable development of the energy sector should be encouraged by fiscal/tax policies

The Alberta oil boom has created many jobs in the rest of Canada, especially in professional services and in the materials and capital equipment supply industries. However, the induced real exchange-rate appreciation has cost jobs in manufacturing-based provinces, which are also competing with emerging Asia. For a time the positive job and income spill-overs offset the negative ones. However, with the gathering US recession and depreciating US dollar, the balance has been shifting. This is straining the fiscal federal equilibrium and increasing demands for subsidies and transfers. *Alberta should implement allocation and withdrawal rules for its Heritage Fund: preferably, it should save all its oil revenues in a foreign asset fund, as Norway does, spending only smoothed yearly fund income. The federal government should consider doing likewise for revenues resulting from transitory terms-of-trade gains. This would not only avoid Dutch disease effects, but also pre-fund ageing costs and share resource wealth with future generations. Tax policies for the oil and gas sector must be updated for the era of high oil prices by: removing the preferential elements of federal deductions for exploration and development; discontinuing "flow-through share" agreements; continuing to review Alberta's royalty regime to ensure that pure economic rents are being captured by the province, while reassessing the federal deduction for provincial royalty payments if that is not the case; and removing the exploration/production requirement for tenure rights.*

Effective, market-based environmental policies are essential to set a price on carbon

Higher prices have made the exploitation of the oil sands feasible under existing technologies, but they are still extremely intensive in terms of natural gas and water inputs and greenhouse gas (GHG) emissions. Even though Canada signed up to the Kyoto Protocol, its GHG emissions are currently some 33% above the target. It accounts for 2% of world GHG emissions, second only to the United States in per capita terms, and its emissions are growing faster than nearly any other OECD country, mainly on account of rising oil-sands production. The government now has a plan to rein in such emissions. However, it is based on intensity targets, rather than absolute levels. At foreseeable oil-sands exploitation rates, the government's objective of getting to within what amounts to 8% of the missed Kyoto target by the year 2020 is probably attainable only if technological breakthroughs are achieved. In that context, the federal government has set aside funds for financing pilot projects in carbon capture and storage. *Market-based incentives to devise and adopt helpful innovations will be of primary importance, using standards only when there is an identifiable market failure that cannot be addressed by a price on carbon. The federal plan to implement permit trading is a welcome development and should now be implemented expeditiously. It would benefit from having a price corridor to reduce uncertainty both for firms contemplating a choice of production technologies with varying emissions intensities and for researchers seeking emissions-saving innovations. Finally, not only in the domain of climate change but throughout the environmental area, the cost of regulations needs to be calculated in a transparent manner and monitored on a regular basis.*

Budgetary support to farmers should be cut back to avoid dependency

It is perhaps surprising that a country like Canada with its vast agricultural potential has not seen fit to be a recent leader in pushing for liberalisation, especially when so many of its farmers would benefit so handsomely from a freer global trading regime in this sector. Admittedly, in the 1980s and 1990s government support to agriculture was cut back sharply, and Canada looked set to join Australia and New Zealand in having open agricultural markets. Over the past six years it has been almost alone among OECD countries in backtracking in the protection provided to its farmers. Canadian farmers now receive more generous support than those in the United States and Mexico, but less than their counterparts in most OECD countries. This has had heavy recurrent budgetary costs (CAD 3.8 billion or 16 600 per farm per year in 2006, for example), thankfully in a period of surpluses. But surely *the burden of proof of net benefits has to be set higher for such spending. It needs to be more strictly controlled, particularly in view of the risk of moral hazard behaviour by farmers growing used to living off government handouts. Given high agricultural prices, the time is ripe for setting all farmers free to test out their capabilities in the world marketplace, not just grain producers as the government is trying to do.*

Agricultural supply management should be phased out

Nowhere in Canadian agriculture are the distortions greater than in the supply-managed sectors and above all in dairy farming. Not only are dairy farmers' outputs protected by prohibitive tariffs that result in retail prices for butter and cheese that are around two and a half times those in the none-too-free US market, but their median annual gross income levels have surged to over CAD 250 000, and milk quota values on their balance sheets have soared to over CAD 26 billion in 2006 (around 2% of GDP). This represents several million dollars per farm and CAD 26 000 per cow. Such rents are a blight on the economic landscape and totally unjustifiable in a world of skyrocketing global dairy prices. While support cannot be cut off overnight, it is *crucial that a long-term plan be established whereby they would be phased out. The first step would be to eliminate restrictions on inter-provincial trade in supply management quota. The federal government could then offer some sort of transitional payments that would avoid too great a hit to the finances of current farmers.*

Present ethanol support needs to be re-considered

Farming has also been a part of the nation-wide effort to improve environmental performance, including addressing the challenge of climate change through bio-energy production. The goal has been to improve the efficiency of its production so as to lower GHG emissions, boost farmer incomes and enhance air quality. As in other parts of the OECD, the federal and some provincial governments have introduced consumption mandates and subsidies to expand its use. At present it is obvious that conditions in Canada do not allow its canola farmers to compete with Brazilian sugar farmers on a cost-alone basis, but the hope has been that producing ethanol from cellulose would promise better returns, and substantial budgetary support for research and development has been granted. However, even this source has now been questioned as to its benefits in terms of emissions saving, much less for its cost efficiency and its regressive impact on global food prices. It would seem prudent to *re-examine the premises upon which support has been granted and the mandates imposed and allow the government's reliance on emissions trading to run its course, possibly supplemented by prizes offered for technological breakthroughs.*

Chapter 1

Adapting to new terms of trade, ageing and climate change

A long period of record high growth in Canada appears to have now ended with the global financial market dislocation and cyclical slowdown. A positive terms-of-trade shock (well over \$100 oil and exchange-rate parity with the US dollar) has meanwhile boosted incomes and energy-sector prospects but also dragged down export values, especially in manufacturing. A key macroeconomic policy challenge will be to balance upside risks to inflation in the medium term and downside risks to growth in the short run, while ensuring that symptoms of Dutch disease do not develop. Realising Canada's full potential in the face of imminent demographic ageing requires later retirements and overcoming a persisting productivity gap vis-à-vis the United States via structural policies. Looking further into the future, Canadian and world welfare will depend on curtailing present levels of greenhouse gas emissions. The highly emitting energy sector, in particular, is not sustainable on current development patterns. Outdated policies in the agricultural sector also distort Canada's natural comparative advantage in food while denying domestic market access for poorer food-producing nations. Given its many advantages, there is no reason Canada cannot successfully deal with the challenges posed by new terms of trade, ageing and climate change.

Canada posted another year of solid macroeconomic performance in 2007, bringing its annual average real GDP growth rate since 1993 to a record 3¼ per cent, the highest in the G7 over this period. Living standards have been catching up with US levels, reflecting the substantial benefits of globalisation to Canada as an exporter of many commodities and importer of manufactures, the strong pull of the US growth engine and, perhaps most critically, prudent macroeconomic policies. On the supply side, robust capital formation and a rapid expansion of available workers, mostly thanks to rising female labour force participation and immigration, have accommodated booming demand and helped keep inflation in check. Unemployment has declined to unprecedentedly low levels – about 6% of the labour force. All levels of government have jointly succeeded in sustaining fiscal surpluses and keeping public debt on a firm downward path. And, finally, the external accounts have stayed in equilibrium or better throughout.

The high growth streak seems to have ended in late 2007: plunging net exports – reflecting both the US slowdown and the exchange-rate appreciation – have finally overwhelmed robust domestic demand, leading to what appears to be a temporary downturn. Besides having to navigate this cyclical turning point, Canada faces three major structural challenges. It will have to continue to adjust successfully to the large *terms-of-trade shock* in a sustainable way, through both prudent fiscal policy to contain further real exchange-rate pressure and sound structural policies to smooth adjustment of the exposed sector and expansion of the oil and sheltered sectors. It will need to protect living standards from the drag of a soon-to-be *shrinking domestic workforce*. This requires boosting productivity growth while also making more intensive use of available human resources and continuing to attract large numbers of skilled immigrants. It should adopt a sustainable pattern of growth to address the social and environmental dimensions of development, notably to counteract *climate change*. This will require the sustainable exploitation of vast natural resource wealth, along with investments in energy efficiency and new technologies that mitigate the problem at its source.

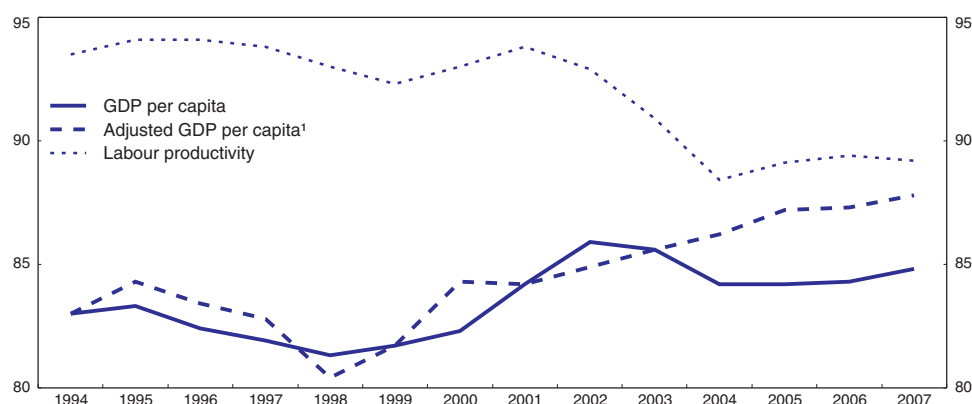
The hitherto buoyant economic situation has facilitated a number of structural reforms, notably tax cuts that helped to boost employment and cut business investment costs. More will need to be done in order to prepare adequately for new shocks and consequent structural adjustments, even if the macroeconomic context may be less supportive for a while. This chapter identifies areas where policy challenges remain significant and those that will be developed further in this *Survey*.

The real income gap and its sources

The long period of strong growth in Canada has narrowed its shortfall in living standards *vis-à-vis* the United States. However, virtually all of the improvement since the turn of the century reflects terms-of-trade gains, notably the hike in oil and other commodity prices and the accompanying Canadian dollar appreciation. Abstracting from such gains in purchasing power – which could someday go into reverse – the gap in per

Figure 1.1. **Canada's GDP per capita**

USA = 100



1. The adjusted GDP per capita is adjusted by consumer purchasing power parity instead of GDP purchasing power parity to reflect terms-of-trade effects. Calculations use the average of income and expenditure approach measures for US real GDP.

Source: Department of Finance Canada calculations.

StatLink  <http://dx.doi.org/10.1787/354445547282>

capita GDP with the United States stagnated (Figure 1.1), as a widening productivity shortfall offset a narrowing deficit in labour utilisation. Although per capita GDP is not particularly low in OECD terms (OECD, 2008), close economic integration with its southern neighbour makes any shortfall in per capita GDP, which has widened from 10 to over 20% of Canada's level since 1981, more worrisome.

Widening labour productivity gap reflects diverging MFP growth

A growth accounting analysis using OECD data to compare Canada, the United States and the three main European economies shows that since 1993 potential growth in Canada has been very strong (3% per year on average), and a similar amount in the United States and the United Kingdom, but less in the major euro area countries. Since 2001, diverging multifactor productivity (MFP) growth between Canada and the United States in favour of the latter largely compensated for decelerating US labour utilisation, compared with the earlier period. Canada was very close to the continental European countries in terms of MFP growth, but markedly outperformed them on labour utilisation. The United Kingdom had consistently strong MFP growth but its labour input grew almost as weakly as in the EMU countries (Table 1.1).

Strong capital formation in Canada largely reflected new investments that were complementary to rising labour inputs rather than any catch-up in capital deepening. The long period of wage moderation and exchange-rate weakness in Canada, as well as high capital taxes, are believed to have boosted the relative price of capital and inhibited capital deepening, leading to considerably lower capital intensity levels in Canada than in the United States.¹ Hence closing the productivity gap will require stronger investment rates. The recent exchange-rate appreciation, which lowers the price of imported capital goods, should start working in this direction, as should business investment tax cuts (see below).

Closing the productivity gap will likewise require higher MFP growth. Much MFP growth reflects "disembodied" technological progress leading to a more efficient use of capital and labour inputs. But the composition of capital also matters, notably pervasive ICT investments that should entail large gains in efficiency, particularly in services. With

Table 1.1. **Potential growth decomposition**¹
Average annual growth rates

	1993-2000				2001-2006			
	Canada	United States	United Kingdom	EMU-3 ²	Canada	United States	United Kingdom	EMU-3 ²
Labour productivity	1.6	1.7	2.2	1.7	1.3	2.0	2.1	1.2
MFP	0.6	0.6	1.3	0.7	0.5	0.9	1.4	0.5
Capital deepening	0.9	1.0	0.9	1.0	0.8	1.1	0.7	0.7
Labour utilisation	1.4	1.6	0.5	0.0	1.6	0.6	0.6	0.5
Hours worked per worker	-0.1	0.0	-0.3	-0.5	-0.2	-0.2	-0.5	-0.4
Potential employment	1.5	1.5	0.8	0.5	1.9	0.8	1.0	0.9
Potential growth	3.0	3.2	2.7	1.7	2.9	2.6	2.6	1.7

1. Derived from a hypothetical Cobb-Douglas production function, $Y = A \times K^\beta \times L^{1-\beta}$, where all variables are in trend terms and: Y denotes output; A, multi-factor productivity; K, total capital services; L, total hours worked in the economy (labour utilisation); and $\beta = 1/3$ for all countries.

2. France, Germany and Italy.

Source: OECD Economic Outlook No. 83 database.

the rapid decline in ICT prices, there was a tendency for firms to substitute toward these types of capital goods, especially during the late 1990s, and Canada was no exception. After 2000, however, these investments slumped, reflecting in part Canada's relative specialisation in telecom equipment, which was more severely affected by the bursting of the high-tech bubble.² Even if somewhat dated, the latest figures on the Canada-US productivity gap therefore point to a rapid widening in both computer manufacturing and non-construction services, and to a marked deterioration in the business sector as a whole (Table 1.2).

Table 1.2. **Productivity level comparisons: selected industries**
As per cent of US level

	GDP per worker		MFP	
	1995	2004	1995	2004
Primary	81	98	84	76
Mining	109	142	109	113
Construction	107	150	107	155
Manufacturing	88	58	93	66
Primary metal	116	112	120	118
Computers	128	21	185	23
Transportation	108	100	107	108
Services	62	55	65	61
Wholesale	77	62	107	90
Retail	64	60	79	73
Finance and insurance	62	59	65	67
Total business	72	63	72	66

Source: S. Rao, J. Jang and W. Wang (2006), "What factors explain the Canada-US Productivity Gap?", Industry Canada, Working Paper, No. 2006-08, Ottawa.

Narrowing labour utilisation gap thanks to female participation

The better news on labour utilisation reflects strongly expanding employment, in particular of women, in the aftermath of the early 1990s recession, helping to narrow the total hours worked gap with the United States (Box 1.1).³ Higher participation and a better

Box 1.1. Rising female participation

A continued remarkable rise in female participation lies behind the rising labour utilisation and per capita income growth since the mid-1990s, though older worker participation also increased (Table 1.3). It partly reflects cyclical factors, but also “family-friendly” reforms to tax and benefit systems (Chapter 3). Longer-term structural changes, notably increasingly educated female cohorts having career aspirations equivalent to men’s, have boosted female participation rates for the last three decades and may continue to do so for about another decade. The shifting of economic activity toward market services and public-sector employment, as elsewhere in the OECD (de-industrialisation), creates jobs for which women tend to be well suited. The fact that women with family responsibilities often prefer part-time work partly explains why the rise in hours worked has trailed that in employment, though average hours are also drifting down for full-time workers. Aggregate labour quality may have dipped insofar as new entrants’ skills and experience were lower than for the working population at large – similarly to Europe, where reforms have eased labour-market entry barriers for many low skilled workers. While such compositional shifts in the workforce are welcome, boosting per capita income growth and improving equality of opportunity, they may temporarily depress labour productivity and standard measures of MFP. Over time, as new workers are trained and gain experience, these effects should vanish.

Table 1.3. Labour force participation rates

		1990			2006		
		Canada	United States	OECD	Canada	United States	OECD
Men	25 to 54	93.1	93.4	94.2	91.1	90.6	92.1
	55 to 64	64.0	67.8	65.2	66.3	69.6	66.3
Women	25 to 54	75.5	74.0	65.6	81.3	75.5	69.8
	55 to 64	34.9	45.2	35.9	51.4	58.2	45.0
Men and Women	25 to 54	84.3	83.5	79.8	86.2	82.9	80.9
	55 to 64	49.2	55.9	50.0	58.7	63.7	55.4
Hours worked per person of working age		1 249	1 352	1 171	1 269	1 308	1 176
Hours worked per worker		1 788	1 836	1 818	1 738	1 804	1 715

Source: OECD, Labour Force Statistics database.

demographic profile (for now) represent an advantage over the United States, against a significant disadvantage in hours worked per capita due to longer vacations and more part-time work in Canada. An inverse relationship between total hours worked and productivity levels should be noted: greater participation brings more low-skill workers into the workforce, pulling down the average qualification and hence productivity; also, the greater the number of hours each person works, the less productive is each hour on average (declining marginal productivity). Therefore the US “structural” labour productivity advantage *vis-à-vis* both Europe and Canada is greater than the data suggests, and Canada’s disadvantage *vis-à-vis* Europe would be smaller.

With prime-age female participation rates by now among the highest in the OECD, there seems to be limited scope for further increases, although employment rates of women 55 and older should continue to rise over the next decade as cohorts with stronger labour force attachment enter this age group (Barnett, 2007). A key question is whether this cohort effect will sufficiently narrow the huge participation gap between prime-age and

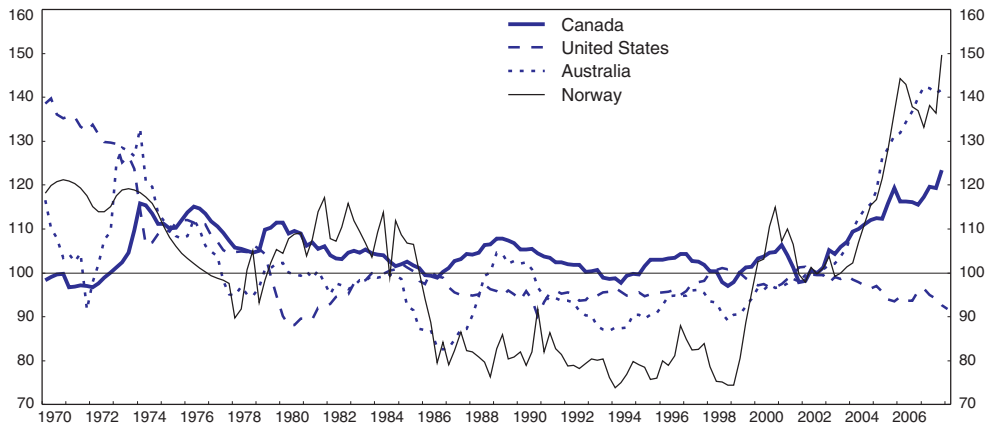
elder women. More broadly, encouraging participation by marginal groups should be a priority. The last Survey (OECD, 2006) recommended, *inter alia*, reform of the tax and benefit system to remove strong disincentives to low-wage work; this issue is taken up again in Chapter 3.

Adjusting to the global terms-of-trade shock via structural shifts


The widening productivity gap has coincided with the largest terms-of-trade shock Canada has experienced in its modern history (Figure 1.2). Even so, the magnitude of the shock is not as great as in Norway and Australia, which are more highly specialised in oil and mining, respectively (hence more vulnerable to fluctuations in corresponding commodities' prices). As already noted, this positive shock has supported rising living standards, despite the weakening of productivity growth. But the large relative price shift poses a stark medium-term adjustment challenge for Canada, both for the real economy and the fiscal accounts, especially as it is widely seen to be long lasting rather than transitory.

Figure 1.2. **Terms of trade**

Index, 2002 = 100



Source: OECD Economic Outlook No. 83 database.

StatLink  <http://dx.doi.org/10.1787/354467463078>

Commodity-price cum exchange-rate shock

The positive terms-of-trade shock has reflected Canada's generous natural-resource endowments and growing demand for raw materials and food by China and others, who were simultaneously putting downward pressure on OECD manufactured import prices (at least until 2007 when global capacity pressures came to the fore), both of which entailed a strong appreciation of the exchange rate (Chapter 2). This multiple shock has been mirrored in sharply shifting internal terms of trade in favour of the raw materials/primary and sheltered services sectors. Substantial inter-provincial migration has come about in response to large relative wage shifts. According to Sharpe *et al.* (2007), a 50% increase in the number of interprovincial migrants in Canada between 2003 and 2006 (mostly to high-productivity Alberta where oil sands reserves are being developed) has provided a one-time boost to aggregate labour productivity.

“Dutch disease?”

Specialisation in natural resources extraction involves risks. Smaller open economies in particular are vulnerable to adverse external shocks that may have dramatic economic consequences. Dutch disease describes a crowding out of the traditional tradable sector by way of an appreciating real exchange rate. Most discussions of Dutch disease highlight the need to maintain a critical mass of manufacturing as the locus of significant R&D activity in the non-renewable-resource-rich economy. If resource shifts were to occur too rapidly and go too far in terms of squeezing out the exposed non-resource sector and/or expanding the public sector, this could durably weaken productivity growth; oil reserves will eventually run out in any event. So far, there are no clear signs of Dutch disease: severe labour and skills shortages have emerged in the booming resource sector and associated wage pressure is spilling over, but only in the regional economy; lay-offs in the exposed traditional sector have been mounting but are being more than offset by job creation in the expanding sectors; and – according to administrative data – the public-sector workforce has been growing roughly in line with private employment, with little public-sector wage pressure observed (Table 1.4). Nevertheless, the risk of developing symptoms – as the oil sector grows or if disorderly unwinding of US financial imbalances were to push up the Canadian dollar further – requires close policy vigilance.

Table 1.4. General government employment and compensation

	General government employment ¹		General government compensation ²	
	2000	2006	2000	2006
Canada	19.0	19.5	22.3	22.5
France	22.5	22.6	25.7	25.0
Germany	11.6	10.7	15.1	14.3
Italy	15.4	14.5	26.6	26.2
Japan	8.4	8.3	12.1	11.8
United Kingdom	17.9	18.7	17.9	20.2
United States	14.5	14.9	15.6	17.1

1. Per cent of total employment.

2. Per cent of total economy compensation.

Source: OECD, calculations from OECD Economic Outlook No. 83 database.

Monetary and fiscal policies have been supporting the adjustment

Monetary policy faces a dilemma like in many other OECD economies, as the recent global oil price and financial system shocks imply simultaneous upward risks to inflation and downward risks to the real economy. In accordance with its inflation-targeting mandate, the Bank of Canada must counteract inflation pressures arising from the oil-price rise, having both direct and indirect (oil sector-induced) impacts, albeit for the time being largely offset by the endogenous exchange-rate appreciation. The more pressing concern, however, is to provide support to an economy that could dip into recession. Economic cooling itself will put a brake on domestic inflation momentum, yet risks remain. The credit crisis gripping financial markets this past year has presented special problems for the conduct of monetary policy, and begs many questions as to whether regulatory changes are necessary to ensure financial market stability (see Chapter 2).

Fiscal policy is at the front line of combating symptoms of Dutch disease. As the example of other OECD resource-rich economies shows, much of the real exchange-rate pressure exerted by resource wealth occurs by way of fiscal policy, as ultimate ownership is usually in public hands. Excessive public spending in the context of a budget constraint loosened by ample resource revenues and terms-of-trade-related income gains can cause the exchange rate to overshoot via the expectations channel. It may also exacerbate inflation pressures, insofar as the capacity to spend revenue windfalls is limited. This may aggravate manufacturing-sector shrinkage to an extent that is inconsistent with robust and balanced long-run growth. Expanding public-sector employment can directly undermine growth dynamics by crowding out private market services.⁴ Conversely, fiscal policy that ensures a predictable and prudent phasing in of resource revenues would act to stabilise the real economy, inflation and the exchange rate.

Canada's fiscal policy has been by and large exemplary and has thereby contributed to good economic performance since 1993. Spurred by its earlier budget crisis, it is the only G7 country to have cut public spending and debt to any significant extent. A major challenge will now be to maintain budget discipline despite greater resource-related rents and cyclical slowing: future budgets remain exposed to volatility in commodity prices and, eventually, an erosion of the resource tax base. The government's commitment to curtailing federal spending will be important (see Box 1.3 below). Looming ageing-related liabilities, reflecting mainly future health-care costs falling within the purview of the provinces, who own most of the nation's natural resources, must also be tackled and this will partly depend on well-functioning fiscal federal relations. Chapter 2 takes up the discussion of these challenges.

Closing the productivity gap via physical and human capital investments

There is a strong political commitment in Canada to building a more dynamic economy to best withstand the twin structural challenges of global competition and population ageing (see Box 1.3 below). This will require action to close the productivity gap vis-à-vis the United States and, more significantly, to arrest any tendency for a future widening because of worse demographics or competitive disadvantages in Canada. At the same time, Canada's vaunted "quality of life" advantage should be safeguarded.

Ageing puts a premium on productivity growth

As is well known, slower workforce growth and a rising proportion of dependent retirees is projected over the next few decades (Table 1.5), and the transition has already begun to set in as the oldest baby boomers enter their 60s. For the moment, Canada is benefiting from the ageing of its workforce, more so than the United States, as its median worker gains in education and experience. Eventually, though, demographics will turn to Canada's disadvantage as the median worker passes his peak and the ranks of the retired swell and, absent a sharp productivity growth pick-up, per capita income will likely decelerate. While Canada's ageing problem is not among the most dramatic in the OECD, it is more serious than in the United States, even with Canada's higher immigration inflows.

It may be difficult to elicit continuing rises in total hours worked in order to temper the slow-moving ageing shock. There is scope for boosting participation rates of older workers (OECD, 2005), which could boost supply more than proportionately thanks to a fast-rising share of older workers in the working-age population. However, welfare costs and possibly diminishing returns to extra years of work (like extra hours) need to be considered. The

Table 1.5. Impact of ageing on baseline growth
Annual average growth rates

	Potential employment	Potential labour productivity	Potential GDP	GDP per capita	Memo: Working age population ¹	Memo: Total population ¹
2008-09 ²	1.4	1.4	2.8	1.9	0.9	0.8
2010-14 ²	0.6	1.4	2.0	1.2	0.5	0.8
2015-30 ³	-0.1	1.5	1.4	0.7	0.1	0.7
2031-55 ³	-0.1	1.5	1.4	1.0	0.2	0.4

1. Medium fertility, life expectancy and immigration scenario (Statistics Canada).

2. OECD medium-term baseline.

3. After 2014, assumes: i) no change in participation rates by age group, hence labour force growth reflects only changing size and age structure of workforce; ii) no change in structural unemployment rate (at 6%) or average working hours, hence potential employment growth equals labour force growth; and iii) no change in trend productivity growth (at 1.5%).

Source: Statistics Canada; OECD, MTB83 database; and OECD (2005), *Ageing and Employment Policies: Canada*, Paris.

ongoing structural shift could also induce more early retirements by downsizing firms in the exposed sector, at least for a time. Canada's best way forward would be to boost labour productivity in order to maintain rising prosperity and welfare. Policies will therefore need to focus on ways to move Canada toward the technology frontier.

Competition is key

It may be argued that the less the regulatory interference with market forces and the more discipline that domestic and global competition and financial-market oversight can exert, the more likely it is that Canadian entrepreneurs will seize on global technologies that are there for the taking. Indeed, many factors likely to be related to productivity growth – ICT output and penetration, human-capital formation, managerial skills and effort, firm growth, international orientation – flourish under the pressure of competition (Box 1.2).

Taxes (not only regulations) distort competition and impede growth

Canada's tax-to-GDP ratio has recently been reduced in the context of strong budget surpluses, and it is comfortably below the OECD average. However certain systemic features still promote inefficiencies. The marginal effective tax rate (METR) on new business investment, the OECD's highest just a few years ago, has been and will continue to be substantially reduced by major corporate income tax cuts and the elimination of provincial general capital taxes (Figure 1.3). According to legislated reductions, Canada's METR will be the lowest in the G7 by 2010. The METR will likely remain above the OECD average, however, which partly reflects sales taxes on capital inputs levied by some provinces. Significant tax breaks to "traditional" sectors like manufacturing and natural resources also keep statutory rates higher than otherwise, while discriminating against services like telecommunications, retail distribution and finance. This may seem at odds with rigid regulatory protections in such sheltered sectors but leads to the same end result: large productivity shortfalls *vis-à-vis* the United States. There has also been generous tax relief to small firms, which may impede their growing to more efficient size. High taxes on capital furthermore reduce Canada's international desirability as a place to do business and stifle competition. By impeding productivity-enhancing investments, they have negative impacts on real wages of workers. Taxes on labour also adversely affect growth directly. The link between past marginal tax rate cuts and rising female participation is a positive example. But Canada's top marginal tax

Box 1.2. Factors possibly explaining the productivity gap vis-à-vis the United States

There is widespread agreement in Canada that a significant (if imperfectly measured) productivity gap has opened up with the United States, and it is widening. A falling behind in Canada's living standards could put it at a disadvantage in intense North American and global competition for human skills and investment capital (Rao *et al.*, 2006). It is thus important to ascertain the main causes of the growing gap and to take policy actions to address them.

ICT diffusion and service-sector competition

Flaccid product-market competition appears to be a key reason for the ICT gap. Regulations, especially in ICT-using sectors, have prevented the diffusion of new technologies throughout the economy, pushing countries like Canada further away from the expanding US technology frontier (Conway and Nicoletti, 2007). In Canada, restrictions on competition remain in sectors such as electricity, rail transport, postal services, retail distribution and professional services. In the latter two sectors, regulations appear more restrictive of competition than in almost any other OECD country (OECD, 2008). Retail seems a particularly large missed opportunity for productivity gains through the implementation of ICT. Even if the more local nature of the Canadian markets due to population dispersion may also be a relevant factor, as some authors have emphasised, ICT could be expected to help with problems of this nature as well. It has also been suggested that Canada's ICT investments failed to translate into subsequent efficiency enhancements (MFP) to the same extent as in the United States because of insufficient personnel training and organisational change that need to accompany them (Dion and Fay, 2008); while this seems plausible, empirical evidence for a significant ICT investment-MFP link in Canada has not been established (Rao *et al.*, 2006).

Technical and managerial skills

Studies have found that less educated managers are less receptive to innovation or poorly skilled at formulating and implementing business plans that tap into export opportunities, and they may not see as much benefit in training their workers or in hiring better educated staff (Dion and Fay, 2008). A relative underproduction of post-graduate degrees, in particular MBAs, is often seen as a barrier to improving Canada's productivity growth and competitiveness, yet demand is strong and the capacity to provide such degrees should be expanded (Institute for Competitiveness and Prosperity, 2008). However, mere qualifications are not enough – management and worker effort also matters, and what stimulates effort is competition and/or financial-market and shareholder oversight. Canada also has a sizeable relative deficit in PhD degrees that it will need to address. A solid domestic core of technical skills in areas like mathematics, science and engineering has been found by the OECD to matter to a country's receptivity and ability to absorb technical knowledge from abroad, as do research-business links. Canada's high ranking in global comparisons of performance among research-intensive universities indicates a strong base upon which to build such a technological advantage (Institute for Competitiveness and Prosperity, 2008).

Firm size

Small firms are typically less productive than large firms, but Canada has more of them (92% and 87% of firms in Canada and the United States, respectively, have less than 20 workers), while the small-large productivity gap is larger in Canada, at least in manufacturing. As much of the economic growth process should come about by firms growing to larger size via healthy firm dynamics, the question of what keeps Canadian firms small is apt. Financial system inefficiency, costs of technology adoption and taxes have been proposed as causes. However, Kluyev (2008) demonstrates that small firms are generally able to get adequate financing in Canada, while at least one survey shows that technology adoption costs are at least as high in the United States (Baldwin and Gu, 2005). This leaves a discriminatory tax regime as possibly a key factor keeping the share of small firms inefficiently high in Canada (see Chapter 3). A lack of managerial quality (above) may also contribute to keeping firms small and less productive (Dion and Fay, 2008).

Box 1.2. Factors possibly explaining the productivity gap vis-à-vis the United States (cont.)**Export exposure in manufacturing**

Even if only firms that are highly productive in the first place can gain an initial foothold in foreign markets, exposure to international competition through exporting transmits ideas and knowledge, thereby further stimulating their productivity. Past trade liberalisations have imparted major productivity gains (notably the Canada-US FTA and NAFTA). Unlike the sheltered services sectors, trade-exposed firms in manufacturing must continuously innovate in order to survive. The exposed sector is a lightning rod for productivity-enhancing R&D, not only because of competition pressures but also access to global markets, which allows expansion of scale and hence the spreading of the fixed costs and investment risks associated with innovation. Indeed, in a number of heavily trading manufacturing sub-sectors, *e.g.* automobiles and primary metals, Canadian firms are more productive than their US counterparts (Table 1.2). The sector must now adjust to the exchange-rate appreciation shock by moving up the value-added chain, but its ability to do so may be hampered by weaknesses in the innovation framework and still high business taxation.

FDI flows and multinational orientation

Foreign controlled plants are more R&D intensive, innovative and productive than their domestically owned counterparts, even after controlling for other factors like size and capital intensity. These advantages arise from the multinational orientation of their parents, not foreign ownership *per se*. Thus, Canadian plants belonging to Canadian owned multinationals are as productive as foreign controlled plants, *i.e.* more innovative and R&D-intensive than non-multinationals (Dion and Fay, 2008). This suggests that FDI flows in both directions are equally important for exposure to international best practice and knowledge, including management skills. Once combined with vigorous competition, even the domestic rivals of multinationals benefit from learning effects. Canada has seen a strong increase in FDI outflows and inflows in recent years. Even so, relatively high barriers to FDI suggest further scope for productivity enhancements (OECD, 2008). According to some researchers, even though Canada has a good track record in developing global leaders, it has lost ground in major sectors such as telecommunications, being possibly ill-served by high business taxation, a lack of financial-sector dynamism including in the area of venture capital, and deficient management skills (Institute for Competitiveness and Prosperity, 2008).

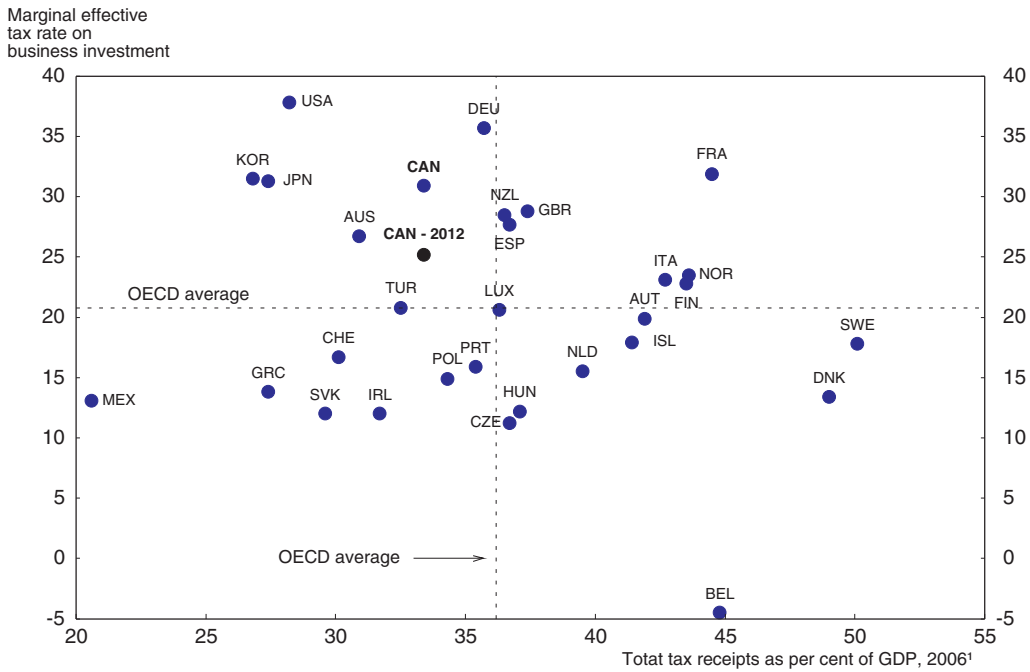
rates on personal income still rank high on the OECD scale. They reduce the return to savings, education and innovation – preconditions for capital accumulation and MFP growth. Taxes on consumption are among the least distortive, as they do not affect inter-temporal choices, but they could still play a larger role in Canada (see Chapter 3).

The tax system also assures a more equitable income distribution, which is important, since relative income has been found to play a stronger role in people's perceived "happiness" than material wealth *per se* (above a certain minimum). The Canadian and US tax systems are relatively more important tools of redistribution than in Scandinavia, or in other parts of Europe, where there is a much greater reliance on (taxed) transfers, so that among those countries where government is smaller taxes are, perhaps surprisingly, more progressive (Table 1.6). In Canada, sharply rising effective tax rates have followed from the growth of income-tested family supports to those on low incomes. This perversely discourages work and may create welfare dependency, making it harder to meet the challenges of ageing and structural shifts. Upper income groups for their part have benefited from alleviated taxes on personal capital income, ostensibly for efficiency reasons, but this has tended to supplement the rising inequality of market incomes.

Although inequality often rises during periods of structural change such as the present (since technological progress and globalisation are putting a high premium on

Figure 1.3. **Effective tax rate on capital vs. total taxes**

Per cent, 2007



1. Provisional.

Source: J. Mintz (2007), Tax Competitiveness Report: A Call for Comprehensive Tax Reform, C.D. Howe Institute Commentary, No. 254, September; D. Chen (2007), “Flaherty’s Missed Opportunity”, C.D. Howe Institute e-brief, December; and OECD (2007), Revenue Statistics database.

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Table 1.6. **Income inequality and the tax/transfer systems in selected OECD countries**

Late 1990s

	Gini coefficient		% reduction of Gini	of which, due to:	
	Market income	Disposable income		Transfers (%)	Taxes (%)
Sweden	0.375	0.238	36.5	38.0	-2.4
Denmark	0.345	0.237	31.3	32.5	-0.1
Canada	0.390	0.298	23.6	17.9	6.9
United States	0.436	0.363	16.7	7.9	9.6

Source: Pontusson (2005), *Inequality and Prosperity: Social Europe vs. Liberal America*, Cornell University Press.

skills), this does not necessarily imply more poverty, as Canada’s experience proves. Canada also continues to enjoy much better intergenerational income mobility than for instance the United States or France.⁵ However, low or negative returns to paid work for vulnerable groups – notably Aboriginals, the disabled, high-school drop-outs, new immigrants, lone parents and unattached persons aged 45-64 – can keep them in relative poverty over a lifetime, and prevent important virtuous cycles for the economy as a whole from getting underway (Institute for Competitiveness and Prosperity, 2007). A major challenge is to resolve such difficult efficiency-equity dilemmas, and Chapter 3 discusses tax reforms within such an optic.

Assuring sustainable high performance: key roles for the agriculture and energy sector

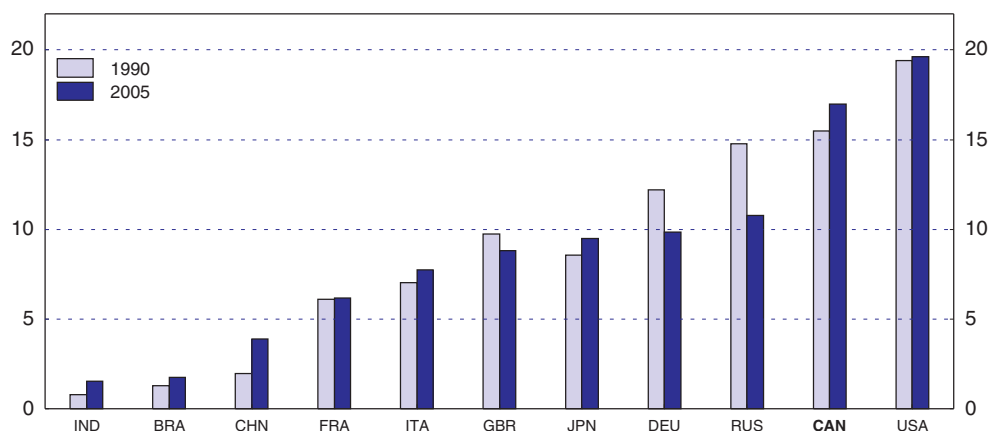
Looking ahead, once Canada adapts successfully to the present shocks, it will face the far greater challenge of climate change, now being aggravated by rapid, even if highly desirable, global growth. The associated catastrophe scenarios are well known, and it is in Canada's long-run interests to take early action as part of a global effort to avert the materialisation of these risks. Globalisation also brings with it fast rising incomes and demand for higher quality and quantity of food, while bio-fuels to address climate change have restricted food supply. Hence, food commodity prices are increasing almost in tandem with oil, and global food security is becoming an issue. With its vast fertile territory, Canada is already a major world food supplier; supply management, however, limits productive capacity while denying market access for poor nations.

Sustainable development of the energy sector


Oil sands are ample – the second largest proven underground oil reserves in the world after Saudi Arabia's – yet expensive to extract and, worse, highly polluting in terms of carbon dioxide and other toxic emissions.⁶ Developing oil sands to their full potential without jeopardising environmental targets, not just with respect to greenhouse gas (GHG) emissions but also water conservation, will almost certainly require technologies to curb emissions that do not yet exist. OECD countries are discussing market-based mechanisms to provide strong incentives to develop new technologies that help to solve this puzzle. The Canadian government is likewise planning emissions permit trading to help make up for ground lost in the aftermath of Kyoto. However, unlike other countries, it is now targeting the emissions “intensity” of production rather than setting fixed emission caps. Canada's starting point is poor (Figure 1.4), though, and its dynamics worse. Exploiting plentiful energy resources while fulfilling environmental commitments may be Canada's top long-term challenge.

Sustainability may also hinge on how fairly resource wealth is distributed. By constitutional right, provinces own most natural resources and have the power to raise fiscal revenues that such ownership entails. However, very unequal economic development between Alberta and the rest of the country is straining the federation. The government subsidises the energy sector, thereby exacerbating regional divergences, and

Figure 1.4. **Emissions per capita**
Tonnes of CO₂ per capita



Source: International Energy Agency, *CO₂ emissions from fuel combustion, 1971-2005*, 2007 Edition.

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then provides equalisation payments to below-average regions – a form of inefficient fiscal churning. On present trends, provinces with 80% of the population may before long be receiving equalisation payments as the national fiscal standard is steadily lifted by a few high growth provinces. “Have-not” provinces are prone to demanding discretionary federal transfers (McKenzie, 2005).

A key role in this drama belongs to Alberta itself. With 3½ million people and 20% of provincial output coming from petroleum, Alberta’s challenge is not too dissimilar from Norway’s (4½ million people and 25% share of petroleum in GDP) – a huge resource wealth sitting on a relatively small ownership base. Norway has shown the way with a rules-based allocation of its oil revenues into a foreign asset savings fund, allowing smoothed withdrawals of income to stabilise both the budget and the economy in the short, long and very long runs. A key budgetary principle is that resource revenue is simply a transformation of wealth in the ground to wealth in the bank (rather than current revenue), belonging to all generations of Norwegians alike. Alberta, however, lacks such a meaningful fiscal anchor, having only a variety of discretionary funds in which to park unspent oil revenues. Yet over the longer term, its budget position may be challenged: conventional reserves of crude oil and natural gas are falling rapidly, while the transition to less profitable sources like oil sands may result in lower revenue and the costs of climate change policies are unknown (Busby, 2008).

Chapter 4 will develop these issues in depth and recommend policies for sustainable energy development, notably market signals to encourage efficiency and innovation, more sustainable fiscal interventions for the energy sector, and coherent energy-environmental regulations.

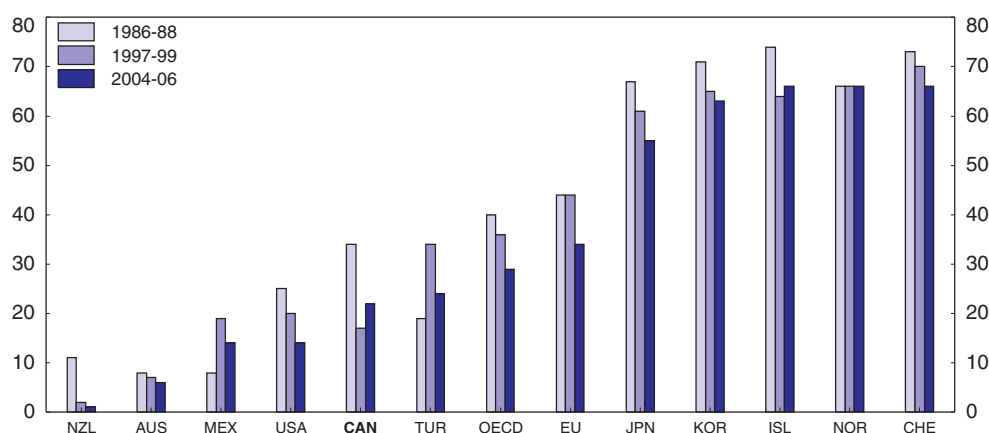
Liberalising agriculture

The agricultural sector is small in absolute terms, some 2.5% of GDP, but large for a G7 country. It is relatively productive thanks to capital and land intensity, so that its employment share is only about 2½ per cent as well. There has been notable longer-term progress in paring back government support to agriculture, although the same holds for most other OECD countries, and there has been some backtracking in recent years, contrary to elsewhere (Figure 1.5). New Zealand and Australia have significantly more liberalised agricultural sectors and could provide useful benchmarks for Canada.

The dairy and poultry sectors remain heavily protected from market forces, with quotas on domestic production imposed to maintain high prices. Prices for dairy, eggs and poultry are consequently two to three times higher than in the United States. This reduces Canadians’ welfare, and in a regressive way, since food claims a much larger proportion of poor households’ budgets. However, complaints from consumer groups are few. There also seems to be an arguably perverse effect on the structure of the sector overall, as lucrative quotas have induced a process of consolidation of small farms into large agri-businesses, displacing many farmers.

Farm activity may reduce biodiversity and lead to trend increases in pesticide use, with adverse ecological effects. Indeed, Canada’s agricultural sector as a whole may be neglecting organic farming precisely because the weakness of market forces provides insufficient incentives. Subsidies also diminish the incentive to be parsimonious in the use of scarce water and polluting energy. But, most importantly, Canada’s government policies – like those elsewhere – are inappropriately encouraging grain producers to shift to producing ethanol, driving up food prices with little, if any, pay-off in GHG emissions if the full production life-cycle is taken into account (Chapter 4).

Figure 1.5. **Producer support estimate**
Percentage PSE



Source: OECD, PSE/CSE database 2007.

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Farmers in other sectors like grains and meat have clamoured for opportunities to sell their output abroad, as they are highly productive and competitive. However, the process of liberalising grain export marketing has been slow, with strong vested interests in the current arrangements. Producer interests along with general consumer apathy make further agricultural reform politically difficult, and a key challenge may be to promote better advocacy of the benefits of reform. Chapter 5 looks into ways to put agriculture on a more sustainable footing, namely by dismantling irrational protection to unleash the sector's latent potential, with beneficial consequences for trade, output and consumer welfare.

The reform agenda

Canada is a top OECD performer and has done remarkably well in boosting female employment, reducing unemployment, avoiding Dutch disease, and cutting the debt and tax burdens. Recent macroeconomic performance has been strong, and Canada is weathering the global financial crisis and slowdown as well as can be expected. The federal government's structural policy agenda, which has been progressively implemented, reveals the ambition to secure Canada's global pre-eminence long into the future by focussing government's activities on what it does best, unleashing market competition, and upgrading the nation's human capital, environmental and public infrastructure endowments (Box 1.3). Yet, there are areas where it could do even better in order to ensure that its good performance can be maintained and that it will be resilient to future shocks. Based on the identification of Canada's main structural policy challenges in this chapter, policies needing further reform relate to: competition; budget matters; taxation; the environment and energy production; and agricultural support. Reforms in these areas will no doubt be mutually reinforcing. Eliminating tax non-neutralities so as to create a level playing field is a critical complement to more competitive and open markets. Strengthened competition, in tandem with tax reform, would help the manufacturing sector to adjust to worsened terms of trade by moving up the value-added chain. Sustainable growth of the energy sector and control of Dutch disease effects via a foreign asset fund for commodity revenues would likewise provide a strong budget buffer to face imminent ageing costs.

Box 1.3. **Advantage Canada**

Advantage Canada (Department of Finance, 2006) is the government's multi-year economic strategy document. It espouses the important principles of: improving government efficiency and accountability; improving incentives for people to study and work productively; stimulating innovation, a clean environment and modern public infrastructure, including via partnerships with the provinces and private sector in each of these areas; and freeing up businesses to grow and succeed on a global scale. These principles are geared to developing Canada's competitive advantages in a fast changing global economy and with an ageing population, while anchored in Canada's inherent strengths. Their faithful implementation should thus assure steadily rising living standards and quality of life for all Canadians.

