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This Survey is published on the responsibility of the Economic and Development Review Committee of the OECD, which is charged with the examination of the economic situation of member countries.

The economic situation and policies of Norway were reviewed by the Committee on 16 June 2008. The draft report was then revised in the light of the discussions and given final approval as the agreed report of the whole Committee on 2 July 2008.

The Secretariat's draft report was prepared for the Committee by Paul O'Brien and Romina Boarini with Statistical assistance from Thai-Thanh Dang, under the supervision of Patrick Lenain.

The previous Survey of Norway was issued in January 2007.

BASIC STATISTICS OF NORWAY

THE LAND

Area (1 000 km^2):		Major cities (thousand inhabitants, 1.1.2008):	
Total (2005)	385.2	Oslo	560.5
Mainland (2005)	323.8	Bergen	247.7
Agricultural (2004)	10.4	Trondheim	165.2
Productive forests (2003)	74.7		

THE PEOPLE

Population (thousands, 1.1.2008)	4 737.2	Total labour force (thousands)	2 507
Number of inhabitants per km^2 (1.1.2008)	12.3	Civilian employment (thousands)	2 443
Net natural increase (thousands, 2007)	16.5	Civilian employment (% of total):	
Net migration (thousands, 1.1.2007)	39.7	Agriculture, forestry and fishing	2.8
		Industry and construction	24.9
		Services	76.1

PRODUCTION

Gross domestic product:		Gross fixed capital investment:	
NOK billion	227.7	% of GDP	20.8
Per head (USD)	82 016	Per head (USD)	17 043

TTHE GOVERNEMENT

Public consumption (% of GDP)	19.8	Composition of Parliament (number of seats):	
General government (% of GDP):		Labour	61
Current and capital expenditure	32.2	Progressive	38
Current revenue	46.5	Christian Democrats	11
		Conservative	23
		Centre	11
		Socialist Left	15
Last general elections: 13.9.2005		The Liberals	10
Next general elections: September 2009		Total	169

FOREIGN TRADE

Exports of goods and services (% of GDP)	45.4	Imports of goods and services (% of GDP)	28.1
of which: Oil and gas	23.1		
Main commodity exports (% of total):		Main commodity imports (% of total):	
Fish and fish products	4.5	Ships	1.4
Base metals and products	10.6	Foods and animals	5.2
Machinery and transport equipment		Chemicals and related products	8.8
(excluding ships)	7.6	Machinery and transport equipment	
Mineral fuels	64.5	(excluding ships)	35.6
Non-oil commodity exports by area (% of total):		Non-oil commodity imports by area (% of total):	
Denmark and Sweden	17.6	Denmark and Sweden	21.7
Germany	8.6	Germany	13.7
United Kingdom	8.4	United Kingdom	7.0
United States	8.3	United States	4.9

THE CURRENCY

Monetary unit: Krone		2007	
		NOK per USD	5.86
		NOK per euro	8.03

Executive summary

The Norwegian economy has been flourishing of late, enjoying substantial real income growth with low inflation and very low unemployment. *Benefiting from rising world energy prices and favourable supply shocks in the wake of globalisation, this good performance also reflects fiscal restraint, broadly successful monetary policy and the economy's capacity to attract foreign labour. Macroeconomic policy is nevertheless facing a number of difficult challenges, both in the short and medium terms.*

The inflation targeting framework used by Norges Bank has worked well but faces a difficult period*. Although financial market conditions had tightened, the spring of 2008 saw core inflation rising close to the central bank's inflation target, while headline inflation was high and fluctuating. The monetary stance may need to tighten further if demand pressure continues and cost-inflation accelerates or import prices pick up. But with downside risks from high household debt and the still uncertain resolution of the sub-prime crisis and ensuing financial turmoil, a cautious approach is required.*

The authorities have managed well the accumulation of buoyant petroleum revenues in a fund invested abroad, but long-term challenges remain. *Despite room in the short term within the confines of the budget rule, current government projections show a long-term financing gap that the expected returns from the Pension Fund are insufficient to close. On this basis, long-term fiscal consolidation is needed, and necessary structural reforms to increase working hours and reduce future pension and health spending will contribute to this adjustment. In the short term, while the 2008 budget plans to undershoot the fiscal rule, in practice it now appears that the budget is quite expansionary. Budgetary plans for 2009 should avoid an increase in the structural deficit, unless the output gap were to narrow significantly.*

Strong demand has reduced unemployment and maintained high participation rates, but further efforts to reform disability and sickness leave schemes are required. *Immigration has helped manage demand pressure, probably contributing to both higher growth and lower wage inflation than would have otherwise occurred. But, while immigration may be helpful for short-term stabilisation, it cannot be a remedy for disincentives to labour market participation.*

Norway is not making the most of education expenditure: the compulsory education system appears to be cost-inefficient by international standards. *Considering the large amount of public resources invested in education, improving educational outcomes is both possible and necessary: high educational achievement is essential for future productivity growth, innovation potential and high labour force participation. A number of measures must be taken to improve teaching quality, such as increasing qualification standards for new teachers, and increasing teachers' use of appropriate professional training. Cost-consolidation measures, increasing the size of schools or classes, would help to contain high unit costs, freeing resources that might be used for improving teaching quality. Finally, the increased resources the government is intending to put into education will not achieve their aim, in the highly decentralised Norwegian system, if accountability is not improved through provision of better performance information at all levels, with appropriate incentives for the various partners in education to work together to improve results.*

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Assessment and recommendations

Norway was a major beneficiary of the booming world economy and will not be untouched by the current slowdown

Norway has seen several years of strong economic growth and very low unemployment. Low imported inflation has allowed Norwegians to enjoy large real wage gains with only modest increases in inflation until recently. A number of OECD countries have seen long booms brought to an end by an abrupt about-turn in housing and financial markets, while others have seen tentative upswings fade, with inflation rising under the influence of energy and commodity prices. Norway's upswing may be slowing but shows no sign of coming to an abrupt end. Pressures that act as negative supply shocks in some countries have beneficial effects for Norway. The rise in the prices of oil and some metals, and low or falling prices for many imports, have brought considerable terms of trade gains to Norway over the past few years. Increased income from oil and gas production both benefits public finances and stimulates demand in the oil-supporting sectors of the mainland economy, contributing to the excellent growth and productivity performance that mainland Norway has been showing. However, Norway is not untouched by the ongoing slowdown in the OECD, while domestically generated inflation has also begun to pick up. Macroeconomic policy is now facing a number of difficult challenges.

Progressive monetary tightening has been vindicated

In the short term, the rise in inflation might in one sense be greeted with relief by macroeconomic policy makers, as they had been anticipating it for some time. Between 2004 and 2005 the central bank kept interest rates very low: output had been below potential and inflation was subdued. Sustained low interest rates also encouraged a housing boom. The accompanying decline in the household saving rate (it was negative in 2007) has helped to sustain high consumption growth, although the resulting increased level of households' financial liabilities (almost entirely at floating interest rates) also poses a potential downside risk. Norges Bank began to raise interest rates in mid 2005 and, as it became more evident that demand pressure was building up, the pace of increases was stepped up slightly in 2006, a move supported by the last *Economic Survey*. Nevertheless, economic growth has remained strong, output has risen rapidly above potential and unemployment has fallen to a low level. In 2008, headline inflation picked up substantially and core inflation has been rising as well.

The policy interest rate is now at or perhaps above its neutral level. But with the spread between the policy rate and market rates having widened in the wake of financial turmoil, effective financial conditions are certainly somewhat tighter than the level of the policy rate would normally imply. At the time of its latest interest rate increase in June, the central bank was projecting a decline of headline inflation only after some further increase over the summer, and underlying inflation was also expected to rise for some time before beginning to fall back by the end of 2008. The bank still expects that headline inflation at the end of 2009 is equally likely to be above the 2.5% target as below. Although growth is moderating, rising core inflation and wage pressure, and the need to anchor inflation expectations led the Norges Bank to increase its policy rate in June, in line with OECD projections published in the June *Economic Outlook*, and it left open the possibility of a further increase later. In view of ongoing inflationary pressures, it is too early to say whether monetary policy has been successful in stabilising inflation close to the target.

Monetary policy is approaching the end of the tightening phase

As always, the authorities need to monitor economic developments continuously and be ready to modify their projections as new information comes in. The possibility of a slowing economy, but continuing inflation pressure, will present different challenges from the environment of the last few years, in which Norges Bank has developed its techniques of flexible inflation targeting using innovative methods – including an informative method of publishing forecasts of the policy interest rate. For the moment, however, the continuing strength of the economy in early 2008 is certainly a reminder that the danger of overheating will not recede immediately and interest rates may need to go higher. It is also difficult to gauge the strength of the underlying supply response, but the OECD, Norges Bank and the Norwegian Ministry of Finance estimate output to have been substantially above potential by the end of 2007. Part of the supply response in recent years has been a much higher than expected increase in the working age population and labour force as flows of immigrant labour, attracted by Norway's low unemployment and high wages, have allowed the economy to grow at rates well above what potential would otherwise have been. Since Taylor rules are themselves based on estimates of the output gap, and the sensitivity of inflation to the measures of the output gap is uncertain, it is more important than ever for Norges Bank to continue to use a wide range of indicators in making its policy decisions.

Intelligent policy design insulates the economy from oil market fluctuations

Oil and gas exports accounted for over 20% of total GDP in 2007, helping to make Norwegian per capita GDP the highest in the OECD apart from Luxembourg. But public and private consumption together account for only about 60% of GDP, compared with between 80 and 85% in G7 countries (except Canada, another important per capita oil producer, at 75%). This difference is due to the policy of transferring petroleum revenues directly into an offshore fund, known as the Government Pension Fund, Global (hereafter referred to as the Pension Fund).