These principles have strongly shaped the last three federal budgets and accompanying structural policy initiatives, evidence of a largely unwavering political will for reforms. The policy focus is on five main "advantages":

- *Tax advantage – reduce taxes for all Canadians and improve business tax competitiveness.* The government will deliver on its commitment to reduce the goods and services tax (GST) rate to 5%. It will reduce taxes on savings, including capital gains, to make them more competitive with tax treatment of savings in other countries. It will establish the lowest tax rate on new business investment in the G7. The government will help low-income Canadians over the "welfare wall" by implementing a Working Income Tax Benefit and continue to reduce personal income taxes to make the tax system fairer so as to attract and retain high skilled workers.
- *Fiscal advantage – eliminate Canada's total government net debt within 25 years.* The government will show leadership by reducing the federal debt to 25% of GDP by 2012-13 (now advanced to 2011-12). It will dedicate all interest savings from federal debt reduction to ongoing personal income tax reductions, and use unanticipated surpluses to accelerate debt and personal income tax reductions. The federal government will also keep the rate of growth of public spending, on average, below the rate of growth of the economy, and introduce a new Expenditure Management System designed to ensure that spending is well focused and provides value for money. The government will limit federal spending power, restore fiscal balance through stable and principle-based arrangements with provinces and territories, and strengthen the economic union. Low inflation will be maintained.
- *Entrepreneurial advantage – reduce unnecessary regulation and red tape and lower taxes to unlock business investment; create a more competitive environment to spur businesses and benefit consumers.* The government will cut the administrative (paperwork) burden on business by 20% and consider a principle-based legislative framework to guide regulators. It will improve the framework for competition by implementing modern competition policies and effective rules and regulations, and ensure a leading edge financial system. Canada will be open to trade and foreign investments and the government will provide leadership to ensure competitive open markets within Canada's borders as well.
- *Knowledge advantage – create the best-educated, most skilled and most flexible workforce in the world.* Policies – including immigration policies – will aim to increase participation in the labour market and improve labour mobility across Canada. Workers' skills will be enhanced through post-secondary education and training. Canada will likewise retain its leadership among the G7 for public-sector research while maximising value by better focus and increased linkages with the private sector.
- *Infrastructure advantage – create a modern, world-class infrastructure.* The government will work toward a comprehensive plan for infrastructure – including gateways to foreign markets and border crossings – that will include long-term predictable funding and greater use of public-private partnerships. It will also create a healthier environment and more sustainable economic growth including through responsible use of its natural resources and effective use of regulation, market-based instruments and technology.

Competition policies were already treated comprehensively in the 2004 *Survey* and recommendations have been updated regularly in the OECD's annual *Going for Growth* publication, which are summarised along with other policy updates in Annex 1.A1. Hence, this report treats the other four issues in detail in each of the following chapters.

Notes

1. There is some debate about the actual extent of the capital underinvestment problem. Baldwin *et al.* (2005), for example, demonstrate that applying (lower) US capital depreciation rates to Canadian data (especially for engineering structures and buildings) essentially equalises capital intensities across the two countries.
2. By 2006, new ICT investment per overall economy worker by the United States was almost double that for Canada. The US per worker advantage in machinery, equipment and software investment was much smaller, at about 30%, compared with only 10% in 1981 (Institute for Competitiveness and Prosperity, 2008).
3. As with capital intensity, there seem to be US-Canada comparability problems with hours worked data. Maynard (2007) estimates that by harmonising measurement methods for average hours worked per job, half of the US-Canada productivity gap would vanish.
4. In some countries, resource windfalls and heavy social transfers may have dulled incentives to work, study and innovate, leaving the country worse off. The ample literature on the "resource curse" discusses the historical prevalence of such impoverishing effects, which are more severe where governance is weak.
5. In Canada, only 20% of parental earnings advantage is passed on to children, a rate similar to that found in Scandinavian countries. In the United States, the United Kingdom and France, on the other hand, 40 to 50% of the advantage is passed on. See Institute for Competitiveness and Prosperity (2007).
6. Recently revised US regulations may prohibit government imports of oil produced from oil sands due to its life cycle greenhouse gas emissions, putting further pressure on Canada to improve the technology.

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ANNEX 1.A1

Progress in structural reform

This annex reviews action taken on recommendations from previous *Surveys*. Recommendations that are new in this *Survey* are listed in the relevant chapter.

Recommendations	Action taken since the previous <i>Survey</i> (June 2006)
Business taxation	
Abolish capital taxes as rapidly as possible.	The federal government abolished its capital tax and introduced a financial incentive to encourage provinces to eliminate theirs. All provinces plan to eliminate their general capital taxes by 1 July 2012.
Switch from provincial sales taxes to value-added taxes.	In Budgets 2007 and 2008, the federal government announced its willingness to work with the 5 provinces that still have retail sales taxes to facilitate the transition to provincial value-added taxes harmonised with the federal GST.
Undertake more comprehensive tax reform that broadens the corporate tax base, and treat all businesses equally.	The focus has been on broad-based business tax relief (<i>e.g.</i> elimination of the surtax and capital tax, and reductions in the general corporate tax rate). Some base-broadening and neutrality-enhancing initiatives have also been implemented, notably the phase-out of accelerated CCA for general investment in oil-sands projects, changes to the tax treatment of publicly traded flow-through entities, better alignment of CCA rates with the useful life of assets and a 75% reduction in the differential between federal statutory corporate income tax for small and large firms by 2012.
Product market competition	
Further improve the competition legislation framework.	The Competition Policy Review Panel created in July 2007 is examining the <i>Competition Act</i> , the <i>Investment Canada Act</i> and Canada's sectoral restrictions on foreign direct investment. The Panel will report by July 2008.
Lift restrictions on foreign direct investment in airlines, telecommunications and broadcasting.	See above.
Minimise use of industrial subsidies, and scale back business assistance programmes to those that address a real market failure, ensuring that they do so at minimum economic cost.	Canada is emphasising better collaboration between public research institutions and the private sector to improve commercialisation outcomes and provide targeted innovation assistance for businesses as part of its strategy, <i>Mobilising Science and Technology to Canada's Advantage</i> , released in May 2007.
Financial markets	
Lift the constraints on ownership concentration, remove the need for political approval of bank mergers and ease the specific rules on foreign bank entry.	The equity thresholds that trigger the wide ownership rules were raised from \$1 billion to \$2 billion for medium-sized banks and from \$5 billion to \$8 billion for large banks. Amendments to the <i>Bank Act</i> were made in March 2007 to remove near banks from the foreign bank entry framework.
Work toward a single securities regulator.	The federal government has established an Expert Panel on Securities Regulation to advise by the end of 2008 on ways to enhance the effectiveness, content and structure of securities regulation.

Recommendations	Action taken since the previous <i>Survey</i> (June 2006)
Innovation	
Develop a clearly articulated and integrated national science and technology policy and a priority-setting framework.	In May 2007 Canada announced a new S&T strategy, Mobilising Science and Technology to Canada's Advantage, which is based on four core principles: promoting world-class excellence, focussing on priorities, encouraging partnerships, and enhancing accountability.
Examine whether the efficiency of the SR&ED tax credits might be improved.	Changes to the phase-out limits for access to the enhanced SR&ED benefits for small businesses in the 2008 budget will reduce the disincentive to growth.
Eliminate the federal and provincial tax credits for investments in Labour-Sponsored Venture Capital Corporations.	Ontario proposed to complete the phase-out of its tax credit for Labour-Sponsored Investment Funds by 2012.
Fiscal policy and fiscal federalism	
Pursue efforts for provinces to grant cities more autonomy to finance their spending responsibilities.	The 2007 <i>City of Toronto Act</i> provides the city new powers and more autonomy to pass bylaws and broad authority to manage its financial affairs, including limited authority to undertake "tax increment financing" and permissive authority to raise new taxes except in prohibited areas (<i>e.g.</i> income tax, general sales tax).
Clarify the treatment of non-renewable resource revenues in the equalisation formula, and ensure an equitable treatment among provinces.	A new Equalization formula was legislated until 2013-14 with 50% (or full) exclusion of resource revenues, ensuring incentives for resource development. Equalization payments are capped to ensure that the post-equalisation fiscal capacity of a receiving province does not exceed that of any non-receiving province.
Social and labour-market policies	
Ban contractual mandatory retirement.	With the exception of the federal jurisdiction and New Brunswick, all jurisdictions have now passed legislation to prohibit mandatory retirement.
Adopt a more rigorous system of evaluation of ALMPs. Make ALMPs more effective.	Summative evaluations of Employment Benefits and Support Measures (EBSMs) in 7 provinces and territories have been completed.
Improve co-ordination between federal and provincial assistance programmes to reduce claw-back rates.	Budget 2007 introduced the Working Income Tax Benefit (WITB) to lower the welfare wall. Work with provinces and territories is ongoing to ensure that the WITB works well with provincial and territorial income support programmes.
Extend health benefits for people exiting social assistance for employment or until employer health benefits are available.	A number of provinces already have programmes extending partial or full health benefits to those leaving social assistance and/or their children. In 2007 Manitoba announced such measures would be implemented as part of its Rewarding Work initiative.
Continue developing better procedures for assessing and recognising foreign credentials and tailor training programmes to improve immigrants' low levels of literacy and fluency in Canada's official languages.	The Office of Literacy and Essential Skills (OLES) was created in April 2007 to improve the literacy and essential skills levels of all Canadians. As of 31 March, 2008, the Foreign Credential Recognition Program (FCRP) had undertaken 97 projects (61 completed and 36 in progress). And the Foreign Credentials Referral Office (FCRO) was launched on 24 May 2007.
Remove the differential treatment for public funding of for-profit and non-profit childcare in provinces where such differentials still exist.	No known actions taken.
Make current adjustment to CPP actuarially neutral for workers between 60 and 65, relax restrictions on rights' accumulation and eliminate the stop-work clause.	No action taken. The next triennial Canadian Pension Plan (CPP) review by Ministers of Finance to examine whether changes need to be made to the CPP to reflect longer working lives will take place over the course of 2008.
Introduce employer experience rating into unemployment insurance, or scale back access to unemployment insurance for seasonal and temporary workers.	The 2008 federal budget proposed the creation of an independent Crown Corporation to ensure that EI premiums are dedicated exclusively to the EI programme.
Give greater incentives for physicians and hospitals to enhance efficiency by modifying funding mechanisms.	Provinces and territories have undertaken a number of initiatives in the area of physician and hospital funding, such as increased use of alternative payment plans for physicians and activity-based allocation of new funds for Ontario hospitals.
Extend health insurance coverage to home care and catastrophic drug costs.	Provinces, territories and federal government departments have a variety of programmes that provide home-care services and coverage for drug costs.
Clarify role of private health insurance.	Provinces and territories are responsible for this area and have a variety of provisions in their legislation. For example, in response to a Supreme Court decision, the Province of Quebec has implemented Bill 33 to establish rules for private insurance in certain limited circumstances.

Chapter 2

Macroeconomic policies for the end of a boom cycle

Canada's economy has greatly benefited from the commodity boom of the past few years, though the resulting exchange-rate appreciation has put strains on the central regions that have a more balanced economic base. But the economy has proven flexible and has entered the current phase of global economic turmoil from an enviable position. Despite an expected slowdown in 2008, the economy is expected to rebound in 2009 and emerge from the credit crisis relatively unscathed. The baseline projection calls for growth well above recession territory – even if below potential rates – for both 2008 and 2009. Looking further ahead, there are significant risks to the Canadian economy from worldwide adjustments to the large global current account imbalances that have been building for some time, particularly in the United States. Nevertheless, weathering short- and medium-term macroeconomic tempests should not detract policymakers from longer-term structural issues identified in past Surveys. Recent experience in credit markets harbours lessons that the central bank and financial-market regulators can use to strengthen financial-system efficiency, stability and transparency. And the coming wave of baby-boomer retirements calls for fiscal policymakers to improve expenditure controls, accelerate debt reimbursement and put more of current resource revenues aside to help prepare for the fiscal implications of demographic change.

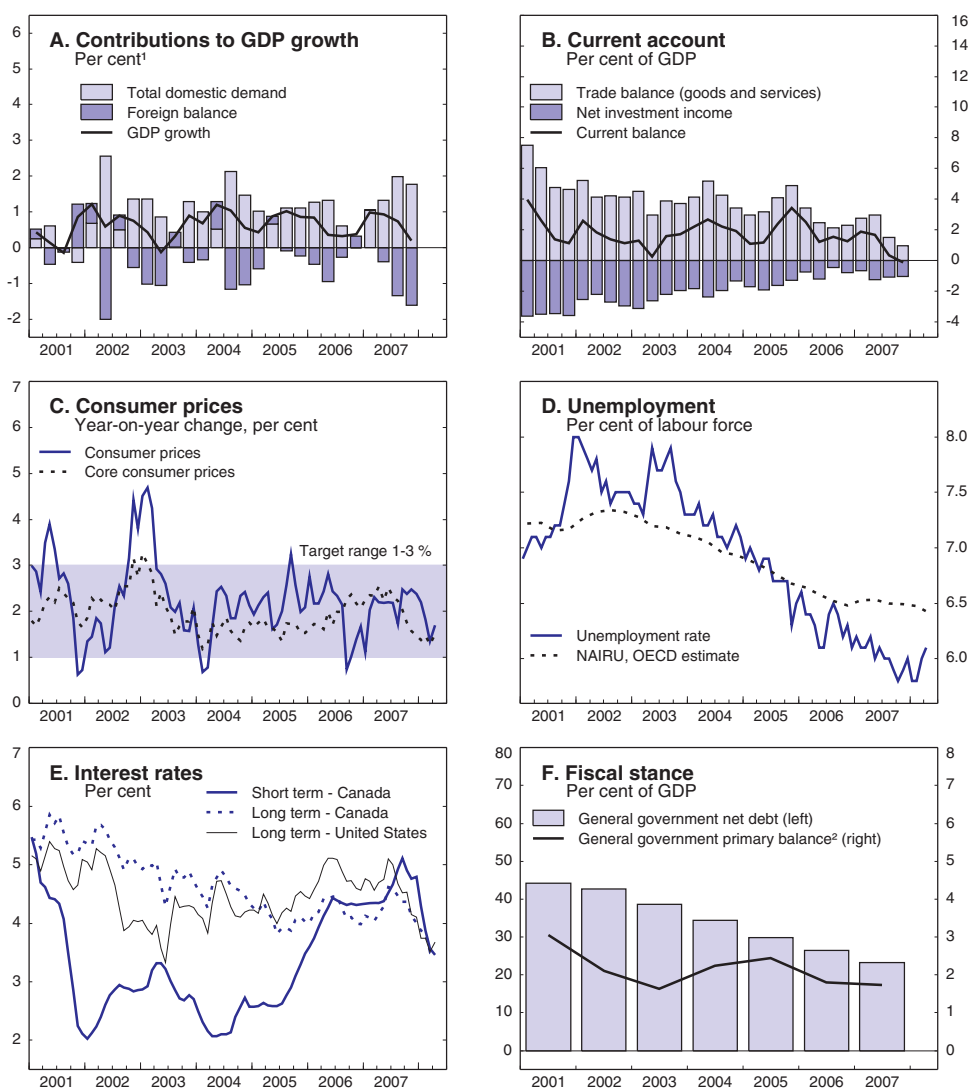
Since the turn of the century, Canada has benefited from strong demand for its natural resources and a sound policy framework, and its economy has performed remarkably well. Large relative price changes related to the commodity boom have provoked a substantial reallocation of labour and other resources from declining to expanding sectors and regions, but the economy has proven flexible and the labour market has coped well. Real GDP growth has been robust, employment gains have been impressive, the unemployment rate has fallen to its lowest level in a generation, and positive terms-of-trade effects have combined with real per capita output growth to boost Canadian living standards significantly. Benefiting from the buoyant economy and the strong financial position of both the corporate and household sectors, the federal and most provincial and territorial governments have achieved budgetary surpluses and have been able to offer taxpayers a combination of tax relief, debt repayment and higher-than-anticipated spending. The Bank of Canada has skilfully kept inflation close to the official target. In the short term, macroeconomic risks are on the downside and stem from the deflating housing-market bubble in the United States and associated worldwide turmoil in credit markets. The Canadian economy slowed as from the last quarter of 2007 in response to these negative shocks, mainly through a sharp drop in its external balance. The baseline outlook calls for modest growth in 2008 but a rebound toward potential growth in 2009.

The economic situation and outlook: a period of heightened risk

Recent developments: a possible end to the lengthy expansion


Canada's economy is winding down from one of the strongest periods of economic growth in its history. The year 2007 was the sixteenth consecutive year in which the economy expanded. Over the past decade, real GDP growth has averaged more than 3% per annum, though it has recently slowed to 2.8% in 2006 and 2.7% in 2007, slightly below the OECD average (Figure 2.1). A buoyant global economy has been behind much of this strength. Robust world-wide growth has pushed up commodity prices significantly, an effect compounded by supply constraints for agricultural commodities, base metals and crude oil. As Canada is an important commodity producer and exporter, these external shocks have increased the value of goods produced in Canada considerably. At the same time, the emergence of China as a manufacturing superpower has put downward pressure on the price of many of the goods Canada imports (Francis, 2007; Pain *et al.*, 2006). The terms of trade have thus risen by approximately 20% since 2002 (Figure 2.2). The Canadian dollar has responded by appreciating to around – and briefly well beyond – parity with the US dollar, thereby magnifying and spreading the terms-of-trade gains to the whole economy. Taken together, these effects have added significantly to national income and boosted domestic demand, which has been the main driver of economic growth in recent years (Macdonald, 2008). The combination of strong economic growth and terms-of-trade gains has led to a significant improvement in Canadian living standards, as exemplified by the steady rise in so-called “command GDP”, a measure of economic output that adjusts for terms-of-trade changes by deflating exports by import prices. Accordingly, real income per capita has risen by over 20% since 2002.

Figure 2.1. Macroeconomic performance



1. The sum of the contributions does not equal GDP growth because the data are chained-linked and the statistical discrepancy is not included.
2. Cyclically adjusted as per cent of potential GDP.

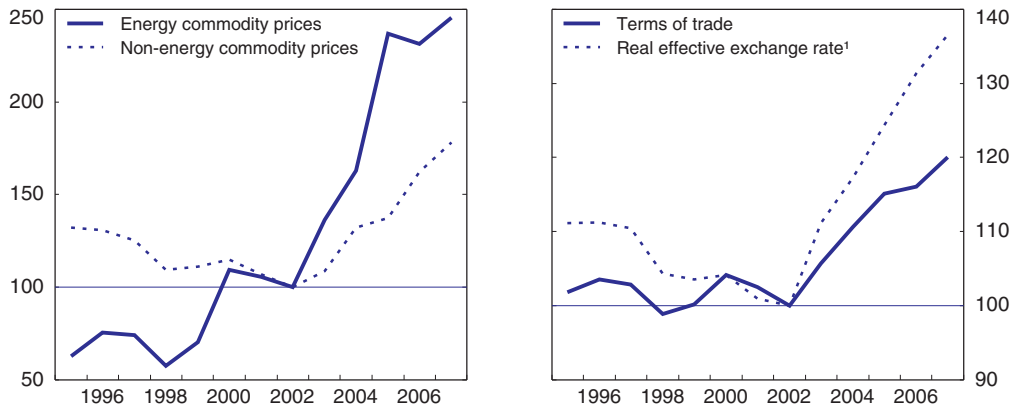
Source: Statistics Canada; OECD Economic Outlook No. 83 database.

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The large real exchange-rate appreciation since 2002 has caused imports to surge and exports to slow appreciably, curbing overall GDP growth especially toward the end of 2007 (Figure 2.3). The current account, which had been registering surpluses of around CAD 5 billion per quarter for the past few years, dropped sharply in the third quarter of 2007 and turned negative in the fourth quarter for the first time since 1999. So far, however, strong internal demand has picked up most of the slack. With the lowest unemployment rate in 33 years (near 6% for the past few years), rising personal income, and household net worth as a percentage of disposable income at a 20-year high (close to 650% in 2006), household spending on both consumption and residential investment has supported growth in the economy; this has been aided by falling prices for many consumer goods brought about by the exchange-rate appreciation. Falling prices for a


Figure 2.2. **Commodity prices, terms of trade and exchange rates**

Index 2002 = 100

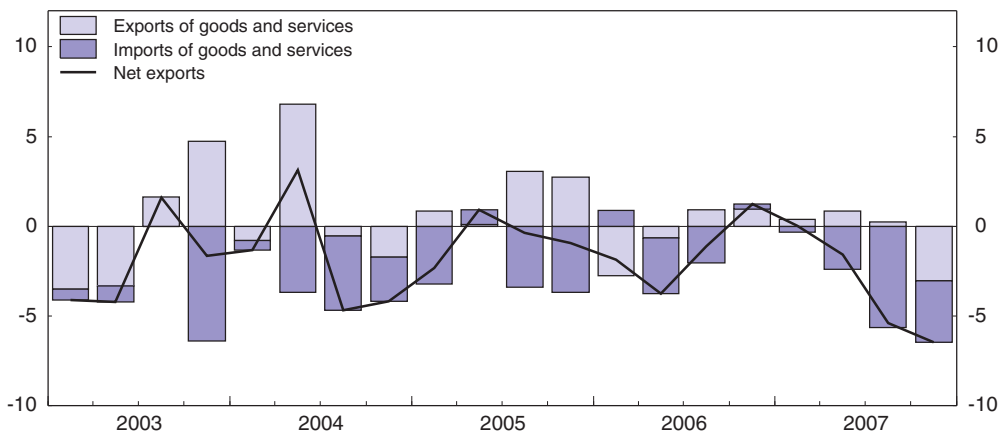


1. Based on CPI.


Source: Statistics Canada and OECD Economic Outlook No. 83 database.

StatLink  <http://dx.doi.org/10.1787/354661842163>Figure 2.3. **The role of foreign trade**

Contribution to growth from previous quarter at annual rate



Source: OECD Economic Outlook No. 83 database.

StatLink  <http://dx.doi.org/10.1787/354725500472>

broad range of domestic goods has helped to keep inflation contained despite the buoyancy of demand. Consumer price inflation has averaged 2% in the five years to April 2008 and core inflation – which excludes the eight most volatile components and the effects of indirect taxes – has averaged 1.8%. Corporations and governments have also contributed to strong growth in domestic demand. Corporate profits have risen well above their historical average and remain near a record-high 14% of GDP. Healthy profitability, combined with falling prices for imported machinery and equipment, have underpinned rapidly rising business investment. And governments, with many of them recording higher-than-expected surpluses, raised real consumption and capital expenditures by more than 3.5% in both 2006 and 2007, a point taken up later in this chapter. All in all, final domestic demand has grown strongly since the end of 2006 and more than offset the drag on GDP growth coming from the external balance.

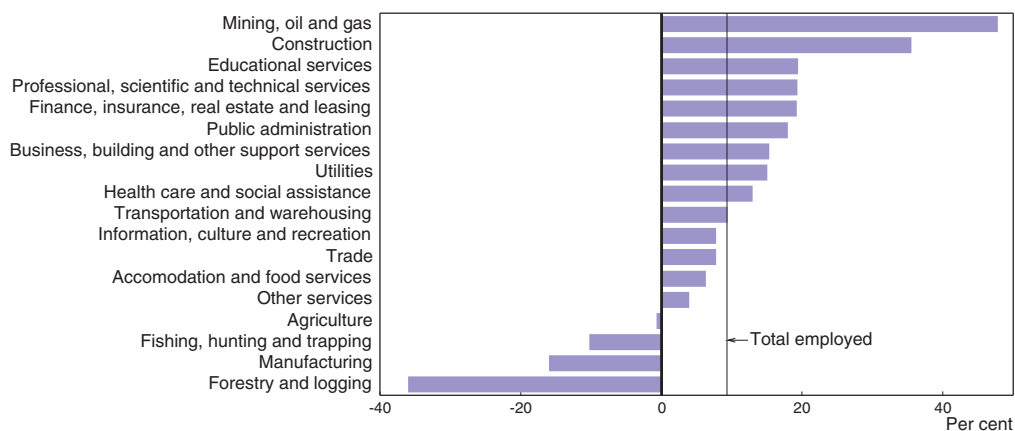
Perhaps the only disquieting macroeconomic indicator over the past few years is productivity growth. The already significant gap that has long existed between Canadian and US labour productivity levels has opened up even further, as total economy labour productivity growth from 2002 to early 2007 averaged barely 1% per year, down from slightly over 2% per year from 1997 to 2001. Low productivity growth in the business sector has been linked to weak innovation, less educated managers and financial professionals, smaller scale and lower competitive pressures (Boothe, 2007). These diagnostics provide the beginning of a roadmap for improving business-sector productivity performance (see Chapter 1 for more on the productivity challenge).

Sectoral and regional asymmetries

With important external pressures applied to the Canadian economy and its regionally differentiated pattern of production, the interesting story of the past few years revolves around how flexible the economy has been in responding to outside shocks. Given the cleavage between the commodity-based economy in the west and the more traditional manufacturing-based economy in central Canada, some feared that the post-2002 boom in commodity prices and exchange-rate appreciation would precipitate a case of “Dutch disease” – the combination of a booming resource sector, a rising currency and a resulting decline in manufacturing output. While the Canadian economy shows all these symptoms, the underlying malaise is not identical to the Dutch case, which involved the discovery of a new resource. Instead, recent economic adjustments in Canada stem more from the integration of emerging nations, particularly China, into the global economy. The arrival of China has simultaneously lowered the prices of consumer goods and raised resource prices. This combination of price changes has accelerated a widespread restructuring of the Canadian economy (Macdonald, 2007).

Between November 2002 and April 2008, employment in Canada’s manufacturing sector fell by over 16%, or 375 000 jobs. Offsetting this loss, employment in other goods-producing sectors rose by roughly a quarter, representing 431 000 jobs (Figure 2.4). Furthermore, over the same period, employment in the services sector rose by more than 1.5 million. A shift of productive resources out of the manufacturing sector is the

Figure 2.4. **Employment by industry**
Cumulative growth from December 2002 to April 2008

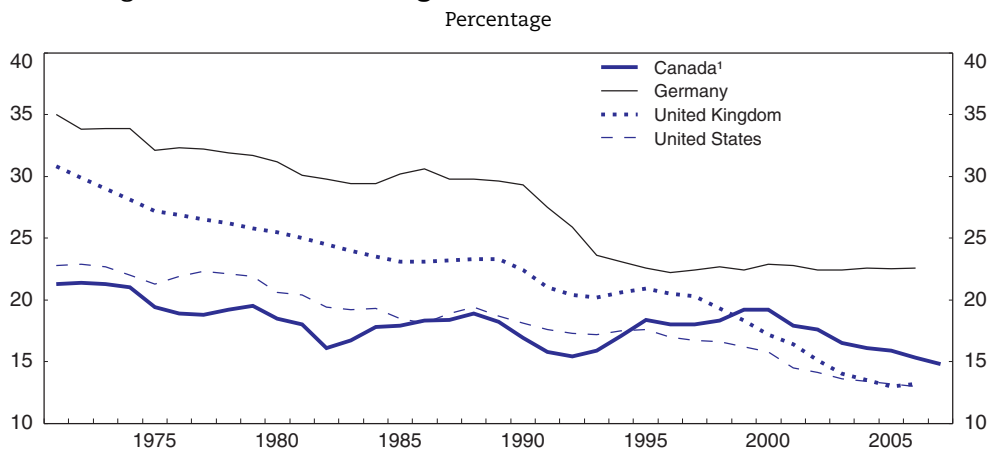


Source: Statistics Canada.

StatLink  <http://dx.doi.org/10.1787/354747856454>


appropriate response to the relative price movements Canada has seen over the past several years. Thankfully, this shift has happened relatively smoothly. The reduction in employment levels in manufacturing has happened mainly through a sharp drop in new hires. Layoff rates, in particular permanent layoff rates, have remained fairly constant and have generally been lower than they were during the 1994-2002 run up in manufacturing employment. There has been no spike in manufacturing layoffs, or in unemployment. Instead, the most important factor leading to the decline in employment in the manufacturing sector seems to have been attrition: workers who left have not been replaced. In addition, many of the cuts in manufacturing reflected structural changes in areas such as clothing, autos and forestry products that originated for reasons other than the rising exchange rate. The declining importance of manufacturing in Canada is in fact part of a generalised decline of this industry in all G7 countries, though the rate of decline in the manufacturing share of output has been faster in Canada than comparable countries in recent years (Figure 2.5). Part of it can probably be explained by “catching up” on the decline witnessed elsewhere through the end of the 1990s, Canada’s manufacturing output having remained broadly stable during that period, supported by a weak Canadian dollar.

Figure 2.5. **Manufacturing shares of GDP in selected countries**



1. Average of the first eleven months for 2007.

Source: Statistics Canada; US Bureau of Economic Analysis; United Kingdom’s Office for National Statistics; and Department of Finance calculations.

StatLink  <http://dx.doi.org/10.1787/354764556023>

The Canadian labour market has responded well to the challenge of reallocating labour out of declining sectors and into the booming resource sector in the west. The resource boom has resulted in higher wages, attracting individuals, primarily from the Atlantic Provinces, to the West, notably Alberta. Net inter-provincial migration to Alberta averaged 33 000 per year from 2003 to 2006. In 2006 alone, Alberta received 58 000 migrants from other provinces, the largest such movement on record back to 1962. Country-wide employment growth has been strong: about 2% in both 2006 and 2007, and the unemployment rate has fallen and remained close to a 33-year low of 5.8%. All regions have posted strong employment and wage gains, though wages are up more significantly in resource-intensive areas than elsewhere. For instance, as the 375 000 manufacturing jobs mentioned above were being shed, average hourly earnings nevertheless increased at an average annual pace of 3.2%. Strong wage gains indicate that newly created jobs have tended to be of high quality (Tal, 2008). Unlike in a typical case of Dutch disease, then, the

restructuring of the Canadian economy appears to have left the overall labour market stronger. But even large migration flows have made only a small dent in regional disparities in unemployment rates, which remain high (Guillemette, 2007). As advocated in past *Surveys*, the Canadian labour market could be made even more flexible by eliminating regionally differentiated provisions and introducing employer-side experience rating in the federal Employment Insurance programme.

Current macroeconomic conditions and short-term projections

The main factor currently affecting the outlook for the Canadian economy is weakness in the US economy. Despite claims that Canada has become less dependent on the United States through rising trade with other large and growing countries, the two economies remain tightly intertwined (Box 2.1). Hence the US slowdown is affecting and will continue to influence Canadian economic performance. Many forecasters now expect a US recession (defined as two consecutive quarters of negative economic growth) in 2008 and some foresee a prolonged one. At the heart of current US economic troubles is the bursting of the housing bubble that helped to power US growth since the current economic expansion started seven years ago. The global repercussions of the ensuing credit crisis have negatively affected Canada through two main channels.

The first is the *trade channel*. Because about three-quarters of all Canadian exports (representing 25% of GDP) are destined to the United States, a weaker US economy means less business for many Canadian exporters. For example, the large decline in US new

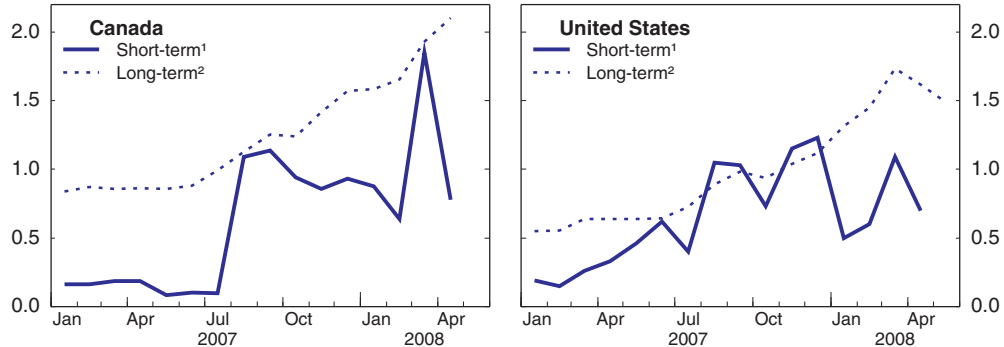
Box 2.1. Canada-United States economic decoupling?

The possibility of a US recession has recently brought to the fore the debate on business-cycle decoupling, that is, whether Canada's business cycle is more independent from its US counterpart than in the past. Some analysts have suggested that a US recession need not mean a recession or even slower growth in Canada because other regions, notably Asia, would maintain strong demand for commodities, ensuring continued growth. This hypothesis is unlikely to hold, however, for several reasons. *First*, Asia is simply not a large export destination for Canada: exports to Asia (excluding Japan) account for only 6% of total exports. *Second*, China – Asia's current economic engine – may not continue to grow quite as fast as it has recently. With inflation there spiking, some backpedalling on market reforms and falling export demand, 2008 could be particularly challenging. *Third*, recent research continues to confirm strong business-cycle links between the United States and Canada. Kose (2004) finds that Canadian-American free-trade agreements (Canada-US FTA and NAFTA) have substantially increased trade and financial flows between the two countries while increasing business-cycle synchronicity. Justiniano (2007) demonstrates that the US business cycle explains about half the variation in Canada's real GDP and industrial production. Similarly, Ivaschenko and Swiston (2007) estimate a two-country model to study the influence of US shocks on Canada's economy and find that they significantly affect both Canadian output and inflation. And Swiston and Bayoumi (2008) estimate business-cycle synchronicity in the NAFTA area and find that a one-per cent shock to US real GDP shifts Canadian real GDP by $\frac{3}{4}$ of a percentage point in the same direction. So although demand for Canadian commodities from Asia could buffer some of the impact of a US slowdown if the Asian economy stays strong, there is little doubt that a significant US economic downturn will be reflected in slower growth of Canadian output and employment.

housing starts that began in early 2006 has depressed Canadian exports of construction materials (especially softwood lumber) and transformed products (such as door and window frames). More significantly, though, the large decline in US housing wealth that has accompanied falling prices for existing homes has a negative effect on US households' financial positions. US consumers have used rising house prices and easy access to credit and home equity to finance consumption and have kept the North American economy growing. With house prices declining and access to home-equity loans becoming much tougher, that sense of riches is now evaporating. A substantial decline in house prices is very rare, so it is unclear how consumers will react, but each 10% decline in US house prices would cut Canadian exports to the US by between USD 0.7 and 2.3 billion dollars (between 0.04% and 0.15% of Canadian GDP).¹ The impact on Canadian exports is already being felt and is likely to remain a drag on both the US and Canadian economies for some time. In the case of Canada, the trade channel is amplified by the pure exchange-rate effect – loss of confidence in US financial markets has helped drive down the US dollar relative to the Canadian dollar – depressing Canadian exports to the United States even further.


The second is the *credit channel*. Tighter credit conditions mean more difficult access to capital in Canada to finance both consumer and business spending. The US financial crisis that began with sub-prime mortgages in 2007 has now spread far beyond that particular market and beyond US borders. Long-term corporate bond spreads in Canada have been rising since the crisis began (Figure 2.6). The negative impact on domestic demand will persist as long as spreads do not return to normal levels.

Figure 2.6. **Recent short- and long-term corporate spreads**



1. Yield on three month prime corporate paper minus yield on three month treasury bill for Canada and yield on three month non-financial commercial paper minus yield on three month treasury bill yield for the United States.
2. Merrill Lynch composite yield for 10-15 year corporate bonds minus yield on 10-year government bond for Canada and Merrill Lynch composite yield for 7-10 year AAA corporate bonds minus yield on government bonds at the same maturity for the United States.

Source: Statistics Canada, Thomson Financial, Federal Reserve Bank and OECD Economic Outlook No. 83 database.

StatLink  <http://dx.doi.org/10.1787/354804814555>

The trade and credit channels are expected to continue dragging down Canadian economic growth over 2008 and 2009. The slowdown will be led by persistent export weakness, as growth slows to a crawl in the United States and the high exchange rate continues to weigh on competitiveness. Imports continue to be encouraged by pass-through of the appreciation into import and ultimately consumer prices. As a result, the projections show a small current account deficit for 2008 that widens in 2009. An end to that part of household income growth associated with the recent trend improvement in

the terms of trade leads to a projected deceleration in domestic demand. This view is reinforced by weaker employment prospects as well as by recent survey evidence pointing to falling consumer and business confidence. Slowing job creation and high mortgage spreads should restrict growth in residential construction further, and consumer expenditures, resilient so far, should also soften. Business investment will likewise suffer from the higher cost of capital as well as from weaker export prospects. Employment and wages, both lagging indicators, are expected to slow in 2008. The unemployment rate, which has recently inched up from its 33-year low of 5.8%, is expected to continue edging up over the next few quarters, reaching 6.4% by mid-2009.

Inflation pressures related to capacity constraints, which as recently as July 2007 forced the Bank of Canada to increase its policy rate, have now largely abated. Headline and core inflation, which were both running at over 2% year-over-year through much of 2007, have lately fallen to 1.7% and 1.5%, respectively. A cooling economy and the continued (albeit diminishing) pass-through of the currency appreciation should help maintain a benign inflation environment, leaving the Bank with room to cushion the economic slowdown. It has already shifted to an easing stance, cutting its target for the overnight rate by 150 basis points since December 2007.

Given the relatively healthy state of the economy as it entered the slowdown, fiscal stimulus estimated to be 1.4 percentage point of GDP for the federal government alone, and the aggressive monetary policy easing built into the projection, a recession is likely to be avoided. According to monthly industry data, in the first two months of 2008 real GDP grew at an annualised rate of 0.5% over the last quarter of 2007. Economic growth is expected to remain weak through 2008, with GDP expanding 1.2% overall over 2007, before bouncing back in 2009 as credit market stresses begin to recede and lower interest rates along with tax cuts work their way through the economy. Economic expansion is expected to gather pace through 2009, reaching a growth rate of around 3½ per cent by year-end. The output gap should start to close around mid-2009 and consumer price inflation to inch back up toward the 2% target (Table 2.1). The principal risk to the short-term outlook is for the credit crisis and adjustment in the US housing market to be sharper and/or continue longer than currently expected (through to spring 2009), affecting Canadian exports and consumer confidence negatively and prolonging the weakness in the Canadian economy. On the other hand, it is also possible that the US slowdown will be milder than currently projected, with corresponding implications for Canada's economic prospects.

US economic fortunes as a medium-term risk to Canada's economic outlook

The main risks to Canada's medium-term economic outlook stem from the large global current-account imbalances that have been accumulating for some years, best exemplified by the US external deficit (Jarrett, 2005). The United States has run trade deficits for the past 30 years, and these have gradually become much larger, going from roughly USD 365 billion in 2001 to 709 billion in 2007. Though the negative trade balance has recently come down a bit, it remains large absolutely, large relative to US GDP (5.1% in 2007) and large relative to the US export base. It implies an even larger deficit in the broader measure of the US external balance, the current account (5.3% of GDP in 2007), and a rapid increase in the US net external indebtedness, as current account deficits have to be financed by borrowing from abroad. The broadest measure of the amount the United States owes the rest of the world – the (negative) net international investment position – has gone from USD 800 billion in 1999 to 2.5 trillion in 2006, or from roughly 8% to 19% of GDP.

Table 2.1. Short-term projections
Annual percentage change, volume (chained 1997 Canadian dollars)

	2004	2005	2006	2007	2008	2009
Demand and output						
Private consumption	3.4	3.8	4.2	4.7	4.3	3.0
Government consumption	2.5	2.2	3.3	3.6	3.4	2.3
Gross fixed capital formation	7.7	8.5	7.2	4.1	2.8	1.8
Public ¹	5.0	11.0	8.2	4.5	4.5	2.4
Private residential	7.5	3.5	2.1	3.2	1.8	0.7
Private non-residential	8.4	10.8	9.9	4.4	2.9	2.3
Final domestic demand	4.1	4.5	4.7	4.3	3.8	2.6
Stockbuilding ²	0.2	0.4	-0.2	0.0	-0.2	0.0
Total domestic demand	4.2	4.9	4.4	4.3	3.6	2.6
Export of goods and services	4.8	2.2	0.7	0.9	-2.6	1.8
Imports of goods and services	8.3	7.5	5.0	5.7	4.4	3.6
Net exports ²	-1.0	-1.7	-1.4	-1.6	-2.3	-0.6
Statistical discrepancy ²	0.0	0.1	0.0	0.0	0.0	0.0
GDP at market prices	3.1	3.1	2.8	2.7	1.2	2.0
Prices and employment						
GDP deflator	3.2	3.4	2.4	3.1	2.8	1.5
Private consumption deflator	1.5	1.7	1.4	1.5	1.1	1.1
Total employment	1.8	1.4	1.9	2.3	1.6	0.8
Unemployment rate	7.2	6.8	6.3	6.0	6.1	6.3
Memorandum items						
General government financial balance ³	0.8	1.6	1.0	1.0	-0.2	-0.4
Short-term interest rate	2.3	2.8	4.2	4.6	2.9	2.9
Current account balance ³	2.3	2.0	1.6	0.9	-0.2	-0.8
Output gap (per cent of potential GDP)	0.4	0.5	0.4	0.2	-1.3	-2.0

1. Excluding nationalised industries and public corporations.

2. Contributions to changes in real GDP (percentage of real GDP in previous year).

3. As a percentage of GDP, national accounts basis.

Source: OECD Economic Outlook No. 83 database.

So far, many of the necessary adjustments to global imbalances seem to be happening relatively smoothly, and the hope is that smooth adjustments continue. But with many analysts expecting a prolonged US slowdown in response to the credit crisis and a declining US dollar, external investors' willingness to continue holding huge amounts of dollar-denominated assets – not to mention financing still large US current-account deficits – could change quickly. The economic adjustment that has started could rapidly prove more disruptive. If external debtors start selling large quantities of US assets to “beat the trend” and avoid capital losses, the mood could quickly worsen. If that happens, interest rates would spike, the US currency would drop, foreign finance would quickly dry up, US domestic consumption and investment would contract and output would quickly slump. Asset prices, such as house and equity prices, would experience even large falls, reducing wealth. A significant and sudden US economic slowdown would negatively affect all of its trading partners, and a rapidly falling US dollar would have worldwide implications for an already fragile financial system. Canada would not be spared. External demand for Canadian products would fall even more than it already has, and a sudden further appreciation of the Canadian dollar relative to a falling US currency would exacerbate current negative shocks on manufacturing and other export-oriented sectors in Canada. Thankfully, a more likely scenario is that these adjustments occur over a long

period of time, in which case the negative impacts on Canada through declining demand and currency appreciation would be broadly the same in nature as the more pessimistic scenario just outlined, but slower in speed, easing the burden of adjustment to a path more in line with the baseline outlook.

Monetary policy has thus far successfully navigated the numerous shocks experienced

Up to and through most of 2007, monetary policymakers were primarily concerned with domestic inflationary pressures from rising commodity prices, strong domestic demand and tight labour markets. Because those pressures were being felt differently across the country, while policymakers have access to only one national monetary policy instrument, the challenge was to set a policy stance that was neither too restrictive for central Canada nor too loose for western Canada. The Bank of Canada has managed this challenge well and kept country-wide average inflation close to the national target. By the end of 2007, however, emphasis had shifted to managing Canada's response to the global credit crunch and to concerns about a slowing US economy. The main challenge for monetary policy now is to design the appropriate policy stance to keep inflation on target as the Canadian economy reacts to the US slowdown. The Bank of Canada is also in the process of absorbing lessons from the credit crunch. On that score, further efforts by the Bank and other government regulators are desirable to improve transparency, flexibility and competition in Canadian financial markets.

Financial-market turmoil has increasingly dominated policymaking

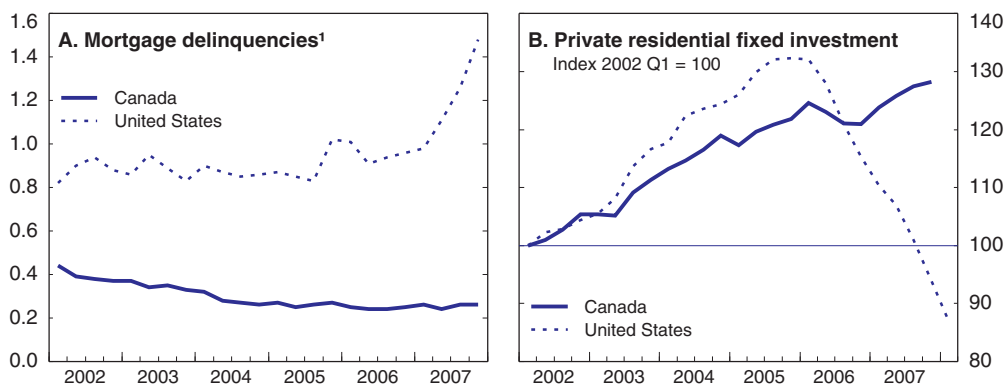
From mid-2006 to mid-2007, the Bank's target for the overnight rate remained unchanged at 4.25%, while headline CPI inflation ran above the 2% midpoint, reflecting inflationary pressures from an economy operating above potential. Wages were also growing strongly, and the rise in house prices was showing no sign of slowing down. So in July 2007, concerned about continuing inflation pressures, the Bank upped its target rate 25 basis points (bp) to 4.5%. Bank officials expected to have to tighten again before the end of 2007, but the fallout from the credit crunch in effect did it for them. In October 2007, the Bank estimated that financial strains were equivalent to a 25bp rise in short-term borrowing spreads and seemed satisfied with that monetary stance. Toward the end of 2007, however, the Bank judged that global financial-market difficulties related to the valuation of structured products, anticipated losses on US sub-prime mortgages and tightened credit conditions, and the impact on Canadian exports, had shifted the balance of risks for inflation to the downside. Furthermore, corporate and mortgage interest-rate spreads had been on the rise since mid-2007 in response to deteriorating global credit conditions, effectively tightening access to financing. The easing of monetary policy in December 2007 and January 2008 (by 25bp each time) was therefore consistent with keeping actual output growth close to potential, and further easing in March 2008 (by 50bp) reflected concerns about the US economy slowing down more than first predicted. Additional pass-through of the exchange-rate appreciation is expected to occur throughout 2008, acting as a drag on goods prices, especially for those that are easily traded. A one percentage point cut in the GST that took effect on 1 January 2008 is also helping to hold inflation down. Most importantly though, the US slowdown is expected to quickly reduce inflationary pressures in Canada, and the Bank has hinted at further

interest rate cuts later in 2008. Much of the challenge for monetary policy in the United States, and by extension for Canada, emanates from the housing market. Thankfully, Canada's housing market is in better shape.

The Canadian housing market has softened only slightly


The Canadian housing market is softening in response to deflation of the US housing bubble, but so far there are no indications of major difficulties. Although the cumulative increase in Canadian house prices since 1997 has been almost as strong as in the United States, mortgage financing has been much less problematic in Canada. For example, interest-only mortgages made up less than 5% of originations in both countries in 2000. Over the next six years, they grew to represent about 20% of the market in the United States, but remained rare in Canada (Tal, 2007a and b). At the same time, sub-prime loans accounted for less than 3% of outstanding mortgages in Canada, and only one-fifth of all mortgages were securitised, reflecting the statutory requirement that all bank-held mortgages with loan-to-value ratios above 80% be insured (these mortgages carry a zero risk weight for regulatory capital-requirement purposes, reducing the incentive for originating banks to securitise). Therefore, unlike in the United States, where the appreciation in house prices was partly attributable to a combination of aggressive lending practices and irresponsible borrowing, the gains in Canada look much more sustainable as they are supported by terms of trade gains, migration trends and a general catching-up to global prices. Mortgage delinquencies have been on the rise in the United States, but they remain stable in Canada (Figure 2.7). Housing-market activity and prices in Canada are expected to level off over the next few years, but indicators suggest a soft landing. Still, Canadian financial institutions do participate in US mortgage and related markets. They have therefore not been entirely immune to the credit crisis that originated there, nor has the Bank of Canada.²

Figure 2.7. **Housing market indicators**



1. Per cent of all residential mortgages in arrears by 90 days or more.

Source: Canadian Bankers Association (includes data from BMO, CIBC, HSBC Bank Canada, National Bank of Canada, RBC Royal Bank, Scotiabank, and TD Canada Trust); Mortgage Bankers Association (National Mortgage Delinquency Survey, which includes data from 120 reporters on about 45 million mortgages in the US); and OECD Economic Outlook No. 83 database.

StatLink  <http://dx.doi.org/10.1787/354852156225>

The Canadian asset-backed commercial-paper market has been frozen

In the summer of 2007, it became clear that banking systems throughout the world, including Canada, had significant exposure to US sub-prime losses through the asset-backed

commercial-paper (ABCP) market. Because of the complexity of financial products in which US sub-prime mortgages were bundled, exposure levels were not easily quantifiable, leading to a more general loss of confidence. Lenders pulled out of ABCP markets, triggering liquidity problems. In Canada, major problems emerged in the portion of the ABCP market not sponsored by banks (valued at about CAD 33 billion), roughly three-quarters of which is backed by highly structured products. Because liquidity for this paper was guaranteed only in the event of a “general market disruption”, liquidity providers – most of whom are international banks – declined to step in as this paper came due. Thus, a fundamental restructuring of non-bank-sponsored ABCP was required. Discussions on such a restructuring between investors and liquidity providers, and supported by the Bank of Canada and the government, have progressed well. A key element of the agreement, dubbed the “Montreal Protocol”, involves swapping the short-term paper for longer-term notes, with maturity of up to nine years, with a back-up credit line of roughly CAD 14 billion to ensure the smooth operation of the restructured market. Noteholders voted overwhelmingly in favour of the plan on 25 April, which, as at time of writing, still needs to be sanctioned by the court to be put into effect. The achievement of a purely market-based restructuring would be an encouraging development.

The way forward for the Bank of Canada and financial-market regulators

Securitisation has made determining the appropriate monetary policy stance more difficult. Monetary authorities must keep a close eye on trends in securitisation to evaluate monetary conditions in the economy. Because the process of securitisation enhances the ability of financial institutions to make loans, there may not have been a full appreciation of just how much its expansion in recent years represented an effective easing of credit conditions. Any given policy rate would thus have been less restrictive than was judged earlier, implying that interest rates globally might have been lower than would have been appropriate. A reduction in securitisation now seems likely, and a degree of re-intermediation by financial institutions can be expected once credit markets return to normalcy. The cost of credit relative to the overnight interest rate should now be higher, all other things equal, than during the time leading up to the crisis. But by how much, and for how long, and whether the process of re-intermediation will persist and thus affect the future conduct of monetary policy, are all questions whose answers are unclear.

Legislative changes are needed to give the Bank of Canada more flexibility in responding to the current and future financial crises. Until now, the central bank’s options in addressing credit market liquidity problems have been curtailed, in part by limits in the *Bank of Canada Act* on the kinds of financial instruments that the Bank can purchase, including in purchase and resale (repo) agreements. Proposed amendments to the *Bank of Canada Act* would allow the Governor to establish the list of financial instruments that the Bank could purchase or sell for the purpose of implementing monetary policy and supporting the stability of the financial system. Such a change would enhance the Bank’s flexibility in responding to credit crises, as recently recommended by the Financial Stability Forum, but could also expose it to more risk.

The crisis has also been a reminder that financial-market efficiency, transparency and stability are prerequisites for achieving sustained economic growth and prosperity. When financial markets exhibit these properties, investors receive the highest possible risk-adjusted returns on their investments, borrowers minimise the costs of raising capital, and economic resources are allocated to their most productive uses. In recent years, the

government and the Bank of Canada have worked on many issues to promote efficiency and stability in financial markets. The global credit crisis underlines the need to keep up this work, on several fronts.

First, the ongoing turbulence in financial markets has highlighted the importance of information disclosure and transparency in financial markets so that market participants can properly value highly complex and structured financial products. For example, before the credit crisis hit, asset-backed commercial paper backed by highly structured assets was sold in Canada in the so-called “exempt” market – where issuers are not bound by the same disclosure rules that apply to issuers in the retail market. It is worth considering establishing the principle that issuers of structured products make available to investors all the information that they now make available to credit-rating agencies – which failed to correctly assess the risks underlying most such products – so investors can do their own research. But it is not enough to have transparency if banks and other investors have no incentive to use the information. As the Chairman of the US Federal Deposit Insurance Corporation has remarked, the new Basel II capital adequacy framework for banks may have unintentionally encouraged heavy bets on new classes of non-transparent securities (Bair, 2008).³ Canadian regulators should take part in and support international efforts to take a second look at the capital adequacy rules within the Basel II framework. For instance, the so-called “advanced approaches” in Basel II allow banks to use their own models to assess risk and determine the amount of regulatory capital they need. Such freedom may have tempted them to be over-optimistic about their risk exposure – and rely too much on external ratings – to minimise required regulatory capital and maximise return on equity.

Second, more work is needed to develop and adopt a uniform national securities law. The current diversity of regulations – each province has its own securities regulator – makes it difficult to maximise efficiency in Canadian markets and increases the risk that firms will choose to issue securities in other countries. Significant improvements to the regulatory system have been made as a result of the creation of the Canadian Securities Administrators (CAS), and more should come from the implementation of the passport system.⁴ Even better would be to consolidate all regulatory and oversight functions in one agency for the whole country. A single regulator would allow policy development to be streamlined, allowing Canada to respond more quickly to local and global events, and it would eliminate the inefficiencies created by the limited enforcement authority of individual provincial agencies. As the former Superintendent of Financial Institutions notes in a recent report on Integrated Market Enforcement Teams (Le Pan, 2007), Canadian credibility on enforcement issues is low. Better cooperation and coordination of efforts among securities commissions, law-enforcement agencies, Crown prosecutors, Ministers of Justice and attorneys-general would enhance the reputation of Canadian securities markets and ensure their future. Encouragingly, in February 2008, the Government of Canada announced the creation of an expert panel on securities regulation to provide recommendations on, among other things, how a model securities act could be implemented under a common securities regulator.

Third, the regulatory framework governing Canada’s financial institutions should allow them to embrace the trend toward an ever more internationalised and globally integrated financial sector. Large non-Canadian banks have increasingly followed strategies to become global players, operating across different regions and business areas. Globalising operations allows them to cash in on efficiency gains and risk reductions from allocating capital directly

on their balance sheets between regions or areas of operations. Moreover, as global banks face strong global competition, gains from operating so-called internal capital markets are passed on to their customers. Canadian banks currently do not have the size necessary to become truly global retail banks or leading international investment banks. Some of them have considerable retail and investment presence, mainly in the Americas, but none can be seriously regarded as a leading bank that could operate on a scale and scope that would produce the full additional benefits of internal capital markets. OECD evidence shows that Canada's banking sector exhibits high overhead costs, low competition and low foreign-bank penetration, and that the negative impact on economic growth of competition-restraining regulation is significant (OECD, 2006a). Bank of Canada research also suggests that Canadian financial institutions would reap efficiency gains through economies of scale by getting bigger – gains that could flow to the rest of the economy through lower costs for business and retail lending (Allen and Liu, 2005). Today, ten years after the first bank merger proposals were blocked by government, it is time to welcome competition and internationalisation in Canadian financial markets by lifting the ban on bank mergers. Mergers would give Canadian banks the size required to either take over large foreign institutions or enter foreign markets directly. The threat of foreign takeovers would force them to pass on most of the benefits from an expanded scale to their customers.

The monetary policy framework

The adoption of inflation-targeting in 1991 has brought Canada important economic benefits. Inflation has been lower and more stable, and expectations have become well anchored on the 2% target, not just in the short term, but also in the long term. Because consumers and businesses have greater certainty about the future purchasing power of their savings and income, borrowers pay a much smaller premium to compensate investors for inflation risk. The results are lower costs for borrowers, more predictable returns for investors, and a more efficient allocation of resources. With low and stable inflation, along with other important policy improvements and structural reforms, notably the uninterrupted decade-long series of fiscal surpluses, the peaks and valleys of the business cycle have become less pronounced, and the economy has shown increased resilience in adjusting to various types of shocks. Existing research supports the thesis that the current regime has yielded significant benefits to the Canadian economy (Bank of Canada, 2008).

In November 2006, the Bank of Canada and the federal government renewed their joint inflation-targeting agreement for another five years. At the same time, in an effort to find out if good performance could be made even better, the Bank launched a concerted research programme to answer two questions. First, what would be the costs and benefits of an inflation target lower than 2%? Second, what would be the costs and benefits of replacing the current inflation target with a longer-term price-level target?⁵ The Bank is encouraging intensive internal and external research on these questions in time to examine the results and take them into account before the next renewal of the inflation-targeting agreement at the end of 2011. No country has yet adopted price-level-path targeting, which makes its evaluation difficult. In addition, it is important to note that targeting a path for the price level does not imply that this path would be flat, or even that it would be lower than that implied by the current inflation target. It only means that undershoots or overshoots with respect to the chosen path would have to be offset using monetary policy, which may well imply greater inflation/output volatility in the short term than under the current regime. Some recent

research on Canadian inflation dynamics since the mid-1990s suggests that the current monetary policy rule has an element of price-level-path targeting in it and that, as a result, Canadians may already be benefiting from a high level of certainty about the future path of the price level (Kamenik *et al.*, 2008). Switching to an explicit target for the price level would then yield little extra benefit. Other research suggests that, given the type of shocks typically hitting the Canadian economy, price-level-path targeting could deliver more macroeconomic stability through lower inflation, on average, and lower nominal interest-rate volatility (Coletti *et al.*, 2008). A reasonable assessment is that, at the present time, no compelling argument supports the view that changes to the current inflation-targeting regime would generate benefits that would outweigh the possible costs of: i) getting the new policy wrong; and/or ii) undermining the stock of credibility that the Bank has accumulated over the past 17 years. Further research is thus necessary to make an informed decision in 2011. Given the success of the Canadian inflation-targeting regime to this point, and the risks associated with changing it, the burden of proof should lie with those who advocate reform.

Fiscal policy remains on a prudent course

Canada's fiscal situation has improved significantly since the mid-1990s as deficits were turned into surpluses and Canada's debt burden declined from the second highest to the lowest among G7 countries. Both federal and provincial-territorial levels of government are in sound fiscal positions. The federal government has posted a budget surplus for each of the past 11 years. Provinces and territories recorded an aggregate surplus in seven of the last nine years. As a result, general government debt has been reduced, and, combined with lower interest rates, debt-service costs have fallen substantially over the past decade (Table 2.2). The general government's footprint in the economy has shrunk, as shown by

Table 2.2. **General government revenues and expenditures**

Per cent of GDP, national accounts basis

	1990	1995	2000	2005	2006	2007
Total revenues	43.0	43.2	44.1	40.8	40.4	40.0
Direct taxes	16.9	16.1	18.2	16.0	16.1	16.6
<i>of which:</i>						
Household	14.1	13.1	13.4	12.0	12.1	12.6
Corporate	2.7	3.0	4.8	4.0	4.0	4.0
Indirect taxes	13.7	13.8	12.6	12.2	11.8	11.5
Social security	4.3	5.0	4.6	4.8	4.6	4.5
Other revenue	8.2	8.3	8.7	7.8	7.8	7.5
Total expenditures	48.8	48.5	41.1	39.2	39.3	39.0
Current primary expenditures	37.9	38.1	33.2	33.6	33.7	33.6
<i>of which:</i>						
Consumption	22.3	21.3	18.6	19.1	19.3	19.5
Social security	10.7	12.2	10.3	9.8	9.9	9.8
Subsidies	1.5	1.1	1.0	1.2	1.1	1.0
Capital expenditure	5.0	3.5	3.0	3.9	4.2	4.3
Debt service	9.5	9.6	7.1	4.6	4.4	4.1
Net lending	-5.8	-5.3	2.9	1.6	1.0	1.0
Cyclically-adjusted net lending ¹	-6.5	-4.4	2.1	1.4	0.8	0.8
Net debt	43.7	70.7	46.2	29.9	26.5	23.3
Gross debt	75.2	101.6	82.1	70.3	68.1	64.4

1. As a percentage of potential GDP.

Source: OECD Economic Outlook No. 83 database.

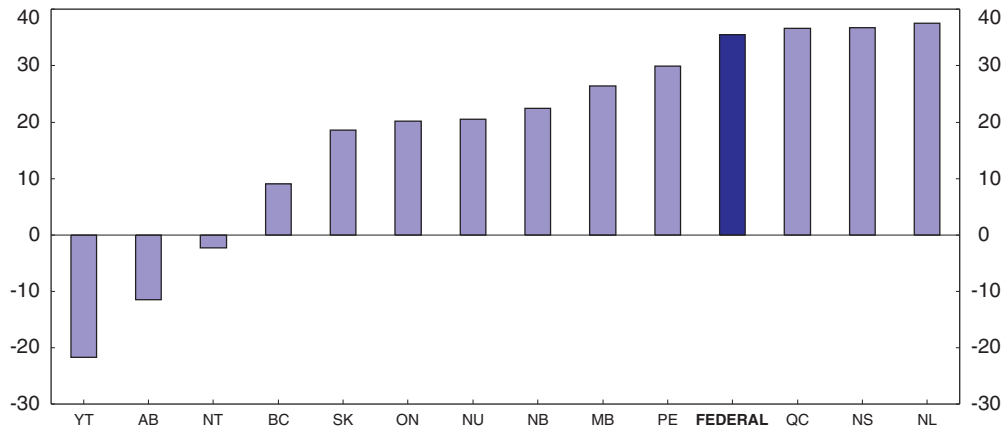
lower revenue, spending and net debt relative to GDP. Current primary expenditures as a share of GDP were reduced sharply in the latter half of the 1990s but have edged up slightly since 2000. Over the next few years, the combination of recent sizeable tax cuts and lower economic growth may eat into government budget surpluses, raising the prospect of deficits, especially if lower commodity prices were to pare tax revenue received from the resources sector. Given these factors, Canadian governments should strengthen expenditure-control mechanisms. Provincial and territorial governments should also take note of potential future costs related to population ageing and accelerate debt repayment in preparation.

Long-term fiscal challenges related to population ageing


While the fiscal situation looks healthy in the short term in comparison to those of many other OECD countries, Canada faces the same long-term fiscal challenges related to population ageing. As the last *Survey* pointed out, Canada is going to experience one of the fastest rates of population ageing among OECD countries. The old-age dependency ratio (those 65 years old and above as a proportion of those 18-64) is projected to rise from about 21% now to 50% over the next 50 years (Guillemette and Robson, 2007). The rapid increase in the number of retirees will begin as soon as 2011 when the oldest baby-boomers reach the age of 65. The impact on public finances will be felt through age-dependent programme spending, mainly health care (OECD, 2006b). On the basis of a few straightforward assumptions about economic growth, increases in service intensity and inflation, Robson (2007) estimates the present value of the total net additional claims public programmes will make on Canadian incomes over the next 50 years as a result of demographic change at CAD 1.4 trillion. Stated in another way, major demographically driven programmes today require a little less than 15% of GDP, but their claim on the economy will rise steadily to reach close to 20% of GDP five decades from now. And the burden is unevenly spread. While the federal government would show a net improvement because of lower spending on tertiary education and child/family benefits, provincial governments would have a combined present-value financing gap of CAD 1.7 trillion, mainly because the share of health spending in GDP is expected to double. These amounts are considerably larger than the present value of deferred income taxes governments can hope to take in when retirees cash in their registered retirement saving plans (RRSPs) – about CAD 289 billion for the federal government and CAD 185 billion for provincial/territorial governments. That the calculation shows no net demographic liability for the federal government is an artefact of the assumption that the burden of health-related spending is fully assumed by provinces, when in fact the federal government largely contributes through the Canada Health Transfer. Both federal and provincial government finances will be affected by rising health expenditures. Unless changes are made, future taxpayers will need to pay more for the same lifetime package of programmes and benefits than earlier generations. Among the policies that could help alleviate this problem are: more rigorous spending controls; programme reforms aimed at improving the efficiency of public expenditures, especially in health care; faster debt reduction; shifting provinces' taxation to more efficient bases; and growth-friendly policies to help future generations afford the rising costs of government programmes (see OECD, 2008). Implicitly, the federal government is already preparing for demographic change by reimbursing debt, which is equivalent to pre-funding future expenditures. The federal debt/GDP ratio has fallen from a peak of 68% in 1995 to about 30% today. The federal government has pledged to reduce it to 25% of GDP by fiscal year 2011/12 and proposed that Canada should aim to eliminate total government net debt

by 2021. Several provinces would be well advised to follow suit and speed up debt reimbursement while most baby-boomers are still in their prime earning years. Some, notably Newfoundland and Labrador, Nova Scotia and Quebec still carry large amounts of debt that resulted from past spending excesses (Figure 2.8).

Figure 2.8. **Government net debt**
Per cent of provincial/national GDP, 2006



Source: Statistics Canada.

StatLink  <http://dx.doi.org/10.1787/354855264034>

The need for better expenditure controls

Higher spending than initially budgeted, largely due to end of year decisions, is an issue for the federal government and almost all provincial and territorial governments. For example, looking at the decade to fiscal year 2006/07, the federal government underestimated growth in its revenue by about CAD 62 billion. Part of the extra revenue went to debt repayment, but close to 29 billion was spent in excess of what had been initially planned (Busby and Robson, 2008). Relative to the size of its budget, the federal government is neither the worst nor the best among Canadian governments in terms of its propensity to overspend. Over this ten-year period, all underestimated revenue on average, and all spent more than announced at budget time (Table 2.3).

One can argue that exceptionally strong economic growth in Canada over those 10 years made the task of forecasting revenue growth difficult, and that governments chose to be prudent at budget time. But economic expansion implies less need for non-discretionary government spending, on automatic fiscal stabilisers for instance. In most jurisdictions, surprises on the revenue side have been used to reduce debt and taxes, but have also led to higher spending – that is, actual spending tends to be higher than initially budgeted in years when revenue is higher than expected, and vice-versa. Disposing of some of the revenue surprises through a combination of higher spending and lower taxes can be viewed as procyclical, adding to inflationary pressures. A budgetary framework whereby revenue surprises would be entirely allocated to debt repayment would circumvent this problem, as debt repayment is neutral with respect to the economic cycle. Booking all expenditures at the beginning of the fiscal year would also help make the year-to-year choices of governments and rates of spending growth more transparent to taxpayers. In addition, all governments in Canada should implement and/or refine their

Table 2.3. **Accuracy in budget projections in the last decade**

	Change in revenue forecast		Change in expenditure forecast	
	Root Mean Square Error (%)	Total overrun (CAD million)	Root Mean Square Error (%)	Total overrun (CAD million)
Federal	4.50	61 849	3.84	28 657
Newfoundland and Labrador	6.98	890	4.71	147
Prince Edward Island	5.48	367	5.21	390
Nova Scotia	3.91	1 406	2.87	1 086
New Brunswick	3.47	1 326	2.56	836
Quebec	3.57	7 429	2.24	3 267
Ontario	4.93	10 806	2.37	12 272
Manitoba	4.50	2 405	3.88	2 005
Saskatchewan	8.44	4 482	4.50	2 251
Alberta	18.47	36 032	6.07	10 499
British Columbia	6.78	10 875	3.03	6 274
Northwest Territories	9.29	377	3.34	173
Yukon Territory	9.09	375	8.57	404
Nunavut	10.75	350	8.45	460

Source: C. Busby and W.B.P. Robson (2008), "Off the Mark: Canada's 2008 Fiscal Accountability Ranking", *C.D. Howe Institute Backgrounder*, No. 112, C.D. Howe Institute, Toronto.

expenditure review systems drawing on the conclusions of a recent review of performance budgeting in OECD countries (OECD, 2007). In 2007, the federal government did so by announcing the implementation of a new expenditure management system. Savings identified so far have been marginal, however, with the 2008 federal budget reporting that in 2007 – admittedly only the first year of a four-year review cycle – only CAD 386 million in yearly savings were identified. These savings represent less than 3% of all expenditures under review that year and less than half of one per cent of all federal programme spending. Stepping up efforts to identify inefficiencies and redundant expenditures would help to keep spending in line with budget plans.

As regards accurately estimating changes in government revenue and expenditures, Alberta has posted particularly large forecasting errors. In the 10 fiscal years to 2006/07, it has underestimated revenue growth by CAD 36 billion (which translates into an underestimation of revenue growth by 15.9 percentage points each year on average) and its spending overruns over the same period have totalled CAD 10.5 billion (5.3 percentage points per year on average). A significant part of the downside error in the revenue forecast can be attributed to the interaction of two factors: the large share of natural resource revenues in total government receipts in Alberta and the volatility of resource prices and the resulting inherent difficulty in forecasting them. The source of these errors notwithstanding, it is reasonable to conclude that Alberta could have allocated its non-renewable resource wealth more effectively. The province has already erased its debt and given resource rebates back to its citizens. It should now transfer most resource revenues into its Heritage Fund with long-term investment goals, so as to reduce fiscal stimulus that adds to inflationary pressures (see Chapter 1), but more importantly, to make sure that future generations also benefit from non-renewable resource depletion. Consolidating the Heritage Fund with other Alberta savings funds and, above all, investing the assets outside Canada (so as to shield the exchange rate as much as possible) with long-term objectives – as do Norway's Government Pension Fund and Chile's Economic and Social Stabilization Fund – would be appropriate (Busby, 2008; see also Chapter 4).

Recent budgets

For the past decade, Canada's federal government operated under a prudent fiscal policy framework combining economic assumptions based on the average of private-sector forecasts, balanced budget targets and explicit contingency reserves. In 2006, the framework was amended to plan on CAD 3 billion annual debt reduction and an explicit objective of reducing the federal debt to 25% of GDP by 2013/14. This objective has since been advanced to 2011/12. Given this conservative fiscal framework, the combination of robust economic growth, rising employment and consumer spending, healthy household and business balance sheets and record-high corporate profits has in recent years provided most Canadian governments with stronger-than-expected tax receipts and surpluses exceeding projections. Recurrent favourable surprises have allowed governments the freedom to cut taxes, pay down debt and increase spending at a good clip all at the same time. The 2008 federal budget, tabled on 26 February, did not announce significant, ongoing additional tax or expenditure commitments, other than the creation of a new tax-free savings account, whose cost will be minimal in the first few years but is expected to eventually grow to over CAD 3 billion per year.⁶ Significant tax reductions at the federal level were instead announced in the October 2007 Economic Statement, including a further one-percentage-point cut in the goods and services tax to 5% as from 1 January 2008 (following a one-percentage-point cut on 1 July 2006), an increase in the basic personal exemption (from CAD 8 839 in 2006 to 9 600 in 2007 and to 10 100 in 2009); a cut in the lowest personal income tax rate (from 15.5 to 15% retroactive to tax year 2007); and annual gradual reductions in the basic federal corporate income tax rate (from 22% in 2007 to 15% in 2012). A number of provinces have also reduced capital, corporate and personal tax rates in recent years (see Chapter 3 for more details).

The federal government's fiscal outlook remains solid, and its fiscal stance, which calls for revenues, expenditures and net debt to decline as a share of GDP over the medium term, is appropriate, given a slowing economy and the need to prepare for future fiscal pressures. That being said, downward revisions to economic growth projections for 2008 and 2009 and a tighter fiscal framework have increased the probability of deficits. The government is planning on surpluses of CAD 2.3 billion in 2008/09 and 1.3 billion in 2009/10, both expected to go entirely toward debt reduction. However, the government's own simulations show that a one-percentage-point decrease in 2008 real GDP growth relative to the baseline assumption of 1.7% would lower the budgetary balance by CAD 3.3 billion in the first year and by 2.8 billion in the second. That alone would be sufficient to send the federal budgetary balance back into deficit. To avoid such an outcome over the next few years, it is even more important than usual for the federal government to respect its budget plan, control spending growth and fund any new expenditure programmes by reallocating savings from a more aggressive expenditure review exercise.

Box 2.2. Macroeconomic policy recommendations

The following recommendations would help the economy weather the current slowdown in global economic activity and strengthen Canada's macroeconomic framework in preparation for longer-term challenges related to demographic change.

Monetary policy and financial system regulation

- Put the burden of proof for switching to price-level-path targeting or to a lower inflation target on its proponents, because the performance of inflation targeting has been excellent.
- The federal government and the provinces should work toward the creation of a single securities regulator and reinforce stakeholder cooperation in enforcement activities by implementing the recommendations in the Le Pan Report (Le Pan, 2007).
- Enhance competition and efficiency in the financial sector by allowing domestic bank mergers.
- Collaborate in and support future international efforts to review the framework for risk rating of bank capital in the Basel II accords to align bank incentives with the goals of financial market stability and transparency.

Fiscal policy

- Control spending at the federal and provincial levels by respecting budget plans and by funding new programmes with savings reallocated from lower priorities.
- Avoid large increases in expenditures driven by fiscal surpluses associated with commodity booms.
- Encourage the acceleration of debt reduction at the provincial level, because provinces will face the brunt of future health care costs. Provinces with high debt loads should emulate the federal government and include debt-reduction objectives within their medium-term fiscal frameworks.
- Allocate more of Alberta's resource revenues to its Heritage Fund, and invest them fully outside the country.

Notes

1. The Congressional Budget Office (CBO) estimates that US consumer spending declines by between USD 2 and 7 for each USD 100 decline in housing wealth (CBO, 2007). Each 10% decline in US house prices would thus reduce consumer spending by anywhere between USD 55 and 191 billion. Assuming a marginal propensity to import for consumption around 0.08 and a Canadian share of US imports of 15%, one obtains the impact on Canadian exports.
2. As of March 2008, Canadian banks had announced approximately CAD 6.7 billion in write downs related to the US subprime mortgage market (corresponding to about half of one per cent of the total size of that market), with the Canadian Imperial Bank of Commerce, the hardest-hit Canadian bank, responsible for about two-thirds of the total.
3. Basel II is the second of the Basel Accords, which are recommendations on banking laws and regulations issued by the Basel Committee on Banking Supervision. The purpose of Basel II, initially published in June 2004, is to create an international standard that banking regulators can use when creating regulations regarding how much capital banks need to put aside to guard against financial and operational risks.
4. The first phase of the Passport System was implemented in September 2005 and gave participants (comprising all provinces and territories except Ontario, which refuses to join the passport effort, holding out instead for the goal of a unique national regulator) certain exemptions when dealing with multiple Canadian jurisdictions. Phase two of the Passport System will allow participants to clear a prospectus, register as a dealer or adviser, or obtain a discretionary exemption from the

regulator in their home province or territory and have that decision automatically apply in all other passport jurisdictions. Phase two also ensures public companies are subject to only one set of harmonised continuous disclosure requirements in passport jurisdictions.

5. The main difference between inflation targeting (IT) and price-level-path targeting (PLPT) is the treatment of past deviations of inflation from the target. While IT “lets bygones be bygones”, past deviations of inflation from the target under PLPT have to be offset in the future so as to bring the price level back to a pre-determined path.
6. The revenue cost will be small in the beginning because contributions to the new account are not tax deductible (but the savings grow and can be withdrawn tax-free) and are limited to CAD 5 000 per year (indexed).

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Chapter 3

Tax reform for efficiency and fairness

The Canadian government has set a high priority on reducing the economic burden of taxation. In a context of fiscal surpluses, it has been: markedly reducing corporate income and capital taxes; providing more personal tax relief especially at lower incomes and above all for saving; and cutting the federal value added tax (GST). While such measures, in particular income and capital tax cuts, reduce the economic damage caused by tax and improve business competitiveness, Canada should go further along this route with significant revenue-neutral reforms to achieve a more efficient tax mix that also retains its redistributive features. Numerous tax preferences to favoured activities, firm types, investments and savings vehicles narrow the tax base and create loopholes, keeping statutory rates higher than otherwise and distorting resource allocation. They should therefore be removed. It would also help to shift the tax mix toward more user fees and indirect taxes – including VAT, environmental levies and property taxes – which do not distort inter-temporal economic choices as income taxes do. Lower corporate and personal income taxes could improve the incentives for capital formation, FDI, innovation, entrepreneurship, labour-force participation, work effort, and the pursuit of higher education. The result would be higher standards of living.

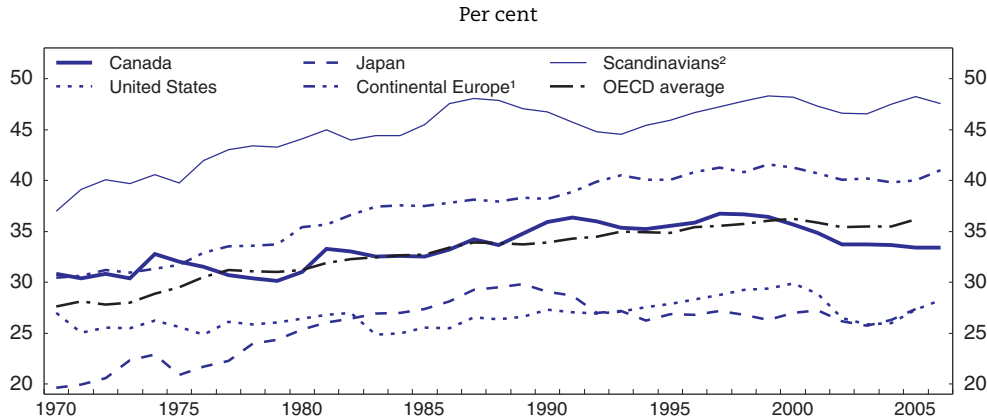
Canada has a long history of tax reform and has been actively cutting taxes since the late 1990s against a background of general government surpluses. The resulting gains in business tax competitiveness are expected to raise investment and attract foreign capital. A flatter personal income tax structure, along with better targeting of tax reliefs, has generally improved work incentives and helped to boost female labour-force participation. The near-term economic slowing prevents further tax cuts while the imminently mounting public expenditure burden of ageing will require more tax receipts. Tax reforms must henceforth focus on a combination of rate cutting and base broadening that would be broadly revenue-neutral and maximally growth-promoting. Within such a framework, there is a need to go further in restructuring taxes to make them less distortive through neutral treatment of economic choices. Adjusting tax policy in this way could boost savings, investment and innovation and should be central to the nation's productivity agenda. There is likewise a need to do better in reducing the high effective taxation of low skilled groups in order to price them into the labour market, helping to counteract demographic ageing. Tax policy is also arguably Canada's main instrument to confront a widening income distribution across individuals and regions. This chapter looks at making the most of tax policy in these respects.

Main tax trends

Canada exhibits an average tax-to-GDP ratio in the OECD context, although with a comparatively high reliance on more distortive income taxes. The Canadian government is thus on the right track in reducing such taxes, though efforts are called for to shift the tax base toward consumption. However, with its strong federal structure, Canada needs to continue to co-ordinate tax policy across autonomous government levels, a reform hurdle that few other OECD countries face to the same degree.

Canada in a global perspective


Having a tax ratio around the OECD average may reflect a middle way between the heavy spending nations of continental and northern Europe, and the more market-oriented approaches of the United States and Japan (Figure 3.1). It is also plausible that the higher a country's tax/spending levels, the greater its emphasis on distributive justice, as achieved by social benefits targeted to the less well-off and progressive tax structures. But it is also the case that in many European countries, less progressive taxes, such as payroll and consumption taxes, account for a larger share of total taxes (see below). Indeed, there is no other way to finance a thorough social safety net than to tax heavily along the whole income scale. Canada and the United States, committed to leaner government, are all the more reliant on their progressive tax systems to pursue equity goals (see also Chapter 1, Table 1.3).

Figure 3.1. **Tax-to-GDP ratios in OECD countries**

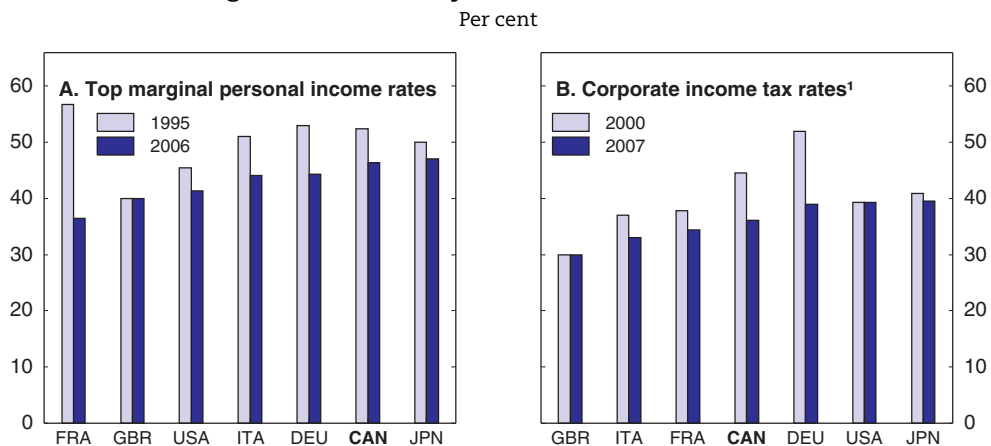
1. France, Germany and Italy.

2. Denmark, Norway and Sweden.

Source: OECD (2007), Revenue Statistics database.


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OECD tax ratios, which had long been trending upwards, broadly stabilised by about the early 1990s. Nonetheless, OECD tax systems are in a marked state of flux. Globalisation has increased the mobility of capital and high skilled labour. This has exerted relentless downward pressure on countries' ability to tax income earned by those factors and required greater reliance on less mobile labour and consumption tax bases. Globalisation, via the trade channel, has also raised the stakes for productive efficiency, innovation and structural flexibility in the OECD.¹ This challenge calls for a much more efficient tax structure, or less public spending, to reduce the excess burden of taxation. Many OECD countries have responded with cuts in personal and corporate income tax rates (Figure 3.2). Corporate tax bases in continental Europe have been particularly exposed to tax competition, and these countries have gone far in reducing corporate tax rates in order to safeguard revenue bases. Canada also tends to be vulnerable because of its high degree of openness to the United States, and it too has been cutting corporate tax rates substantially.

Figure 3.2. **Statutory tax rates in G7 countries**

1. Defined as the basic combined central and sub-central corporate income tax rate.

Source: OECD, Tax database. Calculations from Centre for Tax Policy and Administration.

StatLink  <http://dx.doi.org/10.1787/354881105756>

Statutory rate cuts have in most countries been funded by base-broadening measures, as income tax revenues have not declined. An important issue is how much further such base broadening can go: once a country has eliminated most loopholes, there is little further it can do to reduce average tax rates apart from cutting spending ratios or raising consumption-based taxes, generally thought to be less distortive albeit also less redistributive than income taxes. Canada alone among the G7 has managed to cut spending as a share of GDP to any serious extent.² Hence, it has experienced a falling tax ratio since the late 1990s, bucking the recent OECD trend to rising tax burdens.³

As to the tax mix, the main cross-country change over the last decade or so has been a growing share of corporate income taxes, which could reflect a highly elastic response of the tax base to rate reductions as well as cyclical conditions and a likely positive evolution of the “structural” profit share – in Canada’s case, reflecting *inter alia* the commodity price boom (Table 3.1). Personal income tax shares have tended to fall, most notably in Canada where marginal tax rates were cut in the latter half of the 1990s. Canada’s tax structure, like those in other English-speaking countries, remains heavily based on income taxes and in particular personal income taxes; these also bear the principal burden of tax-based redistribution. Continental Europe, by comparison, displays a much greater reliance on payroll and social security taxes, reflecting generous social insurance schemes, and on value added taxes (VAT). The Scandinavians also rely markedly on VAT but differ in their mixes of personal income taxes and social security contributions. There has been no widespread long-term shift from direct to indirect taxes, as growth in VAT revenues has been offset by falling specific consumption taxes, notably excise duties.

Table 3.1. **The tax mix in OECD countries**

Per cent of GDP

Tax base:	United States		Canada		EU15		Sweden		Denmark	
	1995	2005	1995	2005	1995	2005	1995	2005	1995	2005
Corporate income	2.9	3.1	2.9	3.5	2.6	3.4	1.8	2.6	2.3	3.8
Personal income	10.0	9.6	13.4	11.9	10.5	10.2	16.1	16.0	26.2	24.5
Payroll	6.9	6.7	5.8	5.7	11.8	11.5	14.3	15.9	1.3	1.3
Goods and services	5.0	4.8	9.0	8.5	11.8	11.9	13.3	13.2	15.7	16.2
Property	3.1	3.1	3.8	3.4	1.7	2.1	1.3	1.5	1.7	1.9
Total	27.9	27.3	35.6	33.4	38.8	39.7	48.1	50.7	48.8	50.3

Source: OECD (2007), *Revenue Statistics database*.

Canada is one of the most federal OECD countries, as extensive spending devolution is matched by exceptional sub-national revenue autonomy, implying a high degree of fiscal decentralisation. Provinces have the constitutional authority to define both the tax rate and the tax base for income taxes, even though most provinces have agreed to harmonise their personal and corporate income tax bases with those of the federal government.⁴ This means that the central government is limited in how much it can do in the way of tax reform, apart from using its spending power and setting a hopefully compelling example. It also suggests that tax distortions could be magnified by adverse spill-overs from one level’s policies onto the tax base of another within the federation. Administrative and compliance costs are also likely to be higher where there are multiple layers of tax authority. On the other hand, Canada has the chance for superior public-sector

performance, in terms of better targeted and more efficient public-service provision in accordance with the subsidiarity principle of fiscal federalism theory – provided that political accountability for the use of tax dollars is preserved at all levels of government.

Tax reforms in Canada

Tax policies in Canada have evolved partly in reaction to the domestic macroeconomic situation, but also in line with prevailing influences of tax theory and practices within the OECD. The late 1980s' reductions in marginal tax rates on personal income to enhance tax system efficiency were followed by the introduction in 1991 of a federal goods and services tax (GST), a VAT, to reduce the deficit and replace a series of cascading sales taxes on goods only. The mid-1990s federal budget crisis then required temporary tax surcharges and tightening of allowances, although most of the adjustment occurred on the spending side. Between the late 1990s and 2007-08, uninterrupted federal budget surpluses allowed an unwinding of crisis measures and resumption of tax reductions. The present federal tax-cutting programme includes significant corporate income and capital tax cuts to improve business tax competitiveness; personal income tax relief targeted on those with lower incomes, partly to make up for progressivity lost at the top with earlier cuts in marginal tax rates; but also a first-time pair of cuts in the GST (Table 3.2). The federal government has encouraged parallel reforms at the provincial level, where a shift to balanced or surplus budget positions likewise had set the stage for tax cuts.

Table 3.2. Distribution of federal tax relief

CAD billion, year ending March

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	Total	Share in total (%)
GST	7.1	12.0	12.6	13.2	13.7	14.2	72.7	39
Personal income tax	12.3	10.3	10.1	10.3	10.6	11.2	64.9	34
Business income tax	1.1	5.9	7.9	9.3	11.5	14.8	50.5	27
Total	20.5	28.2	30.6	32.8	35.8	40.2	188.1	100
Total as per cent of GDP	1.3	1.8	1.8	1.9	1.9	2.1		

Note: Totals may not add due to rounding.

Source: Department of Finance (2007), *Economic Statement*, 30 October and OECD, *MTB83 database*.

The ambitious new programme of tax cuts is to be commended, as it clearly reduces the “excess burden” of taxation (*i.e.* the amount by which the cost to society of each dollar in tax raised actually exceeds that one dollar, insofar as the tax distorts economic choices and causes production and/or welfare to shrink). Even so, it is valid to ask whether this golden opportunity for achieving useful tax reforms is being well exploited. The cumulative 2007-13 federal tax cuts, being divided roughly evenly among business, personal and consumption taxes, appear to be broad-based and thus may be wise in a political economy sense. However, it is unclear whether such a use of scarce budget funds is as effective in boosting long-run social welfare as it could be. In general, business tax cuts are best for economic efficiency, since such taxes are thought to carry a high excess burden, while GST cuts not so much.

The Department of Finance has estimated rankings of the main categories of taxes according to the economic harm they do, and conversely, to the gains from reducing them (Box 3.1). Taxes on capital are the most distortive, because they directly reduce savings,

Box 3.1. Differential economic efficiency costs of capital, labour and consumption taxes

Baylor and Beauséjour (2004) have calibrated and simulated a dynamic general equilibrium tax model for Canada in order to arrive at comparative estimates of the marginal efficiency costs (MEC) of seven main categories of taxes. As with most such models found in the literature, taxes on savings and investment are found to carry far greater MECs than wage and consumption taxes, with strong implications for the optimal tax mix. In addition, generalised investment incentives are found to be highly effective welfare- and growth-boosting measures. The key results are the following:

- Cuts in personal capital income tax and in capital goods sales tax, as well as increases in capital cost allowances (CCA) on new capital, are by far the most beneficial: each dollar of reduction in such taxes implies long-run welfare gains of 1.3 to 1.35 dollars. A higher after-tax marginal product of capital raises savings and investment and leads to a higher capital stock, hence greater output, income and wealth. It likewise stimulates labour supply, because the real wage rises along with the capital stock.
- An equivalent cut in the corporate income tax produces only 0.4 dollars worth of welfare gains, partly because it also reduces the value of deductions (notably CCA and interest on debt). Another reason for the lower impact is that some of the gains accrue to foreign owners of capital (it is a source-based tax), whereas changing the personal capital income tax (a residence-based tax) affects only domestic residents. The gap with the sales tax on capital goods and CCA largely reflects the fact that these measures focus entirely on new investment so that, unlike the corporate income tax, there is no windfall gain to existing capital.
- Taxes on labour (payroll tax) appear to be considerably less distorting, with estimated long-run welfare gains of only 0.15 per dollar of wage tax reduced. In part this reflects that labour supply is relatively less sensitive to changes in the real wage than investment is to changes in the cost of capital. Increased demand for work due to higher after-tax wages raises the marginal product of capital and, hence, the demand for capital, especially in labour-intensive industries.
- Consumption taxes are slightly less distorting still, providing 0.13 dollar of welfare gain per dollar of tax cut, i.e. they are the most efficient type of taxes. A consumption tax cut, like a wage tax cut, raises the real after-tax wage, but only in terms of non-housing goods (housing is not subject to the tax). It will again induce a positive labour-supply effect, increasing the marginal product of capital and capital formation in the non-housing sector as compared with a large decline in housing capital.
- An alternative metric to evaluate the impact of taxation on the economy is the impact of tax reductions on the steady state levels of GDP. While the GDP measure provides a more familiar concept, it has the drawback of not taking developments during the transition into account. Nevertheless, the key results continue to hold, and the relative ranking of the different measures are similar under both metrics. The main difference is that tax reductions that boost both domestic and foreign investment (particularly the capital and corporate income taxes) tend to be relatively more effective in terms of GDP impacts.

To be sure, the model does not provide definitive answers. Some of the channels through which tax policy affects the economy are not modelled, and these seem in particular to understate the efficiency gains from corporate income tax cuts. For example, income shifting abroad (considered by many to be a main reason for corporate income tax reductions) is not modelled. It is also assumed that the domestic resident is the marginal investor, but, if instead it is a tax-exempt foreign investor (as in a highly open economy), then the potency of personal capital income tax cuts diminish while that of corporate income tax cuts would rise. Another ignored benefit of corporate income tax cuts is (according to some studies) relatively large effects on R&D investments, which generate substantial positive spill-overs.

Table 3.3. Long-run economic well-being from revenue-neutral tax reductions¹

	Welfare gain per dollar tax reduction	Impact of tax reduction on GDP level ²
Sales tax on capital goods	1.3	3.1
Personal capital income tax	1.3	3.4
Capital tax	0.9	3.6
Corporate income tax	0.4	1.9
Average personal income tax	0.3	1.3
Wage tax	0.2	0.7
Consumption tax	0.1	0.2
Capital cost allowance	1.4	4.4

1. The revenue loss is assumed to be recovered through lump-sum taxation.

2. Percentage change in steady state GDP for an *ex ante* 1% of GDP tax reduction.

Source: M. Baylor and L. Beauséjour (2004), "Taxation and Economic Efficiency: Results from a Canadian CGE model", Department of Finance, *Working Paper* 2004-10.

investment and growth. The wealth and income tax cuts going to business should thus account for more than half of total eventual welfare gains (and two-thirds of the overall boost to long-run GDP) from the federal tax-cut package, even though costing less than one-third of it. It is in this sense fortunate that the provinces have responded well to federal incentives to cut their own, equally distortive, capital taxes, boosting expected efficiency gains further. The personal income tax cuts are somewhat larger than those for corporate income in terms of budget cost, and, being focused on low-income groups, they improve work incentives, but give rise to only about half the expected welfare benefits because labour supply is relatively less price sensitive than is capital. The biggest share of the tax-cut pie, some 40%, goes to the federal GST (a consumption tax), but it delivers less than a fifth of the total ultimate welfare gain, which also remains modest on a per capita basis. Had the government conditioned its GST cuts on equivalent shifts to VATs from provincial retail sales taxes (RSTs), which are estimated to fall 40% or more on business inputs (Smart, 2007), the resulting net gain could have been perhaps quadrupled with welfare gains from the overall tax cut programme almost doubled.⁵ Even though such calculations are rough and impressionistic, they help to set the stage for the analysis of Canadian tax policies that follows.

Issues in business tax competitiveness

A top tax policy issue is the comparatively high effective rate of corporate capital taxation, which reduces Canada's attractiveness as a place to invest. A relatively high statutory corporate income tax rate also reduces its attractiveness as a place to report profits. The federal government's programme goes a long way to remedy this situation. However, provincial retail sales taxes still penalise business inputs. Also, federal and provincial targeted tax reliefs have been on the rise, distorting the playing field within Canada while preventing base broadening and deeper statutory rate cuts. On the other hand, where there are large and clear social spill-overs from private behaviour, tax interventions – tax relief in the case of beneficial activities like R&D and tax surcharges in the case of negative activities like polluting emissions – to correct the failure of markets to internalise these effects can be a first-best solution.

Effective tax on capital: from highest to lowest in the G7

Only a few years ago Canada imposed the heaviest effective tax burden on business investment in the OECD and one of the highest in the world (Table 3.4). But since then, corporate tax cutting commitments by a succession of federal governments have been implemented. As measured by the marginal effective tax rate (METR) on capital, Canada moved from 2nd highest of 81 countries in 2005 to 5th highest in 2006, then by 2007 down to 11th place, still some 10 points above the OECD average but only in the mid range of the G7 countries.⁶ A critical medium-term goal the government has set for itself is to fall to the bottom of the G7 business tax rankings. The federal measures already announced would just be sufficient to bring this about, assuming that other G7 countries do not announce any new measures of their own. Besides the ongoing deep cuts in statutory corporate income and capital tax rates, capital METRs have been reduced by better alignment of capital cost allowances (CCA) with true economic depreciation rates of assets, especially as technology developments may have shortened the useful lives of some equipment, notably computers, relative to the past. (CCAs going beyond true economic depreciation would lower METRs further, but would be worse for allocative efficiency).

Table 3.4. **Marginal effective tax rates on capital by country**

Per cent

	2005 average	2006 average	2007			2012 average	Memo: Statutory corporate income tax rate 2012 ¹
			Manufacturing	Services	Average		
United States	36.7	37.8	34.7	40.1	37.8	36.9	38.1 (38.5)
Japan	30.4	31.3	35.2	30.4	31.3	31.3	41.9
Germany	36.1	35.7	36.9	35.3	35.7	29.7	30.2 (37.0)
France	33.0	31.9	33.0	31.7	31.9	31.9	34.4
Italy	23.4	23.1	21.8	23.4	23.1	18.7	31.4 (37.3)
United Kingdom	28.5	28.8	24.4	29.8	28.8	26.9	28.0
Canada	39.1	36.6	23.1	36.4	30.9	25.2	27.3 (34.2)
Australia	23.4	26.7	27.7	26.6	26.7	26.7	30.0
Korea	31.7	31.5	32.8	31.0	31.5	31.5	27.5
Mexico	15.6	13.7	17.1	12.1	13.1	13.1	13.1
New Zealand	25.1	28.5	29.9	28.2	28.5	25.7	30.0 (33.0)
Norway	21.0	23.5	25.8	23.2	23.5	23.5	28.0
Brazil	39.1	36.6	37.6	36.6	36.6	..	..
China	47.2	49.0	48.5	46.8	47.1	..	..
Hong Kong	5.8	5.6	3.6	6.2	5.6	..	..
India	24.6	29.5	28.8	30.1	29.8	..	..
Russia	36.3	35.7	38.0	34.9	35.7	..	..

1. The numbers in brackets denote the statutory CIT rate for 2007, if it is higher than that scheduled for 2012.

Source: J. Mintz (2006), "The 2006 Tax Competitiveness Report: Proposals for Pro-Growth Tax Reform", C.D. Howe Institute Commentary, No. 239, September; J. Mintz (2007), "2007 Tax Competitiveness Report: A Call for Comprehensive Tax Reform", C.D. Howe Institute Commentary, No. 254, September; and D. Chen (2007), "Flaherty's Missed Opportunity", C.D. Howe Institute e-brief, December.

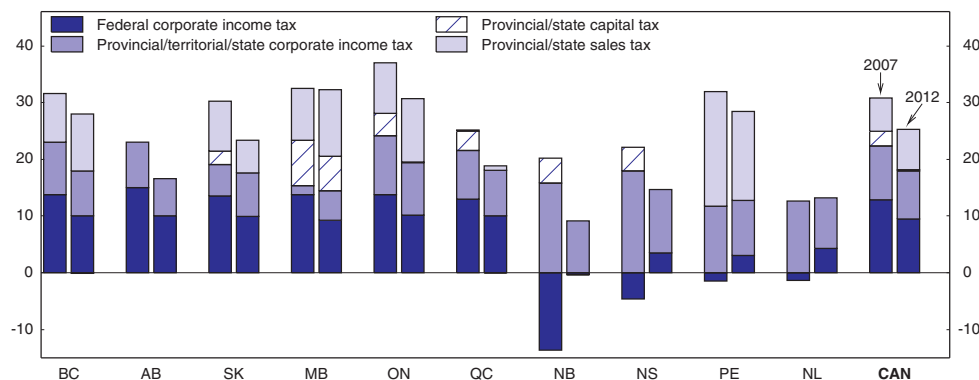
A key reference point for Canada is the United States, against which Canada seeks to increase its business tax advantage to 9 percentage points by 2012 (against a 2½ percentage points disadvantage in 2005). The lion's share of this advantage would reflect a sharply lower statutory tax rate in Canada as a result of its cuts. Otherwise, a comparatively less onerous sales tax on capital inputs in Canada would be offset by fewer capital taxes and more generous depreciation and inventory-accounting treatment in the United States. The United States allows companies to choose either FIFO or LIFO inventory accounting for tax purposes. Canada allows only FIFO accounting, which effectively implies using historical costs to value inventories. In the presence of inflation, this would understate the actual cost of carrying inventories, increasing the tax bill and the METR. Canada has rejected LIFO accounting, however, and this is consistent with its tax system generally, which does not take inflation into account. In any event, Canada's commitment to low inflation should keep this tax disadvantage to a minimum.