The purpose of the Pension Fund is to support long-term management of petroleum revenues. Proceeds from the fund are used to finance the non-oil budget deficit and are not

earmarked for pension expenditures. Since 2001 this framework has been supplemented by the fiscal guideline stating that only the expected long run real returns can be channelled into the budget; long run returns are estimated using a 4% real rate of return, and over time the non-oil structural deficit should correspond to these returns. *Taken together, the Pension Fund and the 4% guideline have had a major, highly favourable impact on both the economy and public finances*. The benefits to the economy are twofold: first that the potentially destabilising impact of highly variable export revenues on the exchange rate and demand pressure on the mainland economy is almost entirely eliminated; secondly, what could have been a major aggregate demand shock for the mainland economy is spread over a number of years. *It is important that this approach be maintained*.

But oil wealth puts continuous long-term pressure on "mainland" supply

Although the Pension Fund and the "4% rule" bring some stability and make for a rational way to spread the benefits of petroleum wealth over a number of generations, the underlying challenge of adapting the economy to a trend increase in demand cannot easily be avoided. In a sense, fiscal policy is now always "expansionary" since it is the vehicle for transmitting the trend increase in income into demand. A drastic cut in petroleum production or a decision to consistently save much of the financial income from the Pension Fund would make a significant difference; while this might only postpone the challenge, it could smooth the impact of the fiscal impulse if it came at a time when the Pension Fund were growing more slowly, owing to declining production.

Meanwhile, the application of the 4% rule to the structural budget deficit rather than the actual deficit is a sensible way to ensure that automatic stabilisers work fully, around this expansionary trend. The rule allows some latitude for active demand management in specifying that the constraint on the non-oil structural deficit be met over the cycle. The planned structural deficit in 2007 was about in line with the 4% guideline, but the actual outcome was smaller. Given the size of the output gap and continuing though moderating growth, it would have been appropriate to maintain this tighter fiscal policy into 2008, rather than the quite large increase in the structural deficit in the revised budget; such tightness could also be thought of as continuing to compensate for structural budget deficits that exceeded the 4% rule in the earlier phase of the cycle. *On current OECD projections, the excess of total demand over supply will diminish substantially by 2009. But fiscal restraint – avoiding an increase in the structural deficit – would still be wise. Also, a strong case can be made for undershooting the 4% per cent rule in the medium term, when the oil price is high and the Fund is growing rapidly*. Such a policy would have a number of advantages: it would provide support to monetary policy in a period of inflationary levels of excess demand in the economy and upward pressure on interest rates and the exchange rate; it would reduce the risk of short term relaxation in, for example, already generous welfare spending programmes with long term fiscal costs and potential adverse incentive effects; and it would build up a greater cushion of pre-funding for the long-term fiscal gap that can be seen under current projections.

Despite oil wealth, long-term fiscal challenges persist

In the medium term, over the next 10 to 20 years, public finances in Norway are in relatively good shape, partly because of increasing Pension Fund revenues, but also because the effects of the ageing of the population are coming somewhat later in Norway than in most countries. One measure of this, the level of taxation required to balance the budget while funding expected expenditures under current policies, is calculated to decline for the next few years, before turning up again only after 2015. From then onwards, however, Ministry of Finance projections made in the autumn of 2007 suggest that the situation will get quite significantly worse: they foresee a financing "gap" of 7% of GDP for the year 2060. While the size of this gap is sensitive to assumptions such as the oil price, and those projections assumed an oil price well below current levels, it seems likely that there will still be a shortfall even if oil prices remain high. The main contributors to the gap are old age pensions and age-related health expenditures.

The pension reform, due to be implemented as from 2010, will convert the state pension system into a notional defined contribution (and still unfunded) scheme, *i.e.* the expected value of retirees' pensions will be equivalent to the notional accumulated value of their lifetime pension contributions. The new pension accrual rules will be phased in over time, with full effect from the 1963 cohort onwards, while the other reform elements (life expectancy adjustment and transition to wage/price indexation of benefits after retirement) are planned to take effect from 2010.

At present, by agreement between the social partners, a supplementary pension scheme (AFP), subsidised by the government, significantly reduces incentives to work after age 62 for a large majority of the workforce. In the 2008 wage round covering the private sector, it was agreed to reform the AFP as from 2010, making it an income supplement for people over age 62, thereby restoring work incentives. The wage round negotiations resulted in an increase in the AFP subsidy for the benefit of the oldest cohorts. At the same time the government agreed to a partial deferment of the life expectancy adjustment for pension benefits accumulated under the present pension system. The government estimates the total cost of these concessions as having a present value of about 6% of GDP, with a maximum yearly cost of 0.2% of mainland GDP in the late 2020s. In current expenditure terms this may seem small, but the principle of buying short-term industrial peace towards the peak of a cycle, with concessions that have long-term effects is a poor one (it was in such conditions that the original AFP scheme was introduced).With these measures, the government has gone a considerable way to shelter older cohorts from the full effect of the pension reform. *Such concessions should not be extended further, or given to younger cohorts. Furthermore, the remaining elements of the pension reform, notably concerning disability and public sector pensions, should be implemented in line with the key elements of the reformed main pension system.*

Demand for labour is strong; some policies inhibit its supply

As demand pressure on the mainland economy continues to grow, adjustment takes the form of supply shifting away from the tradeable sector, where imports financed by Pension

Fund revenue can replace domestic production, to the non-tradeable sector where they cannot. A partial exception is agriculture where a highly protectionist policy inhibits this shift by preventing imports of certain foods when similar domestically-produced food is available, though at a much higher production cost. Labour shortages in the non-traded sector are reflected in high wages, by international comparison, and the high and increasing relative cost of living.

The 2007 *Economic Survey* pointed out that a number of policies in Norway act to reduce the supply of labour. Although labour participation rates are among the highest in the OECD, they are partially offset by average hours worked that are among the lowest. Low working hours and increased leisure would be a natural reaction to increasing wealth, so they are not to be criticised in themselves. But they may also in part be a reaction to a generous sickness benefit scheme. Reforms to this scheme were introduced in 2004, when the number of days lost initially diminished. Since then sick leave has been on an increasing trend, and further measures were introduced in 2007, but sick leave remains prevalent as the system retains incentives towards excessive use of the scheme. Proposals made in the 2006 *OECD Report on Sickness and Disability* and repeated in the 2007 *Economic Survey* should be implemented – notably to reduce benefit levels, and remove responsibility for assessments from family doctors. In fact, *there seems to be no strong reason why the culture of strict conditionality for which the unemployment benefit system is known, and which has in the past helped to maintain unemployment relatively low even in downswings, should not be extended to the sickness scheme, provided of course that its basic aim of protecting the genuinely sick is met. The same goes to some extent for disability pensions, which are frequently used as a supplementary early retirement scheme and are apparently also being awarded increasingly to young people*. Here again some reforms have been introduced, but while it is too early to assess their impact, it is a fairly safe assumption that further improvements to incentives to participate in the labour market within the objective limits of the disability scheme could be made. More recently, there have been some new policy initiatives to tackle these problems. *If the "NAV reform" (in which various labour market and welfare services are brought together under one roof) can be completed successfully, it should be used as an opportunity to try to impose the successful disciplines of the unemployment insurance system on the less strict welfare scheme.*

While the pension reforms will restore better incentives for older workers to remain in the labour market, slow progress in sickness and disability reform suggests that it is difficult for the government to increase domestic labour supply, despite the potential for this. It was estimated in the previous *Economic Survey,* for example, that a significant increase in labour supply could be achieved if Norway adopted reforms to increase working hours to a level in line with the average in the European Union.

Labour market reforms might increase the benefits from immigration

Some policies thus act to restrict the supply of labour. Meanwhile, high wages and the tightening labour market have attracted historically large migration inflows since 2004, boosting the labour supply substantially. This was facilitated by the increased freedom of movement of labour within the expanded European Economic Area. Along with most potential destination countries, Norway retained some restrictions on the inflow of labour from the "EU8" countries, and later on Romania and Bulgaria too; the need for a work permit was retained, but an offer of employment is essentially sufficient for a worker from

these countries to obtain a permit. Until 2007, workers from the "EU10" needed a permit before starting to work, but this restriction was abolished from 2008 – they can now start working once an application for a work permit has been submitted. With Norwegian employers eager to recruit, Polish workers in particular have taken advantage of this increased freedom of movement. As from 2009, the government is intending to remove the transitional arrangements with the EU8, and to relax some restrictions on non-EEA immigrants too.

Labour mobility generally improves welfare, so these plans are a welcome contribution, although one should beware of measuring the benefit from immigration simply in terms of the increased GDP that it certainly permits. The gains to existing residents are generally much less than this, since the migrants themselves are likely to receive much of the extra output in wages so the benefit comes mainly in the form of higher profits and tax revenue. In addition there are gains from improved availability of certain services when immigrants enter sectors where native labour supply is particularly limited. The policy of extending collective wage agreements beyond the parties to the original agreement, in order to force up wages paid to immigrants, tends to reduce the share of the gains accruing to natives. As part of a set of measures against "social dumping", this may be the price for improved equity, *but it should not be allowed to be used as a disguised way of inhibiting competition among domestic companies and shutting out foreign ones*.

More generally, it is frequently observed that there are labour shortages in certain areas or professions in Norway. The construction boom means that this sector is sometimes cited, but also some engineering professions, teachers or scientific graduates. But the convention in the Norwegian labour market makes it unclear whether there really is a shortage of such labour, since the wage negotiating system seems to prevent a significant impact of relative demand and supply on relative earnings. In the current wage round, for example, despite very low unemployment and the suggestion of labour shortages just mentioned, the private sector settlement included a provision for low paid workers – in a system with one of the flattest wage distributions in the OECD – to be paid an additional amount on top of the general increase for all workers, thus further flattening the wage distribution. Plant-level bargaining introduces flexibility around the national agreements, but these do not seem to substantially increase wage differentials across sectors or types of labour. It may not be necessary to change a system that has overall worked quite well for some time, but *introducing freedom of labour movement beyond the common Nordic labour market probably necessitates, in the longer run, a greater willingness to accept that relative wages should reflect supply and demand for labour more directly*.

The benefits to natives from labour immigration, notably the fiscal benefits, generally last only as long as immigrants do well in the labour market. For as long as the boom lasts, this seems practically guaranteed, and even in a downturn there is no big problem if immigrants return home. However, given the generous nature of parts of the Norwegian welfare system discussed earlier, significant numbers may choose to stay; *this could provide an additional incentive for governments to reform the welfare system*.

Poor performance in school education is a cause for concern

In the long run, and as in all countries, improving the quality of the supply of labour – creating human capital – is an important function of the education system. Of course, it is not the only one and there is room to differ on the relative importance that should be attached to economically "productive" aspects of education on the one hand and the social aspects of education that are particularly important in Norway, on the other. The special chapter in this *Survey* devoted to the compulsory education system presents strong evidence that this part of the Norwegian education system could do much better in developing human capital than it does, and that its relative performance may have been getting worse for pupils in lower-secondary education in recent years. This diagnosis may not hold for the education system as a whole, since it focuses on compulsory schooling and does not cover upper-secondary and tertiary education. However, given that the evidence for school childrencovers the only internationally comparable information available on education performance at the moment, and that this information focuses on competences and problem-solving ability rather than simple memory-based learning, it cannot be ignored.

Resources in education need to be spent more effectively

Compulsory education in Norway is not cost-efficient regarding pupils' achievement in reading, mathematics and science. Although there are different ways to compare costs per unit output across countries, it is clear that schools in Norway deliver below average results on the OECD's international student assessment (PISA) scores, for expenditure per student which may be as much as 40% higher than average. Although per student costs have been growing more slowly in Norway than elsewhere, this is not much consolation since relative PISA performance seems to have declined between 2000 and 2006. Cost-efficiency can, in an abstract sense, be improved either by reducing expenditure for given results or improving results for given expenditure. This is a somewhat artificial separation since resources saved by cutting inefficient expenditure can, in principle, be used elsewhere to give improved results (unless there are strongly diminishing returns to resource use, which some international comparisons suggest may in fact be the case). However, *the government's already stated intention to increase spending on education will produce disappointing results and even make future reforms more difficult if it is not accompanied by strong steps to improve the efficiency of resource use*.

Some sources of cost-inefficiency are quite clear: a large number of small schools and a low pupil-teacher ratio. Gaps in teachers' competences are also apparent, and the number of hours that teachers are actually required to teach is low, as is the number of instruction hours that children receive. Other sources of inefficiency are more subtle, for example little use is made of mechanisms that give either teachers or schools any external incentive to improve performance; more fundamentally, there is also a lack of information on which such assessments can be based, although this situation is improving. There is evidence that some aspects of teaching practices are particularly ineffective too: in many cases this may be illustrative of lack of feedback on results. All of these points are taken up below.

Small schools increase the cost of education, partly reflecting regional policy

In view of poor cost-efficiency, *the government could consider measures to close or merge small and medium sized schools*. However, the government has few instruments to directly affect this, because decisions on school closures are entirely delegated to local municipalities and central government funding is largely supplied through block grants, not earmarked for education. Nevertheless, block grants do take into account factors such as population density and geography deemed to be out of the control of local government, as part of the general policy of maintaining a larger population in rural and remote areas than would otherwise be the case. *Central and local government should review all mechanisms that may directly or indirectly encourage the underutilisation of economies of scale in education*.

Improving teaching quality is the priority

Improved outcomes will only be achieved with improved teaching in classrooms. The analysis in this *Survey* is not designed to recommend detailed changes in teaching practice. Nevertheless, it highlights some explanations for the poor performance, notably gaps in teachers' competencies, the low number of teaching and instruction hours, the use of experimental teaching methods, which studies have found to be largely ineffective, and the apparently low standards that seem to be expected of children. *Hence, teachers should be encouraged to strengthen and update their competences, both in subjects taught and in teaching methods. Recent efforts to improve training programmes are on the right lines, but a shift towards training that leads to formal accreditation is necessary.* In the new White paper presented in June 2008 measures are proposed to put more weight on formal training programmes for both teachers and principals. Since increased instruction hours would also improve learning outcomes, municipalities and schools should be encouraged to consider this among their options for improving performance.

Provision of better information would improve performance, and could also be used to improve incentives

Local government of course responds to the wishes of local electorates, but these need to be well-informed, which implies knowledge of the relative performance of different schools; municipalities have the power to publish this information, but few outside Oslo do so. *The government should consider publishing the results of national assessment tests school-by-school, provided steps are taken to adjust the scores for known exogenous influences on results, such as social background, (i.e. to publish the results in "value added" form) and to protect the identities of the children involved*. These assessment tests, only recently introduced, are intended to play an important role in giving schools and parents' information on the educational needs of individual children. But the results are not used systematically to give feedback to teachers on how well they have performed. *It should be part of school principals' duties to provide this information to teachers*.

A more radical change would be to use this information to provide direct monetary incentives for school teachers. The county and municipality of Oslo have already taken this

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step and the Oslo administration is convinced that it has had beneficial effects on both results and cost-efficiency. In a country with Norway's traditions this might be too radical a reform to impose centrally, given the legitimate doubts about how such incentives really work. However, the example of Oslo should be studied closely with a view to adopting some of its practices elsewhere if they prove to be beneficial. The idea is less controversial for school principals or leaders, however; *school-wide results, including measures of cost-efficiency, should be used as part of the assessment and reward system for school leaders*, as is again already the case in Oslo.

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Chapter 1

Maintaining prosperity while dealing with overheating and labour supply constraints

The Norwegian mainland economy has expanded at a surprisingly strong pace since the 2007 Economic Survey, generating substantial real income gains, robust consumption growth and near full employment for its citizens. Favourable developments in world demand for key Norwegian exports and declining prices for many of its imports have played their part in this success. Macroeconomic policy has been tightened progressively, mostly through a long series of interest rate increases up to spring 2008 but also through a degree of fiscal restraint in 2007, and the economy seems to have started to slow in early 2008. Pressure on the labour market shows in rising wage inflation and increasing inflows of foreign labour while, paradoxically, there is only slow progress in dealing with aspects of labour and welfare policy that seem to restrict the supply of labour. Despite strong demand for labour, the compulsory education system performs rather poorly compared with many of Norway's partners.

In recent years, the Norwegian economy has generated wealth and jobs at almost unprecedented rates. Output growth has been rapid and unemployment low, while inflation pressures remained subdued until late 2007. But wage growth was increasing and, at the end of 2007 and into 2008, consumer price inflation picked up sharply; in the first half of 2008 the economy was looking rather overheated.

As the last *Economic Survey* noted, good fortune and good management have both contributed to Norway's success. To maintain this record of success, it will be important to ensure maximum flexibility of labour supply, whether in meeting the continued high levels of aggregate demand which have been putting pressure on capacity, or in helping to ensure a soft landing if the external environment changes for the worse. In the short term, record labour immigration has played a major role in maintaining high economic growth. Despite high overall participation and employment rates, there are potential weaknesses in domestic labour supply; in the longer term these trends, and the future potential for and desirability of immigration, will be key determinants of the potential rate of growth.

While recent experience suggests that the immediate challenges in Norway are largely related to high demand and growth, the economy may well have entered a period of much slower growth, for both domestic and external reasons. Managing macroeconomic policy and maintaining a well-functioning labour market will be no less important in such a period.