It is probably optimistic to assume that Canada's comparator countries will stand still on tax reductions until 2012, given the intense global competition for increasingly mobile capital. Therefore, to be sure to achieve the government's objective, provinces need to do their "fair share" in the national effort to lighten business taxation. As proposed in the government's strategy document (*Advantage Canada*, 2006), this result could be achieved by: i) reductions in provincial statutory rates parallel to the federal ones; ii) elimination of all provincial capital taxes; and iii) conversion of all remaining provincial retail sales taxes into a federal-type VAT, or so-called harmonisation, which by definition exempts business inputs. All provinces plan to eliminate their general capital taxes by 1 July 2012, and most have already legislated the phase-out. Several of these provinces have responded to the

federal incentive that encourages provinces to eliminate their capital taxes as quickly as possible. However, there has as yet been no progress on VAT harmonisation, and sales taxes will continue to add significantly to business capital costs in the five provinces with RSTs (Figure 3.3). Encouraging the provinces to go in the direction of such harmonisation is therefore appropriately a top priority of the federal government.


Figure 3.3. **METRs on capital investment by province**

Per cent, 2007 and 2012¹



1. In calculating the METRs, different assumptions are used by the Department of Finance (2012 data) and by the C.D. Howe Institute (2007 data), which may give rise to slight discrepancies.

Source: Department of Finance (2007), *Economic Statement*, 30 October; and D. Chen, J. Mintz and A. Tarasov (2007), "Federal and Provincial Tax reforms: Let's Get Back on Track", *C.D. Howe Institute Backgrounder*, No. 12, July.

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Even without VAT harmonisation, by 2012 Canada will have managed a remarkable reduction in the marginal effective capital tax rate, by more than one-third from its 2005 peak (from 39 to 25%). This will result in a decline in the cost of capital that should stimulate productivity-enhancing capital-for-labour substitution and crowd in previously unprofitable investment projects. If the ultimate impacts of tax cuts are large, as some studies predict (with elasticities of real investment with respect to the cost of capital of perhaps 1 or more; see Mintz, 2007), then the resulting expansion of the corporate income tax base might help pay for part of the rate cuts. This process cannot be without limit, however. Mintz (2007), hypothesising a non-linear effect in cross-country analysis, derives a "Laffer curve" relationship, suggesting a revenue-maximising corporate income tax rate of around 28%.⁷ As Canada plans to go to a 25% rate by 2012, there would be a small net loss of tax revenues relative to that maximum, but a significant net gain compared to the old tax rate of 39%.⁸ Mintz nonetheless argues for a further reduction to 20%, since the economic efficiency gains of doing so would far outweigh the added net budget cost.

Non-neutralities due to selective tax reliefs

The contribution of the tax cuts to productivity and growth will in the end depend not only on boosting the level of investment but also on its efficient allocation. Insofar as tax cuts may be targeted on selected industries or firm types, they could be squandered in relatively less efficient investments. Preferential tax policies, i.e. special low rates and deductions, also complicate the tax code, raising costs and creating opportunities for rent seeking and tax avoidance. In general, non-neutralities in pursuit of extraneous goals (largely shaped by politics and lobby groups) erode the tax base and reduce investment quality. They are often counter-productive and hugely expensive in opaque ways.

In Canada, a substantial tax rate reduction, some 16 percentage points, is given to small firms (see Table 3.5). The small business rate is the third largest federal corporate tax expenditure and the seventh largest overall (see Table 3.6). Furthermore, small firms can claim federal R&D credits at a rate of 35% against only 20% for large firms.⁹ Owners of shares in small firms can claim a lifetime capital gains tax exemption of CAD 750 000. A number of other OECD countries allow such preferences, but Canada's is particularly large and the qualifying ceiling for taxable income is especially generous (Johansson *et al.*, 2008). Canada also seems to be unique in allowing only domestically-owned firms to have access to the lower rate, though this restriction may not be binding (foreign-owned firms tend to be large). Small-firm tax breaks are often considered as compensation for financial-market information asymmetries and other factors making it hard for small and new firms to raise money. However, it is not clear that a tax preference is the most efficient way to address this market failure, or money wisely spent. Previous OECD *Surveys* have considered it to be a serious distortion, reducing firms' incentives to grow to the optimal size for scale economies, while also creating opportunities for personal and corporate tax avoidance.¹⁰ Johansson *et al.* (2008) furthermore presents evidence that reducing the CIT for large firms would produce far more growth benefits than reducing it for small firms, in part because profitability of the latter is too small to be affected very much by corporate income taxation in the first place.

Table 3.5. **Corporate income tax rates for large and small firms**

	2006	2012
General rate		
Federal	22.1	15.0
Weighted provincial average	12.2	12.6
Total	34.3	27.6
Small business rate		
Federal	13.1	11.0
Weighted provincial average	5.4	5.4
Total	18.5	16.4

Source: Department of Finance.

Table 3.6. **Largest tax expenditures**

Top ten expenditures in 2007	CAD billions	Percentage changes 2002-09
RPPs: Net tax expenditure	17.0	339
RRSPs: Net tax expenditure	11.2	152
Partial inclusion of capital gains for corporate income tax	5.1	113
Partial inclusion of capital gains for personal income tax	5.1	217
SR&ED tax credit	4.3	122
Non-taxation of capital gains on principal residences: partial inclusion rate	4.2	211
Low tax rate for small businesses	4.1	16
Zero-rating of basic groceries	3.7	-1
GST/HST credit	3.6	21
Charitable donations credit	2.5	67

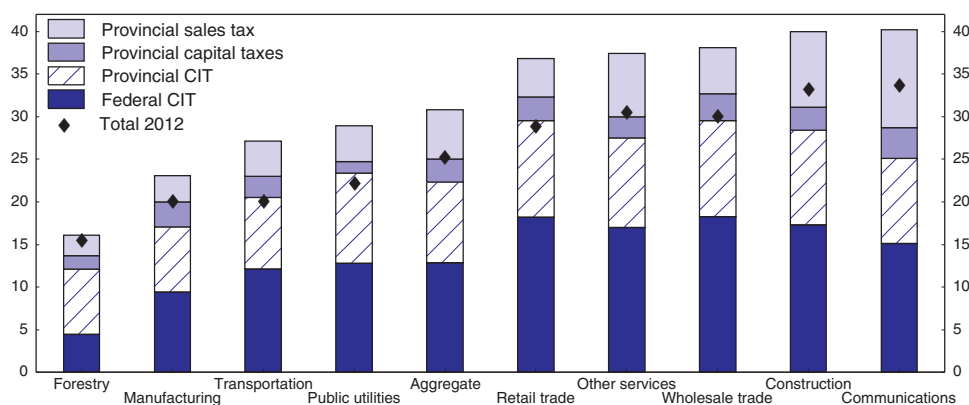
Source: Finance Canada, *Tax Evaluations and Expenditures*, 2007.

Measures have recently been taken to reduce these disincentives. The Canadian government, like some others in the OECD such as the United Kingdom, is moving away from small-firm tax-rate relief in an effort to reduce the standard corporate tax rate further. It is focusing its ongoing tax cuts on the general corporate rate and allowing only smaller reductions for the preferential small business rate. The result will be a laudable (75%) reduction of the federal large-small firm tax-rate differential between 2000 and 2012. Taking all levels of government into account, though, this differential remains large (over 11 percentage points), as targeted tax cuts for small business are continuing at the provincial level.¹¹ Convergence at the federal level should thus be speeded up, and provinces should follow this lead.

Other types of targeted federal and provincial tax relief are suggested by highly variable effective tax rates on capital across sectors (Figure 3.4). Market services – increasingly the main source of productivity growth and comparative advantage of OECD economies – are strongly disadvantaged by the tax system relative to manufacturing, public utilities and natural resources. Indeed, the tax subsidy given to manufacturing, relative to both services and the overall economy average, substantially exceeds that in any other developed or emerging market country examined in Table 3.4. Capital-intensive market services such as construction and communications are hard hit by the incidence of provincial retail sales taxes, mainly because special exemptions are given to manufacturing and public utilities. High taxation of financial services (included in “other services”) could result in higher lending margins (especially as this sector is not highly competitive), reducing savings and investment in the economy (Dahlby, 2005). Provinces are indirectly affected by these sector differences according to their production mix or by direct federal investment credits to lagging regions on the Atlantic coast (see Figure 3.3).¹²

Figure 3.4. **METRs on capital investment by industry**

Per cent, 2007



Source: D. Chen, J. Mintz and A. Tarasov (2007), “Federal and Provincial Tax Reforms: Let’s Get Back on Track”, C.D. Howe Institute Background No. 12, July; and D. Chen (2007), “Flaherty’s Missed Opportunity”, C.D. Howe Institute e-brief, December.

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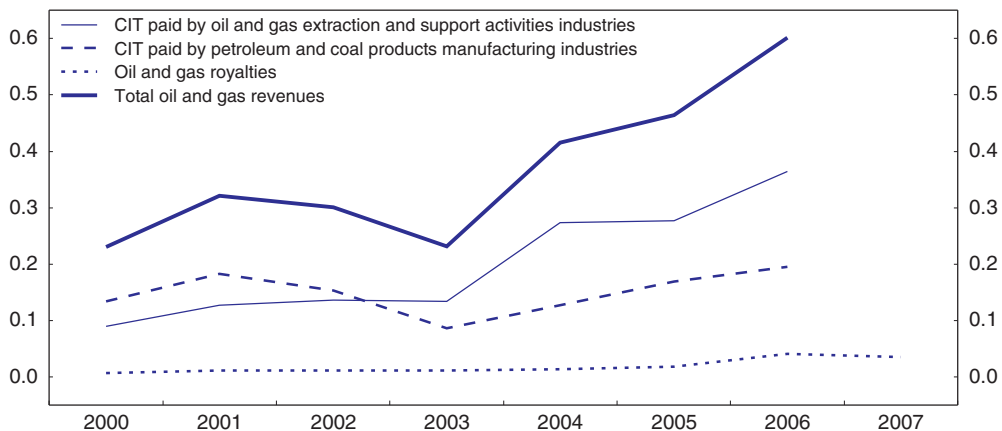
It seems important that the government wind down generous tax preferences to “traditional” sectors like mining, forestry and manufacturing for the efficiency and competitiveness reasons noted above. However, discretionary tax reliefs are in some cases even being enhanced. In the last two years, credits have been adopted or enhanced at federal and provincial levels alike for sports, transit passes, film making, research, labour training

and manufacturing and forestry equipment (Chen *et al.*, 2007). The 2007 federal budget provided for a temporary two-year write off for capital equipment for manufacturing which was extended for another three years in the 2008 budget.


The 2007 and 2008 federal budgets achieve a better alignment of CCA with the economic lives of assets, which goes in the direction of a more efficient CIT, namely by increased CCAs for non-residential buildings, computers, natural gas pipelines and other assets. Accelerated CCAs for clean energy might also be viewed as a socially desirable tax intervention (though it is in general better to tax “dirty” energy than to subsidise “clean” energy; see Norregaard and Khan, 2007). However, providing accelerated depreciation provisions for manufacturing alone is highly non-neutral, and even if it assists this sector in the light of the exchange-rate shock it has sustained, it could also retard the needed structural shift toward services. If adjustment assistance has to be given to the hard-hit forestry and manufacturing sectors, a more accountable way would be as explicit grants, which have to pass the annual appropriations process.

Oil-sands developments have likewise benefited from accelerated CCA, which is now being phased out. This non-neutrality may have contributed to overheating in the sector and the surrounding economy, now well lubricated by well over \$100/barrel oil. Thus, its announced elimination is highly appropriate, if overdue. However, tax preferences for the oil and gas industry remain (see Chapter 4). The federal and Alberta governments should reassess such preferences, which would also be consistent with efforts to curb greenhouse gas (GHG) emissions, of which the energy sector is a major source. It would furthermore increase the contribution of the oil and gas sector to general government revenues, being more commensurate with the profits it generates (Figure 3.5).

Figure 3.5. **General government revenues paid by the petroleum sector**
Per cent of GDP



Source: Statistics Canada.

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Some desirable tax interventions

This is not to say that targeted tax instruments can never be justified. In clear cases of externalities, tax credits or surcharges to alter private behaviour in desired directions, sometimes in combination with grants and regulations, may produce better social

outcomes. A general rule is that they be applied equally to all firms and sectors across the board; otherwise, non-neutral tax preferences could creep into the tax system ostensibly justified by externality arguments.

Tax subsidies to private research are used by virtually all OECD countries because of the existence of externalities and therefore under-investment in R&D in the absence of government support. R&D credits figure among the top 10 federal tax expenditures in Canada (Table 3.6), although multifactor productivity statistics have so far failed to show much of a payoff from all this spending (see Chapter 1). Canada's R&D credit scheme should thus be further evaluated for "value for money". Its impact is possibly diluted by giving small, Canadian-owned firms a substantially larger credit (Box 3.2).

Box 3.2. Correcting for social externalities: R&D credits

R&D credits are a prominent example of a justifiable tax subsidy, one that is widely used in OECD countries on the premise that R&D provides benefits to society at large (knowledge spill-overs) beyond those to the individual firm undertaking the investment. They are *a priori* more efficient than research grants, which are administratively costly and may involve government picking winners, though basic research usually taking place within the private or non-profit university sector may require a grants approach. Administration of a tax credit is not costless either as vigilance is required to ensure that the credit is not abused by firms reclassifying sundry spending as "R&D".

Canada offers one of the most generous rates of R&D tax assistance among a large group of OECD and emerging market countries (Johansson *et al.*, 2008). The effective marginal subsidy (reduction in the METR) for large firms is close to 120% (as compared with 30% in the United States; see Lester *et al.*, 2007). Canada's high ranking reflects the generous federal Scientific Research and Experimental Development (SR&ED) credit on eligible current spending (mostly wages) along with provincial add-ons. Work by Parsons and Phillips (2007) has evaluated the efficacy of the SR&ED credit for both large and small firms, finding a positive welfare effect (including the non-negligible costs of administration) of about 11 cents per dollar of foregone revenue. This results from an estimated 30% cost of additional distortive taxes offset by a 41% return to additional R&D spending. This result does not differentiate between nominal and real gains, so that wages of R&D workers could in principle be bid up by the public subsidies in the case of supply constraints in the form of a lack of professionals with the right skills on hand.

Currently, 32% of the total value of SR&ED tax credits goes to small firms who are likely to account for a much smaller share in total-economy R&D, although the taxable capital ceiling for access to such credits has just been raised significantly. Future research should look into whether unifying the tax credits for small, Canadian-owned and large firms – respectively 35 and 20% – at the lower level would raise the public's rate of return insofar as large and foreign firms may be better placed to undertake R&D investments. OECD research suggests that fiscal incentives can be effective when firms face financial constraints and tend to provide a stronger stimulus than direct government subsidies, but their overall impact on innovation may be small (Jaumotte and Pain, 2005).

Even though it has proposed a system of GHG emissions permit trading (see Chapter 4), the government should consider a tax on carbon emissions on excluded sectors to internalise the expected costs to future generations of Canada's current contributions to global warming.¹³ Existing environmental excise taxes could be broadened to include other

energy sources in order to more fully account for emissions. The rate of tax should vary with the environmental damage that the various energy sources inflict. The tax would also need to be set at an appropriate level to discourage emitting activities and encourage the development of cleaner technologies. It should not be viewed as a revenue-raising device. As seen with alcohol, tobacco and gambling levies, the tax rates are often set to achieve revenue targets, rather than dissuade people from consuming products. Governments become reliant on the revenue so that other social objectives can be compromised (Mintz, 2007).¹⁴ One way for government to discipline itself and to gain political acceptability would be to announce one-for-one reductions in other (business) taxes as revenues are collected under the proposed emissions tax.¹⁵ Indeed, the province of British Columbia may have shown the way forward for the rest of Canada in its 2008 budget, which imposed taxes on GHG emissions from fossil fuel combustion and legislated that this carbon tax revenue will be returned to taxpayers through reductions in other taxes.

Cross border-tax competition and leakages

As a G7 country, Canada is not a “small” open economy, but next to its giant US neighbour with whom it has extensive trade, investment and production links, it is quite vulnerable to relative tax-rate shifts in two major ways. *First*, lower statutory tax rates in the United States would partially deplete Canada’s tax base insofar as multinational enterprises adjusted to minimise their tax liabilities. *Second*, if US effective tax rates fell, and Canada did not respond, the United States would become a more attractive location for many economic activities that can be sited in either country (McLure, 2005). The latter supposition reflects the fact that location-specific rents (such as size of market, agglomeration and network effects, infrastructure availability, labour quality, etc.) are a major underlying determinant of FDI flows and are presumably high in the United States, which can in principle set a correspondingly higher tax rate. By the same token, Canada can expect to reap considerable benefits from both real resource and declared profit inflows in response to competitive reductions in its own statutory and effective rates.

Tax competition for FDI flows

Foreign investors are likely to respond to tax incentives, perhaps even more so than domestic investors, as such capital is by its nature “footloose”. But here the interaction of home and host countries’ tax codes including relative effective tax rates,¹⁶ withholding tax arrangements and tax treaties all matter, as do taxes in alternative host-country jurisdictions. Even if labour costs, in turn a function of the labour tax wedge, and business environment factors may be more important determinants of FDI location decisions (Hajkova *et al.*, 2006), the magnitude of Canada’s realised and prospective corporate tax cuts is such that even a marginal response by foreign investors could involve a significant and highly desirable inflow of capital into Canada – provided that the foreign direct investment regime stays open and that authorities not over-react to fears of a “hollowing out” of Canadian business.

International tax arbitrage

Tax arbitrage – when an investor pays tax-deductible interest to finance a tax-preferred investment – is generally countenanced by the tax law but could go beyond interest deductions to include, for example, aggressive transfer-price manipulation and debt-placement strategies to shift profits to low-tax countries and incur debts in high-tax

countries like Canada where the value of their deductions would be higher. OECD (2006b) noted that a significant part of share price rises associated with mergers and acquisitions arises from the possibility of taking large tax deductions for the heavy proportion of debt used to finance these takeovers. Lower statutory taxes will greatly reduce the profitability of such tax arbitrage, even turning it to Canada's advantage and helping to reduce revenue losses. Canada has recently put an end to certain types of tax arbitrage and is also stepping up information exchanges and other forms of co-operation to discourage international tax planning (Box 3.3).

Box 3.3. Measures to deal with abusive international tax planning

The international tax measures in the 2007 federal budget set out important initiatives to deal with aggressive international tax planning by multinational groups and the use of secrecy laws in other jurisdictions that facilitate tax evasion in Canada, both of which have led to significant leakage in Canada's tax revenues. These include proposals to respond to multinational groups' use of low-tax jurisdictions and other avoidance structures as a means of obtaining two deductions for the same financing expense.

In respect of the use of secrecy jurisdictions, Canada has announced that it will not conclude new tax treaties, or update an existing tax treaty, unless the treaty partner country agrees to abide by the highest international standards of transparency and exchange of information for tax purposes established by the OECD. In addition, a jurisdiction that has a tax information exchange agreement (TIEA) with Canada will be granted an important benefit that up to now has been reserved for tax treaty partners: active business income earned there by the subsidiaries of Canadian companies will be eligible for Canada's exempt surplus system, so that dividends paid to the Canadian parent from business income will not be subject to tax in Canada. Active business income earned in a jurisdiction that has not agreed to a TIEA within five years of the beginning of negotiations (and does not have a tax treaty with Canada), on the other hand, will be taxed in the hands of the Canadian parent company as the subsidiary earns it. This measure should at once protect the Canadian tax base, while expanding the number of jurisdictions in which Canadian firms can earn business income without attracting Canadian tax. Canada's public endorsement of the OECD's standards of transparency and exchange of information in tax matters should be applauded in this regard, as it shows that they can be accommodated within a competitive international tax system.

Canada's decision to stake out a strong tax advantage *vis-à-vis* the United States and other G7 countries makes a great deal of sense. At the limit, though, such strategies could drive capital tax rates toward zero, in the prototypical "race to the bottom", especially in small open economies.¹⁷ Some experts are predicting the demise of the corporate income tax for that reason,¹⁸ and others advocate its abolition by shifting all capital income taxation onto individuals. However, there are reasons to maintain a corporate income tax, primarily its usefulness as a withholding tax on personal income.¹⁹ Taxation of risky returns to entrepreneurship (with tax loss carry-forward and -backward provisions) may also be seen as a form of risk sharing by government (OECD, 2006b).

Issues in personal taxation – balancing efficiency and equity

Canada's labour force participation rates are the fourth highest in the OECD, but high tax wedges that discourage work are a growing concern in light of labour shortages in many regions and prospective ageing. Indeed, participation by marginal groups is weak and that of older workers only average. Personal savings tend to be discouraged by income taxes but are critical for sustainable growth and public finances. The net benefits to education are also reduced by high marginal taxation of future earned income. Efficiency-enhancing tax reforms – to boost savings, work and human-capital investments – often reduce tax progressivity, however. Consumption-based taxes *cum* better targeting of tax reliefs to the needy (progressivity concentrated at the lower end of the income spectrum) could help resolve this dilemma.

Tax distortions on participation, work, effort and study

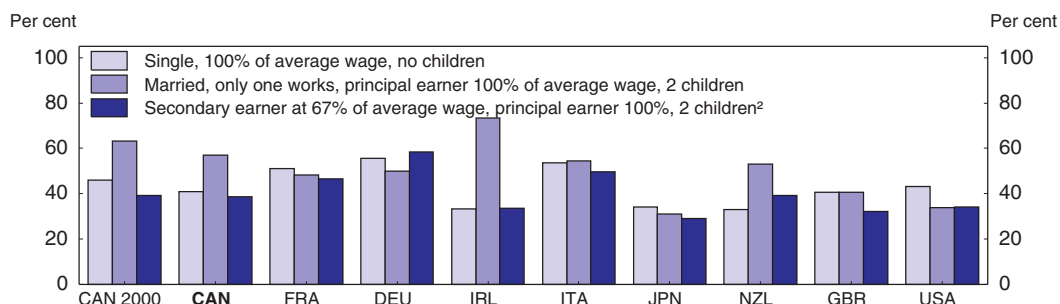
Taxes on wages increase the attractiveness of leisure or home production relative to paid work, but on the other hand they require more work in order to maintain income. The average effective tax rate enters into the labour supply decision at the extensive margin, *i.e.* the discrete choice of whether to participate and where (province or country). The marginal effective tax rate determines the work choice at the intensive margin: for the single worker, how many hours to put in; for the family unit, whether secondary earners should work and, if so, whether part or full time; for low-income or disabled people, whether to work rather than collect benefits; and for people eligible for retirement, how soon to withdraw. Demand for labour is reduced by employer social-security contributions, which must be paid on top of wages, but the market-clearing wage may fall, thereby ultimately absorbing all or part of this cost if the bargaining power of workers (and thus rent sharing) and public benefit systems are weak enough. Business taxes will also tend to be passed through into lower wages and productivity, especially in a small open economy, implying a double hit to workers' wages arising from taxation.

The tax wedge captures the effects of various labour taxes, namely social security and payroll charges plus personal income tax on final worker compensation. In Canada, the marginal wedge for the average wage ranges from around 40 to 60%, depending on family type – higher than in the United States but lower for some family situations than in Europe (Figure 3.6).²⁰ Empirical work points to a strong link between the tax wedge and labour-market outcomes: on average in the OECD, each 10 percentage points of extra tax wedge reduces labour input by up to 3% (Nickell, 2004). Bassanini and Duval (2006) show that the rise in Canada's structural unemployment rate between 1982 and 1993 overwhelmingly reflected a rising tax-wedge trend, as product- and labour-market regulations were being eased. But a declining tax wedge since the mid-1990s has helped to produce the opposite effect: the estimated structural unemployment rate has over the same period declined by some 1¼ percentage points, and actual unemployment rates have plunged thanks also to cyclical effects (see Chapter 2).

Most estimates show that by far the most elastic labour-supply response to the after-tax wage is that of married women, who provide a second family income but also face added opportunity costs in terms of child- and/or elderly-care expenses. Canada's tax system appears to do a good job in encouraging female participation, and indeed, given lacklustre productivity growth, rising female participation has been the mainstay of per capita real income growth over the last decade (see Chapter 1). Two events appear to have been pivotal in this regard. In the late 1980s, the federal spousal exemption was replaced by a non-

Figure 3.6. Marginal tax wedges on labour¹

2007



1. Marginal tax rates covering employees' and employers' social security contributions and personal income tax with respect to a change in gross labour costs.
2. Marginal tax wedge on secondary earner captures the share of his/her earnings that goes into paying additional household taxes, calculated as $1 - (\text{increase in household net income} / \text{increase in household gross income})$, where the base case is the one-earner couple-earning 100% of average wage, in each case with 2 children.

Source: OECD, Taxing Wages database.

StatLink <http://dx.doi.org/10.1787/355001144000>

refundable credit. This eliminated “jointness” of the individualised system, and, in response, female participation rose strongly for a time.²¹ In the 1990s, tax cuts and benefit increases to lower income families, in particular child benefits,²² sharply reduced the tax wedge for second workers, and female participation shot up to nearly rival that of the Nordics. The secondary-earner tax wedge remains higher than in Japan and most other English-speaking countries but is considerably lower than in continental Europe. However, the 2007 federal budget raised the spousal exemption for the supporting spouse, and, even though by a symbolic amount, this step risks once again increasing the jointness of the system.

METRs capture disincentives of benefit withdrawals in addition to taxes on earned income

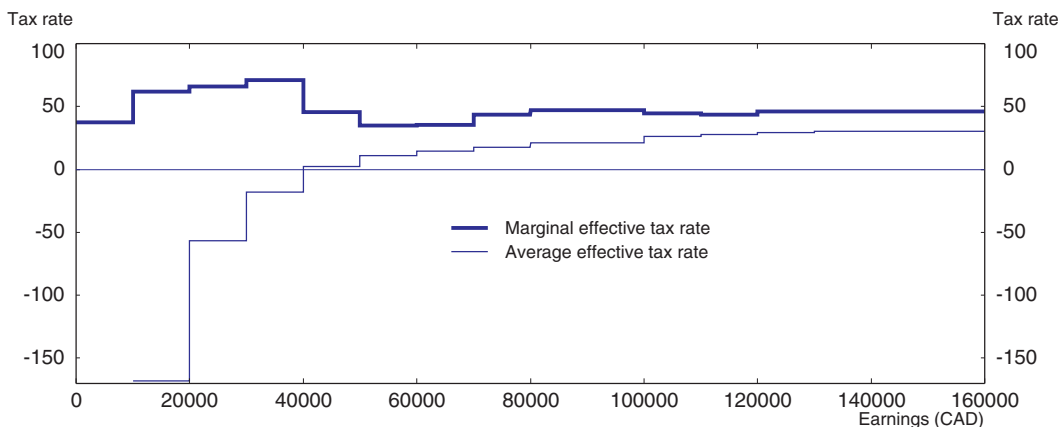
Particularly strong work disincentives afflict marginal groups – such as the disabled, ethnic minorities, immigrants, lone parents, unattached individuals, long-term unemployed, the low skilled, ex-convicts, etc. – all groups who are often eligible for social assistance. They face extremely high METRs as benefits are withdrawn with earned or pension income: up to 100% or even more if taxes are levied at benefit-qualifying income levels, as in some provinces. First-time job-seekers may be priced out of work and denied a chance to develop skills by high entry-level social-security charges combined with binding minimum wages.

Some OECD countries are trying to “include” marginal or first-time workers by reducing social-security charges. Canada has recently introduced federal in-work tax credits (the Working Income Tax Benefit, WITB) and other refundable credits, notably for child care, coming on top of the 1991 GST credit which notionally offsets a portion of the GST paid by low- and modest-income families. Such “non-wasteable” credits are phased out as income rises. The US Earned Income Tax Credit, the inspiration for the WITB, has been successful in improving labour-market participation of low-income individuals as well as reducing poverty,²³ and it is by far the most important US federal assistance scheme, albeit a costly one. In Canada, provinces have the main competence for social benefits. These benefits have had the side effect of increasing METRs as they are phased out with rising earned income, undermining work incentives higher up the income range. The costs of working are even understated by the measured METRs, as they also involve the loss of non-cash benefits like free medical and dental services.


Marginal effective tax rates faced by low-income Canadians vary significantly across provinces and family types depending on their respective structures of income taxation and support. In some jurisdictions, METRs can reach 100% for families on social assistance, although the WITB partially offsets that as from an income of CAD 3000 per year. For Ontario, the largest province, the social assistance reduction rate has in recent years been reduced to 50% and the initial earning disregard eliminated.²⁴ This removes the sharp METR spikes at very low incomes observed elsewhere but pushes the problem out to modest incomes. Hence, Ontario METRs reach around 60 to 70% between yearly incomes of CAD 10 000 and 40 000 as some federal and provincial incomes-tested benefits are clawed back. They then fall to a trough of 35% between incomes of CAD 60 000 and 80 000 before stabilising at 46% at higher incomes, where they are not far above average effective tax rates (Figure 3.7). High marginal tax rates at middle income levels (where taxpayer density is also highest) continue to weaken work effort and/or induce tax planning and evasion practices, especially for the self-employed – in either case shrinking the tax base. On the other hand, labour-supply responsiveness to METR spikes might decline as income rises, as prospects for upward wage mobility also strengthen.

Figure 3.7. **Marginal and average effective tax rates on earnings**

One earner couple with two children in Ontario, 2007



Source: Finance Canada calculations.

StatLink  <http://dx.doi.org/10.1787/355012002757>

There seems to be scope for efficiency gains by reducing statutory tax rates all the way up the income scale. Phasing out cash benefits well before middle incomes are reached could also help, and, even if that pushes up METRs at lower incomes, this could be mitigated by applying the resulting savings to lowering income tax rates. Better harmonisation with provincial cash-benefit programmes could further reinforce work incentives of the federal tax credit schemes by smoothing out METR peaks.

Acute labour shortages in booming areas like Alberta should elicit the growing participation of marginal groups while drawing migrants from other parts of Canada. However, as seen, METRs for marginal groups are too high. Those for unemployed workers in poorer regions like the Atlantic provinces may also be high, curbing their incentives to search for jobs, as Employment Insurance (EI) benefits are perversely higher and last longer where unemployment is higher. Even though labour mobility is already high and the factor shift in response to the commodity price boom has gone smoothly (see Chapter 1), it could

be even better. *Going for Growth* has recommended cutting EI benefits in order to improve labour mobility, especially given that in-work benefits are now provided via the tax system. Regional policy goals should be pursued by more transparent and less distorting means.

High marginal rates may limit innovative capacity

METRs at higher incomes, which are correlated with the progressivity of the tax system, may distort incentives to invest in education. This weakens the impact of public subsidies for education (Mintz, 2006). Conversely, high average effective tax rates (likely to be highly correlated with METRs) reduce the opportunity cost of studying, but when combined with generous education subsidies, a perverse effect could be prolonged schooling and shortened working lives. OECD research suggests that the impact of taxes on tertiary education can be sizeable, including for Canada (Oliveira Martins *et al.*, 2007), so that reducing top marginal tax rates could encourage human capital investments. It may likewise be desirable to replace “middle-class-welfare” – type tuition tax credits by income-contingent loans (see OECD, 2007).

But sufficient demand for the resulting knowledge acquired, and of the right type, is also important. As high top marginal tax rates reduce the pay-off to risk-taking by individuals, reducing them could boost entrepreneurship and innovative activity in the economy. A lower tax wedge, as seen, should enhance Canada’s ability to attract FDI inflows, hence international knowledge diffusion that enriches domestic human capital development. In conjunction with corporate tax reform, greater openness to foreign capital will also spur market competition, providing the stimulant for enterprises to innovate and hence to demand research skills and managerial talent. It thus seems important to reduce top marginal tax rates – still the second highest in the G7 (see Figure 3.2) – in order to raise TFP growth.²⁵

Reducing tax disincentives to savings

Net household savings rates have fallen to historical lows in Canada. This partly reflects the long period of exceptionally easy monetary conditions, along with rising household wealth thanks to capital gains. Nevertheless, savings are critical to sustainable long-run growth, since they help to finance productivity-enhancing investment, even if Canada has had a surplus of national savings for many years and domestic investment can (up to a point) be financed by foreign savings. Equally important, a robust rate of personal savings underpins fiscal sustainability, because reformed public pension schemes rely increasingly on private pensions to supplement retirement incomes.

As with a labour tax, a tax on savings has a dual impact: it penalises future consumption relative to present spending (an inter-temporal distortion), reducing the incentive to save, but it also makes it necessary to save more in order to attain a target future level of wealth. METRs of 46% for top earners and 60% or more at lower incomes plus even a moderate inflation tax virtually wipes out the reward to saving, and this distortion increases sharply as the investment horizon lengthens.²⁶ In order to encourage more savings and investment, therefore, a large chunk of personal savings has been sheltered from tax.

Reduced taxation of shareholder income

Reduced taxation of shareholder capital income is practiced, as in many OECD countries, with the aim of curtailing the “double taxation” of corporate capital income.

That is, post-tax corporate profits are either: a) distributed as dividends; or b) reinvested as retained earnings, which in turn causes share values to rise – in either case giving rise to a further tax liability at the shareholder level. Thus, in recognition of prior corporate taxes paid on profits, dividends in Canada benefit from a corresponding tax credit,²⁷ while capital gains enjoy a one-half exclusion and are taxed only upon realisation rather than as they accrue. A capped lifetime capital gains exemption under the personal income tax is provided for farmers, fishermen and small business owners, and it was sharply raised in the 2007 federal budget. The dividend tax credit and half exclusion rate on capital gains together ensure that income from unsheltered equity investment is taxed at an overall rate that is roughly comparable to that on other forms of income, which by increasing tax neutrality between stock and bond investments reduces capital-market distortions. Such reliefs likewise help to “integrate” the CIT and PIT,²⁸ though other possible non-neutralities across the two tax systems remain.²⁹

Near-consumption tax treatment of housing

Housing is far and away the major investment most people make. A true comprehensive income tax requires that individuals pay tax on imputed rental income from owner-occupied housing, while deducting their mortgage interest and maintenance and depreciation costs. Canada neither taxes imputed income nor allows mortgage interest and other costs to be deducted – in other words, largely consistent consumption treatment, though exempting capital gains upon sale. Explicit rental income from leased real estate is taxed on an income basis, i.e. allowing for depreciation and other costs including mortgage interest payments, while capital gains are taxed with a one-half exclusion as for shares. Property tax has to be paid at the provincial and local levels, and might be seen not only as a wealth tax but as a kind of user fee for local public services and amenities that maintain the value of the property and contribute to enjoyment of housing services. However, residential property tax may be set too low for this purpose (see below).

Since a consumption tax exempts the normal return to investment whereas an income tax does not (Auerbach, 2006), home ownership enjoys a tax advantage relative to renting and other non-sheltered investments, further increased by the exoneration of capital gains, which, as an economic rent, should be taxed under either basis. It is not certain how large the final advantage is, since the normal return (roughly the risk free rate of interest) is itself not very large, but imputed rent is more than that. What is clear, though, is that Canada’s treatment avoids the big distortions found in many other OECD countries, namely blithely exempting mortgage interest payments while failing to tax implicit rents to owner-occupied housing (besides exonerating capital gains upon sale, often conditional on the purchase of a new home). Furthermore, near-consumption treatment of housing as well as most other types of savings (below) makes Canada look ready to move toward consumption-tax treatment of *all* savings.

Consumption tax treatment of qualified pension savings plans

Investors are able to shelter investment income from tax by investing in registered pension plans (RPPs) or registered retirement savings plans (RRSPs), up to a limit. Most forms of financial assets can be held in these accounts, and all incomes and losses are treated equally. The tax treatment is “EET”, that is, the initial contribution and the returns are untaxed during one’s working life, but withdrawals are taxed upon retirement. The result is once again consumption-based tax treatment. That is, since the initial investment

outlay is fully expensed (i.e. normal return is exempt), income is taxed only as it is consumed. From the government's perspective, revenues will be needed more when the population is aging than now (when they may be given away in tax cuts, rather than saved for future ageing needs). However, these preferred savings vehicles will tend to crowd out those non-qualifying financial instruments offering meagre or negative risk-adjusted post-tax returns.

Many low-income seniors suffer extraordinarily high METRs on their pension returns, some 70% for single seniors with annual incomes of around CAD 17-21 thousand, because of the claw-back of old-age benefits, notably the Guaranteed Income Supplement (Mintz, 2006). This effective tax may far exceed the tax savings achieved by making contributions to plans while working. Hence, there is very little incentive for lower-income people to contribute to pension savings plans as heretofore constructed. The 2008 federal budget proposes a new Tax-Free Savings Account, a "pre-paid" savings plan (or "TEE") in which contributions are from after-tax income but investment income including capital gains and all withdrawals are tax free. This appears tailor made for such cases where income and hence the marginal tax rate are lower while working than in retirement. Allowing penalty-free withdrawals prior to retirement likewise is well suited to the poorer saver. The budget also stated that TFSA income and withdrawals will not affect eligibility for federal income-tested benefits and credits, providing a guarantee that withdrawals will be immune to means testing for the GIS, a critical condition for success of the reform (Poschmann and Robson, 2004). The modest annual contributions cap (CAD 5 000 vs. up to 20 000 for EET plans) should probably be maintained, targeting the plan on small savers, as unlimited exemption of capital gains and other "supra-normal" returns could be regressive and costly for the budget.

Tax exemptions for pension savings absorb the lion's share of federal tax expenditures, and they are (together with capital gains reliefs and R&D credits) among the fastest growing, reflecting sharply rising investment income (Table 3.6). It is important to ask whether all this tax expenditure augments national savings, as opposed to merely displacing non-sheltered forms. Evidence from other countries suggests that pension savings tax breaks do not create much net new savings (OECD, 2006a). But in Canada, with about 90% of individuals expected to hold all of their financial assets in tax-sheltered vehicles as the TFSA matures over time, this displacement of non-sheltered savings should be progressively reduced. This suggests that the limited taxation of savings in Canada should help to stimulate net savings. Further reducing tax on savings would continue to improve the neutrality and efficiency of the Canadian tax system.

It is true that favourable treatment for some types of capital income reduces effective capital income taxation. But it does so in a very different way than, for example, would shrinking the income tax and replacing the lost revenue with a consumption tax (Auerbach, 2006): *first*, the differential treatment of assets distorts the allocation of capital; and *second* (albeit thankfully less so in Canada), the differential treatment of assets and liabilities and in particular the full deductibility of interest combined with reduced taxation of capital income encourages borrowing to invest in tax-favoured assets, rather than saving. Instead of attempting to fix one tax distortion by imposing another, the problem should be corrected at its source, i.e. too high METRs. Thus, moving toward a consumption tax (EET treatment) should be accelerated. Some progress has been made over the recent years in Canada to move towards a consumption tax but more should be done. This would imply extending current EET tax treatment of pension savings to other

forms of savings while removing all contribution caps. An exception could be made for the new Tax-Free Savings Account, which should stay on a TEE basis to prevent the claw-back of savings by low and modest-income individuals. METRs would be equalised across competing investments and capital allocation improved, with a potential reflow of non-sheltered savings held in low-tax jurisdictions abroad. There would also be a better allocation of income between current and future consumption needs, particularly for large savers for whom contribution limits act as binding constraints. Making private pension savings mandatory (as in Australia), or else considering options like automatic enrolment and matching contributions, could then address the externality concern that because of myopia or cash constraints, people do not save enough for their old age.

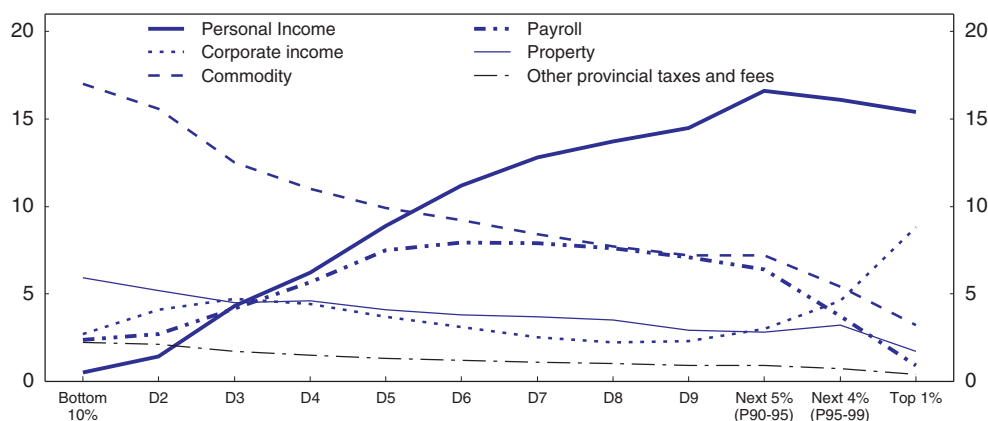
Equity considerations

Distributional issues seem to be the Achilles heel of tax reform. The tax-cutting agenda unfolded just as pre-tax income distribution in Canada had widened due to rapid income growth at the top against a 30-year-long stagnation of real wages for the bottom 80%. *A priori*, as more people are pushed into higher (inflation-adjusted) tax brackets, progressivity should rise because of compositional effects. However, declining top marginal rates, increasing thresholds for higher tax brackets, and large capital income tax breaks meant that the bulk of reform gains have gone to the top earners,³⁰ as higher payroll taxes generally offset income tax gains for the middle, and the tax system as a whole has become less progressive, especially since 2000.³¹ Studies show that provincial income tax cuts are the culprits behind Canada's eroding tax progressivity (Lee, 2007), even though distribution is the concern of provincial as well as federal governments, through either the tax system or the provision of public goods and services.


The classical dilemma is that most of these efficiency-enhancing reforms are also distribution-widening. Critics note that greater income inequality *per se* may have efficiency costs. For example, it may be one factor behind increasing consumer debt and plummeting net personal savings, as lower and middle-income groups attempt to emulate the consumption of the more affluent. More fundamentally, it is said to undermine democracy (Jackson, 2007). It is often asserted that social spending for the poor, as well as that for infrastructure that benefits all Canadians, has been squeezed in order to make way for tax cuts that put cash in the pockets of the already well-off few. Indeed, the cases of the Nordic countries go to show that a high level of economic efficiency and heavy taxation are not necessarily mutually exclusive.

As seen (Table 3.1), there has been a shift in the tax mix away from PIT towards CIT. Looking at each tax's estimated incidence by income decile, the CIT becomes very progressive at the top end as may be expected, while the PIT simultaneously turns regressive because of its generous capital-income reliefs; conversely, at lower incomes CIT is mostly regressive while PIT is substantially progressive (Figure 3.8). Hence, any shift from PIT to CIT might be on balance regressive. The most regressive tax, however, is that on commodities (goods and services), which implies a 15-17% average effective tax rate on the poorest but less than 6% on the richest. This seems to militate against efficiency-enhancing shifts in the tax mix toward consumption. However, much of the regressivity of consumption taxes reflects excise taxes on alcohol and tobacco, combined with fact that provinces with sales tax do not tax most services. Hence, an increase in VAT would have smaller regressive effects.

Figure 3.8. **Tax progressivity**
Combined federal and provincial tax rates by type – 2005



Source: M. Lee (2007), "Eroding Tax Fairness", Canadian Centre for Policy Alternatives, November.

StatLink  <http://dx.doi.org/10.1787/355038133814>

These arguments need to be taken seriously but also nuanced. Even a flat tax can be made progressive by adjusting the basic exclusion (Zee, 2005). Regressivity could be avoided by the use of tax credits against liabilities in lieu of deductions from income, as the value of the latter increases with the taxpayer's marginal tax rate whereas the former remains invariant. Such credits could also be made income-contingent and non-wasteful (producing a negative income tax). As noted, Canada has been following such an approach. The federal GST income-contingent refundable credit in the PIT partly corrects for the GST's regressivity.³² The new child and in-work tax benefits have helped raise a standard simple measure of PIT progressivity to the highest in a group of OECD comparator countries by 2007³³ – albeit also inducing high METRs due to benefit phase-out. Intergenerational mobility is among the highest in the OECD (see Chapter 1). More could be done, though. GST zero-rating of basic groceries, which benefits the rich as well as the poor, should be abolished and replaced by an expansion of the GST credit (which would double; see Table 3.6), enhancing both efficiency and equity. Federal and provincial benefit programmes could be better co-ordinated to iron out METR spikes as income is earned and benefits withdrawn. But it remains the case that the PIT at the top end becomes perversely regressive. Abolishing special tax preferences on certain savings vehicles and forms of capital income while reducing tax rates across the board as advocated above would have largely offsetting efficiency impacts and cause the tax incidence curve to become steeper while shifting downwards, thus easing the burden on the middle class.³⁴

Furthermore, the adverse distributional consequences of moving to a consumption tax may be more apparent than real. In the presence of consumption smoothing, a consumption tax base will always appear less progressive when evaluated on an annual basis than on a lifetime basis. Indeed, its purpose is to remove the inter-temporal consumption distortion of the income tax. Hence, the lifetime consumption base is the relevant one, and it is equal to the lifetime income base apart from bequests, which can also be taxed. Canada also taxes "deemed" capital gains on death, which is like an estate tax. There are various ways of implementing a consumption-targeted tax, and an "expenditure tax" seems the least regressive (Box 3.4). Most countries, like Canada, have been moving in that direction via tax-preferred savings vehicles. But this implies unequal

Box 3.4. Moving toward a consumption tax

Virtually all OECD countries are moving in the direction of a consumption tax as they increasingly tax earnings from capital at a lower and flatter rate than labour income. According to Zee (2005), there are various ways to target consumption under a personal “income” tax. As taxing labour income is equivalent to taxing consumption over the life cycle of a taxpayer, this outcome can be achieved through two alternative but equivalent reforms to a conventional PIT: 1) shifting the base of the PIT to wages (wage tax); and 2) allowing a deduction for savings (expenditure tax).

The well-known “flat tax” (e.g. Rabushka-Hall tax) and “USA tax” (unlimited savings allowance) respectively correspond to the wage and expenditure tax notions but also differ as to the corresponding treatment of corporate tax. The flat tax replaces the conventional PIT/CIT with the individual wage tax/corporate cash flow tax (immediate expensing of new capital with no allowance for debt interest) combination. The USA tax replaces the conventional PIT/CIT with the individual expenditure tax/corporate consumption-based value added tax. The dual income tax (DIT) exempts the “normal” return to capital but maintains progressivity on labour income tax. Norway has revised its DIT in order to counteract the tendency for small or privately held businesses to classify labour income as capital income.

Auerbach (2006) has pointed out that the distributional impacts of the alternative approaches to consumption targeting can differ significantly. Notably, the switch to a wage tax is highly regressive, whereas transitional asset-price impacts or implicit double taxation of old wealth under a full savings exemption scheme are an important means by which efficiency gains are earned and progressivity is restored. And, as noted above, capital gains and other forms of economic rent continue to be taxed under a consumption tax, further underpinning fairness. Thus, consumption targeting may not be quite as regressive as often feared with holders of “old” capital (rather than advocates for the poor) providing major political resistance and demanding compensation for “transition costs”.

In some cases, however, *ad hoc* moves toward a consumption tax may be worse than reforming the original income tax. In particular, allowing accelerated corporate capital cost allowances and relieving capital income taxation at the individual level without providing for consumption-based treatment of interest expenses sacrifices revenue while not gaining the efficiency advantages or simplicity of a consumption tax. A hybrid tax of this sort also winds up exempting economic rents from taxation, which even the slightly regressive consumption tax does not. According to Zodrow (2005), referring in this case to the US experience, “piecemeal reforms that cobble together various elements of a consumption tax reform, but do not include all of its features, can be highly undesirable”.

Some small, open OECD countries such as Belgium and the Scandinavians have respectively implemented a corporate consumption based tax and the dual income tax. So-called flat taxes have been adopted by some transition countries such as Estonia, Russia, and Slovakia, which has apparently boosted tax compliance through lower tax rates and a simplified tax code. Canada has already gone a long way toward consumption tax treatment with its high share of coverage by tax-preferred vehicles. Moreover, mortgage interest, usually a political stumbling block to adoption of a consumption tax, is not deductible in Canada, nor is interest on provincial and local debts.

treatment of savings vehicles which creates distortions. In Canada, as a large proportion of savers (two-thirds) already hold all their savings in tax-preferred vehicles, and housing is taxed on a quasi-consumption basis, further increasing consumption tax treatment of all savings may not cost too much but could stimulate savings and reduce tax distortions to capital allocation.

Tax issues in fiscal federalism

A very uneven distribution of natural-resource wealth, high oil prices and strong tax preferences for the resource sector are straining the national revenue equalisation system and distorting provincial tax competition. Federal redistribution thus takes on a crucial role. Achieving VAT harmonisation is a high priority in federal-provincial relations, not only as a major source of efficiency gains but also as a secure and comparatively well distributed revenue base for the provinces. Municipal property taxes and user fees likewise provide scope for efficiency gains and can help to assure sustainable local finances.