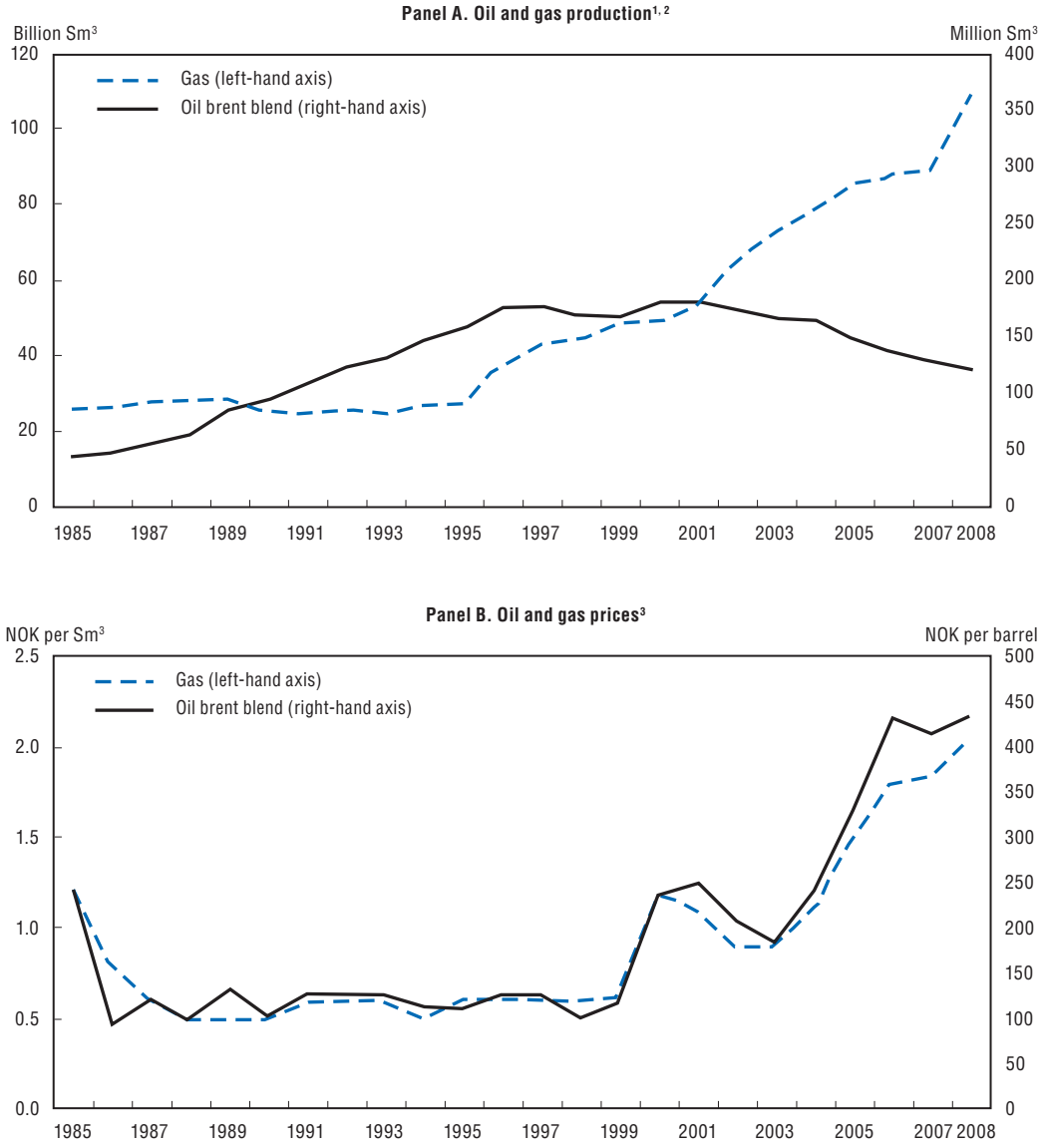
This chapter first surveys the key factors in recent growth performance, and discusses the macroeconomic policy challenges that recent growth has presented. It then looks at the labour market, migration and the education system, to highlight potential longer term problems for which Norway must be prepared, even while enjoying the fruits of current success.

Strong mainland output growth

The volume of output in the off-shore sector (including oil and gas extraction and related services, as well as the off-shore shipping industry) fell quite substantially in 2007, due mainly to temporary technical factors in oil production (Figure 1.1, panel A). Although output will bounce back, oil production has in fact probably peaked, while gas output will continue to rise for some years to come. But despite the output losses, record nominal levels for petroleum (*i.e.* oil and gas together) prices have boosted revenues (Figure 1.1, panel B); this has provided some direct stimulus to the mainland economy, through demand for goods needed by the off-shore sector, and through incomes and profits.

In 2007, the growth of real income in the total economy (as measured by nominal GDP adjusted by the deflator of domestic demand) was lower than in 2006. Real income was hit by falls in petroleum output and by the stagnation of the terms of trade, for the first time since 2002, as energy prices marked a pause and import prices increased. It is likely that real income gains received a boost in the first half of 2008 from the rise in energy prices, if judged by the rapid increase of total terms of trade in the first quarter (an increase of 15% from the same quarter of the previous year).

Figure 1.1. **Falling production and rising prices for petroleum**



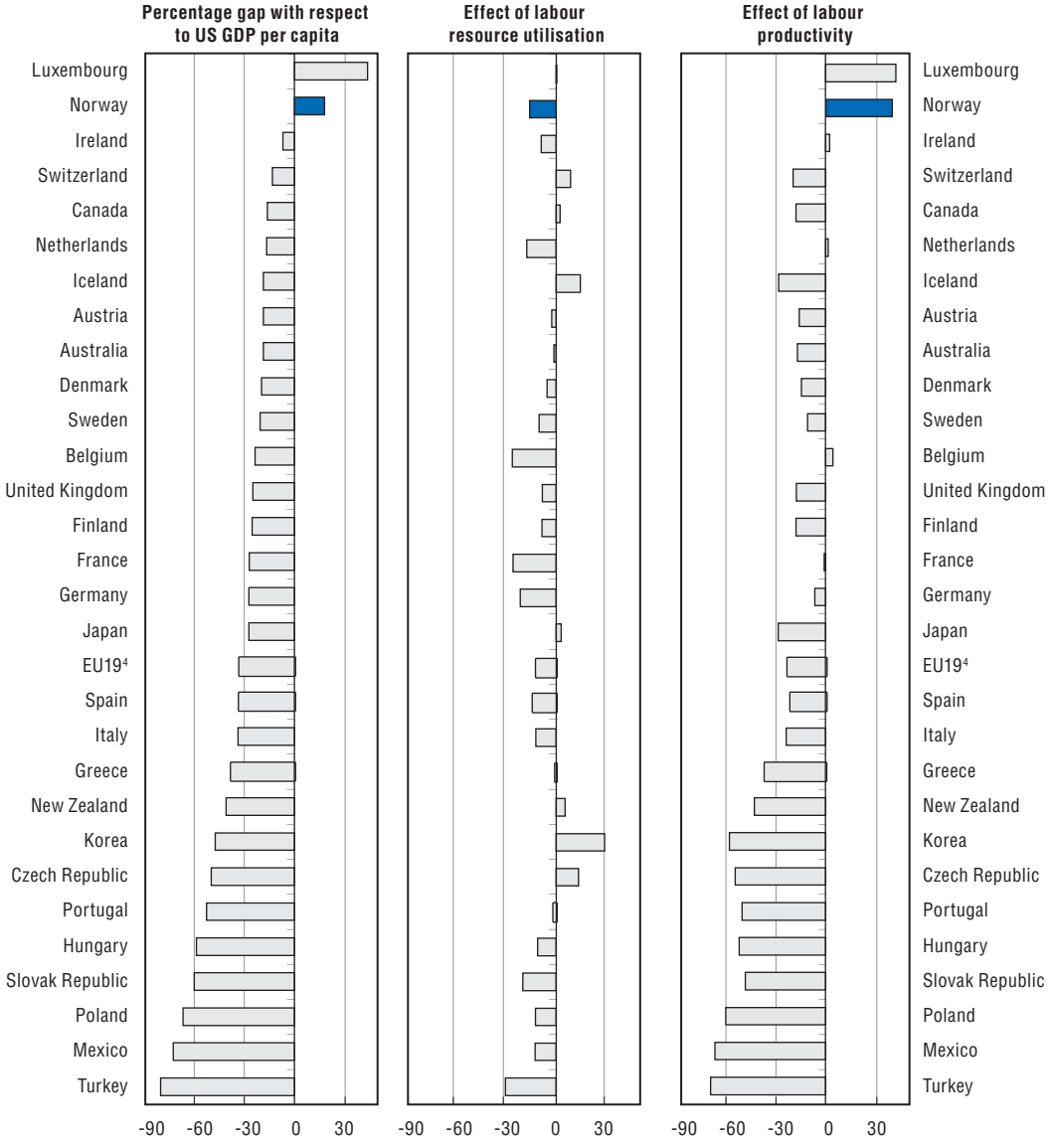
1. Oil and gas production in 2007 are inclusive of January-September data only.
2. Oil and gas production levels are measured in standard cubic meter oil equivalents (Sm3).
3. Gas prices refer to an average of export gas prices.

Source: Statistics Norway and Norges Bank.

StatLink http://dx.doi.org/10.1787/425280856235

Unlike the offshore sector, the mainland economy has seen rapid growth in the volume of output in 2007. The direct spill-over from investment growth in the petroleum sector accounted for less than 0.2% of mainland GDP growth, but many other factors contributed. In common with many other OECD countries, relatively easy credit conditions have combined with rising incomes and rising income expectations to generate a housing boom. The construction sector, both residential and commercial building, has been expanding rapidly, and is a major source of demand for migrant labour, but most other sectors have been growing fast too, reflecting a general boom in the economy (as for

Figure 1.2. **The source of real income differences**



Source: OECD Analytical database.

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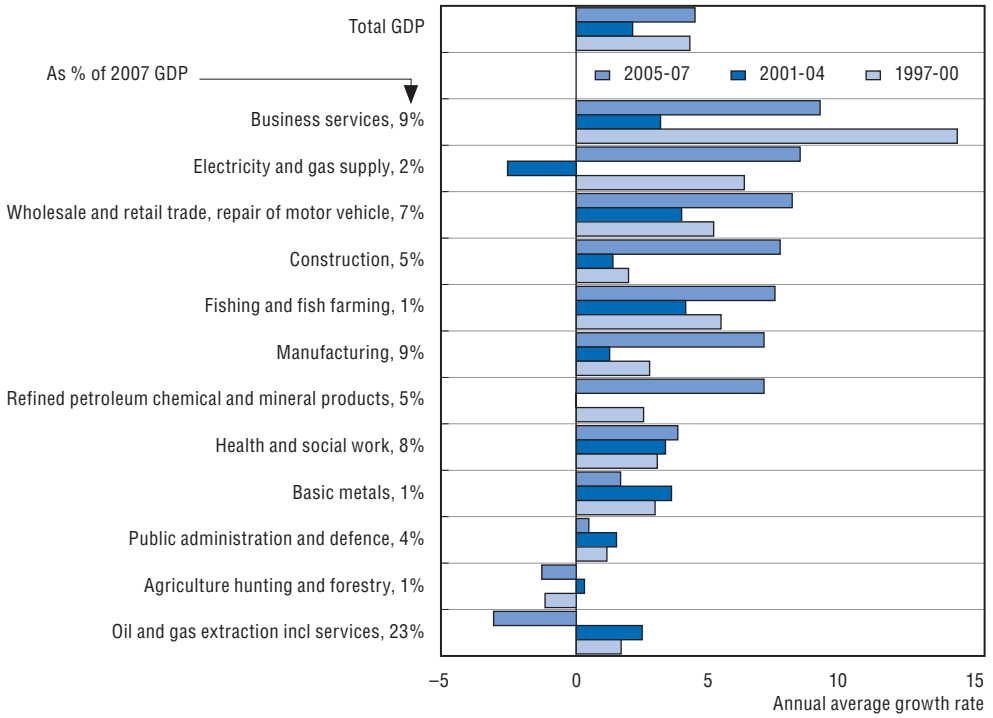
instance business services and manufacturing, where output grew twice as fast as total output) (Figure 1.3).

Employment growth has become spectacular by the standards of most European economies. It has driven down unemployment and may well have sparked the slight upturn in labour participation rates; most significantly it has both encouraged and been fed by a major increase in, and change in the nature of, immigration. Strong immigration has probably also contributed to sustaining this boom – the population rose by 1.2% in 2007, the highest growth rate for over 60 years, almost entirely due to immigration (Figure 1.4). The booming economy and the immigration inflows have been to some extent self-reinforcing.

Figure 1.3. **Real GDP growth by industry**



Source: Statistics Norway.

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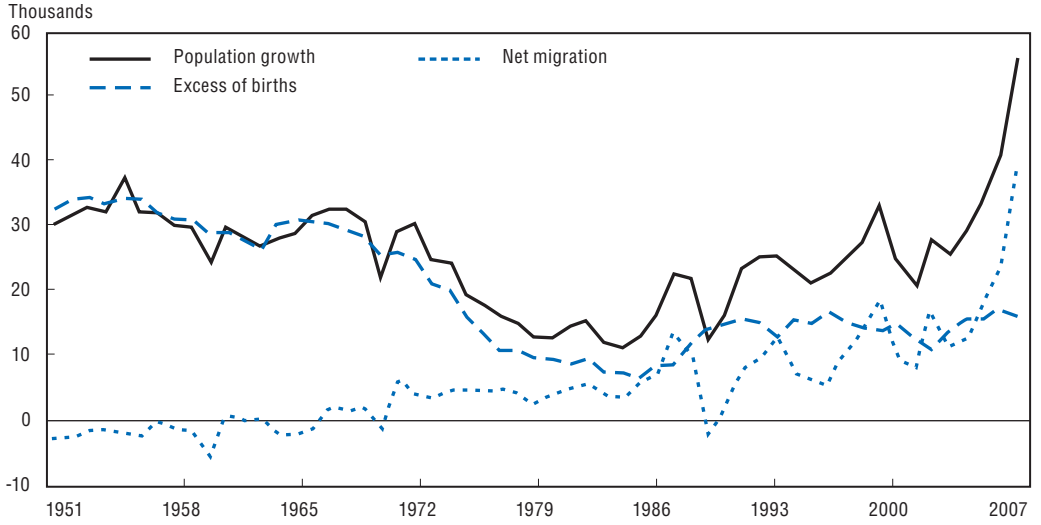
Figure 1.4. **Excess of births,[1] net migration and population growth[2]**



1. Excess of births is defined as live births net of deaths.
2. Population growth is the difference in population on January 1st between two subsequent years. For 1955, 1958, 1960, 1966, 1968 and later years population growth does not equal excess of births plus net migration.

Source: Statistics Norway.

StatLink http://dx.doi.org/10.1787/425365432532

Productivity growth in the mainland economy remained more than respectable in 2006 and 2007 by international comparisons, but slowed distinctly compared with 2004-05 (see Table 1.1). Slackening productivity growth may just be due to the cycle reaching its peak (as employment usually lags output growth), but to the extent that product market reforms contributed to its acceleration in earlier years, the absence of enthusiasm for continuing such reforms in recent years may presage somewhat slower growth in the future (see Annex 1.A1). Insufficient innovation activity has also been identified in the past as a problem for Norway; although the previous *Economic Survey* already noted that if innovation was lacking the good productivity performance since 2003 was rather paradoxical. *The OECD Review of Innovation Policy* suggests that a part of the phenomenon may be explained by productivity enhancing innovative activity occurring in areas that are not typically picked up by conventional measures of innovation (OECD, 2008).

Table 1.1. **Sources of Real Output Growth in selected OECD countries, 2001-2007**

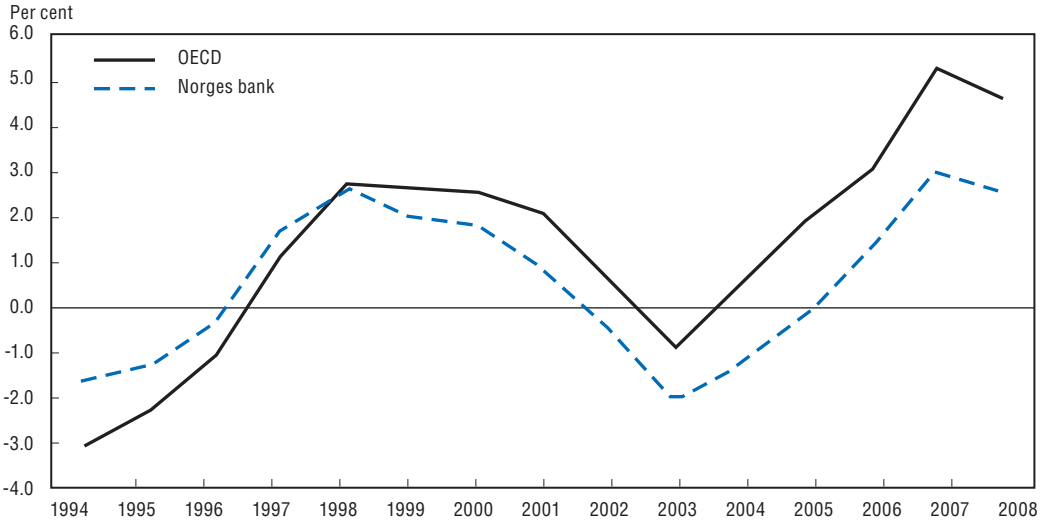
		2001	2002	2003	2004	2005	2006	2007
Norway (mainland)	*Real output growth*	2.0	1.4	1.3	4.4	4.6	4.8	6.0
	Productivity growth	1.7	1.0	2.0	4.1	4.0	1.6	2.6
	Employment growth[1]	0.4	0.4	–0.8	0.3	0.6	3.2	3.4
Norway (total economy)	*Real output growth*	2.0	1.5	1.0	3.9	2.7	2.5	3.5
	Productivity growth	1.6	1.1	1.8	3.6	2.1	–0.7	0.1
	Employment growth[1]	0.4	0.4	–0.8	0.3	0.6	3.2	3.4
Euro area	*Real output growth*	1.9	0.9	0.8	1.8	1.7	2.9	2.6
	Productivity growth	0.3	0.1	0.4	0.8	0.6	1.3	0.8
	Employment growth[1]	1.6	0.8	0.4	1.0	1.1	1.6	1.8
United Kingdom	*Real output growth*	2.4	2.1	2.8	3.3	1.8	2.9	3.0
	Productivity growth	1.5	1.3	1.8	2.2	0.8	2.0	2.4
	Employment growth[1]	0.8	0.8	1.0	1.0	1.0	0.9	0.7
United States	*Real output growth*	0.8	1.6	2.5	3.6	3.1	2.9	2.2
	Productivity growth	0.9	2.8	2.5	2.6	1.5	1.1	1.3
	Employment growth	–0.2	–1.2	0.0	1.1	1.6	1.8	0.9
Denmark	*Real output growth*	0.7	0.5	0.4	2.3	2.5	3.9	1.8
	Productivity growth	–0.2	0.4	1.5	2.9	1.6	2.2	0.0
	Employment growth	0.9	0.0	–1.1	–0.6	0.9	1.6	1.8
Sweden	*Real output growth*	1.2	2.4	2.1	3.5	3.3	4.5	2.8
	Productivity growth	–0.8	2.4	2.7	4.2	3.0	2.7	0.5
	Employment growth	2.1	0.0	–0.6	–0.7	0.3	1.7	2.3
Finland	*Real output growth*	2.4	1.6	1.9	3.7	3.1	4.8	4.3
	Productivity growth	0.9	0.6	1.8	3.2	1.6	3.1	2.1
	Employment growth	1.5	1.0	0.1	0.5	1.4	1.7	2.1

1. Based on labour force statistics rather than on national accounts.
Source: OECD Analytical database.

The strains of high capacity utilisation begin to show

As mainland GDP growth has increased, most slack in the economy has been absorbed and, to judge by the unemployment rate and measures of potential output, by the end of 2007 the economy had been operating well above capacity for some time. Quite how far above is hard to tell, however: output gap estimates are subject to great uncertainty and even when underlying estimation techniques are very similar, they can vary in a fairly large interval. Figure 1.5 shows the output gap as estimated by the OECD and various national authorities. While there are differences between OECD estimates and the national ones,

Figure 1.5. **Measures of the output gap**
Per cent of potential GDP



Source: OECD Analytical database, Ministry of Finance, Norges Bank.