Horizontal fiscal imbalance: the natural-resource shock

Canada confronts the challenge of a natural-resource shock having highly asymmetric impacts across the federation, in particular the large concentration of oil and gas in Alberta and the shifting of collateral costs to other regions via a knock-on exchange-rate effect (see Chapter 1).³⁵ The Canadian constitution requires that comparable levels of services be provided at reasonably comparable levels of taxation in the various provinces. The federal equalisation system was set up to implement this provision and modified in 2006 to address the resource issue. It basically corrects upwards for fiscal capacity shortfalls of provinces below the national standard tax base. However, the recent resource shock is having profound effects on relative revenue-raising capacities of different provinces, stretching the capabilities of the equalisation system: Alberta's rising tax capacity raises the average to which all "have not" provinces must be lifted, even though only 50% of its resource revenues are counted, and since the system is not symmetric, rich provinces are not required to contribute directly to these transfers (see Usher, 2007). The shock is thus an unprecedented source of imbalance in the Canadian federation (Boadway, 2006).³⁶

Corporate tax preferences to the resource sector artificially boost the natural advantage of resource-rich regions. On top of generous tax write-offs for exploration and development expenses in the resource sector, federal revenue losses occur through the deductibility of provincial resource levies from the federal corporate tax base and, until 2006, acceptance of income trusts (flow-through entities that were heavily used to eliminate corporate tax liabilities, especially in the resource sector) (Boadway, 2006). A distorted playing field for fiscal competition due to highly unequal fiscal capacities and distorted product-market competition can exacerbate inter-provincial asymmetries. Fiscal migration, having nothing to do with inherent productivity differences but rather with the attraction of low taxes and high public spending, could amplify the main symptom of Dutch disease, *i.e.* excessive movement of resources from exposed traditional sectors toward the non-renewable resource sector, albeit also providing a safety valve in the form of reduced wage pressure.³⁷ On the other hand, migration could be held in check by rising house prices in the booming region, as well as certain features of Employment Insurance (EI) that discourage mobility (see Chapters 2 and 4). The latter policies seem more pernicious, because they tend to keep people idle, rather than displacing them from alternative productive employment as fiscal competition might.

Federal instruments such as progressive income taxation and EI need to alleviate asymmetries and promote balanced and sustainable national development. To enhance these instruments, reform of the PIT is called for, but even more so reform of the CIT, which becomes a useful redistributive device when there are major per capita income differences across regions. A possible federal carbon tax would likewise go in this direction. The deductibility of provincial royalty payments in calculating income for federal tax purposes, introduced in 2003, may have the opposite effects insofar as it shifts part of the burden of provincial royalty payments to the national taxpayer (Dahlby, 2005), creating a significant negative vertical fiscal externality (Dahlby *et al.*, 2000) and accentuating regional inequities. This tax-shifting effect is set to increase with the recent reform of the Alberta royalty regime, which will allow the royalty rate to vary over an increased range of the price of oil (see Chapter 4). In general in Canada, “expenses” such as municipal or provincial property taxes, capital taxes, payroll taxes, user fees, and resource royalties incurred to earn income are deductible in computing income for tax purposes. This treatment might be best reconsidered, at least in the case of royalties. In particular, insofar as provinces fail to capture pure resource rents via their royalty systems, deductions for royalty payments from the federal CIT should be curtailed.

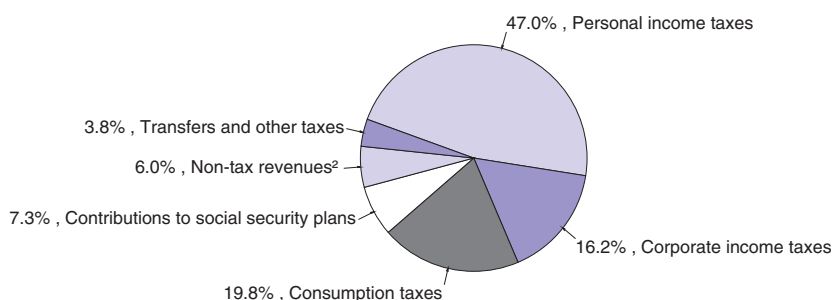
Vertical fiscal balance: achieving VAT harmonisation

The issue of vertical fiscal balance is one of finding the “right” mix between provincial revenues obtained from their own tax sources as opposed to federal transfers. Most major tax bases are co-occupied by provincial and federal governments (Figure 3.9). This could give rise to negative vertical externalities in tax policy – i.e. when one level raises its tax rates, it reduces the shared tax base and thus forces the other level to raise its tax rate also. Higher federal taxes and transfers (i.e. over and above those for equalisation) along with lower provincial taxes might in such a situation be justified to reflect the fact that the marginal cost of raising public funds is likely to be smaller for the federal government – given that it faces a less mobile tax base – than for the provinces. But there is a political risk that federal discretionary transfers could exceed such a theoretical optimum. A corollary of this risk is that transfers could be abruptly cut if the federal budget runs into difficulties, as in fact happened in the mid-1990s. Hence, a more sustainable funding source for provinces, who bear the brunt of ageing and other health-care cost pressures (see Chapter 2), might be an increase in their share of the VAT, which is a comparatively dynamic, efficient and well distributed tax base apparently well suited to federalist arrangements.³⁸

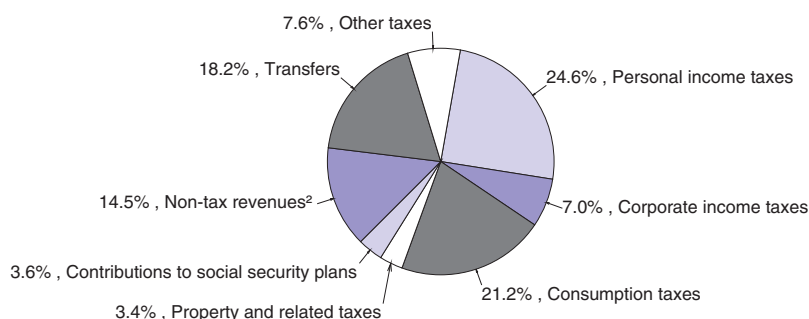
There have been various proposals to implement such a shift of tax power. One is to centralise all sales taxes by adopting an Australian or German style VAT-sharing system and to assign revenue collection to the federal government, which would then distribute the proceeds to provinces according to a transparent apportionment formula (Boadway, 2006). Three Atlantic provinces – Nova Scotia, New Brunswick, and Newfoundland and Labrador – have already signed up to the Harmonized Sales Tax (HST) system, of which one element is the assignment of revenue collection to the federal government, with payments made to each province on the basis of a revenue-estimation formula. Unlike in Australia or Germany, though, the federal-provincial harmonisation agreement that accompanies the HST legislation also provides participating provinces with a degree of latitude to change their common provincial tax rate, as well as shared responsibility with the federal government for changes to the tax base. Compared with the relinquished retail sales taxes, the HST has yielded significant efficiency benefits: annual M&E investment in harmonising

Figure 3.9. **Decomposition of government revenues**
As a percentage of total revenues

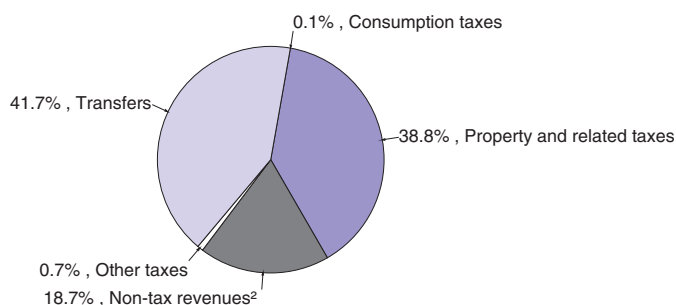
A. Federal government revenue, 2007¹



B. Provincial and territorial government revenue, 2007¹



C. Local government revenue, 2006¹



1. Year ending 31 March for federal and provincial revenues, 31 December for local revenues.
2. Includes sales of goods and services, investment income and other revenue from own sources.

Source: Statistics Canada.

provinces rose 12.2% above trend levels in the years following the 1997 reform (Smart, 2007). By comparison, Quebec has chosen a different approach by adopting a provincially-legislated VAT. It has adopted an essentially harmonised VAT but maintained its autonomy to modify the provincial rate and base and administers both the provincial VAT and the federal GST in the province, resulting in a so-called dual VAT. Given that there are some differences between the two systems, provinces could be expected to consider the relative advantages and disadvantages of each approach. However, central revenue collection of harmonised VATs would continue to provide significant efficiency gains. A federal auditing role could likewise avoid VAT “carousel fraud”, a serious problem in the EU, which lacks a central revenue authority.

A few years ago Dahlby (2005) argued that the federal government should reduce its GST rate from 7 to 5% in a strict exchange for the remaining five provinces with RSTs to adopt a VAT. As the VAT has a broader base than the RST, this could offset the loss of sales tax revenues deriving from taxation of business inputs. Political resistance to the switch has often derived from the fact that housing would be subject to the VAT whereas it is not under the RST. However, the direct impact should be largely offset by the lower taxation of construction inputs into housing production (Table 3.7). Hence, provinces could keep their old RST rates unchanged under the new VATs to increase their political palatability, with little or no sacrifice in revenue. The federal government has in fact reduced its GST rate from 7 to 5% in the last two years. While this could well be a first step in the devolution of GST, no province seems to have yet taken up the available tax “room”. Indeed, they are not likely to do so with a steadily increasing transfer flow, and unfortunately the federal government set no conditions on its own cut. If anything, the federal GST cut may increase the political pressure to do the same at the provincial level. Alberta is exerting similar competitive pressure on its fellow provinces with its “no-sales-tax” policy. The problem for the federal government is to find a way to induce VAT harmonisation, now that it has passed up the chance to use the GST cuts for this purpose. A more explicit offer of assistance may be necessary (IMF, 2008).

Table 3.7. **Predicted revenue impacts of provincial sales tax reform**

CAD billion

	Ontario			British Columbia		
	Current RST	Harmonised VAT	Difference	Current RST	Harmonised VAT	Difference
Estimated change in statutory tax burdens on:						
Consumers						
Goods	5.4	6.7	1.3	1.5	1.9	0.4
Services	2.6	3.3	0.8	0.4	1.1	0.7
Housing	0.0	1.8	1.8	0.0	0.6	0.5
Business						
Construction inputs	1.6	0.0	-1.6	0.5	0.0	-0.5
Other intermediate	2.7	1.2	-1.5	0.8	0.3	-0.5
Capital	1.4	0.4	-1.0	0.4	0.0	-0.4
Government	0.4	0.6	0.1	0.2	0.1	0.0
Total	14.1	14.0	-0.1	3.9	4.1	0.2

Source: M. Smart (2007), “The economic impacts of value added taxation: Evidence from the HST provinces”, mimeo, University of Toronto, February.

Improving cities’ finances

Cities are often seen as a primary engine of growth in Canada. However, the municipal financing base has not been able to keep up with the pace of urbanisation. The main municipal tax base is property (see Figure 3.9). This is an ideal local tax, as it fulfils the benefit principle and is visible, imposes discipline on the quality of services and level of taxes, and is relatively immobile and resistant to tax-base flight. It is therefore highly efficient. Its use should be extended in order to provide a dependable revenue base for cities. However, provinces are providing a high level of transfers to cities, while curtailing their flexibility on property tax. This undermines their accountability.

Municipalities in Canada (and other OECD countries – see OECD, 2008b, for example) tend to over-tax business while under-taxing residences under the property tax. The ratio of non-residential to residential property tax rates varies across provinces, from a reasonable 1.5 in New Brunswick up to very high levels in British Columbia, and the excess taxation of businesses relative to households is even greater if adjusted for the relative amounts of local services received.³⁹ This distortion works against firms' long-run competitiveness because property tax (not included in the METRs shown above) must be paid repeatedly on the same investment and is invariant to the profitability of the firm (Mintz and Roberts, 2006). Owners of local enterprises or property investments are often out-of-towners, so that imposing heavy property taxes on them is a politically expedient form of tax exporting, useful to keep those on local voting residents correspondingly low. Such “free riding” may also weaken the incentive to be efficient in spending. Provinces should reduce transfers and give cities the autonomy to update property valuations while restricting their autonomy to vary tax rates across sectors. Lower taxes on business would stimulate the local economy and contribute to a better geographic allocation of resources. In other words, the current differential treatment is not the free ride for a municipal tax base that it might seem to be.

User fees are another worthy revenue source for local governments, by definition satisfying the benefit principle while revealing preferences, hence non-distortive. Canadian municipalities should raise more revenues in user fees. Figure 3.9 suggests that they may not be as regressive as commonly feared. In any event, income redistribution should not take place through the pricing of market-like services, which should be aligned with marginal costs. Under-pricing of services like electricity and garbage collection is more likely to become a subsidy for larger households who may be better off (Mintz and Roberts, 2006). On the other hand, local authorities should avoid setting excessive tariffs for the services of local public monopolies, and competition policies should try to promote yardstick competition. Similar arguments apply to the provinces. Raising co-payments for higher education and health could help avoid tax increases by restraining public demand for such largely unpriced goods, and improve private incentives.

The direction for tax reform

As taxation touches on most aspects of economic behaviour, this chapter has covered a wide range of subjects and made many suggestions for improving tax policy. This section will attempt to tie together main themes and conclude (see Box 3.5). The discussion suggests that the Canadian government is making encouraging progress on many fronts but still has work to do to achieve a tax system that provides the soundest foundation for sustained long-run growth. This would call for reducing still high marginal effective tax rates on income from capital, labour and entrepreneurship – the drivers of growth – while making their incidence as neutral and fair as possible across different activities and individuals.

Chapter 2 indicated that the budget room for tax cuts has probably been exhausted, so that the next phase of reform will need to be revenue neutral. In Canada's case, there is still substantial scope for base broadening that can allow for further reductions in average and marginal tax rates on income. Beyond that, shifts in the tax mix toward consumption-type taxes are warranted. For maximum effect, both approaches should be pursued. It seems vital first to eliminate glaring non-neutralities within each tax component, initially in

Box 3.5. Main recommendations for tax reform

Business tax reform

- Replace remaining provincial sales taxes by harmonised VATs to reduce business capital costs. Maintain all collection (apart from Quebec's, which already has an independent "dual VAT" scheme) at central government level.
- Continue to rationalise the federal and provincial business tax preferences (special low rates, accelerated CCAs, etc.) to sectors like manufacturing and natural resources, and to small-scale, Canadian-owned firms.
- Eliminate the 15% personal mining exploration credit.
- Once the tax base is sufficiently broadened, cut the combined federal-provincial-territorial statutory corporate income tax rates toward 20%.
- Consider eliminating deductibility of provincial royalty payments from federal corporate income tax; use resulting revenue to lower statutory corporate income tax rates.

Personal income tax reform

- Target in-work non-wastable credits on low income earners while starting to phase them out earlier and more gradually to reduce high METRs at low to middle incomes. Co-ordinate federal and provincial benefit programmes to avoid excessive METR spiking.
- Eliminate GST zero-rating for basic groceries and use resulting savings to boost the GST credit for low-income people.
- Following on recent progress made, equalise tax across savings instruments – eliminate targeted tax preferences to qualifying pension plans, and capital gains exclusions.
- Then make "normal" return to all savings tax-free, namely by taxing all savings on an EET (consumption) basis with the exception of the new Tax-Free Savings Account which should stay on a TEE basis to facilitate savings by low- and modest-income individuals.
- Once the base is broadened, cut statutory PIT rates, narrowing the top marginal PIT-CIT rate gap.

Improving the tax mix

- Encourage VAT-harmonising provinces to take up the GST "room" the federal government has vacated, for example by offering them time-limited, modest financial incentives.
- Consider introduction of a (federal) GHG emissions tax at sufficiently high level to achieve environmental targets, as a complement to the emissions-trading scheme to apply to those sectors not covered by such trading. Lower levels of government could also implement more environmental excise taxes and congestion charges. Apply resulting revenues to further reductions in CIT to keep the overall burden on business stable.
- Make more use of property taxes and user fees by municipalities, while easing the property tax burden on business. As their tax base becomes more sustainable, reduce local authorities' reliance on provincial transfers.
- Use provincial savings resulting from lower transfers to municipalities to cut their PIT and CIT rates.

business and then in personal income taxes, and then to get the tax mix right as tax bases are adjusted over time. The following thus appear to be the main reform priorities:

- Targeted tax reductions or allowances under the *CIT* need to be eliminated in order to level the playing field, plug tax leakages and release resources for further reductions in statutory tax rates. Closing the small-large firm tax differential could drive the combined federal-provincial-territorial corporate income tax rate down to 20%. Similar arguments hold for preferential R&D credits to small firms and sector-specific reliefs.
- The *PIT* should be purged of remaining distortions to the allocation of savings and capital. EET treatment, exempting the “normal” return, should be extended to all forms of savings, without caps, the only exception being the new Tax Free Savings Account, which could stay on a TEE basis with a modest limit to meet the needs of poorer savers. High METRs facing those with low to middle incomes should be mitigated by better focusing of tax credits on vulnerable groups (earlier yet more gradual phase-outs) and better co-ordination between tax and benefit schemes across provincial and federal levels of government.
- Further reforms should shift the overall tax mix toward relatively benign consumption taxes. Some possibilities suggest themselves. Greenhouse-gas-emitting activities should be more highly taxed, promoting sustainable development and providing scope for further reductions in distortive taxes on income. Municipal property taxes and user fees should be increased and transfers from provinces (themselves financed by distortive taxes) reduced. Provincial VAT rates (once harmonisation is achieved) should be raised in line with evolving ageing needs.

The benefits of such a programme could be quite large. Substantial productivity and revenue gains could be associated with lower *CIT* rates due to more and higher-quality capital formation, FDI inflows and associated knowledge spill-overs, and reduced exposure to international tax arbitrage. Lower labour tax wedges and *PIT* rates would reinforce productivity gains as they raise FDI appeal, domestic innovative capacity and savings; they also strengthen the incentives to join the workforce facing still excluded persons. The result would be long-run real per capita income gains for all Canadians.

Notes

1. In other words, low wage pressure by emerging market competitors has reduced the price of low skilled labour relative to high skilled labour and capital in the OECD. Relieving formerly high relative taxation of the latter two factors helps not only to prevent their moving abroad but also to induce their substitution in domestic production. However, this tends also to reduce tax progressivity, at least in a static sense.
2. Between 1992 and 2006, Canada's structural current spending to GDP ratio fell by 6¼ percentage points, Germany's fell by 1½ points, while those of all the other G7 countries rose.
3. The average tax burden in OECD countries, measured as the ratio of tax to GDP, was in 2006 back up to the same levels as in 2000 after a brief reduction between 2001 and 2004 (OECD, Revenue Statistics).
4. All provinces and territories except for Quebec have signed a Tax Collection Agreement in respect of personal income taxation that requires the province or territory to adopt the federal tax base. All provinces except for Quebec, Ontario and Alberta have signed a Tax Collection Agreement in respect of corporate income taxation with the same requirement to adopt the federal tax base, though Ontario has agreed to sign such an agreement which will be applicable beginning in the 2009 taxation year.

5. The total dollar amount of tax relief achieved by 2012-13 for each tax in Table 3.2 was multiplied by the per dollar welfare (or GDP) gain shown in Table 3.3. This gives an estimated \$8 billion long-run welfare gain from the \$15 billion in business tax cuts (both corporate income and capital taxes, assumed to have respective assumed weights of 75 and 25%); \$3½ billion from the \$11 billion in personal income tax cuts; and \$1½ billion from the \$14 billion in GST cuts. Replacing the provincial retail sales tax by a VAT in the full amount of the federal GST cuts, and assuming that roughly 40% of the RST falls on capital inputs, would imply a net \$6 billion gain.
6. The METR is the amount of corporate income and other capital-related taxes (sales tax on capital purchases, asset and net worth taxes, stamp duties on securities, and taxes on contributions to equity) paid by a business as a percentage of pre-tax profits for marginal investments. The effective tax burden takes into account not only the tax rate but also the measurement of the base.
7. Dahlby and Ferede (2008) provide a novel cross-provincial analysis suggesting that a 10 percentage point cut in a province's corporate income tax rate is associated with up to a 2 percentage point increase in the per capita GDP growth rate. An equivalent reduction in the top personal income tax rate is associated with a 1 point increase in per capita GDP growth. Furthermore, they find a "Laffer curve" effect in the corporate tax (revenues are maximised at around a 12-14% provincial tax rate) but not in the personal income tax.
8. The budget projections assume no such tax-base feedbacks, which therefore constitute an upside risk. Also, it should be noted that the Mintz outcome is a function of what other countries are doing. If they cut rates, then the revenue-maximising rate could fall to below 28% so that 25% may entail no revenue loss after all.
9. In the 2008 budget, the definition of what constitutes a "small" firm was eased in the case of access to the SR&ED enhanced investment tax credits: the ceiling was raised from CAD 15 million of taxable capital to CAD 50 million. However, for the lower corporate income tax rate, the limit of CAD 15 million in taxable capital remains.
10. According to Mintz (2008), high-income investors can split income with other family members by forming small business corporations rather than by earning salary income. Employees of large public companies create private management companies so that their shares may be eligible for the CAD 750 000 capital gains exemption, reducing taxes on their employment income. Another typical arrangement in the high-tech community is for employees to quit large companies in order to form their own start-ups, in part so as to increase R&D credits. There are safeguards against the behaviours identified by Mintz, though: the lower tax rate for small businesses is restricted to the active business income of a Canadian-controlled private corporation; passive or investment income is not eligible for the preferential rate. In addition, integration between the corporate and personal income tax system through a refundable tax ensures that there is no tax advantage to investing through a corporation as compared to an individual investing directly.
11. A notable exception is New Brunswick, which is boosting its small business rate from 1 to 5%.
12. Variations in the provincial CIT component of the METRs are less indicative of tax non-neutralities *per se* on account of autonomous provincial tax-policy setting. However, horizontal tax competition may keep tax preferences from varying too widely across provinces, putting an effective check on "autonomy".
13. Carbon taxes seem in a number of ways to be a superior solution to permit trading. Taxes give clear, long-term price signals, in contrast to price volatility of permit trading schemes, that make it easier for firms to plan ahead to cut emissions. They also offer fewer opportunities for political favouritism and corruption, and because they do not rest on private property rights, are easier to adjust when needed. Nevertheless, the politics are likely to favour cap and trade systems. Also, the Canadian system can be integrated with others. In any case taxes on transportation fuel are likely to prove a better approach than mandated product standards. See Victor and Cullenward (2007).
14. That said, it is not clear that raising revenue from Pigouvian taxes is a bad thing.
15. This, in principle, would keep the policy focus on reducing emissions while also financing reductions in highly distortive taxes, creating a win-win situation. The EU's approach is along such lines; see Norregaard and Khan (2007). However, the received wisdom in the OECD is that such a "double dividend" is unlikely to exist, except in very special circumstances (see OECD, 2006c, pp. 70-72).
16. According to Devereux *et al.* (2002), the relative average effective rate (which, for infra-marginal investment, is close to the statutory tax rate) is likely to determine the location decision whereas the relative marginal effective rate will matter for the decision to expand investments in a country once there.

17. Economic theory suggests that the optimal rate of tax on capital income in the small open economy is zero: taxing the return to capital earned at source will distort its location. Domestic investment facing a world interest rate declines in response to the capital tax, business activity generating any mobile rents flows out, and the productivity of labour falls because of lower capital intensity of production. The tax falls entirely on (immobile) labour, as output prices are fixed on world goods markets. There are also incentives to shift profits to other jurisdictions.
18. One of these is Roger Martin, Dean of the Rotman School of Management at the University of Toronto.
19. With global capital markets, ownership of large corporations is often widely diffused throughout the world, and it would be very difficult to track down all the individual shareholders to collect the capital income tax. However, collecting tax on global corporate structures and innovative financial operations may not be so easy, either.
20. The marginal wedge has been chosen as the basis for comparison because it corresponds more closely to the critical choices facing marginal groups in Canada: second-worker earnings as a supplement to principal-worker earnings, people graduating from collecting benefits to earned income, or retirees weighing the implicit taxation of an extra year of work due to foregone pension benefits. Nevertheless, average and marginal tax wedges are highly correlated and tend to show the same patterns.
21. Joint taxation is likely to distort the labour supply of women, as it subjects the secondary worker's earnings to the primary earner's higher marginal tax rate. Canada, like most OECD countries, has treated the individual as the unit of taxation since 1998 (the US maintains family taxation mainly for reasons of horizontal equity). But joint taxation can be mimicked under an individualised tax by dependent spouse deductions that are withdrawn as spousal earnings rise. See Crossley and Jeon (2007), who calculated that METRs for a treatment group of low-educated women married to high-earning husbands dropped on average by 17% as a result of the 1998 reform, in turn accounting for a 9-10 percentage point increase in their labour force participation. Tsounta (2006) shows that the secondary-earner tax wedge dropped by some 4 percentage points between 1996 and 2003, which in turn could explain at least 30% of the 5 percentage points rise in female participation in Canada over the same period.
22. This included introduction of the Canada Child Tax Benefit and Earned Income Supplement in 1992 and the National Child Benefit System, expanding on the Child Tax Benefit, in 1997. When the larger Child Benefit was integrated into the basic earned income supplement in 1997, the requirement that taxpayers earn income to qualify for the earned income supplement disappeared. See Poschmann (2008).
23. Empirical evidence shows that the US EITC has positive effects on labour market participation, especially for single parents.
24. Ontario has also announced a major restructuring of its social assistance system to pay children's benefits through a new separate programme, the Ontario Child Benefit (essentially de-linking child benefits from the work status of parents to better protect children), to be integrated with the Canada Child Tax Benefit. This change, which starts in July 2008 and will be fully implemented in 2011, will have a considerable impact on EMTRs for these families, partially offsetting the muting provided by the 50% phase-out rate.
25. Furthermore, labour taxes distort the price of capital relative to labour, affecting capital intensity and causing labour and capital to be combined in ways that differ from the most efficient technology available, thereby lowering production efficiency and MFP (OECD, 2008c). Presumably a too low capital-income tax would also create a bias toward capital-intensive production.
26. Mintz (2006) gives the example of a 20-year government bond earning a 4% return, with a 60% marginal income tax rate and a 2% inflation rate, combining to give a post-tax real return of -0.4%. For 50-year horizons the theoretical literature has found the optimal capital tax rate to be zero (Auerbach, 2006).
27. Eligible dividends from large corporations benefit from a 30% combined federal-provincial tax credit after being grossed up by a factor of 45% (reflecting an average combined corporate tax rate of about 32%). Ordinary dividends from small corporations currently benefit from a 21% tax credit after being grossed up by a factor of 25% (reflecting an underlying corporate tax rate of 20%). Other countries like New Zealand follow a full (rather than notional) imputation system in which actual corporate tax paid that can be allocated to the dividend payment is deducted from the shareholder's tax liability. While more accurate, this approach is also likely to be administratively burdensome.

28. The case for imputation or reduced taxation may be weakened by the fact that the effects of double taxation of dividends are fully capitalised in share prices; hence integration would only deliver windfall gains to (rich) shareholders without lowering the cost of corporate capital (Zee, 2005). Imputation also discriminates against foreign shareholders, which is why some European countries (following a European Court ruling) have chosen to drop it and instead lower their corporate income tax rates.
29. Nevertheless, such distortions may not be large. Canada's tax system treats business income earned and distributed through a corporation, and that earned directly by an individual, in a fairly neutral manner. Even if corporations benefit from tax deferral on their retained earnings, it is only one among many factors that entrepreneurs take into account when choosing an appropriate business structure. In addition, passive or investment income in a Canadian-controlled private corporation, whether distributed or not, is taxed at 28% at the federal level, comparable to the top federal marginal personal income tax rates of 26 and 29%.
30. Individuals also receive tax breaks for investing in flow-through shares, used by corporations to finance mineral exploitation (e.g. the 15% personal mining-exploration credit, renewed in the 2007 and 2008 budgets).
31. According to tax incidence calculations by Lee (2007), the top 1% of the population paid a total tax rate nearly 5 percentage points lower in 2005 than in 2000, and it was then actually slightly lower than that paid by the poorest 10% who saw their average tax rate rise by 5 percentage points from 1995 to 2005. According to OECD (2008c), Canada is among a significant minority of OECD countries where tax reform through 2006, combined with fiscal drag, mainly benefited high-income individuals.
32. The GST credit is not netted out of the commodity tax curve in Figure 3.9 since, as a tax expenditure, it is methodologically treated as an income transfer. The WITB credit is not included because the Lee (2007) calculations underlying the figure are for 2005, whereas the credit became available only in 2007.
33. In 2007, the ratio of the average tax wedge for a two-earner, two-child couple earning 167% of the average wage to one earning only 67% was 1.8 in Canada. This compares with 1.6 in the United States (and for Canada in 2000), 1.4 in Germany, 1.3 in France, 1.2 in Denmark and 1.1 in Sweden. It should also be noted that the same ratio for single parents is heavily negative in Canada and the United States while staying close to those for dual-parent families in the other countries (calculations based on OECD, *Taxing Wages*).
34. According to Auerbach (2006), taxing capital income may allow the government more scope for redistribution, because less capital income increases the cost to high-ability individuals of not working.
35. There could also be highly adverse environmental spill-overs to other regions in the form of heavy water use by the oil sands industry and its GHG emissions (see Chapter 4).
36. Dahlby (2005) argues that the accords that the government signed with Newfoundland and Labrador, and Nova Scotia are other important contributors to horizontal fiscal imbalances.
37. Empirical work by Day and Winer (2005), using a data set for 1974-1996, suggests however that public policies (EI, personal income taxes, social assistance) are notably less important determinants of internal migration than employment prospects and moving costs. But they also find that the impact of large discrete policy shocks, rather than marginal ones, could swamp the retarding influence of even high moving costs.
38. The last OECD Survey proposed abolishing the health and social transfer in exchange for shifting the federal GST base entirely to the provinces and territories. This would eliminate a large amount of fiscal churning under which no government has clear responsibility (Smart, 2005). The 2002 Seguin Commission likewise called for a so-called tax point transfer from Ottawa to the provinces; under this plan, federal health and social transfers would be abolished entirely in exchange for a transfer of federal tax revenue to the provinces (about 4½ per cent of federal income tax or the same number of points from the federal GST base would be needed to make the proposal revenue neutral).
39. Mintz and Roberts (2006) calculate that non-residential properties are over-taxed relative to the services they receive by 56% in Alberta, 29% in B.C., 24% in Ontario, 18% Nova Scotia, 11% in Newfoundland, and less elsewhere. Residential properties are universally under-taxed relative to the benefits they receive.

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Chapter 4

Achieving long-term sustainability of the energy sector

Energy represents a major sustainable-development challenge for Canada. In the short term, labour shortages and infrastructure bottlenecks are likely to hinder energy developments and need to be addressed. In addition, provincial fiscal management could be improved by adopting prudent allocation and withdrawal rules of revenues from non-renewable resources to and from a long-term fund. Eventually the main challenge will be to curb greenhouse gas emissions (GHGs), despite the rapid expansion of high emitting sectors. The effectiveness of environmental policies could be enhanced by better federal-provincial coordination. Efforts should be concentrated on designing and implementing an emissions-trading scheme compatible with corresponding systems abroad. Finally, effective and efficient systems of regulation and taxation are essential to facilitate the timely realisation of energy supply plans.

Achieving sustainable exploitation of its plentiful energy sources is one of the key challenges Canada will face in the years to come. Indeed, the economy relies considerably on energy-based activities whose development has been encouraged by government policies. At the same time, the production and consumption of energy is responsible for the bulk of the country's greenhouse gas (GHG) emissions. With the rapid development of the western oil sands, emissions are expected to grow significantly. In the context of the growing importance of climate-change issues, both at the national and international levels, and in preparation of post-Kyoto negotiations, it will be important for Canada to exploit its natural resources without excessive costs to the environment. For this purpose, it needs to select near- and long-term development strategies that are economically and socially manageable in current circumstances and can be adjusted over time in light of new information.

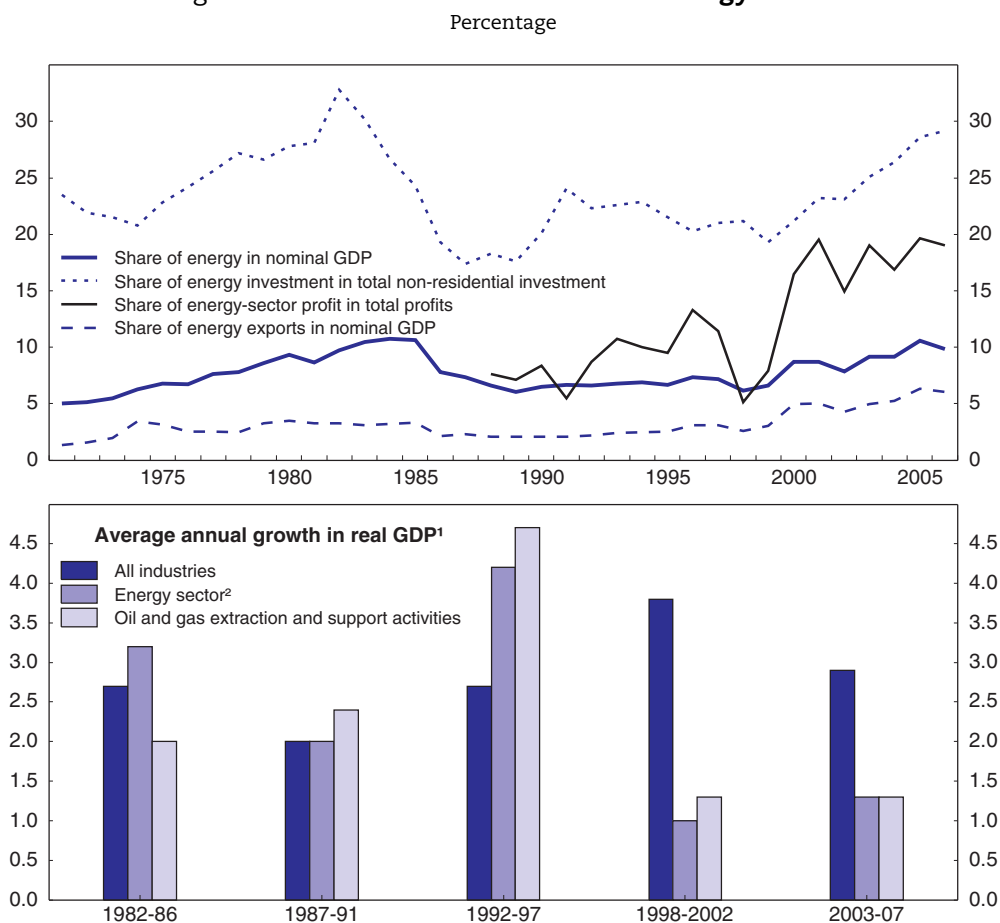
This chapter analyses the current and future challenges that the energy sector (in particular the oil sands) will face and proposes changes to make development more environmentally and socially sustainable. After a brief overview of the sector, the chapter discusses how adjustment to volatile oil prices has triggered boom-bust cycling and how this could be damped. It then examines how the trade-off between energy output and environmental goals in the longer run can be further eased by increased coherence among environmental policy, tax and regulatory frameworks. The last section summarises policy recommendations.

The energy sector is a growing part of the economy

The energy sector has been expanding at a fast pace since 1998, accounting for almost 10% of Canada's nominal GDP in 2006 (Figure 4.1). This growing share is entirely due to very large increases in energy prices, as the growth of real output has been below that of the overall economy. The energy sector is very capital-intensive. Higher prices have boosted profits, and energy-related investments are estimated to have accounted for 29% of total non-residential investment in 2006, up from 21% in 1998 (Carrier and Turcotte, 2006). Driven by the oil and gas extraction industry, employment in the sector has increased at a faster pace than in the economy as a whole, implying declining relative labour productivity performance.

Approximately half of Canada's energy sector is foreign-owned¹ and is strongly focused on export markets. The share of energy exports in nominal GDP almost tripled to 6.0% from 1998 to 2006. In recent years, the share of energy exports directed to the United States has been increasing with the development of offshore oil, the start of gas exports from Sable Island (off the coast of Nova Scotia) and the opening of the Alliance pipeline connecting Alberta to Chicago. Chapter 6 of the North American Free Trade Agreement (NAFTA) prohibits government intervention in North American energy markets whether in the form of price discrimination or direct disruption of supply channels that would cause Canadian energy exports to the United States to fall. However, this clause does not impose any restriction on Canadian producers, who are free to choose their customers and the amount of energy they sell (Holden, 2006).


Figure 4.1. Selected indicators for the energy sector



1. Break in series in 1997.

2. The energy sector is composed of oil and gas extraction, coal mining, support activities for mining and oil and gas extraction, electric power generation, transmission and distribution, natural gas distribution, pipeline transportation, petroleum and coal products manufacturing, other metal ore mining.

Source: M. Carrier and J. Turcotte (2006), The contribution of the energy sector to the Canadian economy, Analytical note, Economic and Fiscal Policy Branch, internal publication of the Department of Finance Canada and Statistics Canada.

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Canada has a substantial endowment of diversified energy resources. At the moment it is the eighth-largest producer of crude oil in the world and the second-largest exporter of natural gas after Russia. Canada is well positioned as one of the few countries outside OPEC with significant prospects for production growth: it has the world's second largest proven oil reserves after Saudi Arabia, albeit with considerably higher production costs. Production in the Western Canada Sedimentary Basin – Canada's most important source of crude oil and natural gas – appears to have reached its peak over the last decade. Despite federal and provincial moratoria on exploratory drilling and development of offshore reserves in British Columbia, activity in offshore locations and the Northern territories is being stepped up. It will nonetheless not be sufficient to stave off the decline in traditional oil and gas fields over the long term (Table 4.1). By contrast, the oil sands, which are mostly located in the province of Alberta, have been developing at a very fast pace (Box 4.1). The shift within the energy sector from conventional to other sources for oil and gas has been facilitated by technological advances and higher world energy prices.² This shift has

Table 4.1. Canadian crude oil and gas production

	Thousand barrels per day				Share			
	1990	2000	2010	2020	1990	2000	2010	2020
Western Canada								
Conventional light and medium	940	734	511	349	56.5	33.5	15.7	7.4
Conventional heavy	263	510	439	322	15.8	23.3	13.4	6.8
Pentanes	116	194	163	155	7.0	8.8	5.0	3.3
Oil sands mining	209	321	932	2 148	12.6	14.6	28.6	45.3
Oil sands <i>in situ</i>	135	289	909	1 616	8.1	13.2	27.8	34.1
Offshore East Coast	0	145	310	150	0.0	6.6	9.5	3.2
Total	1 663	2 193	3 264	4 740	100	100	100	100
	Trillion cubic feet				Share of total world			
		2004	2010	2020	2004	2010	2020	
Natural gas		6.5	6.8	6	6.6	6.0	4.2	

Note: Oil sands *in situ* are recovered by techniques which make the hot bitumen migrate towards producing wells, bringing it to the surface, while the sand is left in place (*in situ* is Latin for “in place”).

Source: Canadian Association of Petroleum Producers (2006), 2006-2020 Canadian crude oil production and supply forecasts, Calgary; Canadian Association of Petroleum Producers (2007), Crude oil forecasts, markets and pipeline expansion, Calgary, June; IEA (2007a), *International Energy Outlook*, Chapter 4, Paris.

resulted in increased exploitation costs and lower productivity, despite important technological breakthroughs. Overall, although new extraction methods are currently available to exploit non-conventional sources, further innovations will be needed to ensure sustainable development of the resource.

Canada also has very large reserves of coal, which is used in electricity generation in some provinces, particularly Alberta. With abundant supply and low price, coal is likely to remain part of the generation mix in the decades ahead, if new clean coal technology improves efficiency and significantly reduces associated GHG emissions through “carbon capture and storage” (see below). Canada is also the world’s largest producer of natural uranium. Nuclear energy generation is concentrated in Ontario where most nuclear units are being used to compensate for the phasing-out of coal-fired stations, but new units are in the works in Alberta. In addition, Canada is rich in renewable energy supplies, including hydro power, wind, forest and agricultural biomass and solar potential. The tax treatment of certain renewable energies (*e.g.* through accelerated capital cost allowances or the ethanol excise tax exemption) has helped support the market entry of these technologies. In addition, renewable energy has also benefited from targeted measures.³ Other low or non-GHG emitting sources such as cogeneration, tidal and geothermal electricity are being developed across the country. A number of liquefied natural gas projects have also been developed in Atlantic Canada.

The regional distribution of energy production is quite uneven, with Alberta and to a lesser extent British Columbia, Saskatchewan and Newfoundland and Labrador accounting for the bulk of primary energy production. Differences in resource endowment have generated regional disparities, and the rise in oil prices has benefited mostly western provinces. The economy in the province of Alberta has been overheating (see Chapter 2), with the highest inflation in the nation, unemployment at an all-time low and workers being brought in from elsewhere (Figure 4.2). By contrast, the increase in commodity prices has generated a marked appreciation of the Canadian dollar and hit manufacturing-based provinces such as Ontario and Quebec, which also have to compete with emerging Asian economies.

Box 4.1. Oil-sands developments

Oil sands are deposits of bitumen, a heavy black viscous oil that must be treated to convert it into an upgraded crude oil before it can be used by refineries to produce gasoline and diesel fuel. The bitumen obtained through either mining or *in situ* production methods can be used directly for asphalt, diluted and transported by pipeline to refineries for processing, or upgraded into synthetic crude oil (SCO). SCO itself is a feedstock for refineries, where it can be further processed into gasoline, aviation fuel or other products.

Reserves

In December 2002, the *Oil and Gas Journal* reported that Canada ranked second in terms of global proven crude oil reserves (15% of world reserves), after Saudi Arabia. The majority of these reserves are found in Alberta's oil sands. Under anticipated economic conditions and using current technology, Alberta has approximately 176 billion barrels (bbls) of proven oil reserves (174 billion bbls of crude bitumen, 1.6 billion bbls of crude oil). While conventional oil reservoirs are scattered throughout the province, oil sands underlie 140 200 square kilometers of land primarily in northern Alberta. There are over 3 100 oil sands agreements with the province totalling approximately 48 973 square kilometers. Close to 65% of possible oil sands areas are still available for exploration and leasing.

Cost and extraction

Producers have focused on improving efficiency and adopting new technology to lower production costs. Operating costs to produce a barrel of oil from bitumen averaged about CAD 18 per barrel in 2004 but have since risen sharply. There are several technologies to extract oil sands bitumen, and all require enormous amounts of energy (often natural gas) and water. Mining operations extract bitumen from reserves close to the surface. For oil deeper underground, processes such as Steam-Assisted Gravity Drainage and Cyclic Steam Stimulation are used. The rise in natural gas prices in 2005-06 prompted development of new extraction and processing methods that do not require natural gas, but these methods remain costly and need to be tested on a commercial scale.

Oil-sands royalties and tenure

Alberta's oil-sands royalty system was specifically designed to encourage development of the resource and takes into account technological risks and capital costs faced by oil-sands developers. A new system was introduced in late 2007 and will be effective in 2009. Under the new system, the royalty base rate will start at 1% and increase for every dollar oil is priced above CAD 55 per barrel, to a maximum of 9% when oil is priced at CAD 120 or higher. The net royalty applied post-payout is currently 25%. In the future, it will start at 25% and increase for every dollar oil is priced above CAD 55 per barrel to 40% when oil is priced at CAD 120 or higher.

The provincial government owns 97% of Alberta's mineral rights. They are administered by its Department of Energy. The remaining 3% are 'freehold' mineral rights owned by individuals and companies and other Crown land held by the federal Government on behalf of First Nations or in national parks. Public offerings or sales of Crown mineral rights are scheduled to be held every two weeks. Oil-sands rights are issued as leases or permits through a competitive bidding system. The highest bidder wins the right to "drill for, win, work, recover and remove" minerals that are owned by the Crown. Water use in the oil-sands area is regulated through a system of licensing and monitoring.

Box 4.1. Oil-sands developments (cont.)

Economic impact of the oil sands

The expansion of oil-sands production is expected to have a beneficial impact on the Canadian economy. As described in Chapter 1, the potential gains in export revenues have resulted in upward pressure on the exchange rate.

The impact of oil-sands developments on GDP will depend to a large extent on the level of the oil price and the oil-natural gas price differential, which affects the profitability of exploitation. Overall, the impact is estimated to be relatively limited for Canada as a whole (Table 4.2). Bayoumi and Mülheisen (2006) point to an even smaller impact, with higher oil production lifting Canada's real GDP by 1.1% in 2020. Oil-sands activity is expected to become an increasing share of Alberta's total GDP and to represent about 20% of Alberta's GDP by 2011 (as against 15% in 2006). Almost half of the employment generated from Alberta's oil sands is expected to occur outside the province (CERI, 2006; Conference Board of Canada, 2007).

Revenues in the form of royalty payments and income taxes from the oil and gas industry vary by province, with Alberta receiving most of them. But the federal Government and other provinces are also expected to benefit from Alberta's energy resource development.

Table 4.2. Economic impact of oil sands

	2006	2011	2020	2006
	CAD billion			% of 2006 national GDP
GDP				
Total	44	69	104	3.0
Alberta	32	49	77	2.2
Rest of Canada	7	11	14	0.5
Rest of the world	5	9	13	0.3

Source: CERI (2006), *Economic Impact of Oil Sands in the Short Term*, December, Calgary.

Environmental impact of oil sands

Oil-sands facilities were responsible for 12% of Alberta's total greenhouse gas emissions in 2006, with Alberta accounting for about a third of Canada's total.

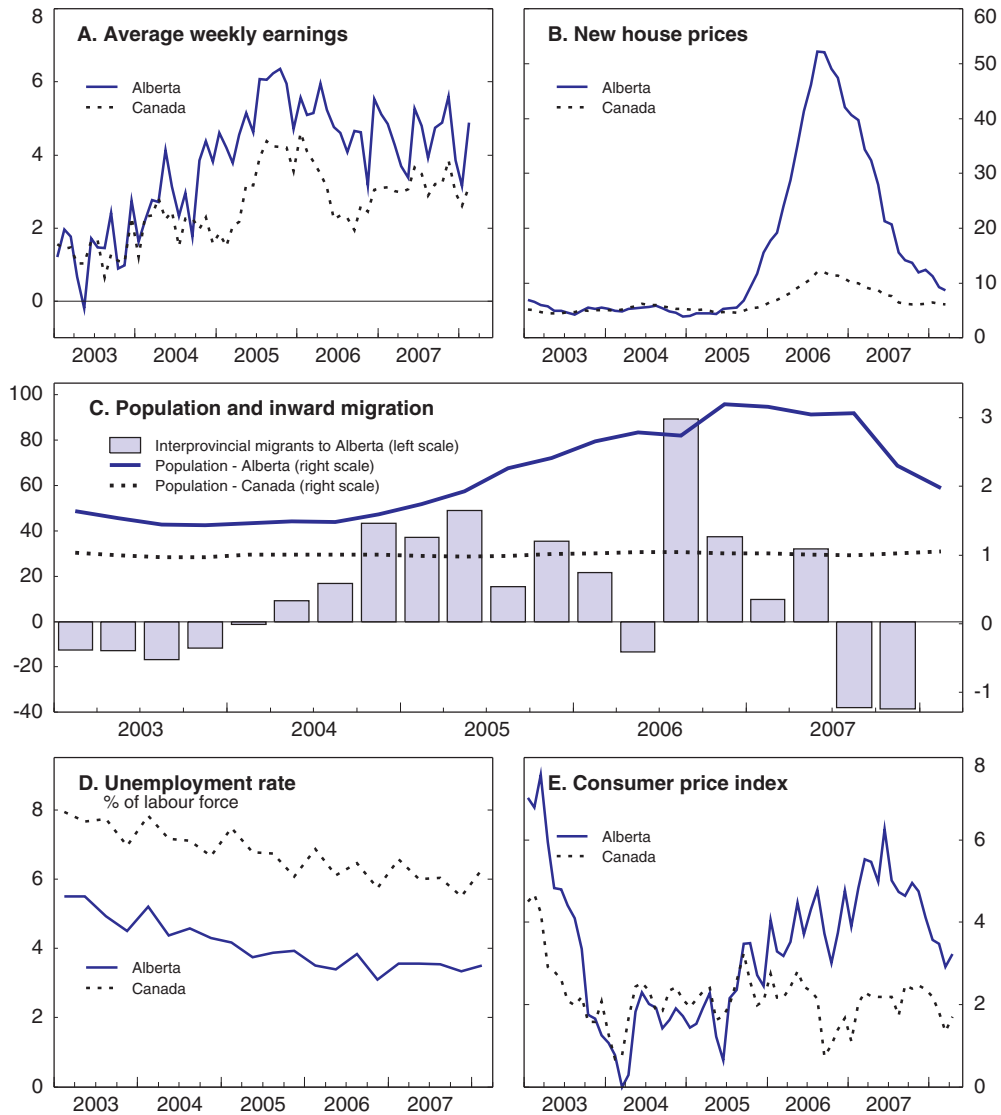
Besides their climate-change effects, the oil sands are generating large and mounting environmental costs in several areas: added demand for water and natural gas (use of between one and three barrels of water per barrel of oil extracted); the accumulation of waste; destruction of delicate boreal ecosystems; and air pollution in the form of acid rain. Oil-sands developments are also reported to be responsible for the declines in a number of fur-bearing mammals (including caribou) and some forest birds throughout Northern Alberta.

Source: Government of Alberta (2006a), Holroyd *et al.* (2007), Environment Canada's estimates.