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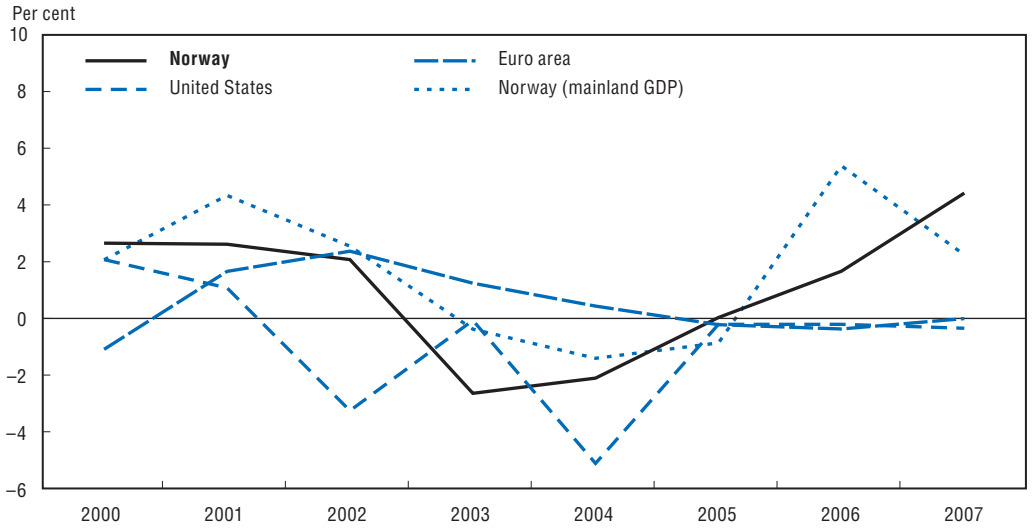
their movement over time is quite similar and the gap is now large whichever measure is used. In the first quarter of 2008 the ratio of job seekers to vacancies was very low (1.5 job seekers per vacancy), with recruiting difficulties in almost every sector but even more so for skilled workers. The spring round of collective wage bargaining was thus particularly tense. The outcome of the negotiations for the main private sector unions (5.6% including expected wage drift) is quite expensive if productivity growth falls, though acceptable to employers because of high current levels of profitability; but the unions would probably have struck for more if the government had not agreed to increase its subsidy to pension arrangements.

In early 2008, growth seemed to continue quite strongly, but as the year has progressed an increasing number of signs have suggested that the economy may be coming off the boil. According to Norges Bank's April regional network survey, capacity utilisation is very high but has begun to fall, with weaker growth in turnover in all industries, especially in construction, and growth in the economy seems to have slowed.

In the mainland economy, productivity growth is no longer offsetting wage growth and unit labour costs have thus been rising since 2005, though decelerating somewhat in 2007. They have picked up and risen rather more in the manufacturing sector in 2007, compared with broadly stable unit labour costs through 2005-07 in the United States and the euro area (Figure 1.6). This is particularly important for the tradeable, non-oil sector; cost-competitiveness for this "exposed" part of the economy has now been deteriorating for two years and is likely to continue to do so with high wage growth now likely in 2008 and 2009. Profitability, however, was still high in all sectors in early 2008.

A number of trends associated with "globalisation" have been particularly beneficial for Norway in recent years. The booming world economy has boosted commodity, especially energy, prices and at the same time the expansion of the supply of manufactured goods has kept Norway's import prices low. After deteriorating somewhat between 2000 and 2004, Norway's terms of trade have since increased by about 45% (even

Figure 1.6. **Unit labour costs, manufacturing**
Per cent change from previous year



Source: OECD Analytical database.

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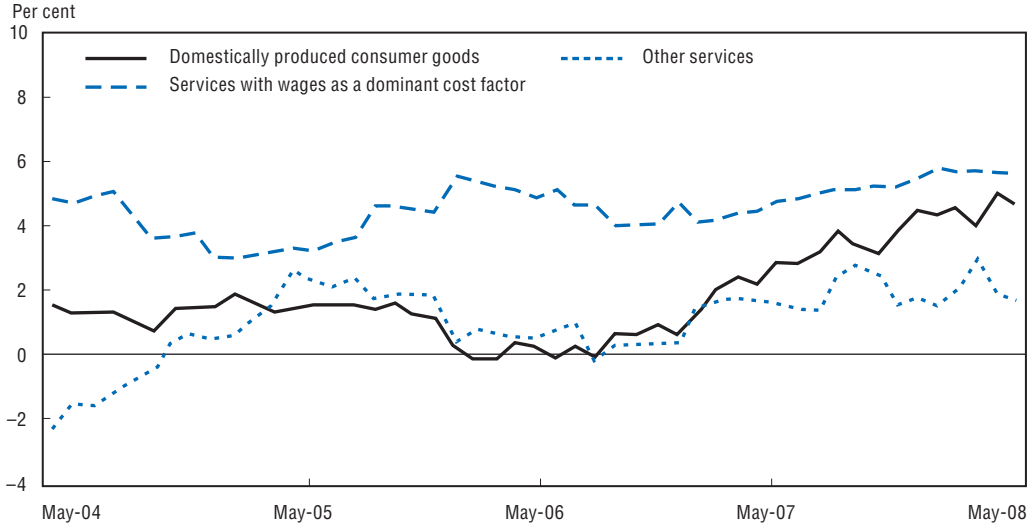
excluding oil and gas there was an improvement, though much smaller at only 10%). This has supported the general tendency towards increased relative prices of services (especially those with wages as the dominant cost factor) and falling actual prices of many manufactured goods. Low import prices have been particularly important in keeping inflation under check, particularly so in 2007 when domestically generated inflation was rising throughout the year (Figure 1.7).

Figure 1.7. **Consumer price inflation**[1]
12-month per cent change



1. CPI adjusted for tax changes and excluding energy products.

Source: Statistics Norway and Norges Bank.

StatLink http://dx.doi.org/10.1787/425426702304

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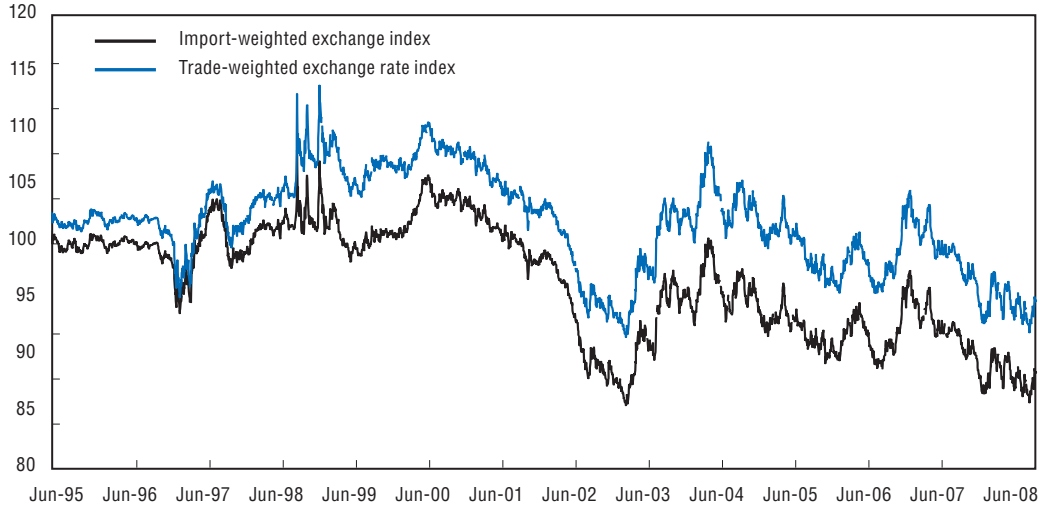
A relatively strong exchange rate has also helped to keep import prices low. The effective exchange rate has fluctuated but has generally strengthened since 2004 (Figure 1.8). High oil prices and the large current account surplus obviously favour the currency. Relative interest rates probably played little role for most of 2004-06, though at the end of 2006, after a period in which the exchange rate seemed to have begun to fall, they began to rise relative to other countries, and the exchange rate also resumed some appreciation.

Figure 1.8. **The nominal effective exchange rate**[1]

Daily rates, index 1995 = 100



1. A decrease in the nominal effective exchange rate measures an appreciation of the currency.

Source: Norges Bank.

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These factors have helped to keep overall inflation quite low for some time. As mentioned earlier, excess capacity had disappeared by around the end of 2005 and by the end of 2007 overall demand was 3% or more above what long-term trends suggest normal capacity would be. Despite this positive "output gap", large by historical standards, inflationary pressures were quite slow to appear, though wide differences between headline and underlying inflation due to swings in hydro electricity prices added to uncertainty over underlying inflation. The central bank had already begun to increase interest rates in mid-2005 from the low level reached in 2004. Although both actual and underlying inflation remained low, it continued to tighten throughout 2006-07 and into early 2008. This cautious approach seems vindicated by the quite sudden increase in headline inflation at the end of 2007, partly due to a reversal of erratic favourable effects from electricity prices, but also no doubt due to continuing pressures of demand on capacity.

While monetary policy was tightening steadily, fiscal policy may have been slightly pro-cyclical. The fiscal rule requires that the structural budget deficit, averaged over the cycle, should be no more than what can be financed by a 4% return on the oil and gas revenues that have been accumulated in the Norwegian sovereign wealth fund (the Government Pension Fund, Global, hereafter referred to as the Pension Fund, see Box 1.1). The deficit was higher than implied by this fiscal rule through to 2005, and slightly undershot for the first time in 2006, when the upswing was already quite advanced. Although the "4% rule" is an excellent prudential rule, a more ambitious target for the

Box 1.1. **The Norwegian Sovereign Wealth Fund**

The Norwegian authorities instituted a Sovereign Wealth Fund (SWF) called the "Petroleum Fund" in 1990 as a fiscal tool to support long-term management of the petroleum revenues. The fund was renamed the Government Pension Fund – Global in 2006 as part of a broader pension reform, highlighting also the fund's role in facilitating government savings necessary to meet the rapid rise in public pension expenditures in the coming years. The Fund is not earmarked for pension expenditures. It is intended that the value of the real capital in the fund be left untouched for future generations.