The energy sector is the largest contributor to total GHG emissions in Canada (Figure 4.3). The country produces over 2% of global emissions, i.e. more emissions per capita than virtually any other country. Canada's emissions are also growing faster than in most other industrialised countries: emissions have been rising primarily as a result of an increasing population, economic growth and expanding fossil-fuel production (Environment Canada, 2007a).⁴ The distribution of national emissions is highly skewed to certain provinces and will become increasingly so in the future (Figure 4.4). Indeed,

Figure 4.2. **Alberta versus the rest of Canada: selected indicators**

Year-on-year percentage change



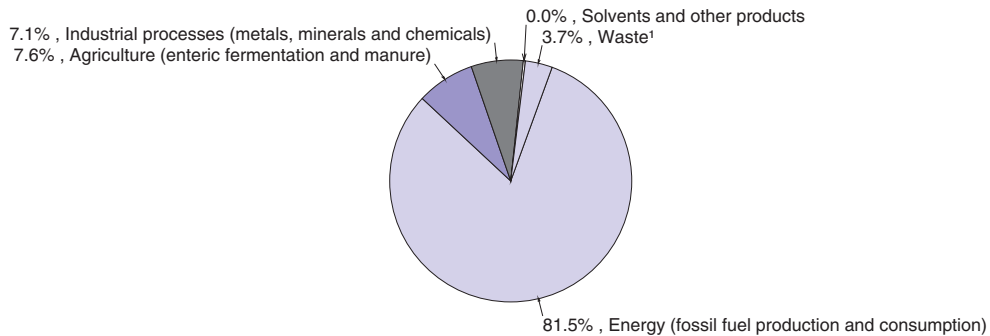
Source: Statistics Canada.

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emissions are disproportionately concentrated in provinces that host most of the country's energy industry, particularly the emissions-intensive oil sands. As a result, associated adjustment costs to curb emissions will be borne unevenly across the provincial landscape.

Climate change is a very topical issue in Canada, and views differ as to the appropriate objective to pursue. The federal government has recently released its final regulatory framework for industrial greenhouse gas emissions, which elaborates its April 2007 Regulatory Framework for Air Emissions. At the moment, Canada is currently emitting some 33% above its Kyoto target. The lack of political willingness to meet the Kyoto target has been criticised within the country and in the international scene. Still, the focus of environmental policies is now mostly on preparing for the post-Kyoto period.

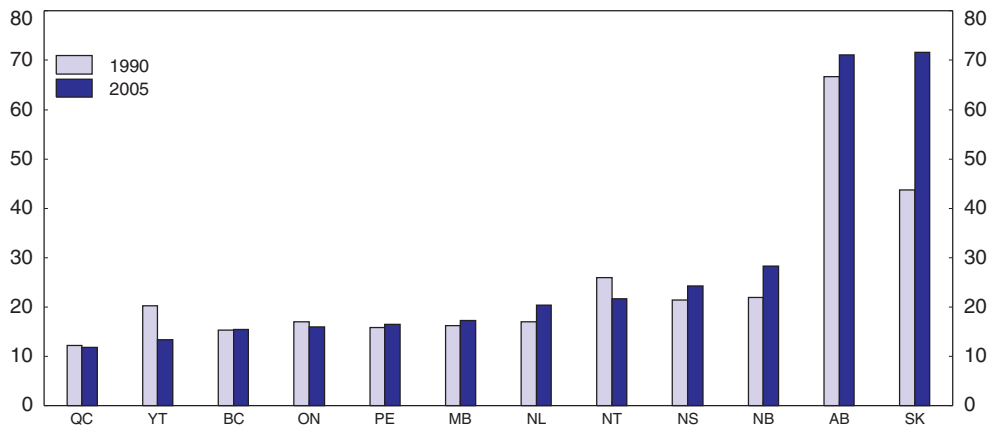
Figure 4.3. **GHG emissions by sector**
2005, as a percentage of total




1. Solid waste disposal, wastewater handling, waste incineration.

Source: Environment Canada (2007), *National Inventory Report, 1990-2005, Greenhouse Gas Sources and Sinks in Canada*, April.

Figure 4.4. **GHG emissions per capita by province**
Tonnes of CO₂ equivalent per capita



Source: Environment Canada (2007), *National Inventory Report, 1990-2005, Greenhouse Gas Sources and Sinks in Canada*, April.

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Concerns about the sustainability of current oil-sands developments are growing

The exploitation of Canada’s oil sands is expected to continue expanding rapidly, but the rate of development will depend on the balance between multiple opposing forces. High expected oil prices, geopolitical concerns, the size of the available resource base and proximity to the large US market, and potentially other markets, are encouraging developments (NEB, 2006). On the other hand, natural gas costs, the light *versus* heavy oil-price differential, water usage, and insufficient labour, infrastructure and services are factors that could potentially inhibit the development of the resource. Another force that will moderate oil-sands development is the obligation to meet new federal and provincial regulations for GHGs and air pollutants.

The rapid development of Alberta's oil-sands industry has generated labour-market bottlenecks and deleterious socio-economic and environmental effects.

Labour shortages

There is currently a limited supply of skilled workers in Alberta. Wage increases have not been sufficient to attract the needed labour. At the same time, many businesses have had to cut back their hours. The most severe shortages are in the construction sector. Indeed, the construction workforce across Alberta is already at an all time high, and many more workers will be needed to meet planned investment growth in the short term. In addition, neighbouring British Columbia's boom due to construction activity for the 2010 Winter Olympic Games is exacerbating the pressures in Alberta. The boom has also placed pressure on staffing in other sectors, in particular those dominated by small businesses, which have limited revenue streams and cannot compete with wage increases in the oil industry. At the national level, competition for labour has pulled workers from other parts of Canada.

The labour market is expected to remain tight in the coming years and to restrict the pace of expansion. According to an Alberta government forecast, the province will need 400 000 more workers by 2015. The challenge for the oil-sands sector is not only to find the right skills to cope with the complexity of the projects being undertaken but also to attract these people to Fort McMurray in the remote Wood Buffalo region, where most of Canada's oil-sands deposits are located.

Both short- and long-term solutions have been proposed to help meet these labour-market needs. The government of Alberta released a 10-year Strategy in January 2006, which includes an *Oil Sands Industry Sub-Strategy*. It outlines various actions to address Alberta's labour-force challenges and is built around four themes: providing education, career, workplace and labour-market information; attracting immigrants and inter-provincial migrants; developing education and training investment; and enhancing community and work attractiveness. A special focus was put on improving labour-force participation of under-represented groups such as women, the disabled and Aboriginals. The Alberta government has also signed an agreement with the federal authorities that will allow for the targeted entry of temporary foreign workers to meet the urgent skilled-labour needs of key projects in Fort McMurray. Overall, it is estimated that these short-term solutions will not be sufficient to increase the supply of skilled workers enough to match the demand created by the rapid expansion of the oil-sands industry.⁵ Looking forward, the construction boom is not expected to last long.⁶ Oil-sands investment is being heavily concentrated in a short period of time, and following the peak, many workers will be released. It will thus be important to ensure Alberta's set of policies allows firms to make the most of this market opportunity, mitigates the boom-bust cycle and facilitates adjustment when the construction boom ends.

At the federal level, changes to the Employment Insurance (EI) programme could foster inter-provincial labour mobility and help address regional labour shortages. Canada is unique in adjusting its EI access requirements in response to local labour-market conditions, with higher local unemployment rates leading to reduced requirements for coverage (Van Audenrode *et al.*, 2005).⁷ This can retard economic adjustment by providing an incentive for individuals to remain in regions with poor economic conditions. It is difficult to determine empirically to what extent the existence of EI slows the adjustment process, as labour mobility within Canada is one of the highest in the OECD (Kongsrud and

Wanner, 2005). Still, modifying the current parameters of the EI entrance requirements by harmonising the regional treatment would enhance labour mobility even further and facilitate the adjustment process. This change is all the more needed as the country has moved from a prolonged state of high unemployment to one of prevailing labour shortages, and institutions need to be consistent with this structural change.

Socio-economic impacts of the boom

Host communities and regions benefit from numerous positive socio-economic impacts associated with oil-sands developments, including employment and government revenue. But Alberta's rapid growth gives rise also to some negative socio-economic effects. *First*, government services such as health care and education are subject to increased pressures, and, more generally, municipal infrastructure lags behind population growth. *Second*, drug and alcohol abuse has increased, and dependence on non-profit social-service providers has risen. *Third*, as population has grown, housing prices have skyrocketed across the province, causing a housing crisis in almost every urban area.⁸ However, prices and resale activity have starting cooling down, and, as average incomes have also markedly increased in Alberta, housing affordability i.e. the proportion of median pre-tax household income required to service the cost of an average mortgage, is still lower than in Quebec, Ontario and British Columbia (Holt and Goldbloom, 2007). *Fourth*, high-school completion and post-graduate education rates, which are already below the national average in Alberta, are being impacted, as students are drawn away from education by high wages for labourer, semi-skilled positions and even service-sector jobs.⁹ *Finally*, high inflation is pushing businesses in secondary industries to relocate elsewhere, taking high-quality, long-term jobs with them.

The provincial government cut capital and social programme spending during the 1990s with the objective of eliminating public debt. These cuts seriously compromised the province's ability to sustain the boom, and its ability to provide the infrastructure necessary to absorb the population growth that accompanied it. As the boom has increased in strength, the government has embarked upon reinvestment in the provincial infrastructure.¹⁰ However, these outlays are adding fuel to an already overheated economy, and, as construction costs have soared, the government is paying a premium for building public infrastructure. Public-private partnerships (PPPs) have been used by some Canadian provinces, in particular British Columbia, and the federal government and could be useful to finance new infrastructure investments efficiently, in particular the provision of urban public transport. Indeed, experience from other OECD countries, such as the United Kingdom and Australia, suggests that, in addition to providing a new source of capital and expertise, PPPs can, in some cases, lower the overall cost of production and hasten delivery of infrastructure (OECD, 2007). PPPs also allow the transfer of some risks to the private sector and overall are reported to lead to more effective risk management. Nonetheless, every effort should be made to define clear a legal and policy framework for PPPs and to ensure that the appropriate capacity within government exists to initiate and manage them (OECD, 2008).

Environmental and energy challenges

The development of the oil sands requires significant amounts of natural gas, whose reserves are in decline.¹¹ As extraction rates triple, energy input needs will also rise. Meeting those needs through other forms of energy such as coal gasification is problematic due to the

significantly higher GHG emissions. Nuclear energy is another option, but at the moment it is expensive and has its own associated risks.¹² In this context, further sustainable production of oil sands will necessitate significant improvements in technology (see below).

Both mining and underground operations use large volumes of water for extracting bitumen from the oil sands, and the limited available supply of water could be a constraint on future expansion plans.¹³ Despite some recycling, almost all of the water withdrawn for oil sands mining operations ends up in tailings ponds (NEB, 2006). Adequate management of river flows is necessary to ensure ecological sustainability, especially in winter when river flows are low. A number of initiatives have been developed to address these water-supply issues in Alberta. *First*, in February 2007 Alberta Environment set strict limits on how much water oil-sands developers can remove from the Athabasca River, and additional measures are expected in the coming years. *Second*, a new Water Conservation and Allocation Policy for Oilfield Injection aims to reduce the use of water for *in situ* projects.¹⁴ It will be important to regularly review the impact of these changes, in particular the new allocation process, to see if policies reach their conservation objectives without imposing excessive costs on firms. In particular, it will be helpful to assess how the current system compares to market-based instruments, which would encourage an efficient use of water by allocating it to its highest value use. Furthermore, establishing a price for water would create an incentive for users to be as efficient as possible, thereby decreasing overall demand for water resources.

The management of non-renewable resources should be improved

The dependence of the economy, Alberta's in particular, on oil revenues poses vulnerability and sustainability challenges. Indeed, economic stabilisation is more difficult because of the reliance on fossil fuel revenues that are uncertain (in terms of value and timing) and unstable (because of the volatility of oil prices). Moreover, the resource raises questions of long-term sustainability and inter-generational equity within Alberta, because the oil is non-renewable. At the national level, these developments are generating large regional disparities, especially because some provinces are affected by negative externalities through the currency appreciation and have questioned the appropriateness of current inter-provincial redistribution mechanisms (see Chapter 3).

Fiscal policy in Alberta should be more prudent. Higher spending may be warranted to cope with the infrastructure shortage and may be politically difficult to avoid in the context of zero public debt and a comfortable surplus. However, public spending can exacerbate inflationary pressures in the short run and does little to prepare the economy to cope with the future costs of an ageing population, when the resource will be depleted. Other nations have shown much more restraint and foresight in managing their resource revenues to mitigate boom and bust cycles by saving their non-renewable resource revenues (see Box 4.2).

At the moment, Alberta has no framework or long-term goals for the use or investment of resource revenues. In 1976 the province set up the Heritage Fund to provide prudent stewardship of the savings from non-renewable resources. The investment objective of the Fund is to optimise long-term financial returns subject to an acceptable level of risk. However, there are no allocation rules for the province's resource revenues, and payments to the funds are discretionary.¹⁵ In addition, interest earned on its assets (less inflation-proofing) is being transferred to general revenues. As a result, the pace of accumulation is very slow, and the current value of the fund is low compared to those set up by other oil-producing countries or states.¹⁶

Box 4.2. **Non-renewable resource funds**

In some countries that are heavily dependent on the export of oil and other non-renewable resources, governments have established non-renewable resource funds (NRFs). The general justification for such funds is that some share of government revenues derived from the exploitation of a non-renewable resource should be put aside for the future, when these revenues decline, because the price of the resource has fallen, or the resource has been depleted or both. By placing the bulk of fund assets in foreign currencies, currency appreciation can be kept to a minimum, preventing the emergence of “Dutch disease”-type phenomena. Savings funds can also serve a stabilisation purpose by helping to reduce the impact of volatile revenue on the government and the economy by specifying a smoothed rate of spending from the fund, while allowing temporary deviations in case of shocks. Such predictability is very important to ensure real exchange-rate stability. Estimations suggest that oil funds are associated with reduced volatility of broad money and prices, and lower inflation (Shabsigh and Ilahi, 2007).

NRFs can take various forms, ranging from separate institutions with discretion and autonomy to funds that amount to little more than a government bookkeeping account. Resources available to an NRF may be large, lending importance to the way its operations are integrated with the budget; the management of the assets; and to issues of governance, transparency and accountability.

The Norwegian State Pension Fund

Norway established its petroleum fund by legislation in 1990, though accumulation in the fund began only in 1996. The Fund has the two-fold purpose of smoothing out spending of oil revenues and at the same time acting as a long-term savings vehicle to let the Norwegian government accumulate financial assets and cope with expenditures associated with the ageing of the population. The Fund serves as a fiscal management tool to ensure transparency in the use of petroleum revenues. It is integrated with the budgetary process: net accumulations in the fund are budget surpluses. The Fund is not earmarked for any specific purpose (despite the political aim of pension provision). Domestic spending from the Fund is restricted to the assumed long-run real rate of return (4%) on the fund’s outstanding value, which in turn determines the size of the non-oil budget deficit.

Norges Bank is responsible for the management of the Fund, on behalf of the Ministry of Finance. The fund is invested in financial instruments abroad, where 60% of the portfolio is allocated to fixed income instruments and 40% to equities. The Fund is also geographically well diversified. Indeed, the Ministry of Finance has defined a benchmark portfolio, which is a theoretical portfolio consisting of indices for the countries in which investments are allowed, and has set limits as to how much the Fund’s investments may deviate from the benchmark.

The Alaska Permanent Fund (APF)

The APF was set up in 1976. Voters approved a constitutional amendment, which stated that “at least 25% of all mineral lease rentals, royalties, royalty sale proceeds, federal mineral revenue-sharing payments, and bonuses received by the State shall be placed in a permanent fund, the principal of which shall be used only for those income-producing investments specifically designated by law as eligible for permanent fund investments”. The APF was thus established as a state institution with the task of responsibly administering and conserving oil and other resource royalties.

Box 4.2. **Non-renewable resource funds** (cont.)

There are two parts to the Fund: principal and income. The principal is invested permanently in the capital markets, diversified among various asset classes and cannot be spent without a vote of the people. The Alaska Permanent Fund Corporation has been designated by law to manage the assets of both the APF and other state investments, separating the management and accounting of the Fund from the rest of state government. The Board's goal is to earn slightly better-than-average rates of return with slightly below-average levels of risk. The Fund has earned a 10.4% annualised total rate of return over the long run. This is in excess of its targeted rates of return during this time frame. Fund income can be spent, and decisions as to its use are made each year by the legislature and the Governor. The APF was established as an inviolate trust, meaning that the principal of the Fund is to be invested in perpetuity. It thereby transforms non-renewable oil wealth into a renewable source of wealth for future generations.

Chile's Copper Stabilization Fund (CSF)

In 1985, Chile established the CSF (now the Economic and Social Stabilization Fund) as part of a Structural Adjustment Loan agreement with the World Bank. The first deposit into the CSF was subsequently made in 1987. The rules of the CSF stipulate that deposits (or withdrawals) will be proportional to the excess of the copper price over trigger prices that are established as two bands (narrow and wide) around a reference price. The reference price is set in real terms (adjusted for dollar inflation) and cannot exceed a six-year moving average of the spot price. Within the narrow band there would be no deposit or withdrawal; outside the wide band all additional copper revenues are deposited (if the price is higher) or withdrawn (if the price is lower); and in between the two bands 50% of the excess is deposited or withdrawn. Furthermore, withdrawals are to be used only for "extraordinary amortizations of public debt".

Source: Website of the Norwegian Ministry of Finance www.regjeringen.no/en/dep/fin/Selected-topics/The-Government-Pension-Fund.html?id=1441, Hartzog (2002), Davis et al. (2001).

The provincial government has taken steps to address these issues. In its 2007 Budget, it announced a surplus management plan that included putting one-third of any unbudgeted surplus into the Heritage Fund and the balance into another savings fund, the Capital Fund. However, this savings plan applies only to one-third of any *unbudgeted* surplus and does not actually apply to any of the budgeted revenues. It will be important to make a more systematic use of these funds and in particular set up allocation and withdrawal rules. More specifically, setting up rules could anchor expectations and counteract real exchange rate volatility and appreciation. It could also enhance transparency (Davis et al., 2001). Such rules could also have some stabilisation objective, for instance when withdrawals are allowed to finance budgetary spending during recessions. In this context, the government of Alberta should use the opportunity provided by the announced review of the various provincial savings plans to reintroduce explicit withdrawal and accumulation rules. For instance, rules similar to those existing in Norway could be envisaged.¹⁷

The federal government also collects part of the resource revenue through corporate tax. For the time being, all unexpected surpluses are directed to pay down the federal debt, and the resulting interest savings are used to cut personal income taxes (the Tax Back Guarantee). In order to finance future ageing and health costs, and in the context of low net debt, it would be worth considering setting up a federal savings fund to which windfall gains from the resource sectors would be allocated. One possibility would be to assess the

impact of oil prices on federal tax revenues and, making an assumption of a benchmark “equilibrium” oil price, to estimate the windfall gains from higher oil prices. Of course, this would represent only a rough approximation of the true resource revenues, as spillover effects to other sectors would not be taken into account, but a simple and transparent allocation rule would have the advantage of increasing the predictability of fiscal policy (Gianella, 2006).

Curbing GHG emissions is a major concern over the long term

GHG emissions and ensuing climate change are certainly the most pressing environmental problem confronting the energy sector in Canada. Emissions in 2005 were 33% higher than the Kyoto Protocol target, which is 6% below the 1990 baseline level. Looking forward, a recent official baseline scenario showed GHG emissions soaring in the future, with half of the projected rise attributed to the oil sands (Table 4.3). Indeed, the baseline implies that the Government of Canada’s target of a 20% absolute reduction in greenhouse gas emissions from 2006 levels by 2020 requires a 330 megatonnes reduction from the reference case projected emissions level of 940 megatonnes in 2020. While all oil and gas producers are working towards decreasing their energy use and developing pollution-abatement technologies, the level of effort required to meet this target will make it increasingly important to find and develop ways to reduce emissions on an economy-wide basis.

Table 4.3. **Current and projected GHG emissions from energy**

Sector	Projected emissions			
	2006	2020	2020 relative to 2006	
	Megatonne		Megatonne	%
Residential and commercial	86	109	23	27
Mining and manufacturing-regulated	77	90	13	17
Mining and manufacturing-non regulated	28	38	11	39
Conventional oil and gas production and distribution and refining	132	114	-18	-14
Oil sands	29	108	79	271
Electricity and heat generation	123	122	-2	-1
Transportation	177	232	55	31
Others	104	124	20	20
Total	756	937	181	24

Source: Government of Canada (2008), *Turning the Corner: Taking Action to Fight Climate Change*, March, Ottawa, www.ec.gc.ca/doc/virage-corner/2008-03.

Improving the design of current policies dealing with climate change and air pollution

Current policies suffer from a number of shortcomings in their design and implementation. Indeed, jurisdiction over the many areas critical to climate-change policy is shared among federal and provincial governments: natural resources are under provincial responsibility, while international treaties and issues of general security are under federal jurisdiction. Consequently, the roles of the federal and the provincial authorities are not clearly defined and have resulted in the publication of environment plans by some provinces in addition to the federal plan (Box 4.3). The federal government has been working closely with provincial and territorial governments to minimise duplication and overlap. This will include the development of equivalency agreements

Box 4.3. Federal and provincial plans for fighting climate change and air pollution

On 26 April 2007, the federal government unveiled the Clean Air Regulatory Agenda, designed to address climate change and air pollution. Additional details related to implementation of the Regulatory Framework for Industrial GHG emissions within the Agenda were released in March 2008. A number of provinces have also published environment plans in recent years.

A description of the federal plan

Greenhouse gases

The federal government is committed to reducing Canada's total GHG emissions, relative to 2006 levels, by 20% by 2020 and by 60 to 70% by 2050. The plan sets mandatory reduction targets for major industries that produce GHGs. In the short term, these targets are less ambitious than those set in the Kyoto protocol. Existing facilities should reduce their emissions per unit of production by 18% from 2006 emissions intensity by 2010. There should be a 2% annual improvement thereafter. The target will be applied at the facility, sector or corporate level, depending on the sector. Minimum thresholds will be set in five sectors to avoid imposing unreasonable administrative costs on small facilities. Fixed process emissions will be exempt from these targets. There is a three-year commissioning period for new facilities. After the third year, the initial GHG emission-intensity target will be based on sector-specific cleaner fuel standards, and subsequent annual targets require a reduction in emission intensity by 2% per year thereafter. All new oil-sands upgraders, *in situ* plants and coal-fired electric plants that come into operation during 2012 or later will be required to meet a more stringent target based on the use of carbon capture and storage by 2018. The federal government will establish an electricity task force to work with provinces and industry to meet an additional 25 megatonne reduction goal from the electricity sector by 2020. There will be an incentive for facilities to be built carbon-capture ready and to use high-efficiency co-generation in the form of lower required emission reductions in the short term.

Companies will be able to choose the best way to meet their reduction targets in a cost-effective way. This includes making reductions in their own facilities, investing in emissions-reducing technologies through a technology fund or taking advantage of domestic emissions trading (including offsets) to deliver reductions in Canada. They will also have access to international GHG credits provided by the Kyoto Protocol's Clean Development Mechanism to a maximum of 10% of each firm's regulatory obligation. The federal government will allow a one-time credit for early action to reward those companies that significantly reduced emissions during the 1992-2006 period. These credits will be tradable and bankable.

Air pollution

The plan also sets national limits for industrial emissions for four air pollutants that cause acid rain and smog (nitrogen oxides, sulphur oxides, volatile organic compounds and particulate matter). There will also be sector-specific caps. Companies will be able to choose the most cost-effective way to meet their targets. This includes making changes to improve their processes within their plants or buying new equipment or technology that will reduce smog and air pollution. Companies will also be able to take part in a Canada-wide trading system to buy credits if they have not reached their nitrogen oxides and sulphur oxides reduction targets. As a result, air pollutant emissions that cause smog and acid rain are expected to be reduced by up to 55% as early as 2012.

Other measures

In addition, the government is committed to addressing emissions from transportation by regulating the fuel efficiency of cars and light trucks, beginning with the 2011 model year. Rules or regulations will be based on a stringent, dominant North American standard. The government has also announced that it will strengthen energy-efficiency standards for a number of energy-using products and take action to improve indoor air quality. It has also unveiled many other programmes and initiatives worth over CAD 10 billion since October 2006; these aim to measurably reduce the impact of GHGs and air pollution on the health of Canadians and the environment. Measures include the ecoENERGY Initiatives, the ecoTransport Strategy, the Trust Fund for Clean Air and Climate Change, support for public transit and support for the production of renewable fuels. In addition, the 2008 federal Budget includes new measures to promote carbon capture and storage and support nuclear energy and invest in research and development projects in the automotive sector for greener and more fuel-efficient vehicles.

Box 4.3. Federal and provincial plans for fighting climate change and air pollution (cont.)**Provincial GHG targets**

Most provinces have some form of restriction on emissions of GHGs and/or air pollutants. However, standards vary considerably across the country. Alberta's Energy Strategy to 2025 is integrated in the provincial government's broader strategic document published in 2005. In March 2007, Alberta became the first province in Canada to enact specific GHG reduction legislation. Companies will have the choice of cutting their own emissions or of contributing to either a technology fund or an Alberta-based offset project. In January 2008, however, the province adopted less stringent emissions reduction targets than previously envisaged. In June 2007, Ontario unveiled GHG targets and a plan to reduce its GHG emissions. It is counting on the planned shutdown of its coal-fired power plants and the use of more renewable energy to take it half way to its targets and will receive funds from the federal government to achieve this goal. British Columbia developed a comprehensive energy plan in 2002 that integrated energy policy and environmental imperatives toward 2015. In a new Energy Plan in April 2007, British Columbia introduced targets for zero net GHG emissions for all new energy production in the province. In 2006, Quebec released its energy plan, including energy and environment objectives to 2015. In 2007, the province of Newfoundland and Labrador presented an energy plan which aims to develop energy resources and ensure energy security and environmental sustainability. New Brunswick and Nova Scotia have announced targets, but these do not apply to major industries.

In August 2007, all Premiers agreed to implement energy conservation strategies and to reduce GHG emissions within their own jurisdictions, according to each province's climate-change plan (see Table 4.4).

Source: Government of Canada (2007a), Government of Canada (2008), provincial Ministries for the Environment, Council of the Federation (2007).

Table 4.4. Provincial GHG emissions targets

Provinces	Targets
Alberta	50% GHG emissions intensity reduction relative to projected levels by 2050, equivalent to a 14% absolute reduction in emissions relative to 2005.
British Columbia	At least 33% below 2007 levels by 2020 (10% below 1990 levels). Interim targets to be set for 2012 and 2016; long-term target to be set for 2050.
Manitoba	6% below 1990 levels by 2012. First step is to reduce emissions to below 2000 levels by 2010.
New Brunswick	10% below 1990 levels by 2020.
Newfoundland and Labrador	10% below 1990 levels by 2020.
Nova Scotia	10% below 1990 levels by 2020.
Ontario	6% below 1990 levels by 2014; 15% below 1990 levels by 2020.
Prince Edward Island	1990 levels by 2010; 10% below 1990 levels by 2020.
Quebec	6% below 1990 levels by 2012.
Saskatchewan	32% below 2004 levels by 2020.

Source: Government of Canada (2008).

with interested provinces that apply at least as stringent targets as the federal government. They aim to avoid as much as possible any duplication and to ensure consistency in the way regulations are applied. At this stage, however, it is unclear what the final outcome of this process will be and at what horizon full harmonisation will be achieved. Moreover, equivalency agreements are of a bilateral nature, so that Canada could very well end up with ten different environmental plans and emissions trading schemes and associated intensity targets to curb GHG emissions. This could raise costs for firms, which would need to adapt to different provincial conditions. Overall, the current situation has increased uncertainty, thereby holding back the investment needed to ensure a sustainable development of the sector.

The federal plan complemented many measures that have been implemented since the 2006 Budget but represents a major shift from a voluntary to a regulatory framework. Past environmental policies have been found to have had limited effects and to have suffered from shortcomings in their designs (Office of the Auditor General, 2006). This is consistent with findings from the literature. Indeed, measures of a voluntary nature (e.g. information programmes and subsidies) are found to be mostly ineffective when applied on their own, while policies that tax GHG emissions (a carbon tax) or regulate emissions (emission caps and permit trading) are found to be much more effective (Jaccard *et al.*, 2006; OECD, 2003).

There has been a great deal of discussion on the choice of intensity (i.e. with intensity a measure of GHG emissions per unit of output) rather than absolute targets for GHG emissions. In particular, this implies a different treatment than for air pollutants, which will be subject to absolute targets. Both types of targets have advantages and drawbacks. Absolute targets offer the benefit of more direct linkage to the final environmental objective, but they are inflexible in the face of potentially high costs of action (Philibert *et al.*, 2003). Intensity targets, conversely, are more sensitive to cost factors but have weaker linkages to any final objectives expressed in terms of atmospheric concentrations or warming (Blanchard and Perkaus, 2004). However, if intensity targets are set at a particularly stringent level they can lead to absolute reductions (World Resources Institute, 2006). Overall, the federal government's recent policies are an improvement on previous policies in that the intensity reductions on industrial emissions are likely to be greater than previous policies (Jaccard and Rivers, 2007) even though they will fail to meet the Kyoto targets (Table 4.5). However, this depends crucially on the use of the flexibility provisions, in particular emissions trading.

Table 4.5. **Federal GHG emissions targets**

	Relative to 2006	Relative to 1990	Relative to Kyoto target
2020	20% below	Approx. 2% above	Approx 8% above
2050	60-70% below	Approx. 49-62% below	–

Source: M. Bramley (2007), "Analysis of the Government of Canada's April 2007 Greenhouse Gas Policy Announcement", Pembina Institute, 28 May, Calgary.

Despite the welcome move away from a voluntary approach, a number of limitations of the federal plan can be put forward, and some of these criticisms are valid for provincial plans as well. *First*, the regulation on industrial emissions at the federal level allows emitters to forego emissions reductions and, through emissions trading, instead pay firms and households in the unregulated sectors of the economy to achieve those reductions in their place.

Second, the focus of the plan is on emissions-intensive industry, which represents only about 40% of total emissions. The transport sector is not subject to the GHG emission limitations, although it is expected to remain a large emitter in the two decades to come. There is currently a Memorandum of Understanding between the auto industry and the federal government, with a target of 5.3 megatonnes of GHG emissions reductions in 2010. Once this agreement expires, the government has committed to establishing a regulated fuel-efficiency standard for the 2011 model year, benchmarked against a stringent, dominant North American standard. The level of this standard will be determined through

the normal regulatory process, including consultations with the automotive industry and other stakeholders. The use of standards may be justified in the presence of market failures which cannot be addressed by market instruments. But it remains to be seen whether these measures will be sufficient to curb GHG emissions markedly at the national level. In that context, there may be merit in Canada considering the introduction of a carbon tax as a complement to the use of standards in the transportation sector (see Chapter 3; Fullerton and West, 2000).

Finally, concerns have been raised as to the high cost of the proposed federal regulations. Preliminary analysis performed by Environment Canada indicates that the annual economic cost of meeting both the regulated GHG and the regulated air pollution targets is not expected to exceed 0.5% of GDP in any given year up to 2020, while the benefits associated with improved human and environmental health would be on the order of CAD 6.4 billion annually (0.5% of GDP) (Government of Canada, 2008). Analysis by the National Round Table on the Economy and the Environment (NRTEE) points to an economic impact whose amplitude depends on the speed of emission reductions. Overall, these simulations indicate relatively small reductions in the size of the economy, with a maximum cumulative lost output from 2011 to 2050 of 2.9% of a business-as-usual forecast level (NRTEE, 2008). Prudence should nonetheless be exercised as these types of estimates are usually surrounded by significant uncertainties. They require an estimate of not only the direct impact on production costs but also of the indirect impact of those costs on future investment decisions, demand and supply, and related consequences for other businesses and consumers. There are many points of uncertainty throughout this chain of actions and reactions.

In addition to addressing the current limitations of environment plans, there is also a need to improve the delivery of efficiency measures aiming at lowering the demand for energy which can be useful when price instruments appear insufficient to foster energy-efficiency gains.¹⁸ Indeed, there is evidence that Canadian households engage in many practices that have a negative impact on the environment (Statistics Canada, 2007). To advance energy efficiency, a range of available policy instruments could be employed, including regulations and standards, fiscal incentives, public information campaigns, labels, and public-sector leadership in procurement. Regulations and standards are generally perceived as less costly, but their final costs can be high. Although they are generally not efficient, they can address market failure in some specific cases. Information instruments are efficient in the case of asymmetric (or lack of) information and may or may not be expensive.

At the moment, a number of specific product standards exist, and further efforts are planned.¹⁹ However, the efficiency of these measures remains generally limited because some of them rely on voluntary action, or the general public may not be aware of their existence. Consolidating and streamlining the overall package of measures would help. It would be preferable to concentrate efforts on those that are most cost-effective.

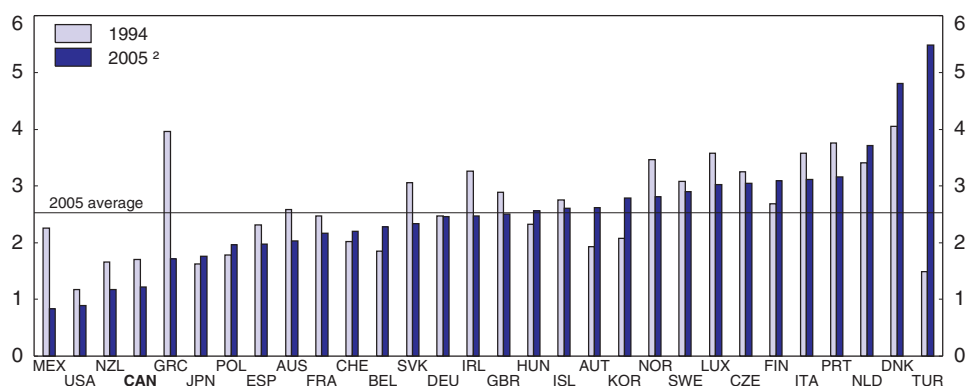
Making more use of market-based instruments

More generally, even if it is recognised that Canada's proposed greenhouse gas regulations are expected to include provisions for emission trading, the efficiency of current policies could be enhanced by focusing more on market-based instruments (such as tradable permits and tax measures, which put a price on carbon) and less on traditional, command-and-control regulation. Indeed, market-based instruments are an effective and

economically efficient means for reducing emissions as they send a clear signal on prices. Market-based instruments increase the relative cost of emissions-intensive technologies and products, creating a continuous incentive for innovation to improve efficiency or to shift to lower-emissions substitutes. When applied in a predictable and persistent fashion, these approaches can also encourage the deployment of low-carbon technologies and promote technology transfer to less developed countries. Recent estimations suggest that a phased-in carbon price in Canada of CAD 75 per ton by 2020 could lead to 21% emission cuts relative to business as usual and could generate some CAD 53 billion in revenues (2.9% of GDP) in 2020 (Rivers *et al.*, 2008).

Despite these advantages, market-based instruments have not been widely implemented in OECD economies, and in Canada in particular, because of their potential distributional leakages and competitiveness effects. Depending on their design, these tools can have disproportionate effects on low-income households. However, personal income tax cuts or increases in benefits can mitigate these distributional effects (OECD, 2006a).²⁰ The imposition of an additional cost on firms and the resulting impact on international competitiveness has been a major concern, particularly in commodity-based sectors where the market price is set internationally and where firms are not able to pass on this extra cost. Recycling a portion of the tax revenues back to the affected firms could lower the effectiveness of the policy (OECD, 2006a). By contrast, increasing international coordination of policies could mitigate these competitiveness impacts and would be a first-best solution. Competitiveness concerns could also be addressed by a shift in the tax mix so that the overall cost would not be overly augmented. One possibility could be to increase environmental taxes, whose level is currently low by OECD standards (Figure 4.5) and lower other corporate taxes. This could also have the advantage of improving the efficiency of the tax system (see Chapter 3).

Figure 4.5. **Revenues from environmental taxes**¹
Per cent of GDP



1. Data refer to revenues from environmental taxes for pollution control.

2. 2004 for Iceland.

Source: OECD (2006), *Consumption Tax Trends*, 2006 Edition, OECD Publishing, Paris.

StatLink  <http://dx.doi.org/10.1787/355116330223>

Emissions trading

Well-designed emissions trading has great potential for reducing emissions of GHGs and other pollutants from energy production, use and sources when energy markets are competitive.²¹ A cap-and-trade system requires emitters to hold permits that provide the

right to emit a certain amount of GHGs and allows them to buy and sell permits in an open market. The sum of the permits corresponds to the overall desired level of emissions of the covered sources. The economic superiority of a system of tradable permits compared to a pure command-and-control regulation rests on its ability to equalise marginal costs among all controlled sources, thereby assuring least-cost compliance with the particular environmental goal. Or, for a given cost, more environmental benefit can be gained (Ellerman, 2000).

Emissions trading allows for the development of financial instruments to manage risk. However, this requires setting scientifically credible and economically achievable emissions-reduction targets, while giving companies maximum flexibility to achieve those goals. This could entail adopting better control technologies or purchasing “reductions” from a source whose cost of cutting emissions is lower. In this context, having access to an international emissions-trading system will be particularly important.

The banking of allowances, whereby permits that are not used in the trading period for which they are issued may be banked for use in a later trading period, is also an important feature of efficient trading systems. This allows firms to adjust their emissions-reduction schedules to their investment programmes. By letting firms smooth their emissions profiles through the business cycle, it is also a way to manage price volatility (Philibert and Reinaud, 2004). Recent estimations suggest banking reduces abatement costs, while it also increases the amount of GHG emissions abated in the short term (Bosetti *et al.*, 2008).

A number of provincial and federal initiatives are currently underway to set up carbon trading systems. The federal plan indicates the government’s willingness to implement an emissions-trading market for GHGs that will be part of the Regulatory Framework. It will have a number of components. A domestic inter-firm trading system, through which regulated firms may buy and sell emissions credits among themselves, will be the central feature. A domestic offset system will allow regulated firms to invest in verified emissions reductions outside the regulated system. In addition, Canadian firms will have access to most qualifying credits from the Kyoto Protocol’s Clean Development Mechanism, with the exception of credits from forest sink projects, for compliance with the regulations. Plans to set up a market have also been announced in a number of provinces, in particular in Alberta and British Columbia.²² However, a number of implementation issues need to be resolved:

- First, decisions have to be taken regarding the allocation of permits. This could be done using an auction or through free distribution to emitters according to some principle, usually historical use (grandfathering). Grandfathering is the more politically feasible alternative and is often used to gain the consent of incumbents for the measures being proposed, but it gives a premium to those who polluted the most in the past. By contrast, auctions increase incentives to reduce emissions, but they impose an additional burden on firms. Coupling auctions with recycling revenues back to the firms could be an option as long as they do not lower the effectiveness of environmental measures. In any case, decisions on how permits are going to be allocated need to be taken rapidly in order to reduce uncertainty. Emissions-trading also requires clarity on the assumptions for economic growth and baseline carbon-intensity improvements, orderly and transparent release of periodic market-relevant emissions data and the imposition of strict penalties for fraud or non-compliance.
- Second, restricting the scope of trading to the Canadian market may generate a high cost of compliance and lead to insufficient liquidity. In this context, the federal government has indicated it will work toward potential linkages with trading systems in the

United States, Europe and Mexico. The province of British Columbia is also seeking to participate in the EU carbon-trading market. These initiatives are laudable steps but will not be straightforward. Indeed, the harmonisation of current schemes, which can have different geographical/sectoral scopes, design characteristics, compliance provisions and rules for “offset” credits, is likely to be long and arduous. Monitoring exchanges in international markets also presents technical difficulties, and standardised reporting protocols for emissions data and penalty procedures need to be put in place to limit fraud.²³ It will also be important to ensure that equivalency agreements do not prevent or render extremely difficult the linking of Canadian trading systems to other international schemes.

Carbon tax

Introducing a carbon tax (either at the federal or provincial level) can also force agents to internalise the cost of GHG emissions by raising the price of the associated fuels, processes and products. These fiscal incentives can reduce the demand for harmful products and increase it for alternative fuels, such as renewables, whose prices thereby become more competitive. They also increase incentives for the private sector to undertake R&D on sustainable innovations and technologies. At the moment such a tax, however modest, exists in Quebec.²⁴ A more substantial carbon tax has also been introduced in British Columbia and will take effect in July 2008. It is a tax on the purchase or use of fuels, such as gasoline, diesel, natural gas, heating fuel, propane and coal, and on tires when used to produce energy or heat. It is intended to be revenue neutral, and revenues from the tax will be returned to taxpayers through reductions in other provincial taxes. The carbon tax starts at a rate based on CAD 10 per tonne of associated carbon emissions and will rise by CAD 5 a year for the next four years. This corresponds to 2.4 cents per litre for gasoline, rising gradually to 7.24 cents a litre by 2012. For diesel and home heating oil, it works out to 2.76 cents per litre, rising to 8.27 cents over the same five-year period.

The economic effect of a (provincial or national) tax depends on its rate and coverage, as well as the monetary-policy and exchange-rate response to its economic impacts, and is empirically difficult to estimate.²⁵ The main difficulty in introducing a carbon tax in Canada is political, as it implies increasing firms’ tax burdens and would run counter to the downward trend in corporate taxation in Canada and more generally in OECD countries. In addition, it could be argued that the setting up of technology funds within current environmental plans already taxes firms. Firms can indeed meet part of their regulatory obligations to reduce GHG emissions by contributing to a fund that will be used to finance investments in energy-saving technology. However, technology funds and a carbon tax are not comparable: the use of the fund is voluntary, and resources will be used to develop technology, while a carbon tax would be compulsory and resources would not be earmarked for any specific use. Moreover, as suggested above, changing the tax mix and cutting corporate tax rates could leave the overall business tax burden for firms unchanged.

One other important criticism of the imposition of a carbon tax is that it is an inflexible tool and cannot be easily adjusted for changing emission levels. In the limit, governments could become reliant on the revenues and be less willing to adjust the tax rates downward when emissions decline as would be called for if the marginal external cost of emissions is increasing. By contrast, tradable permit regimes can be more effective and more flexible, but they involve greater cost uncertainty and may thus curb investment to a greater extent. In theory, emissions trading should result in exactly the same cost as a

GHG tax for a given level of emissions reductions. In practice, emissions-trading guarantees a certain level of emissions, while costs are uncertain. In contrast, a GHG tax guarantees a certain maximum cost, while the extent of emissions reduction is uncertain.

There may be some potential advantages of setting up a hybrid system whereby the permit price can fluctuate within a pre-defined corridor with taxes ensuring the floor and subsidies the ceiling. This would reduce compliance–cost uncertainty of tradable permits, and, in the short term, the system would be similar to a tax. A mixed system of both trading and taxation can lead to better welfare outcomes in the presence of non-linear environmental damage and uncertainty concerning abatement costs (Roberts and Spence, 1976). However, the combination can increase the uncertainty regarding environmental effectiveness compared to the sole use of emissions trading (OECD, 2006a). In this context both federal and provincial authorities should carry out a thorough assessment of the benefits and costs of having a hybrid system.

Moving the energy mix toward low or zero-GHG emissions sources

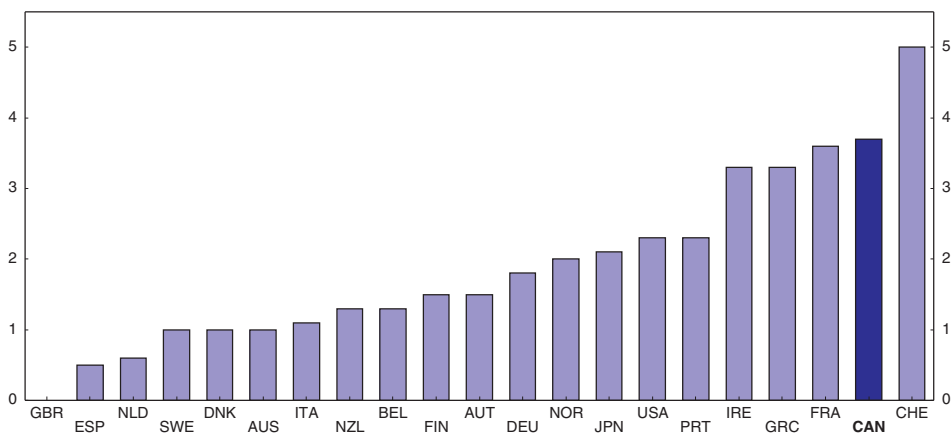
Given the amplitude of the climate-change challenge, it will be important to supplement market-based instruments and environmental policies with other policies that promote the use of low GHG-emissions sources. Stimulating the intensity of competition in energy markets and providing targeted fiscal incentives could boost sectoral innovation and steer outcomes toward lower GHG emissions paths.

Liberalise electricity markets


Competitive electricity markets with cost-based prices are a strong instrument to effectively balance energy systems in terms of economic efficiency, reliability and environmental responsibility. Electricity regulation is more restrictive in Canada than in most other OECD countries (Figure 4.6). This reflects a range of disparate situations across provinces. In most cases, electricity markets are exposed to only limited competition, suppliers are vertically integrated, public ownership remains prevalent, and there is open access to the grid only for generators and wholesale purchasers. Only Alberta and Ontario have full retail markets. In Ontario new projects get the market price, while others get regulated prices set every six months for residential and small commercial users. Until

Figure 4.6. **Electricity regulation in 2003**

The indicator ranges from 0 (least restrictive) to 6 (most restrictive)



Source: OECD, *Regulatory Indicators database*.

StatLink  <http://dx.doi.org/10.1787/355121375463>

1st April 2008 the latter was capped at around 25 times the power used by a typical residential customer. At that point it dropped to 15. The non-profit sector was to be deregulated at the same time. Peak-load pricing will be adopted for all residences by 2010.

There is a wide dispersion of electricity prices across provinces (reflecting both the availability of different types of generation and the regulatory structure), but also between user types within the same province (Hydro-Quebec, 2006). This suggests the existence of cross-subsidies from small to large power users (Boyer, 2007). By encouraging energy-intensive forms of production, these implicit subsidies are inconsistent with current conservation objectives. Moreover, they distort price signals and can reduce incentives to invest in the energy sector, both in hydro electricity and other energy sources, because of unfairly low electricity prices for large-scale users most likely to undertake investments in the first place.

Injecting more competition into provincial electricity markets would generate substantial benefits (see, for instance, Clark and Leach (2007) for Quebec). It would put pressure on companies to use resources more efficiently by ensuring prices match the true value of electricity (i.e. its opportunity cost). Moreover, experience in the United Kingdom, Australia and the Nordic countries shows that, with the right incentives and a stable investment climate, investors respond to market signals and add new capacity in good time (IEA, 2007b). In addition, investors also seem to take the need for energy diversification into account when incentives are clear. Higher electricity prices are likely to alter the economics of other renewable sources of energy (such as wind or biomass) and make them more profitable. Finally, removing cross-subsidies and imposing customer metering where it is not in place can offer substantial opportunities to improve energy efficiency.

There have been some claims that full and open competition and the subsequent rise in electricity tariffs, following the removal of subsidies, would affect mostly low-income households. It is not clear that this can be fully substantiated. Indeed, low prices currently produce a regressive transfer from the poor to the rich. In particular, maintaining prices below full costs deprives the government of resources to finance assistance programmes for the poorest citizens. In any case, concerns about the impact of higher electricity prices on low-income households could be addressed by refundable tax credits.

A number of provinces have detailed energy plans, but they are often incomplete, and implementation is slow. The government of Ontario has committed to replacing all the province's coal power plants by the end of 2014 to reduce emissions of air pollutants and GHGs. However, it remains unclear to what extent nuclear power will be used in replacement, as the four remaining coal plants account for some 20% of Ontario's current supply of energy (Urquhart, 2007). Moreover about 80% of existing power facilities are ageing and will need to be refurbished over the next 20 years. Against this background, the province has been developing an Integrated Power System Plan, which outlines the projects necessary to maintain a clean, reliable and affordable supply of electricity in the province over the next 20 years. At this stage, it looks as though conservation will be relied upon to replace the coal-fired capacity; the nuclear plants will be modernised; and demand growth will be met by expanding the use of renewable and gas-fired generation.

Making better use of existing power assets via inter-provincial trade is one way to effectively delay the need for new generation capacity. Since 1995, the Agreement on Internal Trade (AIT) has aimed at reducing internal trade barriers for the main economic sectors. Nevertheless, a recent survey indicates that a majority of the 181 Canadian businesses surveyed experienced problems from internal barriers whose main impact was to raise costs (Conference Board of Canada, 2006). In particular, only little progress has

been made so far in the energy chapter for which negotiations are still underway, though Ontario and Quebec have agreed to build a new interconnection of 1 250 megawatts starting in 2009. By contrast the bilateral Trade, Investment and Labour Mobility Agreement (TILMA) signed in 2006 by the provinces of Alberta and British Columbia has dismantled non-tariff barriers to trade across major sectors including energy. The Council of the Federation, which is composed of the provincial Premiers, will investigate whether some elements of this agreement could be used in the AIT energy chapter. This initiative should be pursued, and inter-provincial trade in energy goods and services should be liberalised as soon as possible in order to facilitate a better allocation of resources across the country.