The Norwegian fund model relies on three principles: 1) It is fully integrated in the fiscal budget, (where the fiscal guideline provides a medium-term anchor for the size of the flow from the Fund to the budget; see Chapter 2); 2) It is fully invested abroad in financial assets, with the aim of insulating the economy from the traditional negative effects of petroleum wealth, to protect the country from energy-related shocks through automatic sterilisation, and to diversify risk and maximize returns; 3) the Fund is managed with a high degree of transparency, with the Ministry of Finance regularly reporting to the Parliament and publishing all advice from external consultants. Performance, risks and costs are reported every quarter, with a focus on contribution to value-added in operational management.

The Ministry of Finance is the formal owner of the fund, holding overall responsibility for the strategic allocation of assets (setting a benchmark and a band of risk limits), for monitoring and evaluating operational management, for issuing the ethical guidelines and for referring to the Parliament. The operational management of the Fund's international assets has been delegated to Norges Bank, the central bank of Norway. The bank has set up an asset management arm, Norges Bank Investment Management (NBIM), which is separate from the traditional central bank activities. The NBIM implements the investment strategy, exercises active management to achieve excess return, and controls risk; the NBIM also exercises the Fund's ownership rights and provides professional advice on the investment strategy. NBIM manages the Fund partly internally and partly by engaging external managers.

The capital can be invested only in non-Norwegian financial instruments (bonds, equities, money market instruments and derivatives), with a long-term investment perspective (very little leverage, no claims for immediate withdrawals of funds and no direct links to liabilities). Of the changes in the investment strategy that have occurred since the first net allocation to the fund in 1996, the most important are an increased share of equities, more qualitative requirements in risk management and the establishment of ethical guidelines. After implementing the latest plans to gradually build up investments in real estate, the fund's strategic asset allocation will consist of 60% invested in equities, 35% in fixed income and 5% invested in real estate assets. Investments are made in 42 developed and emerging equity markets and 31 currencies for fixed income investments.

The latest report of NBIM shows that the market value of the Pension Fund was NOK 1945.8 billion on 31 March 2008, approximately USD 388 billion or 90% of total GDP. Despite the subprime-related turmoil, equity management generated positive results in 2007, while fixed income management produced a negative excess return. Overall, the nominal return on the fund in 2007 was 4.3% measured in international currency, *i.e.* 0.22 percentage point below the benchmark portfolio defined by the Ministry of Finance. During the past ten years, the fund's average annual nominal return has been 6.0%, of which 0.4 percentage point can be attributed to the manager's outperformance of the benchmark.

Box 1.1. **The Norwegian Sovereign Wealth Fund** *(cont.)*

The management of the Pension Fund is often cited as an example to be followed by other SWFs. Several features appear to follow international good practices: these include a high degree of transparency in all aspects, the Fund's role as a financial investor with non-strategic holdings, an explicit aim to maximize financial returns, and clear lines of responsibility between political authorities and the operational management. The government has also adopted ethical rules barring the managers from investing in companies deemed to deviate from certain criteria. Recent examples of disinvestment include producers of cluster bombs and landmines, companies considered responsible for serious environmental damage, as well as firms seriously violating human rights.

budget balance could have eased pressure on capacity in the recent period. However, it is unlikely that the fiscal stimulus alone is at the origin of the boom in the economy and, as argued in Chapter 2, monetary policy remained expansionary well into the upswing; cheap credit conditions may have encouraged the growth of imbalances in the aggregate household sector.

The economy is slowing, with some downside risks

The strong growth performance that the Norwegian mainland economy recorded in the last few years is coming to an end (Table 1.2). Weaker global demand and lower consumer borrowing will cause a significant slow-down both in 2008 and 2009; the slowdown of domestic demand will come mainly from consumption and residential investments (housing market developments are discussed in more detail in Chapter 2); the household saving ratio, negative in 2007, is likely to rise in 2008 and 2009. While this, the high interest burden and a cooling housing market will tend to slow consumption, wage increases and sustained employment will keep incomes growing relatively fast.

It is also likely that the major positive shocks that contributed to fast growth in the last two years are gradually disappearing. Though export commodity prices (oil and gas and most likely metals) should remain high, non-commodity export prices are expected to fall. With stronger import prices, the terms of trade are likely to reverse some of the gains made in recent years, with negative effects on real income growth.

Despite slowing demand, the output gap will not be closed for some time; this is true even though potential output itself is expected to accelerate somewhat in 2009 thanks to continued migration and high level of capital stock accumulated in the last upswing. With a positive output gap, it is likely that inflationary pressures will continue for some time; underlying inflation already rose close to the central bank's target rate in April 2008.

In the medium term it is uncertain whether productivity will continue to be as dynamic as in recent years. Gains from diffusion of ICT have brought major productivity improvements, in areas such as retail distribution and the financial sector, with Norwegian banks currently in a healthier situation than many others in Europe. These gains, and those due to the effects of earlier deregulation policies, may now be slowing. There have been no new product market reforms recently, although policy indicators for Norway are relatively favourable. The Norwegian government still controls large corporations in a number of sectors and has occasionally ruled against the competition authority in merger decisions. As the traditional tradable sector is likely to suffer more in the future than in the

Table 1.2. **The short-term economic outlook for Norway**

Norway: Demand, output and prices

	2004	2005	2006	2007	2008	2009
	Current prices NOK billion	Percentage changes, volume (2005 prices)				
Private consumption	786.0	4.0	4.7	6.4	3.9	2.6
Government consumption	373.3	0.7	2.9	3.2	3.1	2.0
Gross fixed capital formation	314.2	13.3	7.3	9.6	4.9	1.3
Final domestic demand	1 473.5	5.2	4.9	6.4	3.9	2.1
Stockbuilding[1]	33.7	0.4	0.7	–0.6	0.3	0.0
Total domestic demand	1 507.2	5.5	5.5	5.4	4.3	2.1
Exports of goods and services	732.7	1.1	0.4	3.2	1.9	2.6
Import of goods and services	496.8	8.7	8.1	8.6	6.5	4.1
Net exports[1]	235.9	–2.0	–2.1	–0.9	–1.1	0.1
GDP at market prices	1 743.0	2.7	2.5	3.5	2.6	1.8
GDP deflator	..	8.7	8.4	2.3	8.3	1.8
Memorandum items						
Mainland GDP at market prices[2]	..	4.6	4.8	6.0	3.3	1.5
Consumer price index	..	1.5	2.3	0.7	3.6	2.5
Private consumption deflator	..	1.1	2.1	0.7	3.2	2.5
Unemployment rate	..	4.6	3.4	2.5	2.5	2.8
Household saving ratio[3]	..	10.1	0.1	–1.2	–0.5	1.4
General government financial balance[4]	..	15.1	18.5	17.3	17.9	17.1
Current account balance[4]	..	16.3	17.3	16.4	19.4	18.6

Note: National accounts are based on official chain-linked data. This introduces a discrepancy in the identity between real demand components and GDP. For further details see *OECD Economic Outlook* Sources and Methods, (*www.oecd.org/eco/sources-and-methods*).

1. Contributions to changes in real GDP (percentage of real GDP in previous year), actual amount in the first column.
2. GDP excluding oil and shipping.
3. As a percentage of disposable income.
4. As a percentage of GDP.

Source: OECD Economic Outlook 83 database (does not incorporate revised data released with first quarter national accounts).

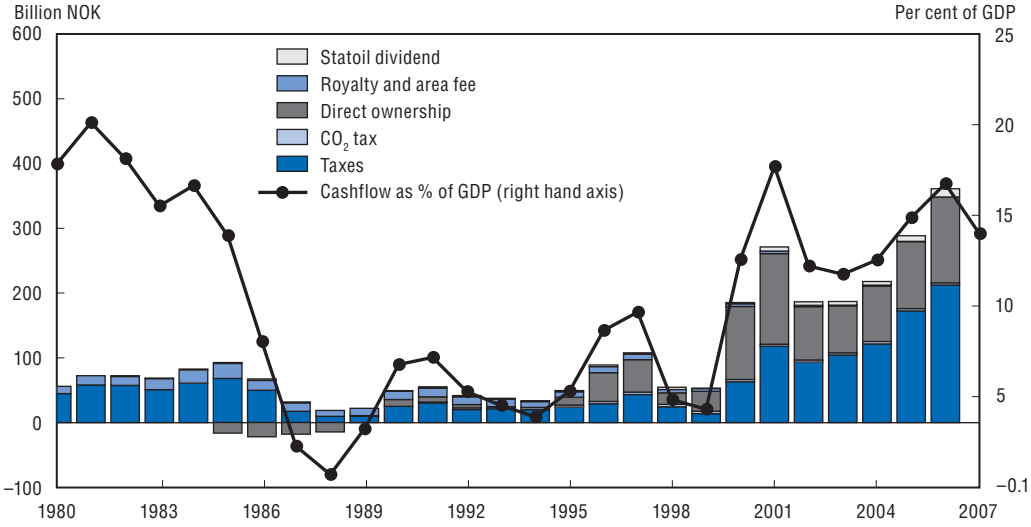
past from increasing competitive pressure and weaker foreign demand, the government will have to continue to behave in a strictly arms-length manner with its holdings, and allow consumer-welfare considerations to rule in competition cases. Otherwise, the continued restructuring on which productivity growth depends may be threatened.