Improve the support to renewable energy

At the moment renewable energy sources receive sizeable financial support. Clean energy generation benefits from federal accelerated capital costs allowances, and renewable energy development is further encouraged through the eco-ENERGY Initiatives. Specific provincial policies also seek to hasten renewable energy supply.²⁶ But both the design and the delivery of programmes could be improved. In many cases there are overlaps or duplications of measures that are provided both at the federal and provincial levels.

In addition, it is not clear whether the focus of current policies on certain energy sources such as corn ethanol or biodiesel is appropriate.²⁷ Indeed, there is still a debate concerning the level of full-cycle energy savings associated with ethanol fuels. When soil acidification, fertiliser use, biodiversity loss and toxicity of agricultural pesticides are taken into account, the overall harmful environmental impacts of corn ethanol and biodiesel can exceed those of petrol and mineral diesel (Doornbusch and Steenblik, 2007). Cellulosic ethanol may lead to more energy savings and GHG emissions reductions, but the competitiveness of Canada's cellulose-based ethanol remains uncertain (see Chapter 5).²⁸ Given the latest available knowledge on the development costs of biofuels and their environmental impact, current support to corn ethanol and biodiesel needs to be re-considered.

Conflicting policies within a jurisdiction can also hinder the deployment of renewable energy. In Alberta, for instance, wind energy benefits from financial support, but the province also caps the production of such energy. Lastly, it is sometimes difficult to track how public funds are being used. Overall, there appears to be a need to investigate the efficiency of the current support provided to renewable energy and streamline its delivery. In particular, it is unclear whether significant aid will still be necessary once an effective emissions-trading system is put in place and increases incentives to use renewable energy.

Foster innovation in the energy sector

The challenges of long-term energy security and environmental sustainability can be met only through the deployment of efficient and cheaper technologies that are capable of using more plentiful, cleaner and cheaper sources of energy. In addition to the diffusion of current clean-energy technologies, better technologies need to be developed and implemented. Canada's innovation rate could be raised by a number of institutional changes, in particular by ensuring that firms operate in a competitive environment (OECD, 2006b). Additional changes are also needed to spur innovation in the energy sector, for instance to reduce air pollution, a field in which Canada's share of patent applications is low.

In its Science and Technology Strategy, the federal government indicated its willingness to focus funding on priority areas that are in the national interest from a social and economic perspective (Government of Canada, 2007b). This includes environmental

science and technologies, and natural resources and energy. This strategy is a promising attempt to integrate energy and environmental concerns into the national innovation system. But it remains to be seen whether it will lead to sufficient coordination of energy, environmental and research policies to promote innovation at the implementation stage.

A number of measures have been adopted to encourage environmental innovation by supporting a wide range of technologies within these priority areas.²⁹ Providing broad support appears appropriate in the current context, as there are no clearly superior approaches among the group of mature generation options, and several technologies will most likely be needed to deliver energy efficiently now and in the future. It will avoid introducing distortions in the market and favouring the development of any particular technology. At the same time, some targeting may be needed to limit fiscal costs. One alternative would be to support the development of technologies that are likely to bring the most value added. This could be those for which the country has a comparative advantage to develop this knowledge (either in the form of expertise in the field or supplies of a natural resource). It could also be technologies that have a large potential to lower emissions over their life cycle (and not only through their direct effect) and that could be easily exported to other countries. At the moment carbon capture and storage appears to meet these criteria (Box 4.4). The province of Saskatchewan has been a leader in the development of this technology, and has proposed to put in place a full-scale commercial demonstration of carbon capture and storage in the coal-fired electricity sector. The 2008 federal Budget provides CAD 240 million in trust in the fiscal year 2007 to Saskatchewan

Box 4.4. Carbon capture and storage

Carbon dioxide capture and storage (CCS) is a process that traps carbon dioxide (CO₂) at power plants and industrial facilities before it is emitted and then injects it into underground storage sites, reservoirs or possibly oceans. It is considered to have a fairly large technological potential to mitigate GHG emissions, although it will not by itself be sufficient to address the challenge of climate change.

Although the capture part of the CCS chain is used as part of industrial processes, storage is not used except in a few pilot projects. The extent to which this technology will be exploited will depend on the costs of CCS. In particular, the price of CO₂ would have to be high enough to cover its incremental costs. CCS is more costly than biological sequestration. Analysts estimate the CO₂ price would need to be in the range of USD 15 to 90 per metric tonne to cover the anticipated costs of CCS and exploit the full potential for geological storage. This wide range depends on the type of plant at which CO₂ is captured and the distance of this plant from the storage facility. If all the sources that could eventually employ CCS did so, and assuming that their emissions would remain at 2005 levels, it would take between 500 and 1 500 years to fully exploit the capacity of potential geological storage sites in the United States and Canada.

There are a number of issues related to the implementation of CCS over the long term. Indeed, geological storage, although expected to be relatively secure, may not be permanent. There is also a need to assign financial responsibility for verification and monitoring of storage reservoirs, and for any damage from leakage. Implementing geological sequestration also raises issues of surface and sub-surface property rights and associated legislation.

Source: Congressional Budget Office (2007).

for this initiative, which will be matched by the province and used to partner with industry. However, it will be crucial to design public support effectively so as to limit crowding-out effects, whereby public investment is done at the expense of its private counterpart. Moreover, the efficiency of the support should be regularly examined.

A major role for the government is also to clear away hurdles from financing environmental innovation. A fund of CAD 550 million provided to Sustainable Development Technology Canada was established in 2002 to address the gap in funding at the demonstration and pre-commercialisation stages, just prior to venture capital investment. The Fund has been successful in providing support to 133 projects involving over a billion dollars of investment thus far, in particular in the energy production and exploration sector. However, its actions are limited to Canadian registered firms, and, as with most other R&D measures in Canada, the support is mostly concentrated on small and medium-size firms, while there is evidence that foreign and large firms account for a large part of innovation (OECD, 2006b). Unless there is strong evidence that the latter can better internalise the benefit of innovation, it would be useful to direct part of the aid provided by the Fund to these firms.

Adapt taxation and regulation

Remove the preferential tax treatment of the oil and gas sector

At the moment, the oil and gas sector benefits from favourable tax treatment, especially at the provincial level. Alberta collects rents through royalties, corporate taxes and lease sales. Its corporate tax rate is the lowest in Canada (10% for the general rate and 3% for small businesses). In exchange for a portion of the revenues, oil-sands companies lease the right from the provincial government to develop the resource and sell the product. This collection is done by sealed bidding in an open market to maximise value to the resource owner. In 2006-07, oil-sands leases generated CAD 1.3 billion to the Alberta government (Canadian Association of Petroleum Producers, 2007b).³⁰

Royalties for conventional oil and gas fit into a complicated structure based on well size, age and production. For the oil sands a different regime was introduced in 1997, known as the generic oil-sands royalty rate, which is more generous than the system existing for conventional oil or natural gas.³¹ The system aimed to foster development at a time when uncertainties surrounding oil-sands exploration and development were much higher than today and when ecological concerns were not so prevalent. As a result, royalties have not kept pace with oil-price increases since the mid-1990s. Looking ahead, the continuing shift from conventional to non-conventional oil and gas would have led to a lower average effective royalty rate, assuming no change is made to the royalty regime. The Alberta Department of Energy estimates that oil-sands royalty revenues would have been the same in nominal terms in 2020 as in 2004-05, despite a tripling of production over that time period.

The current Alberta royalty regime is generous compared to systems applied in other oil-producing countries. The Alberta regime in place until end-2008 leaves 53% of net revenue available from oil-sands developments with companies, while governments retain only 47% (Alberta Royalty Review Panel, 2007). By comparison, firms undertaking oil and gas developments in Norway receive only 22% of the revenues. Concerns have recently mounted that Albertans are not receiving a fair share of the resource rent, while being adversely affected by the negative environmental and socio-economic consequences of oil-sands developments.

Against this background, the Government of Alberta announced a new royalty framework to take effect in 2009 following a thorough review by an independent expert panel (Government of Alberta, 2007). The conventional oil and natural gas royalty regimes will be simplified and made more sensitive to oil prices and production volumes. Moreover, royalty rates for oil-sands production will be increased. In addition, the provincial portion of the Accelerated Capital Cost Allowance for oil-sands projects will be eliminated. The resulting rise in royalties is expected to be CAD 1.4 billion dollars in 2010, a 20% increase over royalty revenue projections under the current system. Conventional oil, natural gas and oil sands will each experience an increase in royalty payments of about CAD 460-470 million. Overall, these changes will increase Albertans' share of the resource and strengthen the need to improve its long-term management and the use of savings funds by the provincial government. Given the rapid development in the oil-sands industry and potential technology breakthroughs, it will be necessary to regularly review the royalty regime and see if it continues to serve the province's needs. One possibility could be to have a formula whereby parameters are reset in line with key competitor country royalty rate changes.

At the federal level, recent changes have moved toward the gradual removal of the advantages favouring the oil sector. In the 2003 federal budget the government introduced a number of measures to be phased in over a five-year period, including the reduction of the federal corporate rate on resource income from 28 to 21%, the phase-in of the deduction for income tax purposes of provincial royalty and mining tax payments and the phase-out of the existing 25% resource allowance. These measures were intended to improve the neutrality of the resource tax system, yet the impact of royalty deductibility may have some undesirable features (see Chapter 3). In the 2007 federal budget, the accelerated depreciation allowance for the oil sands was eliminated, but it still exists for mining. Moreover, there remain some tax preferences within the sector. For instance, the mining sector is allowed 100% deductibility for the intangible costs of developing a new mine (including an oil-sands mine), whereas intangible development costs of oil and gas wells (including *in situ* methods of oil-sands extraction) are eligible for a 30% per year deduction only. This could distort choices in the extraction methods used by oil-sands producers. It would be preferable to level the playing field between technologies. Moreover, no change has been made to the tax provisions relating to exploration or development expenses or to "flow-through shares".³² These provisions were introduced at a time when exploration entailed very large costs and it was difficult for small firms to finance exploration and development. Given the marked rise in the oil price and the prominence of environmental concerns, it is unclear whether the federal government should continue to encourage exploration through these provisions. Their phasing-out should be considered.

The vast majority of Alberta's oil and gas resources is owned by the Crown, and the province leases the right to extract and produce oil sands to private companies. Leases generally run for 15 years and can be continued indefinitely past their initial term.³³ As with its royalty regime, Alberta's tenure allocation system has been designed to encourage investment and the development of the oil sands. But it has not been revised since the 1980s and is now inconsistent with the Government of Alberta's 1999 Commitment for Sustainable Resource and Environmental Management (Holroyd *et al.*, 2007). To continue a lease, a company must either produce oil, or sufficiently evaluate the oil-sands deposits and report on the amount of oil-sands reserves.³⁴ This mandatory exploration/production requirement has been judged to contribute significantly to ecosystem disturbance (AXYS Environmental Consulting Ltd. and Lornel Consultants, 2002). Moreover, the cumulative

impact of both new and existing projects on the environment is not properly assessed. In sum, the oil-sands tenure process should be reviewed and made consistent with the province's sustainability objectives.

Streamline and reduce uncertainty in the project-approval process

The approval process of energy projects is fragmented, complicated and requires applicant firms to provide detailed information at multiple stages. Moreover, many institutions are involved in the process. This has resulted in a lack of coordination and accountability and has become a significant obstacle to the development of major resource projects. This holds for oil-sands developments but also for other kinds of energy across the country, including liquefied natural gas and nuclear.³⁵

The 2007 federal budget took an important step in addressing the issue by putting in place a Major Projects Management Office, which provides a single window on the federal regulatory process for industry. It improves overall accountability by monitoring and reporting on the performance of federal regulatory agencies. The Office serves as the focal point for developing legislative and administrative options to further consolidate and streamline regulatory processes. CAD 150 million over five years was allocated to create the Major Projects Management Office and enhance the scientific and technical capacity of key regulatory departments and agencies that deal with major resource projects. This is a welcome initiative, and further progress toward consolidation and efficiency enhancement of the federal regulatory process should be sought.

A more fundamental criticism is that the outcomes of the energy project approval process are unpredictable. This reflects the lack of precision in guidelines, in particular regarding the integration of environmental considerations in the whole process, so that regional regulators have significant discretion as to the information they can request and their ultimate judgements. One way to improve licensing and approval procedures would be to reduce the number of approval bodies and phases. Ideally, investors should have access to "one-stop-shop" licensing, in which one official body holds as many of the approval responsibilities as possible or at least is given the duty to co-ordinate. Timelines for approval processes must also be clear and established in advance.

One other major uncertainty is linked to Aboriginal land claims, in particular in provinces like British Columbia where no settlement treaty has been signed between the federal government and the Aboriginal communities. Two landmark 2004 Supreme Court decisions have ruled that the government has a moral and legal obligation to conduct meaningful consultations when industrial development is proposed for Aboriginal land whose title is in dispute. Since then, Aboriginal consultations have delayed several huge energy projects.³⁶ The diversity of the Aboriginal population makes it difficult to streamline the process and increase its predictability. Still, further effort should be made by the federal government to improve the consultation process.

Conclusion and policy recommendations

This chapter has examined ways of ensuring a sustainable development of the energy sector over the medium and longer term. Policy recommendations are provided below (Box 4.5).

Box 4.5. Policy recommendations for energy and environmental policies

Management of scarce resources in the short and long term

- Address labour shortages and infrastructure bottlenecks.
 - ❖ Continue action to encourage participation of populations that are under-represented in the labour markets (in particular Aboriginals, women and the disabled) by providing further training support. Modify parameters of the Employment Insurance system to foster greater inter-provincial labour mobility.
 - ❖ Assess whether the current use of public/ private partnerships by the federal and some provincial governments for some large-scale projects ensure efficient building and operation of infrastructure.
- Regularly review water pricing and rights to ensure efficient use of this increasingly scarce resource. In particular, check that the new Albertan water-allocation and licence-transfer processes reach their conservation objectives while minimising their effects on oil-sands developments.
- Adopt allocation and withdrawal rules for the Alberta Heritage Fund as Norway has done. Consider setting up a similar fund at the federal level to which windfall gains from the resource sector would be allocated.

Effectiveness of environmental policies

- Reduce investment risks by continuing to give firmer long-term direction on climate-change-abatement policies and by ensuring that environmental and energy policies are fully integrated.
- Continue to work towards a full set of federal-provincial equivalency agreements, but make sure the system is as harmonised as possible to limit transaction and monitoring costs. In particular, ensure that equivalency agreements do not prevent a future link of the Canadian emissions-trading systems with other international systems.
- Continue to make more use of market-instruments. Focus on the design of the planned national emissions-trading system, and ensure its compatibility with other markets in the United States and/or the European Union. Assess the pros and cons of the establishment of a hybrid model at the federal or the provincial level, whereby the permit price can fluctuate within a pre-defined corridor.
- Monitor emissions in the transport sector, and check that the setting of standards leads to significant emissions reductions. Consider the introduction of a (carbon) fuel tax in addition to standards.
- Consolidate the measures aimed at curbing energy demand and focus on those that are most cost-efficient.

Energy mix

- Liberalise electricity markets in provinces where they are still regulated. Liberalise trade in energy goods and services among provinces by finalising the energy chapter of the Agreement on Internal Trade.
- Investigate the efficiency of the current support provided to renewable energy and streamline its delivery. In particular, review the policy of promoting corn and cellulosic ethanol and other biofuels.
- Make regular assessments of policies that foster technology developments. Ensure that large firms get the appropriate share of support from Sustainable Development Technology Canada.

Taxation and regulation

- Regularly review the Alberta royalty regime. Continue the move toward the elimination of the preferential federal tax treatment for the mining sector. Re-examine the tax treatment of exploration and development costs as well as flow-through shares.
- Review the oil-sands tenure process regularly and remove the exploration/production requirement to make the system consistent with Alberta's sustainability objectives.
- Streamline and make the energy projects approval process more predictable. Improve the predictability of the process by setting up "one-stop-shop" licensing and timelines for approval processes at the provincial level.

Notes

1. Canada's energy sector is to a large extent owned by foreigners: 49.1% of the assets and 55.9% of the revenues are foreign owned (Baldwin et al., 2006).
2. In 2004, 42% of all domestic output came from oil sands, and most of the increase in natural gas production since 2004 has come from coal-based methane (Cross, 2006).
3. This includes the ecoEnergy for Renewable Power programme, a CAD 1.48 billion, 14-year production incentive of 1% per kilowatt-hour for renewable energy sources (e.g. wind, biomass, small-scale hydro, solar photovoltaic, geothermal, tidal and wave) which is expected to increase renewable electricity capacity by 4 000 megawatts.
4. Even without the emissions resulting from oil sands, emissions per capita would be greater than anywhere (except the United States).
5. Analysis shows that one quarter of the jobs needed will not be filled unless new strategies are put in place to recruit and train people from every possible socio-demographic group (Government of Alberta, 2006b).
6. About 9% of persons employed in Alberta were working in the construction sector in 2006. Demand for employment in the construction sector is expected to decrease after 2010 (Construction Sector Council, 2007).
7. In regions with an unemployment rate of 6.0% or lower, a person has to work 700 hours to become eligible for EI. At the other end of the scale, in regions with unemployment rates of 13.1% or greater, a worker needs to work only 420 hours of work. The requirements are higher if the worker is a new entrant or a re-entrant to the labour market.
8. In 2006 measured homelessness in Edmonton increased by 19%, while in Calgary the number of homeless people had risen by 458% since 1996 (Parkland Institute, 2007).
9. This adverse effect on human capital has also been observed in countries experiencing an oil boom and is often seen as a symptom of "Dutch disease".
10. In February 2007, the Alberta Government made a commitment to spend CAD 396 million over three years on housing and infrastructure needs in Fort McMurray. Past estimates from industry and community representatives had suggested that approximately CAD 1.2 billion would be required for critical public infrastructure needs in the Wood Buffalo region over the next five years (Athabasca Regional Issues Working Group, 2005).
11. A few years ago the Canadian oil-sands industry used a thousand cubic feet (Mcf) of gas for each barrel of oil produced from oil sands via *in situ* thermal recovery and another 0.5 Mcf/barrel for upgrading of bitumen into synthetic crude oil (North America Energy Working Group, 2005).
12. These include high levels of fossil-fuel use in the uranium mining and refining process, the risk of accidents, and storage problems for dangerous by-products including radioactive waste with a half-life of thousands of years.
13. To produce a barrel of oil from oil-sands mining requires 2 to 4.5 barrels of water (Griffiths et al., 2006). Moreover, over half of all oil produced in Alberta is from *in situ* projects using "enhanced oil recovery" i.e. injecting water to recover oil from the reservoir. The oil and gas industry's use of saline water has increased fivefold since 1999. Water demand for *in situ* oil sands projects is expected to more than double between 2004 and 2015 (NEB, 2006).
14. Water allocation licenses are now issued for a two-year period, with subsequent licenses eventually issued for a five-year term (Alberta Environment, 2006). This is a reduction from the previous 10-year renewal period, and renewal terms can now be changed by regulation. Moreover, licence transfers are now subject to a review process similar to new licence applications.
15. For instance, the Fund received a CAD 1.25 billion deposit from the 2006-07 fiscal surplus, representing around 18% of government net revenue.
16. Despite large surpluses, current policy requires that the government remove a large part of revenues from the Fund. In 2006-07, it earned investment income of CAD 1.65 billion, most of which was transferred to general revenues, leaving only CAD 283 million in the Fund for inflation proofing. As a result, the current value of the Fund was approximately CAD 16.6 billion in March 2007 (USD 15.5 billion), while Alaska's held USD 38 billion and Norway's almost USD 300 billion at end-2006.
17. Another possibility would be to re-establish the rule that prevailed before 1983 according to which 30% of resource revenues are set aside for the Fund. More stringent rules have sometimes been proposed (Kneebone, 2006).

18. This includes, for instance, retrofitting buildings or tightening requirements on new buildings.
19. Under the Energy Efficiency Act, the government plans to impose: new energy performance standards for 18 currently unregulated products, such as commercial clothes washers and commercial boilers; and more stringent requirements for 10 currently regulated products, such as dishwashers and dehumidifiers.
20. These tools are preferable to tax rate reductions or exemptions because they maintain the price-signal mechanism of the instrument.
21. There is a range of possible models for emissions trading, including cap and trade, baseline and credit, and hybrid schemes with cost capping and other variations. Each may have implications for the design of the broader international framework. For example, cap and trade or baseline and credit schemes would require agreed targets, while other models may require international agreement on prices or other parameters.
22. In June 2007, the Eastern Canadian premiers and New England governors also said they will look more closely at developing a regional system for capping and trading greenhouse gas emissions.
23. The credibility of the penalty structure is relatively easy to achieve for sovereign authorities implementing a tradable permit system within a nation. However, a credible penalty structure is hard to imagine at the international level. In particular, the issue of “over-selling”, whereby a party sells too many permits and fails to cover its own emissions needs, will have to be addressed.
24. Quebec implemented Canada’s first carbon tax in October 2007. The tax amounts to 0.8 cent on every litre of petrol sold in Quebec and 0.9 cent on each litre of diesel fuel. About 50 companies are affected by the tax. About CAD 200 million in annual revenue is expected to be raised, thereby paying for energy-saving initiatives such as improvements to public transit.
25. Jaccard (2007) estimated that a CAD 50 per tonne carbon tax beginning in 2006 would shave about CAD 4.8 billion (about 0.3%) from Canada’s GDP in 2010. The impact would become insignificant for the economy by 2020. According to a 2007 federal government study of measures required to meet Canada’s target under the Kyoto Protocol within the agreement’s commitment period, a more drastic scenario of imposing a carbon tax at a per tonne rate of approximately CAD 195, which would apply to all GHG-producing activities by the industrial, commercial and household sectors, would reduce GDP by some 7% compared to a business-as-usual scenario in 2008 and 2009 (Environment Canada, 2007b). This scenario certainly overestimates the impact of the carbon tax as it excludes any monetary-policy reaction.
26. In 2004, the government of Ontario set a target to produce 5% of the province’s electricity from renewable sources by 2007 and 10% by 2010.
27. On 5 July 2007, the federal government announced the creation of the ecoENERGY for Biofuels Initiative, which will invest up to CAD 1.5 billion over nine years to boost Canada’s production of biofuels such as ethanol and biodiesel. Ontario imposed 5% ethanol content in motor vehicle fuel in January 2007. At the same time the province ended a preferential tax treatment previously granted to ethanol. The resulting proceeds (of CAD 520 million over ten years) will be recycled to a capital fund and support the production of ethanol in the province. See Chapter 5 for further discussion.
28. The government is committed to facilitating the commercialisation of cellulose ethanol, and the 2007 federal Budget allocated CAD 500 million for large facilities producing “next generation” renewables.
29. The federal government is encouraging environmental innovation by: i) creating clear and effective policy frameworks for the environment, including the Regulatory Framework for Air Emissions to reduce air pollution and greenhouse gas emissions, the Clean Air and Climate Change Trust Fund (CAD 1.5 billion) to support major projects with the provinces and Territories to reduce GHGs emissions and air pollutants and the Comprehensive Chemicals Management Plan to manage known and potentially dangerous substances, such as mercury; ii) creating the EcoENERGY Technology Initiative (CAD 230 million) to reduce air pollutants and GHG emissions from conventional energy sources and increase Canada’s supply of clean energy, including through the development of alternative, sustainable energy technologies; and iii) supporting collaborative research initiatives to improve the recovery of energy from traditional sources and develop alternative forms of energy. The 2007 Budget provided CAD 15 million to advance collaborative academic research in these areas and create the Canada EcoTrust for Clean Air and Climate Change to support relevant provincial and territorial projects.
30. This corresponds to an effective tax rate of about 8% on the value of oil-sands output.

31. The current oil-sands regime includes an accelerated capital write-off period in which the royalty is 1% of gross revenues. Once the capital has been paid off, the royalty switches to a rate of 25% of net revenues or 1% of gross whichever is greater. For comparators, natural gas royalties range from 30 to 50% of gross revenues, while for conventional crude oil rates are as high as 40%.
32. Flow-through shares are a financing mechanism that assists a mining or oil and gas corporation to raise capital for exploration and development expenses. In addition to an equity interest in the issuing corporation, flow-through shares transfer to the purchaser of the share the right to the income tax deductions associated with the firm's expenditures on exploration and development. Flow-through shares are particularly important as a financing mechanism for smaller oil and gas and mining corporations that are not currently in a taxable position and do not have easy access to alternative financing arrangements. The Canadian exploration expense (CEE) is deductible at a rate of 100%. For the mining sector, CEE has a broader definition than for oil and gas, as it also includes pre-production development expenses. The Canadian development expense (CDE) is deductible at a rate of 30% on a declining balance basis. For the oil and gas sector, CDE covers mainly the costs of drilling, converting or completing a well in a known reservoir. For the mining sector, it includes mainly the cost of building mine haulage ways and other workings after a mine has come into commercial production. It also includes the cost of acquiring a mining property in Canada.
33. Permits that run for five years and can be converted to leases are another existing tenure instrument, but they are less common than 15-year leases.
34. In addition, an escalating annual rent is charged for all continued oil-sands leases that do not meet a minimum level of production, although it can be offset by research, development or exploration costs.
35. Indeed, overlaps between provincial and federal regulations lengthen the regulatory approval process and increase the development costs of the uranium industry in Saskatchewan (Government of Saskatchewan, 2007). A large number of regulators are also involved in liquefied natural gas (LNG) development projects in the Atlantic Provinces, and there is a lack of clarity regarding jurisdictional authorities and construction and safety standards for LNG terminals (Tu Weissenberger, 2006).
36. A 1 150-kilometre oil-sands pipeline called Gateway, proposed by Enbridge Inc., to connect Edmonton with the west coast of British Columbia for export to China, has been shelved for several years in part because of concerns over Aboriginal rights and unsettled land claims. The 1 200 kilometre Mackenzie Valley pipeline was dogged in 2004 and 2005 by two lawsuits against the government from the Dehcho First Nations, who said they had been unfairly excluded from the review process. The issues have still not been resolved.

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Chapter 5

Modernising Canada's agricultural policies

The agricultural sector in Canada is relatively large, compared to those in most other G7 countries. In recent years, the federal and provincial governments have undertaken a number of sectoral reforms to meet the competitiveness and environmental challenges that it faces. The federal government has tried to end a marketing monopoly in the barley market and may do so for wheat as well. The next generation of agriculture and agri-food policy is being finalised, and implementation of the first part of a new framework, Growing Forward, has begun. But a steady stream of ad hoc programmes in recent years has had significant budgetary costs and no doubt created moral hazard among farmers. There is scope for further liberalisation in supply-managed sectors, which are heavily protected and subsidised by consumers. Moreover, Canada's bio-energy production, in particular the production of second-generation bio-ethanol (from cellulose) is under pressure in light of less costly bio-energy production overseas. Against this background, governments are striving to ensure the long-term viability of the sector.

Although agriculture's share of GDP is near the OECD average, it is much larger than in other G7 economies (except France). The sector is under the dual responsibility of the federal and provincial governments. One of the striking features in the Canadian agricultural system is that, on one hand, there are supply-managed sectors – dairy, eggs and poultry – that are heavily protected, with strong market interventions, consumer-subsidised and that do little exporting; and, on the other hand, there are meat and grain farmers, such as those producing wheat and barley in western Canada, who are very outward-oriented and for whom governments are keen to introduce more market mechanisms. This inconsistency in approach has its roots in the distant past, but the vested interests it has created have made the system resistant to reform as circumstances change. This chapter first outlines the key features of the agricultural sector in Canada. It will then examine four major topics: the sustainability of national supply-management systems; the potential end of the Canadian Wheat Board's marketing monopoly; a new set of policy programmes to follow the Agricultural Policy Framework; and bio-energy and other environmental challenges. Finally, the chapter summarises policy recommendations from the perspective of modernisation of the sector's policies.

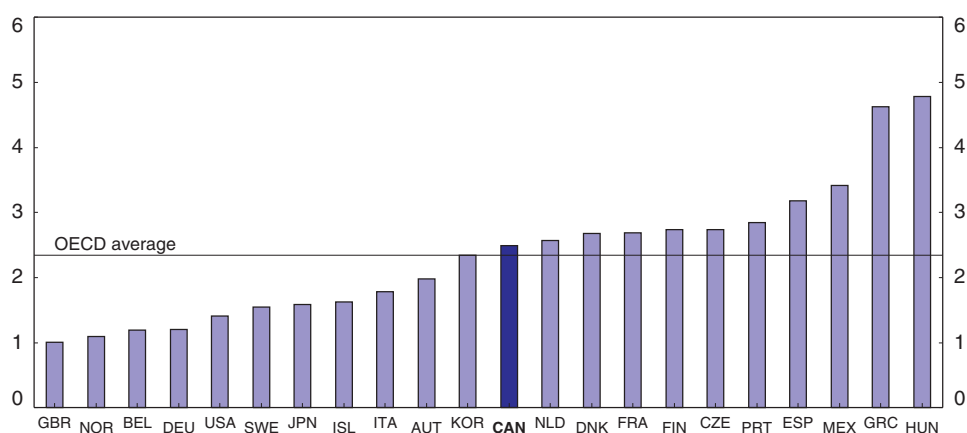
An overview of Canada's agricultural sector

The primary agricultural sector, where the thrust of agricultural policy is targeted, accounts for about 2% of GDP (Figure 5.1) and one in 36 of the nation's jobs (Figure 5.2). Overall, the Canadian agricultural sector is near the average in terms of output share among OECD countries, but it does not employ as many people. This reflects its relatively favourable labour productivity performance, due in no small part to the ample availability of land as an additional factor of production. Average farm capital per farm in 2006 reached almost CAD 1.1 million, up nearly 36% since 2001, indicating that rising capital intensity is also an important driving factor.

Canada is both the OECD's fifth largest exporter and importer of agricultural and agri-food products. Given the large amount of land suitable for agricultural production relative to its population, production in the sector tends to outstrip domestic consumption; thus, trade opportunities and access to foreign markets are crucial to its good functioning and longer-term sustainability (Agriculture and Agri-Food Canada, 2006). Canadian farmers, with the exception of those in the national supply-management systems, have consistently sought to increase international opportunities to sell their products.

The government is in full support of the supply-management frameworks in dairy, poultry meat and eggs. This system, introduced several decades ago against the background of heavy distortions emanating from overseas markets at that point, protects producers and consumers from price fluctuations by effectively matching domestic demand and supply to achieve a target price, while quotas discourage farmers from producing more than domestic demand, and imports are restricted by high tariffs. The lack of producer exposure to market forces results, however, in static resource misallocation. It

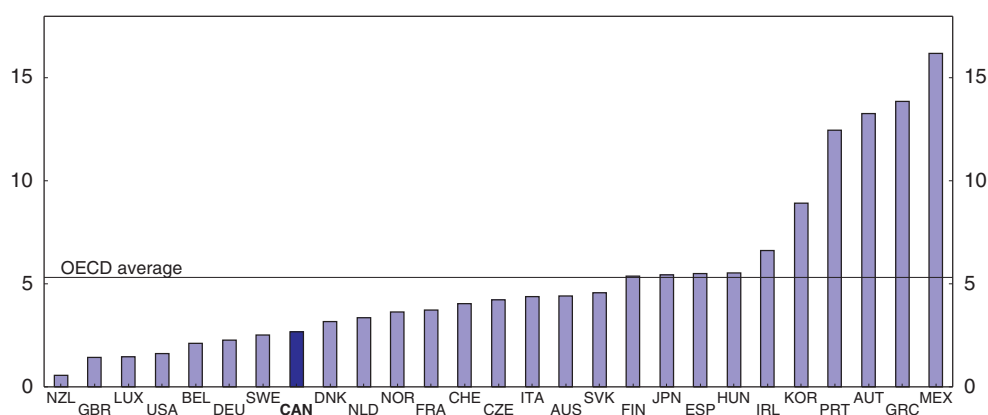
Figure 5.1. **Share of agriculture in total output**
Average 2000-05 or latest available year



Source: OECD, Annual National Accounts database.

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Figure 5.2. **Share of employment in agriculture in total employment¹**
Average 2000-06 or latest available year



1. Agriculture, hunting, forestry and fishing.

Source: OECD, Annual National Accounts database.

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is consumers who pay for the protection enjoyed by the sector:¹ for example, dairy prices are typically more than double those prevailing in world markets. In the past year, however, the price gap has narrowed as world prices have increased rapidly and Canadian prices have posted only moderate growth. Dynamic inefficiencies no doubt also ensue.

In contrast to the supply-management systems for dairy, poultry and eggs, the federal government has taken steps to further liberalise the barley market in western Canada, until recently a Canadian Wheat Board (CWB) monopoly (other than for feed), and is expected to follow a similar strategy for wheat itself, after having fended off legal challenges to the CWB wheat export regime both before the WTO and the NAFTA.² Having completed consultations with stakeholders, the “single-desk” monopoly in the barley market was to end in August 2007, giving more marketing choice to barley farmers. However, the CWB asked the federal court to review the legality of the federal government’s

action, and indeed the court overturned it in July 2007, and the decision was upheld upon appeal. A legislative change is required, and the Government therefore introduced Bill C-46 in March 2008 to amend the *Canadian Wheat Board Act*.

Canada has made substantial progress over the past 20 years or so in paring back government support to the agricultural sector. It reduced total support from 1.8% of GDP in 1986-88 to 0.8% of GDP in recent years. The amount of direct support to producers as well as the share of support linked to specific commodities or the use of variable inputs – the most distorting forms of support – have declined most. The value of support to the sector as measured by the percentage Producer Support Estimate (%PSE)³ fell from 36% in 1986-88 to 22% in 2004-06, well below the OECD average (29%), but still somewhat higher than its NAFTA partners, the United States and Mexico (each with 14%). However, Canada is almost unique in having backtracked since the late 1990s: the per cent PSE rose from a low of 14% in 1997 to 23% in 2006 before higher world prices led to a decline of per cent PSE to 18% in 2007.⁴ Nevertheless, discretionary increases in support in response to various events are continuing. For example, the government of Ontario promised its livestock and horticulture producers an additional CAD 150 million of financial aid in December 2007, and likewise the federal government has made a “Kickstart” payment of CAD 600 million associated with its new policy framework (see below).

In 2003, the federal and provincial governments agreed to a new Agricultural Policy Framework (APF). The APF was intended to provide a comprehensive and long-term basis to reshape Canada’s agriculture policies, covering a wide range of issues such as risk management, long-run sectoral viability through technology and innovation, food safety and environmental responsibility. The milk, eggs and poultry industries operate under supply-management regimes and have been treated differently in the APF. In light of its originally planned expiration in 2008, the federal and provincial governments undertook joint work on the design of its successor, launching a new initiative in 2008 called *Growing Forward* after broad and multi-phased national consultations. Overall, the new framework will focus more on ensuring that the agriculture and agri-food industry can seize on evolving market opportunities in the global context, with a greater emphasis on innovation and science. Furthermore, more comprehensive income support is being implemented in the form of a new suite of assistance programmes.

Exposing dairy, eggs and poultry to market forces

National supply-management systems

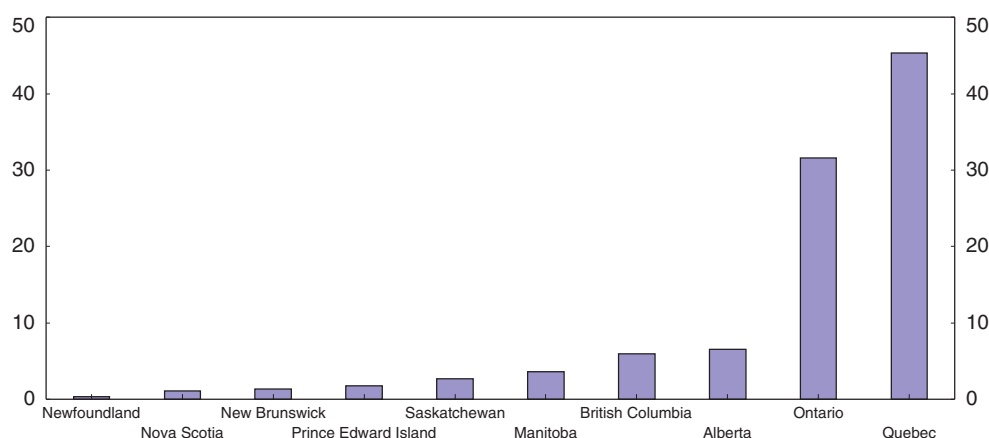
The production of dairy, eggs and poultry (chicken and turkey) has been carried out under their respective supply management regimes since the early 1970s against the backdrop of highly distorted international markets at the time and volatile global market prices ever since.⁵ The systems vary in their detail but are essentially designed to match supply and estimated demand by restricting production⁶ to achieve a target price for the product. For poultry, prices are negotiated between processors and provincial marketing boards. In the case of dairy, the target price is based on a cost-of-production formula.⁷ But the rising value of the dairy quota (see below) is *prima facie* evidence that the impact of productivity growth has been systematically underestimated in its calculation. To maintain the target prices, the amount of each commodity that Canadian farmers are allowed to produce is subject to a quota (originally allocated to farmers for free), and imports are

restricted by tariff rate quotas whereby only limited quantities of products can be imported at lower tariff rates. Prohibitive tariffs (298.5% for butter, 245.5% for cheese, 238% for chicken and 168% for eggs) are imposed beyond WTO minimum access commitments.⁸

Supply-management systems are controlled by national agencies and provincial commodity marketing boards. In dairy, the Canadian Dairy Commission makes a recommendation to the Canadian Milk Supply Management Committee (CMSMC) on the Market Sharing Quota (MSQ) – the national production target for industrial milk. The CMSMC then allocates milk production among the provinces, and each provincial board allocates its share of national milk production among quota holders. The boards buy all the milk produced in the province; milk revenues are then pooled and paid back to producers. Among the provinces, Quebec receives the largest share of MSQ (46.5%), followed by Ontario (31.2%), whereas the shares of all other provinces are relatively small (Figure 5.3). Retail prices of fluid milk are also regulated in Quebec and Nova Scotia, raising consumer prices in those provinces well above the national average.

Figure 5.3. **Provincial shares of national milk Market Sharing Quota**

Per cent, 31 July 2007



Source: Canadian Dairy Commission, Annual Report 06/07.

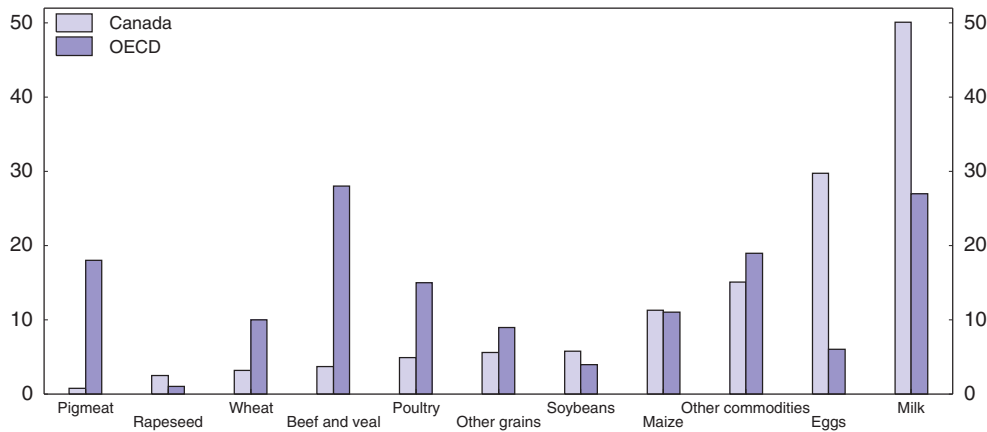
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Key features of the national supply-management systems


While the objective of national supply-management systems is to provide stable prices to producers and consumers and a fair return to producers, they limit the working of the market mechanism within the country and internationally – setting the target price *a priori* rather than by open markets, allocating quotas among producers without regard to considerations of cost or efficiency, and effectively prohibiting competition from imports through the use of high tariffs. The result of these market interventions and border protection are prices for commodities subject to supply management that are relatively high,⁹ with producers protected against entry because of high levels of minimum efficient scale associated with rising capital intensity (see below). The value of these high prices and the lack of competition are reflected in the considerable value of production quota. Indeed, the situation is arguably more distorted even than the taxi industry, where once the production permit is obtained, there is no quantitative limit on supply (taxis can be driven round the clock).

Commodities under supply management (except poultry meat) receive significantly greater producer support than other products in Canada as shown by the single commodity transfers (SCTs) component of the PSE and more than the OECD average (Figure 5.4). According to the OECD's new classification system within the Producer Support Estimate (OECD, 2007), SCTs as a share of gross farm receipts for milk and eggs were substantially higher than the OECD average.

Figure 5.4. **Single commodity transfers**
Per cent of gross farm receipts, 2004-06

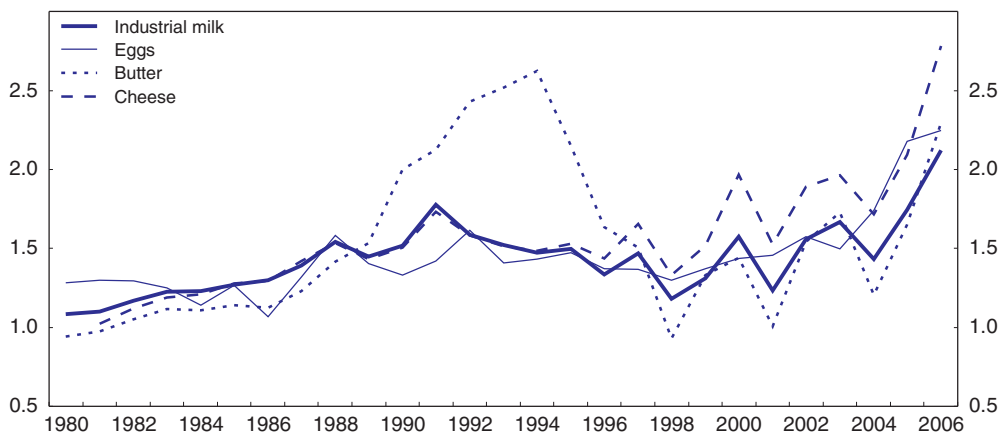


Note: "Other commodities" is a calculated residual whose level is strongly influenced by the high level of support to milk.
Source: OECD, PSE/CSE database 2007.


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While the ostensible objective of Canada's supply management systems is to reduce price variability, in practise they have had the effect of sustaining prices above world levels, considerably so for milk. In particular, prices have been higher than those in the United States, and the gaps between them have tended to widen over time, especially since 1998 (Figure 5.5). In the last year, however, this trend reversed despite the Canadian

Figure 5.5. **Dairy product and egg prices between Canada and the United States**
Ratio between Canadian price and the US price



Source: OECD Agricultural Outlook database, 2007-2016 and OECD Economic Outlook 82 database.

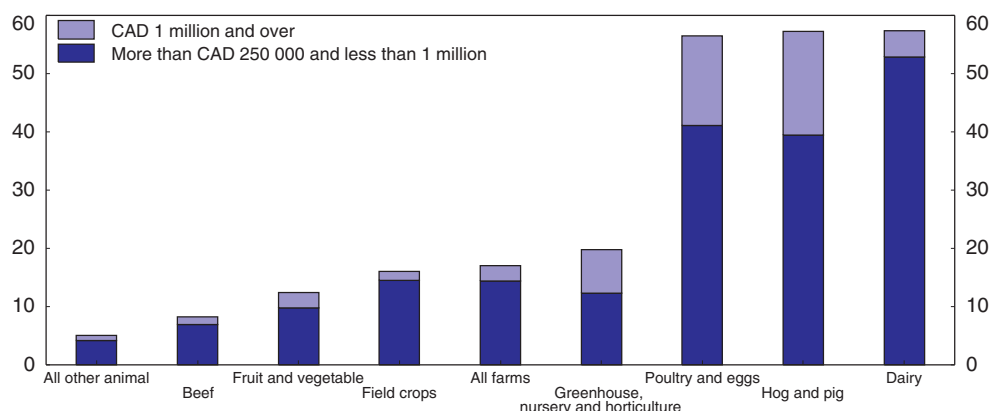
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dollar appreciation, as world prices increased rapidly while Canadian prices posted moderate growth. The higher prices paid by consumers have a regressive effect, as low-income households spend a greater share of their budget on food.¹⁰ This regressive effect is the opposite of what would result if farmers in supply-managed sectors instead benefited from government payments financed by general taxation, since tax liabilities vary directly with the ability to pay. It is especially disturbing in view of the generally affluent situation of most farmers operating under supply management.

One of the benefits of the higher prices¹¹ enjoyed by producers in the supply-managed sectors, as well as their enforced stability, has been that they face lower financial risk than their counterparts who farm other products: in 2005 only 6% of dairy farmers and fewer than 14% of poultry and egg farmers were unprofitable, compared to 33% of all farmers.¹² Moreover, farmers of supply-managed products are often among those farmers with the largest scale (Figure 5.6). The proportion of dairy farmers with gross farm receipts of more than CAD 250 000 was 57.3% in 2005, the highest among all types of farmers. Indeed, the share of such farms had been only 6% in 1986, similar to the all-sector average. This demonstrates that supply management, like other forms of government intervention, is ineffective in sustaining small-scale producers, often in isolated communities.¹³ In addition, with rising prices relative to operating costs and the cost of acquiring quota acting as an effective barrier to entry, the value of milk production quota has risen dramatically over the years (averaging near 10% per year over the past decade), reaching CAD 26 billion in 2006 (Figure 5.7).¹⁴ Indeed, as a share of total assets in the entire farm sector, quotas now represent nearly one eighth, four times more than a quarter century ago and on a par with machinery and equipment.¹⁵

In sum, commodities under the national supply-management systems receive significantly greater producer support than others, and their prices are much higher than those prevailing on world markets. Against such a background, farmers in these systems have substantially higher income than other farmers and Canadians in general, as well as having higher net worth,¹⁶ primarily by virtue of their quota assets. This raises the question as to why these farmers should continue to be protected almost completely from market forces. The rationale is not obvious, particularly from the perspective of consumers

Figure 5.6. **Large farms by type and receipts**¹
Per cent, 2006

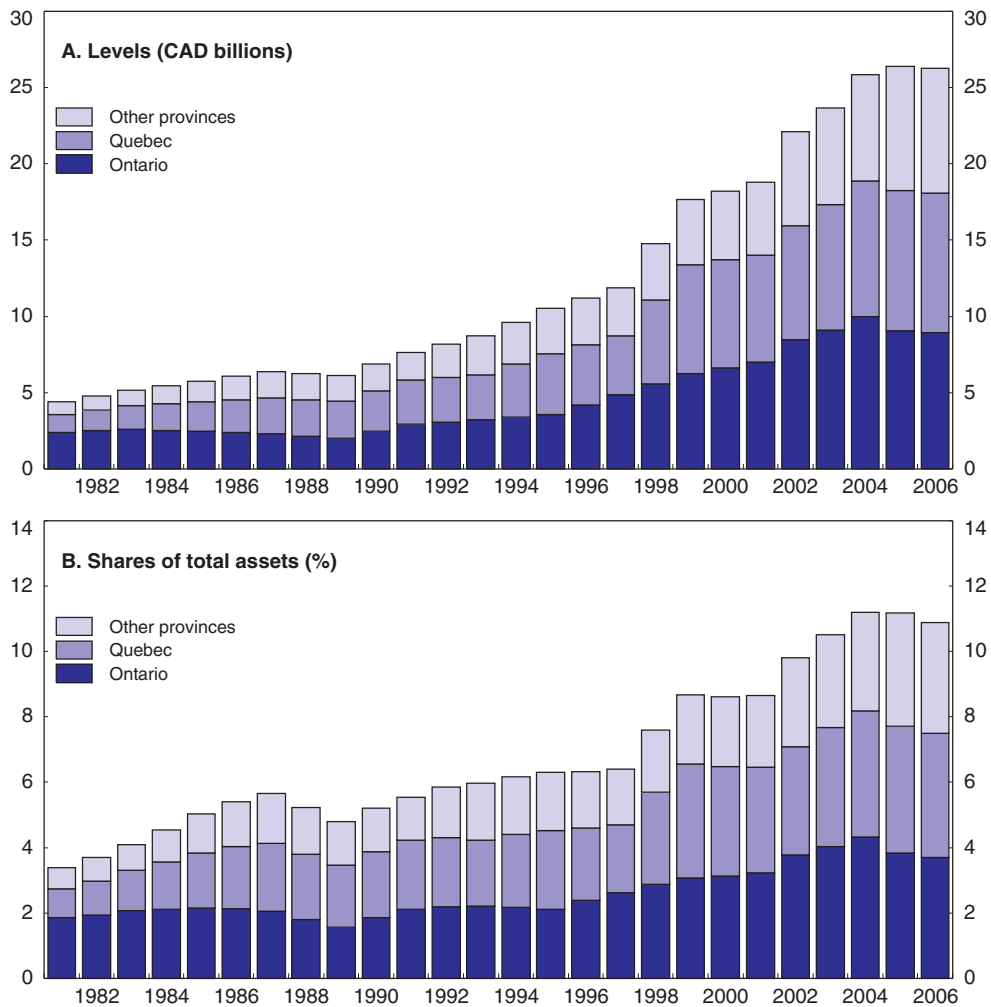


1. Proportion of farms with receipts CAD 250 000 and over by farm type.


Source: Statistics Canada, Census of Agriculture, 2006.

StatLink  <http://dx.doi.org/10.1787/355281762563>

Figure 5.7. Marketing dairy quota values



Source: Statistics Canada (2008), *Balance Sheet of the Agricultural Sector*, January.

StatLink  <http://dx.doi.org/10.1787/355306117064>

who ultimately pay the cost in the form of higher retail prices.¹⁷ Moreover, the system is likely to stifle innovation and the development of value-added products by limiting competition. Faced with the discipline provided by market-based rivalry, the dairy sector in other countries has accelerated consolidation via acquisitions and alliances in emerging countries, and engages in developing innovative products, such as functional food and flavoured milk, in established markets. The lack of competition and the lack of access to overseas markets are depriving Canadian farmers of these opportunities and preventing consumers from benefiting from improvements in price, quality and choice. Given the recent run-up in world dairy prices, the time seems ripe to begin to wean Canadian farmers from their dependence on protected domestic markets.

A useful first step would be to unify the national market by eliminating restrictions on internal trade of quota and allowing at least a modicum of market orientation so that improved domestic competition can weed out the most blatant inefficiencies. But then a difficult political decision has to be taken: that it is unjustifiable to continue to provide one

group of farmers special treatment when there is no evidence that their situation is fundamentally different. While it would be admittedly infeasible and indeed unfair to tear down supply management overnight, in the longer term both equity and efficiency arguments call for a single policy framework for the Canadian agricultural sector instead of the two dramatically different systems in place today. However, the vested interests created by the outstanding value of quotas poses a formidable barrier to reform that can be overcome only by a careful reform strategy. Two broad approaches are possible: liberalise the domestic markets immediately while offering compensation for quota holders; or gradually issue new quota such that the increase in supply naturally brings down domestic prices and therefore quota values. Variants of these alternatives include implementing a transitional intermediate system under which existing within-quota production would be eligible for payments from both levels of government to provide farmers with a constant real price on those volumes, but quotas themselves would be scrapped and transactions prices would be market determined. These payments would then be phased down steadily over an adjustment period of, say, 15 years so as to avoid undue financial harm to the quota holders. An alternative transition package could comprise a mixed mandatory/voluntary quota reduction at the outset along with a long-term phase-out period; federal guarantees on outstanding loans for quota purchases; and assurance that only imports up to the guaranteed access levels will be permitted in the transition period through recourse to safeguards, as has been proposed by Canada's past chief trade negotiator (Gifford, 2005). In any case, should compensation be required to achieve reform, the OECD has developed principles for their application: they should be transparent, time-limited, portable (so as not to discourage exit), cost-effective and not tied to current production levels (Martini, 2007).

Impact of international trade liberalisation on Canada's supply-management system

In the light of its persistently strong popularity among dairy farmers, the federal government has, continued to defend the supply-management system during the WTO negotiations and shown little interest in liberalisation. Indeed, the House of Commons voted unanimously in favour of this position in November 2005, and the system got a reprieve at the Hong Kong ministerial meeting in December 2005.

Even if reform can be staved off for the moment, it is ultimately inevitable. If successful, the Doha Round will lead to a reduction in over-quota tariffs. The adjustment will be more difficult if the current high over-quota tariffs are maintained, only to find later – possibly in a future trade round – that producers are exposed to significant price declines after tariffs are cut (though if world prices stay high, predictable tariff cuts would not impinge on current Canadian prices – see Gifford (2005)). The earlier the reforms are put in place, the more gradual the transition will be.¹⁸

Trade liberalisation may be beneficial not only to consumers who would gain from lower dairy prices but also to downstream dairy sectors, which would be likely to enhance their competitiveness and engage in value-adding activities as those in New Zealand and Australia have done (Box 5.1). Indeed, Canada itself has its own example of a farm sector that transformed itself from a sheltered industry producing low-quality product entirely for the domestic market to a much bigger producer of higher-quality output that has won a place in many foreign markets: wine! It is likely that the refusal to open the supply-management regimes is penalising these sectors by reducing their ability to compete in international markets. International evidence also underlines the fact that liberalising the

Box 5.1. Trade liberalisation and the dairy sector

In Australia and New Zealand, supply-management systems, coupled with high levels of protection, were relied on heavily in the past. Their governments, however, have deregulated the industry with a view to exposing it to the market mechanism. The Australian and New Zealand dairy industries went through major restructurings after the two countries signed a free trade agreement in 1983. Competition has generated not only higher productivity growth but also reallocation of resources to more productive sectors. Consumers have also benefited from lower retail prices as well as a wider range of value-added dairy products.

New Zealand

Agriculture in New Zealand stands out among the OECD countries because of its high performance without any form of subsidy. In 1984, the New Zealand government started its agricultural reform as part of a package intended to achieve overall economic restructuring. Importantly, prior to the reform efforts, New Zealand farmers had recognised that heavy subsidies, causing large budget deficits and inflation, were not sustainable. The export and production support policies were removed, and most reforms were completed by the mid-1980s. Later, single-desk dairy export rights were removed in 2001 with the formation of Fonterra Co-operative Group. Before the recent surge in dairy prices the sector already accounted for around 20% of total merchandise export earnings (Evans, 2004).

Australia

In addition to the free-trade agreement with New Zealand, Australia underwent a major reform of its supply-management system in 2000, eliminating dairy support prices and quotas. The driving factors behind this policy reform were a mandatory review under the National Competition Policy and the backing of dairy farmers in the state of Victoria, where two-thirds of all milk is produced (the system favoured fluid milk production, whereas in Victoria most milk was for manufacturing use). In addition, the Commonwealth government set up a transitional programme (financed by a ten-year retail tax on fluid milk), starting in the form of general assistance, followed by more targeted assistance for farmers in financial distress. The state government also set up an additional aid package.

While the adjustment still continues to some extent in Australia, the industry has become more productive and more export-oriented: over 55% of milk production is exported, primarily as manufactured products (Hart, 2005). Producers are in a good position to capture a large share of growth in demand from emerging markets, an opportunity not available to Canadian dairy farmers, who have no export distribution channels. And consumers have enjoyed a significant cut in the retail price of milk, with consumer savings of AUD 118 million per year just on milk sold through supermarkets (Petkantchin, 2006).

dairy sector would be beneficial to Canada's economic performance both by improving within-sector productivity growth and by accelerating resource reallocation to more productive sectors.

Liberalising the marketing monopolies – implementing marketing choice

Canadian Wheat Board

The Canadian Wheat Board (CWB) was set up with monopoly authority to market wheat and barley on behalf of western Canadian farmers in both overseas markets and the

domestic market for human consumption. Established in 1935 under the Canadian Wheat Board Act, it is built on two principles: single-desk selling and price pooling.¹⁹

- **Single-desk selling:** The CWB acts as a monopoly seller of western Canada's wheat and barley. It is a big user of the private industry transportation system. The Canadian Grain Commission is a regulatory body distinct from the CWB. It licenses grain elevators, regulates other aspects of the system as well as the variety registration system that seeks to provide high-quality seed that maintains a distinct identity for Canadian grains. While farmers can sell their own output, this requires buying back the grain they delivered to the CWB at spot prices.
- **Price pooling:** The CWB operates a price-pooling arrangement to western Canadian farmers. Under price pooling, farmers receive the same returns for the same grades, varieties and types, regardless of when the grain is delivered during the crop year. The arrangement therefore enables farmers to share the risk of short-term price volatility.

The CWB is, however, faced with a number of challenges. The marketing structure of wheat and barley has been changing rapidly, and the international trade-liberalisation agenda is examining calls for more discipline on the use of state trading enterprises (STEs). The majority of western farmers have argued for the right to sell their products to the buyers of their choice. Against such a background, the federal government has been trying to end the CWB's monopoly in the barley market.

Changing marketing structure

While the CWB has advantages for farmers, there is also a cost in terms of reduced opportunities to go beyond bulk commodities so as to market differentiated products. In particular, the single-desk authority takes marketing choice away from farmers, and, given the diversified grain market, the CWB monopoly is likely to undermine the market pricing mechanism that could have been enhanced by giving farmers a choice of marketing methods.

In addition, price pooling is unlikely to provide incentives for farmers to engage in adding value through the production of differentiated grain such as organically grown barley and wheat. For example, reflecting consumers' heightened awareness of food safety, there is now an increasing demand for organically grown farm products.²⁰ In contrast to the bulk market, characterised by high volumes and low margins, this requires a system that preserves the identity of grain, under which all parties involved in the supply chain from seed suppliers to grain processors need to be registered and work closely in order to reflect the needs of grain processors and, ultimately, end-users.

Furthermore, while the CWB has offered an effective mechanism to reduce the risk that farmers face with respect to price fluctuations, a greater range of risk-management tools currently available in financial-derivatives markets poses a question as to whether the CWB continues to provide the most efficient method of risk management. For example, delivery restrictions leave farmers with the risk of storage and downgrading losses. In the worst case, farmers end up selling grain fit for human consumption into the feed market in order to avoid storage losses. This could be managed through derivatives contracts.

Other wheat and barley marketing boards have changed their governance structures over the years, switching from mandatory to voluntary systems (Box 5.2). The Ontario Wheat Producers' Marketing Board has allowed producers to sell their production under the direct marketing programme outside the Board's single desk. This gives producers a choice between the Board programme and the direct marketing programme. Moreover, the

Box 5.2. Transformation from a single desk seller to a marketing choice for growers

There are a number of examples where a single-desk seller has been transformed into a marketing choice for farmers. This box provides two such examples, one in Canada and the other in Australia.

Ontario Wheat Producers' Marketing Board (OWPMB)

The Ontario Wheat Board was transformed in 2003 from a single-desk marketer to a system under which producers can sell their wheat either directly to the market or through the Board. Producers delivering to a specific pool at the Board receive the same gross prices for similar grades, and those marketing directly may choose freely from among various licensed grain dealers. Producers are now entitled to seek their best pricing options in each crop year. While the share of wheat producers delivering to the pool increased from 6% in 2003 to 26% in 2005 (OWPMB, 2006), there are indications that this trend has recently reversed.

Australia: ABB Grain Ltd. and AWB Ltd.

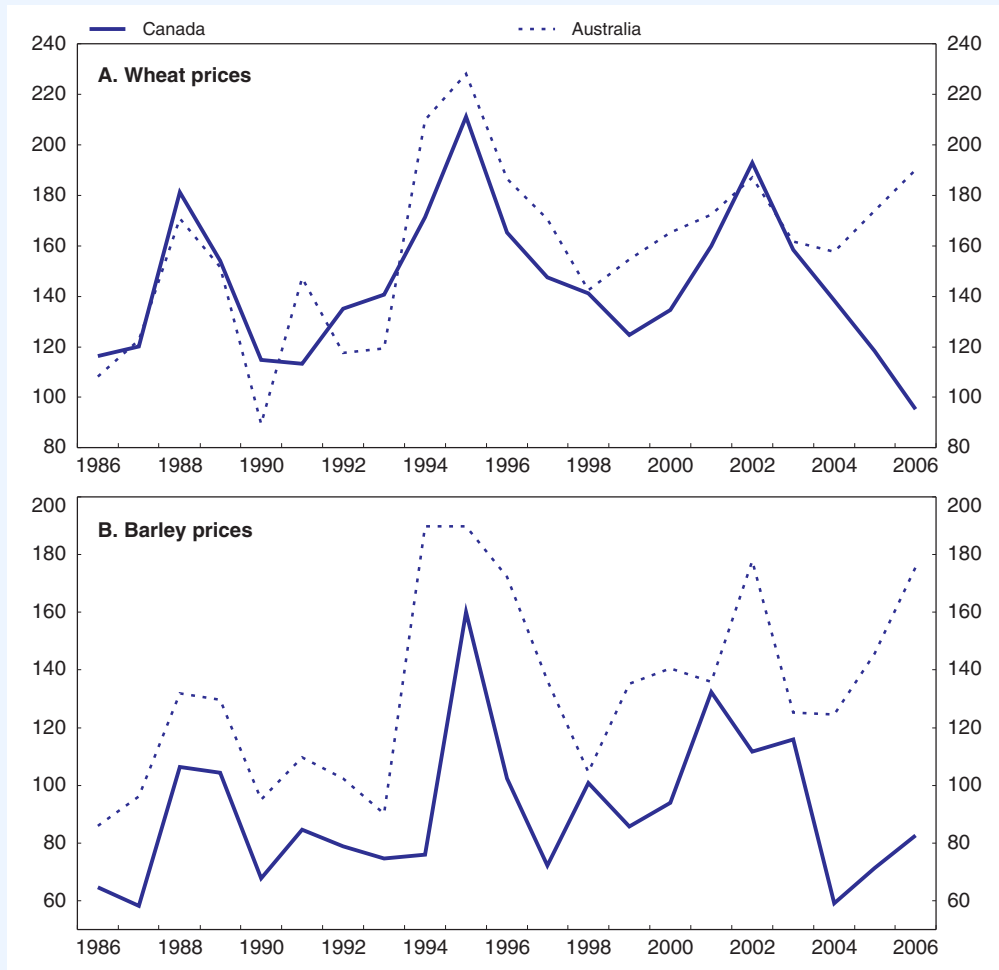
Driven by the National Competition Policy initiatives, which aim to improve Australia's economic performance through greater competition, the wheat and barley markets in Australia have been effectively deregulated. First, the Australian Barley Board, which had a monopoly on barley marketing in South Australia and Victoria, was transformed into ABB Grain Ltd. in 1999. The domestic barley market was thereby deregulated, and single-desk export sales have been eliminated. Shares were issued and listed on the Australian Stock Exchange, where the majority control and ownership are held by grain farmers. ABB Grain Ltd. offers many pricing choices as well as pooling in both domestic and overseas markets. Farmers are entitled to choose either to deliver to ABB Grain's pools or to sell through one of the many alternative pricing options.

Similarly, in 2001 the Australian Wheat Board, which had statutory marketing authority over all Australian wheat, became AWB Ltd., a listed company. The domestic wheat market is fully deregulated, and there is no longer a mandatory single desk in the domestic market. Following more recent changes, AWB Ltd. no longer holds single-desk rights over bulk wheat exports. Further legislation is pending that would allow any registered Australian company to apply to export bulk wheat.

It would be of interest to know if the different policy approaches taken in Canada and Australia have had any effect on the prices their farmers receive. Canadian and Australian wheat prices seem to have moved in tandem until the last three years, but a widening gap has opened up since then (Figure 5.8, Panel A). The reasons are unclear; the Australian drought may have played some role, but so might marketing channels. In contrast, Australian barley prices have been substantially higher than its Canadian counterparts over the years (no doubt because Australian producers are closer to port), and the differential between the two has also increased since 2003 and by a similar amount as for wheat (Panel B).

Box 5.2. Transformation from a single desk seller to a marketing choice for growers (cont.)

Figure 5.8. Wheat and barley prices in Canada and Australia¹
CAD per ton



1. Producer price at farm gate.

Source: OECD, PSE/CSE database 2007.

StatLink  <http://dx.doi.org/10.1787/355321830105>

Board allows flexibility in setting wheat prices by fixing premiums above the contracted prices. Similar examples are also found in Australia, where marketing arrangements for both wheat and barley have been liberalised to provide choice to growers.

Apart from wheat and barley, there is no obvious economic reason as to why price pooling has been in place for certain types of commodities in Canada and not for others. The list of commodities where price pooling exists makes it clear that the implementation of price-pooling arrangements is not commodity-oriented. Even among similar types of field crops, there are differences – wheat and barley are pooled, while corn and soybeans are not (Table 5.1).

Table 5.1. **Commodities that pool revenues across producers**

Type of commodities	Province	Pooling
Wheat (export and milling)	Prairies (CWB)	Mandatory
	Ontario	Voluntary
Barley (export and milling)	Prairies (CWB)	Mandatory
Milk	All provinces	Mandatory
Hogs	British Columbia, Quebec, Nova Scotia, Prince Edward Island	Mandatory
	Ontario, New Brunswick	Voluntary
Sugar beets	Alberta	Mandatory
Potatoes, onions, carrots	Manitoba	Mandatory
Beans	Ontario	Voluntary
Maple syrup	Quebec	Mandatory
Apples	New Brunswick	Voluntary

Source: K. Stiefelmeyer and A. Mussell (2005), "Pooling in Canadian Agriculture Marketing: Logic, Evolution and Performance", George Morris Centre, Guelph, Ontario.

Impact of international trade liberalisation

The WTO negotiations may have a significant impact on STEs, and the CWB can be expected to undergo substantial changes as a result of the negotiations. The possible elimination of monopoly powers of STEs remains under intensive negotiation. In addition, the July 2004 package under the Doha Development Agenda stated that trade-distorting activities such as (implicit) export subsidies by the STEs must eventually be withdrawn. This was followed by the Hong Kong declaration in December 2005, which stated that all export subsidies are to be eliminated by 2013.

The federal government's reform strategy

In the light of these developments, the CWB has made efforts to comply with changing market structure, providing farmers with some marketing choice and boosting their incentives to engage in value-adding activities. For example, it introduced a policy that authorises grain processors to buy up to 500 tonnes of wheat or barley directly from each farmer. Also, a new programme was implemented under which producers of organically grown wheat and barley can repurchase their products directly from the CWB, with the latter providing the financial aid in case the buy-back price exceeds the initial price. Furthermore, farmers now have a number of choices in marketing organic grain, including an option to sell directly to buyers with whom an organic premium can be freely negotiated in addition to the CWB spot price for conventional grain.

Against this background, the federal government undertook a barley plebiscite in March 2007, and 62% of farmers opted for marketing choice (i.e. allowing sales to other buyers, implying an end to the CWB's monopoly). As a result, the government took steps to amend regulations under the Canadian Wheat Board Act. In the government's view, the CWB's single-desk authority in the barley market rested on the regulations under the Act; hence, there was no need to modify the Act itself.

The CWB, which prefers to evolve in a measured pace towards more flexible marketing of barley, publicly opposed the government's initiative to amend the regulations. It contended that neither the government consultation with its board members nor a binding farmer referendum – a requirement for changing the CWB's mandate under the Act – has been met so far (Canadian Wheat Board, 2007). The CWB asked the courts in June 2007 to review the legality of the federal government's procedures to remove the CWB's single-desk

authority (in 1993, the CWB had succeeded in reversing the federal government's decision to remove the CWB's authority in the continental barley market²¹). Notwithstanding the CWB's contention, the government felt that it had adequately consulted with stakeholders on the proposed regulatory amendment, and it tried to remove the CWB's single-desk authority in the barley market from 1 August 2007. At the last minute the Federal Court once again ruled against the government, and this ruling was upheld on appeal. The Government then introduced Bill C-46 in March 2008 to amend the Canadian Wheat Board Act to remove the Canadian Wheat Board's authority over the marketing of barley.

The Agriculture Policy Framework and beyond

Agriculture Policy Framework

Following an agreement by agricultural ministers in 2001, Canada's federal and provincial governments began to implement a new agriculture policy called the "Agriculture Policy Framework (APF)" in June 2003 (Box 5.3). Its aim was to provide a more comprehensive and long-term framework that would reshape Canada's agricultural policies and that would put the agricultural sector ahead of global competition. In essence, the APF was said to be designed to change Canada's agricultural policy from simply focusing on income support to a more comprehensive approach that would include not only risk management but also the long-run viability of the agriculture and agri-food

Box 5.3. Overview of the Agriculture Policy Framework, 2003-08

The APF consisted of five pillars, namely: business risk management, food safety and quality, science and innovation, environment, and the renewal of the agricultural sector.

Business risk management

While previous programmes had been designed to meet risks faced by producers, gaps in its coverage and inequality across provinces remained. Due to such concerns, federal and provincial governments decided to build a comprehensive safety net. The APF programme in the area of business risk management consisted of three blocks.

First, income-stabilisation and disaster-protection objectives were integrated in a new programme called "Canadian Agricultural Income Stabilisation (CAIS)". In essence, producers who joined the CAIS paid a fee, lately 0.45% of the "reference margin" protected. They were then entitled to receive a payment from the CAIS when their current-year margin (allowable income minus allowable expenses) fell short of the average reference margin for the latest five years (dropping the best and worst years from that moving average). By combining the disaster-protection and income-stabilisation programmes, the CAIS aimed to restore the targeted income level more efficiently. The CAIS reflected the "whole-farm" approach where payments are based on the total receipts of the farm, rather than being tied to the production of specific commodities.

Second, Production Insurance, which replaced Crop Insurance in 2003, aimed to stabilise producers' incomes by minimising the production losses caused by natural hazards. It has been run primarily by provincial governments, and both the federal and provincial governments have covered a share of premiums, subsidised administrative costs and provided a reinsurance arrangement to provincial governments.

Third, Provincial and Territorial Programming was intended to provide additional assistance that allowed more flexibility in meeting provincial needs. It included measures to enhance the CAIS, research and innovation, and commodity-specific price supports. While these programmes were supposed to help smooth the transition to the new framework under the APF, there was no provision for their termination.

Box 5.3. Overview of the Agriculture Policy Framework, 2003-08 (cont.)**Food safety and quality**

The food safety and quality chapter had multiple aims: to protect human health by reducing hazard exposure; to increase consumer confidence; and to provide value-added opportunities through the adoption of food safety and quality systems. To realise these objectives, the federal government initiated the Canadian Food Safety and Quality Program (CFSQP), under which it helped stakeholders to develop and implement food safety, quality and traceability systems throughout the food chain.

Science and innovation

The science and innovation programmes, some of the most challenging in the APF, were intended to increase the potential for growth and profitability of the Canadian agriculture and agri-food sector in the long run. While many are still at an experimental stage, they fall under three broad categories: sustainable production systems; bio-products and bio-processes; and science and innovation programming.

Sustainable production systems aim to make production more resilient to natural adversities such as disease and the vagaries of the weather. Bio-products and bio-processes provide opportunities to explore new systems in the area of genomics and other bio-products. Under the science and innovation programming, technology transfer and the commercialisation of new products is being accelerated. The programme has been funding the sunrise industries that are engaged in the production of new commodities and bio-products such as bio-fuels and bio-materials.

Environment

The environmental measures under the APF aim to minimise the risks stemming from environmental liabilities and the market loss due to consumer concerns. They are therefore intended to help the agriculture and agri-food sector achieve sustainability in the areas of biodiversity and soil, water and air quality. Activities in this field have included formulating policies that contribute to achieving Canada's commitments in the area of climate change and environmental sustainability, and developing new technologies that promote environmental sustainability and management.

Amongst a number of initiatives, Greencover Canada, a five-year, CAD 110 million federal programme, is designed to promote land use for perennial forage and trees. The objective is to protect land from wind and water erosion, to improve water quality, to enhance biodiversity, and to increase sub-soil carbon sequestration. In order to identify the most sensitive land for eligibility, an index was created to capture the quality of soil, air and water as well as landscape and wildlife implications: the environmental sustainability index (ESI). The ESI helps identify environmentally sensitive agricultural land, and the programme provides assistance for farmers to convert to perennial cover.

Other important components are: the National Farm Stewardship Program, which has provided technical support to individual farmers to develop tailored Environmental Farm Plans to improve their environmental outcomes as well as cost-sharing for implementation; and the National Water Supply Expansion Program, designed to address the growing risk of water shortages, which also provides cost-sharing support for on-farm water infrastructure.

Renewal of the agricultural sector

This pillar provides farmers with assistance to deal with changing market demand and to improve their business management skills. Its cornerstone is the Canadian Farm Business Advisory Services (CFBAS), under which eligible farmers have access to services ranging from consultations relating to their current farming business to building a new business strategy and implementing it by acquiring new knowledge and developing new skills.

* The programme is federally administered in British Columbia, Saskatchewan, Manitoba, New Brunswick, Nova Scotia, Newfoundland and Labrador, and the Yukon, whereas elsewhere (*i.e.* Alberta, Ontario, Quebec, and Prince Edward Island) provincial governments are responsible for delivery.

industry through technology and innovation, bearing in mind food safety and quality as well as environmental responsibility. However, some of the policies comprising the APF were either in place before its inception or had been previously proposed but were not nationally implemented.

Beyond the Agriculture Policy Framework

In light of the APF's scheduled expiration in 2008, federal and provincial agricultural ministers established a review panel in April 2005. The objective of the panel was to reassess all elements of APF programmes and to provide advice that would enhance their performance. Among the recommendations made in June 2006, the panel emphasised that, *first*, a broader consultative process should be undertaken in order to capture what Canadian society expects from its agriculture; and, *second*, the framework should be based on a long-term perspective, while de-emphasising mechanisms to solve *ad hoc* short-term crises. In this context, the business risk-management pillar, which has received most attention in the APF, was to be better balanced with other pillars – in particular, more emphasis was to be placed on the science and innovation pillar from the perspective of long-term viability of the agricultural sector.

Furthermore, while the APF intended to avoid resorting to *ad hoc* assistance, there have been a number of such programmes since its enactment, and the dominant budgetary focus has remained on the business risk-management pillar. Additional *ad hoc* programme spending was partially necessitated by the discovery of a Canadian cow with bovine spongiform encephalopathy (BSE) in 2003, which resulted in the closure of Canadian export markets for cattle and beef. The impact of BSE was particularly severe for Canada because the export market accounts for a large share of domestic production, so it was not possible to absorb normal production in the domestic market. Starting with the APF Transition Payment (CAD 1.2 billion) in 2002-03, the federal government then introduced the Transition Industry Support Payment (CAD 995 million) in 2004, the Farm Income Payment (CAD 1 billion) in 2005, the Grains and Oilseeds Payment Program (CAD 755 million) also in 2005, the CAIS Inventory Transition Initiative (CAD 1 billion) in 2006-07, the Cost of Production Payment (CAD 400 million) in 2007 and the AgriInvest Kickstart payment in 2008 (CAD 600 million). Overall federal/provincial government support (both ongoing and *ad hoc* programmes) to the farming sector have been stuck in the CAD 3.8 to 4.4 billion range for each of the past six years (about CAD 16 600 per farm in 2006). The result is that such payments may have become embedded in farmers' expectations, thereby creating moral hazard, that is, farmer behaviour that is based on the expectation that such supposedly one-off payments will be regularly forthcoming, should the need arise. Possible examples of such behaviour would be taking excessive risks in planting decisions in the knowledge that government will provide help if conditions do not turn out as favourable as hoped.

Recent programmes no doubt reflect unprecedented challenges in the agricultural industries – the rising age of farm operators,²² the fallout from BSE and avian influenza; the increasing cost of fuels, fertilisers and other inputs; and the rapid rise in the foreign exchange value of the dollar (see Chapters 1 and 2). Nevertheless, the series of payments may result in a “*de facto* institutionalisation of income support” (OECD, 2007a, p. 92), and market-based policies that enable farmers to manage their income risks without resorting to government subsidies need to be explored.

After a year of public consultation based on the *Next Generation of Agriculture and Agri-Food Policy* – an initiative for stimulating a dialogue among stakeholders – the federal and provincial governments agreed on the vision and principles of *Growing Forward* in June 2007. This initiative forms the basis for a new agricultural policy framework, which was partially introduced after the APF expired in March 2008. Implementation is planned to be gradual during the year ending 1 April 2009. While some of the details of the new regime have yet to be decided,²³ a high priority will be placed on competitiveness and innovation, and the governments have shown commitment to supporting an environment that encourages innovation. Otherwise, the intent is to allow greater provincial/territorial flexibility (combined with nationally set objectives). In addition, a new set of business risk management programmes has been agreed. Replacing the CAIS, the new suite will be made up of four components:

- *AgriInvest* will offer to producers savings accounts where small income losses are covered. It also supports investments for mitigating risks and improving market incomes.
- *AgriStability* will be a margin-based income stabilisation programme that provides income support in case of large income losses.
- *AgriInsurance* will combine the current Production Insurance and other insurance programmes, which minimise producers' income losses from natural hazards (i.e. weather, pests and disease). It is being expanded to cover more commodities than under the APF.
- *AgriRecovery* will be a disaster-relief programme that provides rapid assistance not covered by existing programmes.

Overall, the federal government is aiming to make the assistance programmes more responsive, predictable and bankable. Indeed, the new programmes seem to provide a more comprehensive safety net for producers by filling gaps under the current system. Nonetheless, it remains to be seen whether they will lead to less reliance on *ad hoc* assistance programmes,²⁴ since once again it appears as though there is a substantial element of repackaging. Stronger efforts need to be made to resist the temptation to loosen the provisions under which financial support is provided, as has happened in recent years, or else Canada will continue to be an outlier within the OECD by having trend increases in its PSE levels with all the distortions that would imply. And provincial governments too need to move away from old-style, deficiency-payment programmes that set target prices for different crops and then make up the difference between market outcomes and the target.²⁵ In any case, the private sector could in principle provide a similar safety net, while there is every chance that government programmes could be effectively crowding out the potential for a market-based insurance mechanism. Since the series of government payments have no doubt created moral hazard on the part of farmers, the balance between public interventions and farmers' discipline in terms of business risk management should be carefully taken into account.

Rising to agriculture's environmental challenges

The environment is obviously a key input into farming. Yet farmers not only make heavy use of land and water, they also have a significant impact on the environment through their use of energy and chemicals, such as fertilisers and pesticides, as well as the impact of their operations on biodiversity. This section will briefly examine the environmental performance of Canada's agricultural sector, based largely on OECD (2008). It will also place a special focus on the recent expansion of bio-energy production.

Improving environmental performance

OECD (2008) argues that the environmental performance of Canadian agriculture since the early 1990s has been mixed at best. Soil quality has improved, though tillage practices could be improved, and some cropland at high risk of degradation is still being farmed. High-quality water remains abundant. Nutrient surpluses per unit of land are still among the lowest in the OECD. However, several trends are disturbing.

- Nutrient surpluses (nitrogen and phosphorus balances) have risen faster than in any other OECD country, owing to greater use of inorganic fertilisers and higher livestock numbers.
- Pesticide sales doubled between 1990 and 2003, though their damage may not have increased commensurately because of the use of new, lower-dose products. Although the level has been increasing, it is still very low compared to other countries.
- Though recent data are not available, agriculture's share of water use was rising in the 1990s, because of an increase in the area of land under irrigation.
- Direct on-farm energy consumption has also risen; indeed, the ratio of energy inputs to farm output also increased in the 1990s. This has contributed to its greenhouse gas (GHG) emissions, which have been rising by 1.0 (when measured net) to 1.5% per year (on a gross basis),²⁶ whereas elsewhere in the OECD emissions have been edging down. In 2005 farming was responsible for 8% of Canada's GHG emissions, but less than 2% of its GDP.
- Finally, the capacity of farmland to support wildlife continued to decline in the decade to 2001. Indeed, the deterioration accelerated compared to the previous decade.

Policy makers are aware of these trends and have accordingly been devoting increasing attention to the environmental impact of agricultural policy. The 2004-08 APF included CAD 700 million from the federal government (matched by their provincial and territorial counterparts) to help farmers improve their environmental management through technical assistance, extension, research and demonstration activities. Also, on-farm water infrastructure investments are eligible for a one-third subsidy. Nevertheless, it is fair to say that new Canadian agri-environment policies have concentrated on incentives overlaid on top of existing regulations, especially related to management of manure and pesticides. Elsewhere, the polluter-pays principle seems accepted, but that idea has made precious little headway in Canada's farm sector.

The passage of a new Pest Control Products Act in 2002 enabled Canada to continue major efforts in risk reduction from pesticides while it had previously maintained entirely separate standards for pesticide testing and approval. The achievement was underpinned by an early and consistent stakeholder consultation process. Looking ahead, increased availability of information²⁷ should be a priority, both in this area as well as others such as water use and quality. In that regard the environmental performance benchmark indicators that the federal and provincial governments agreed to gather as part of the APF need to be published more often.²⁸

While point-source discharges to surface water from industrial and urban wastewater systems have been significantly reduced, there remains ample room for improvement in controlling water pollution from agricultural sources in Canada, despite a range of measures by some provincial governments (who have sole jurisdiction in this area) to reduce the risk of water contamination. In particular, against the background of the bio-energy expansion (see below), increased use of fertilisers and chemicals to increase

crop yields for its production could create further complications. Measures are needed to address such problems, and water quality trading – a market-based approach to improving water quality – could be explored further (Cantin *et al.*, 2006).

Bio-energy expansion

In parallel with the rapid expansion of government-subsidised bio-ethanol production in the United States as well as biodiesel production in the European Union,²⁹ the Canadian government has introduced consumption mandates and subsidies to expand bio-energy³⁰ production. Motor fuel blends were exempt from federal excise tax until 1 April 2008 at an annual cost of CAD 40 million in 2006. To date, however, ethanol production in Canada has been on a significantly smaller scale than in the United States and Brazil – Canada produced 231 million litres, whereas the United States and Brazil produced 16 139 and 16 000 million litres, respectively in 2005 (Klein, 2007). Thankfully, Canadian bio-fuels policy was more focussed on research credits than production subsidies, as in the United States where there is a federal blending subsidy, currently of USD 0.51 per gallon (about 0.135 per litre), worth some USD 4 billion in 2007 – in addition to other federal and state support. More recently, however, in 2006 the Canadian federal government launched an initiative to mandate a 5% ethanol blend in gasoline by 2010 and a 2% biodiesel blend in on-road diesel and heating oil by 2012. The mandates will require some 2 billion and 0.5 billion litres of additional ethanol and biodiesel per year, respectively, when they take effect. Accordingly, Canada has already introduced initiatives to help the canola sector to produce biodiesel, and moreover it has started to produce second-generation bio-ethanol – the ethanol from cellulose,³¹ which has been used as a liquid transportation fuel on a demonstration basis. Budgetary support totalling CAD 2.2 billion over nine years has been made available for operating incentives, construction of production facilities and investment in next-generation technologies while at the same time eliminating the excise tax exemption on motor fuel blends.

The objectives of bio-energy production are threefold. *First*, the production and consumption of bio-energy are expected to reduce reliance on fossil fuels and thereby lower greenhouse gas emissions (environmental objectives). *Second*, they will produce additional income opportunities for farmers by creating new value-added commodities and generating new markets for these commodities (agriculture and rural development objectives) and, *third*, they will contribute to cleaner air in urban areas.

Downside of bio-energy production

The production of bio-energy has a number of advantages, but its largely policy-induced demand increases also have an important downside: rising crop prices as a result of increased competition with other forms of usage.³² Biodiesel produced from canola and vegetable oils, like the first-generation bio-ethanol produced from grains and sugar crops, is more likely to compete directly with other uses of agricultural commodities, in particular with food consumption. Cellulosic ethanol, which mainly uses agricultural residues and wastes, can also compete with other uses in the markets; therefore, it is not immune from impinging on food production, though it is superior for energy production and for environmental preservation. Canadian and foreign meat producers, facing higher costs of feed inputs as a result of increased demand for plant fibre, are sure to have to pass them on to consumers by raising prices of meat and meat products. Higher input and land prices will also create an entry barrier in farming industries. More generally, increased demand

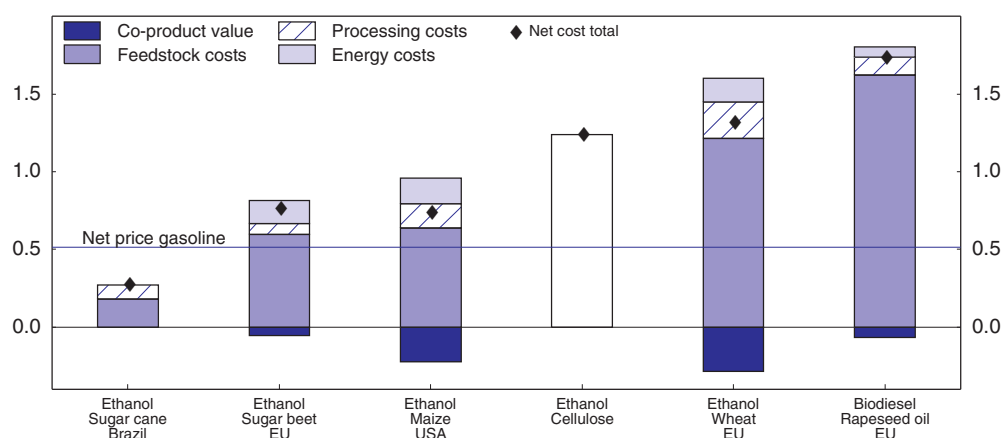
for these commodities is not only contributing to higher prices, but probably to increased price volatility as well. Such developments will pose an adverse effect on importing countries, in particular low-income importers. The situation will become even more complex if developing countries choose to produce more energy crops instead of food crops in light of higher demand from developed countries. This “food versus fuel” trade-off could therefore exacerbate the plight of the world’s poor and malnourished.

Another downside of bio-energy production concerns how much – if at all³³ – it would actually contribute to carbon-emissions reduction, especially given the need to transport the biomass input to large production facilities. From a global perspective, increased demand for bio-energy crops has allegedly contributed to the destruction of natural eco-systems, in particular grasslands and rainforests, such as those in Indonesia and Brazil, with heavy biodiversity costs. The net effect of more forest destruction and more bio-fuel production is difficult to ascertain. The increased use of water to allow the biomass to grow may also be problematic. The first Agricultural Water Use Survey will be helpful in this respect.

Looking at each commodity separately, the amount of greenhouse-gas reduction remains of the order of 20-40% from cereal-based ethanol production, but it increases to a range of 70-90% from cellulosic ethanol production and 40-60% from canola-based diesel production (Klein, 2007). Thus, it seems clear that the second-generation bio-ethanol – which Canada excels at – is a more efficient means of reducing greenhouse-gas emissions than its predecessor.

Nevertheless, the competitiveness of Canada’s potential cellulose-based ethanol remains uncertain. *First*, because of a relatively short growing season, it will be difficult to generate high yields in Canada. *Second*, the logistics involved in cellulosic materials pose significant challenges. *Third*, and not least, its production is more expensive, and most of the alternative forms of bio-energy production cost less, some (especially Brazilian sugar-cane based ethanol) substantially so (Figure 5.9). In short, irrespective of the efficiency of greenhouse-gas reduction, the competitiveness of ethanol production from cellulose is, at this stage, still unproven in terms of its cost efficiency.³⁴ Indeed, the cost of government support per tonne of CO₂ – equivalent avoided is far greater than what can already be

Figure 5.9. **World bio-energy production costs**
2007, US\$ per litre gasoline equivalent



Source: OECD, calculations from Agricultural database and from Worldwatch Institute (2006) for cellulose for which no further breakdown is available.

StatLink  <http://dx.doi.org/10.1787/355322787584>

achieved using other renewable, non-emitting energy forms (Doornbusch and Steenblik, 2007). A carbon tax or permit trading would be superior approaches, as they would not favour any particular technology (see Chapter 4). If such measures cannot be applied to agriculture on political or technical grounds, then offering increased research subsidies or prizes for technological breakthroughs would be preferable than mandated ethanol use.

Policy recommendations

Based on the preceding analysis of these four major issues in Canada's agricultural sector, the following policy recommendations ensue (Box 5.4).

Box 5.4. Policy recommendations to modernise the agricultural sector

The priority for Canada's agricultural sector is to ensure its long-term viability in the global context. As the sector is a major beneficiary of world trade, Canada is in a position to encourage open and competitive agricultural markets.

National supply management systems

- Phase out the supply-management regimes by progressive introduction of market forces, while ensuring the availability of transitional support to smooth the adjustment. A useful first step to increase efficiency would be to remove the restrictions on internal trade of quota.
- Reduce the level of producer support by, in particular, shrinking single commodity transfers for milk and eggs, bearing in mind that these producers are among Canada's most affluent.
- As the Supply Management system is phased out, integrate supply-managed sectors under the new policy framework, rather than treating them differently.

Marketing monopolies

- Following the judicial setback on barley pass the amendments to the Canadian Wheat Board Act. Adopt a similar approach of consultation with stakeholders in the wheat market as was done for barley.

Beyond the Agricultural Policy Framework

- Consider taking greater advantage of business risk management tools available in the private sector, instead of having governments provide the whole range of safety net programmes.
- Once the new framework is in place, avoid *ad hoc* assistance programmes that serve to build up moral hazard and place a heavy burden on the budget.
- Set measurable benchmarks for assessing programme success and report on progress, especially in reaching environmental goals.

Bio-energy and other environmental challenges

- Implement a regular pesticide use survey, in line with foreign practices.
- Heighten efforts to reduce water pollution from the agricultural sector, and examine if a market-based approach to improving water quality might be a workable solution.
- Further examine the viability of the second-generation bio-ethanol production, taking account of its relatively high production cost and difficult logistics pertaining to collection, storage and distribution of biomass. Rather than mandate use, which is likely to prove cost-inefficient, offer increased research subsidies or prizes for technological breakthroughs if a carbon tax or permit trading are infeasible in agriculture.

Notes

1. In general, producers of supply-managed commodities receive little in the way of government subsidies. However, they are eligible for some payments under general risk-management programmes. Nonetheless, since supply management already controls risk through curbing price volatility, these producers have little need of these payments and seldom qualify for them.
2. The WTO decision required that state trading enterprises must behave in a non-discriminatory fashion but found no independent obligation to behave in accordance with commercial considerations (Hoekman and Trachtman, 2007).
3. See OECD (2007a) for further explanation of this concept.
4. Similarly, the amount by which Canadian farm prices exceed world market levels shrank from 40% in 1986-88 to 12% in 2004-05 but rebounded to 15% in 2006.
5. Consideration was given in the 1980s to also putting hog production under supply management.
6. Indeed, one commentator recently referred to Canada's "milk cartel", asking why it is treated with such complacency just because it has government backing (Elgrably, 2008).
7. In the case of industrial milk the target price is based on cost of production surveys. The support prices for butter and skim milk powder are set by the Canadian Dairy Commission to effect the target price. Those prices have risen steadily over the past decade: by 35 and 29%, respectively, most recently by around 1% in February. Admittedly, the last three annual increases have been modest.
8. Canada's bound in-quota *ad valorem* tariff rates for supply-managed products under so-called minimum access commitments are in the range of 0-8.6% and apply to volume of imports representing between 1-8% of the domestic market (which amounts to 10 grams of yoghurt per person, for example, according to Hart (2005)). However, in many cases they are specified as specific amounts in CAD terms, which of course means they have risen sharply in recent years for items whose price has been largely unchanged (that is, all except dairy). For example, milk powder and most cheese is charged CAD 3.32 per kilogram; for the former that works out to around 75% at recent world price levels.
9. In December 2007 the Farm Product Price Index for dairy products was 141.1 (1997 = 100), far higher than any other component; the overall index was only 106.3. Other supply-managed products (poultry and eggs) have also enjoyed strong price increases over the past year, but beef and pork producers have suffered swingeing falls.
10. Boyer and Charlebois (2007) estimate that each person in Quebec spends CAD 75 per year more on milk, eggs and poultry than if (s)he could shop at US retail prices. That excludes derivative products such as cheese and butter. The calculations were made at an exchange rate of 0.94; however, the impact of the appreciated Canadian dollar has been more than offset by the more rapid increase in world prices than in Canadian prices. As a result, Canada's SCT for dairy products dropped sharply in 2007.
11. Even before the recent run-up in global dairy prices, Canadian dairy farmers enjoyed a 30% price increase from 1997 to 2006, while prices for cattle only edged up and those for grains and oilseeds fell sharply. Canadian dairy farmers have seen almost no changes in dairy prices in 2007-08 because the Canadian market remains insulated.
12. Indeed, in 2005 dairy farmers were the most profitable in all size classes. This was not just a one-off: the same goes for 1995 and 2000 as well. Consistent with this picture is the fact that farms in Quebec are the most profitable, and the dairy sector is concentrated there.
13. Since the early 1970s when supply management was implemented the number of dairy farms has fallen from 122 000 to 14 651 (in 2006). While in 1986 an equal number of large farms were in the beef, hog and dairy sectors, by 2006 large dairy farms made up 22% of all large farms as compared to 13% for beef and only 9% for hogs. The only other category to have increased its share of large farms was field crops.
14. At the same time the volume of milk production has remained fairly constant at just over 7 billion litres per year over the past 25 years, while the number of dairy cattle has fallen by half since 1976, reaching 996 thousand in 2006. Thus, the average cow was associated with quota valued at over CAD 29 000 that year, and quota value was some CAD 4 per litre (compared to a support price of around CAD 0.70 for industrial milk that year).
15. In 2005 data from the 2006 Farm Financial Survey (Statistics Canada, 2007c) show that the 14 665 dairy farms had an average quota of nearly CAD 1.8 million, nearly two-thirds of their total assets and 87% of their net worth. These figures varied substantially across provinces: while

Quebec has the most numerous dairy farms, their average quota was only around CAD 1.3 million, which represented 81% of their average net worth. However, in the western provinces quota was worth far more (as much as an average of CAD 5 million per farm in British Columbia and over 100% of average net worth in the three prairie provinces).

16. Average net worth per farm in 2005 was over CAD 2.5 million for poultry and egg producers and over CAD 2 million for dairy farmers. Only potato producers were able to rival these figures; their average net worth was around CAD 2.1 million. Most other farmers had net worth of less than CAD 1 million (Statistics Canada, 2007c).
17. However, there is no evidence that Canadian consumers are upset by the prices they pay for supply-managed products, even though most are undoubtedly unaware of the non-market price-setting system and supplement that supply management schemes cost them. Indeed, 81% of Canadians surveyed in 2007 were not even aware of the existence of the Canadian Dairy Commission (Boyer and Charlebois, 2007). Defenders of the *status quo* also argue that the share of food in total consumers' expenditure is very low in Canada: indeed OECD National Accounts data show that, at 9.6% in 2005, the share of food and non-alcoholic beverages is lower than for most other countries for which such data are available, but nevertheless still well above the corresponding US share of 6.9%. Of course the income elasticity of food is relatively low, so that the country ranking of this ratio is clearly related to levels of GDP per capita.
18. One commentator very recently claimed that "supply management represents a veritable latent tsunami for Quebec and Canadian agriculture. We don't know when it will hit, but its potential strength will destroy the current framework" (translation supplied) (Charlebois, 2008).
19. Historically, the CWB was established in the aftermath of the Great Depression when farmers wanted to reinforce their market power against large purchasers, railways and input suppliers in order to share risks and stabilise prices (Stiefelmeyer and Mussell, 2005).
20. In 2006 only 6.8% of all Canadian farms (about 16 000 in all) produced organic products for sale, whether or not they were certified. Most certified producers were selling hay and other field crops.
21. In 1993, the federal government attempted to introduce an exemption under which farmers were no longer required to obtain an export license when exporting barley to the United States. The courts confirmed that the Governor in Council did not have the power to authorise barley exports without a license.
22. The share of those aged 55 and over jumped from less than a third in 1996 to over 40% in 2006. Those under 35 fell from 20% in 1991 to 9% in 2006.
23. The guiding principles of reform were contained in *Growing Forward*.
24. One reason for such scepticism is that moral hazard has not only crept into individual farmers' decision-making but also into that of the sector's leaders in the sense that it is politically easy to argue in favour of spending more on agricultural support. Another is that *ad hoc* payments can be made with low transactions costs in view of the individual accounts that have existed for some time and will continue under *AgrInvest*.
25. Examples of such programmes are Ontario's Market Revenue Insurance and Quebec's *Assurance-stabilisation du revenu agricole*.
26. The lower figure for net emissions results from a large increase in carbon sequestration by soils as a result of land-use changes and improved soil management practises. The gross increase is attributable to the expansion in the beef, hogs and poultry sectors as well as higher application of fertilisers in the Prairie provinces (Statistics Canada, 2007d, p. 19).
27. Canada is one of the few OECD countries not regularly reporting on the volume of pesticide use. Responsibility for regulating pesticides resides with Health Canada. While risk assessments are carried out nationally, there have been efforts to harmonise data requirements at the NAFTA level.
28. To date there has been only one report under the APF, and it dates back to 2005. Another is planned but may not be available until 2009.
29. Bio-fuels production is also subsidised in Switzerland and Australia (Doornbusch and Steenblik, 2007).
30. Bio-energy is a general terminology used for renewable energy produced from biomass, and it includes bio-fuels, bio-power and bio-heat. Among the bio-fuels – fuels used to power engines in transport – there are, broadly speaking, bio-ethanol, biodiesel, synthetic bio-fuels and biogas.

31. First-generation bio-ethanol produces ethyl alcohol from starch and sugar crops. More recently, Iogen Corporation, one of the leading biotechnology firms in Canada, has developed a technology to convert plant fibre – such as wheat and barley straw and corn stover – into sugar. It will then be distilled to produce cellulosic ethanol.
32. Indeed, calculations show that, even with crude oil prices of only USD 60 per barrel, corn-based ethanol production in the United States is profitable at recent corn prices of around USD 4.75 per bushel (Tyner and Taheripour, 2007).
33. Two very recent studies argue that once the carbon generated in the production of the bio-fuels is properly accounted for the net effect on GHG emissions is unfavourable. Previous research is said to have led to erroneous conclusions because it neglected land-use change. See Searchinger *et al.* (2008) and Fargione *et al.* (2008).
34. Against this background, the Canadian firm Iogen Corporation was awarded up to USD 80 million in start-up subsidies by the US Department of Energy in February 2007, and it announced a decision to open its first commercial production site in Idaho (USA). However, with corn-based ethanol production so highly profitable at current corn and crude oil prices, convincing potential producers to go ahead with such investments is a difficult proposition.

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