Another good year for petroleum revenues

Although output volume declined, 2007 saw only a small fall in petroleum (combined oil and gas) export revenues, and these were growing rapidly at the end of the year. Exports were still almost NOK 500 billion, 22% of total GDP, the equivalent of nearly 30% of mainland GDP. Total net cash flow for the state government attributable to petroleum had risen rapidly in 2006, reaching 17% of GDP (near its highest ever level), as over 50% of the value of gross production of petroleum is channelled to the state in one form or another; increased investment expenditure and lower output caused it to fall back slightly in 2007 (Figure 1.9).

Petroleum income for general government arises through taxes, participation in licences (the "State Direct Financial Interest") or ownership of the producing companies (most production is from majority state-owned companies). Budget calculations including these revenues show that the general government ran a surplus of 17% of GDP last year, down from 18.5% in 2006. For more than a decade, however, this revenue has been

Figure 1.9. **Taxes and royalties attributable to petroleum production**



Source: Norwegian state accounts and National budget.

StatLink http://dx.doi.org/10.1787/425464184286

notionally separated from the presentation of the budget figures, and channelled into the Pension Fund.[1] The level of inflows and gains on world stock markets raised the level of assets in this fund to about 90% of GDP by the end of 2007.

In this way, the rest of the economy is insulated from fluctuations in revenue from North Sea activities, whether these are due to changes in production volumes or world energy prices. The Pension Fund is held entirely in overseas assets, so that foreign currency inflows due to the North Sea are neutralised at the same time. The build-up of the fund effectively converts the non-renewable resources under the North Sea into financial assets.

The growing Pension Fund

The increasing value of assets in the Pension Fund poses some awkward questions as to how they should be used. They potentially give Norwegian governments' great scope for expanding public spending or reducing taxation. Since 2001 governments have agreed to constrain themselves by adopting a rule that only the financial returns on the fund should be used to finance government spending; this gives rise to the "4% rule", 4% being a plausible estimate of the average real rate of return that could be expected over the long term. But even spending only the returns on the fund may present a dilemma, since the expansion of the fund has meant that the real value of the 4% has grown rather rapidly and permits the government in effect to finance a significant and growing budget deficit in the mainland economy. This may appear to have had similar effects to a pro-cyclical fiscal policy in the recent boom period. Chapter 2 discusses whether any alternative approach is feasible.

As assets held abroad in the pension fund build up, income from them is becoming significant. It does not show directly in gross domestic product, but is included in national income, a less often used concept. Since it is retained offshore in the Pension Fund it is largely automatically saved.[2] Given the estimated real rate of return of 4%, on assets currently equivalent to over 90% of GDP, the Pension Fund should thus provide around 4% of national income; this compares with about 22% for oil and gas extraction, nearly 9% for

manufacturing or 1.2% for agriculture, forestry and fishing. In the future this contribution will grow significantly, but to what level is highly dependent on future prices and the extent to which new recoverable reserves can be discovered. Perhaps surprisingly, the build-up of foreign assets has not yet turned Norway into a significant net recipient of income from abroad. National income barely exceeds gross domestic product, as payments abroad, on foreign investment in Norway, along with employment income paid abroad, offset foreign earnings (Table 1.3). This is a reminder that holding large net foreign assets is not a guarantee of substantial net overseas earnings if the returns are insufficient or substantially less than those earned by foreign investors in Norway. In fact, while net foreign assets are increasing, gross liabilities to abroad are increasing too; the non-oil current account of the balance of payments is running a significant deficit around 10% of mainland GDP which is financed by borrowing from abroad.

Table 1.3. **GDP, income from abroad and national income**

	Per cent of national income					
	1990-94	1995-99	2000-2004	2005	2006	2007
Gross domestic product	102.49	101.09	100.03	99.31	100.25	99.57
+ Net compensation of employees from abroad	–0.24	–0.30	–0.43	–0.55	–0.62	–0.80
Of which: from abroad	(0.15)	(0.19)	(0.17)	(0.17)	(0.16)	(0.16)
to abroad	(0.39)	(0.49)	(0.60)	(0.71)	(0.78)	(0.96)
+ Net property income from abroad	–2.25	–0.78	0.40	1.24	0.37	1.23
Of which: from abroad	(2.54)	(3.31)	(5.50)	(7.93)	(9.04)	(9.82)
to abroad	(4.79)	(4.09)	(5.10)	(6.70)	(8.67)	(8.59)
= National income	100.00	100.00	100.00	100.00	100.00	100.00
Memorandum item:						
Net primary income from abroad due to Pension Fund[1]	..	< 0.5	1.2	2.2	2.5	3.3

1. In the national accounts conventions, capital transfers do not include capital gains, which can lead to serious distortions.
Source: Statistics Norway.

Pressure on capacity has attracted immigrants

Capacity pressures would have been much stronger than they actually were if there had not been substantial and increasing flows of labour migration. Within the Nordic labour market there has been a tradition of labour movement between Sweden, Denmark and Norway in response to relative cyclical positions, whereas inward migration from other countries was for a long time mainly related to humanitarian flows and family reunification. Since 2004, however, inflows of labour migration from other countries have picked up markedly, as Norway allowed movements from the new members of the European Economic Area; in practice, this has mostly meant Polish immigrants.

The rate of population growth has been increasing slowly since its trough in the early 1980s, as fertility picked up a little. Net immigration too has been trending up since the late 1980s, with some fluctuations, but the recent acceleration has been quite sudden; in 2006 and 2007 more than half of the increase in population was due to immigrants. Although the actual increase in immigrant inflows came suddenly, pressure had been building up in the labour market for some time, and there was already some increase showing before 2004. The further opening of the European labour market that followed the accession of the new EU members allowed a sudden release of some of this pressure.

Movements of labour such as these are clearly beneficial overall, most of the gains accruing to the much higher earnings immigrant workers can get in Norway than in, say, Poland. The recent inflow has gone hand in hand with continuing – if slowing – labour productivity growth in the mainland economy. This contrasts with the experience of a number of other European countries – notably Italy and Spain – that have seen substantial immigration, but where the inflows have been accompanied by very low overall productivity gains. However, although many recent immigrants to Norway have been recruited to work in relatively unskilled construction or service jobs, at least some of them are in fact relatively skilled and are often recruited directly in Poland by employment agencies that have grown up specialising in selecting workers for specific kinds of job in Norway.

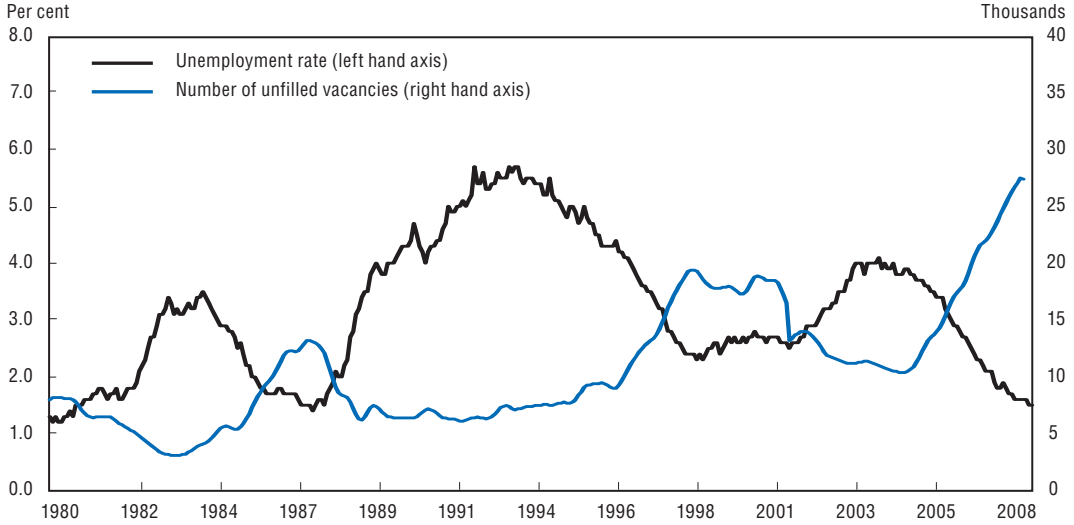
One question that arises is how long can Norway expect such inflows to continue, and what impact this might have on macroeconomic policy, in particular on how to assess capacity utilisation. While the gains to migrants are clear, other questions concern the kind of benefit the Norwegian economy obtains, especially outside the immediate sectors in which immigrants work – new immigrants are particularly concentrated in the construction sector and certain services. Casual observation – very low unemployment, rising wage inflation – suggests that the economy "needs" immigrant labour. But other information – high rates of sickness and disability, a tendency towards early retirement despite the high statutory retirement age – also suggests that some policies may be restricting labour supply from the existing population, accentuating the apparent need for immigration. If this is so, is it a deliberate policy choice or an unwanted side effect of other policies? Chapter 3 discusses some of these issues, in the context of a labour market which has become very tight.

The labour market is tight, some reforms have been neglected

Employment growth has been strong in nearly all sectors of the economy and the balance between vacancies and registered unemployment has never been so tight (Figure 1.10). While the booming private sector economy is behind increases in sectors such as construction, financial services and some manufacturing industries, growth in employment continued in public administration, education and health services. At the same time, as witnessed in an increasing number of European countries, the number of people on sickness and disability benefits – estimated at 10-13% of the labour force – appears to be much higher than can reasonably be justified by the population's real health status. Furthermore, while it is true that the official retirement age in Norway is relatively high, there seems to be an increasing tendency to use disability or other benefits to retire early. In all of these areas, previous *Economic Surveys* have urged action. It seems clear that, while the open unemployment rate is kept very low because of strong demand for labour but also because of strict conditionality imposed on benefit recipients, immigration may not be the only way in which growing demand for labour can be satisfied.

The Nordic model puts great weight on achieving fair outcomes, whether in terms of employment, wages or, as discussed below, in education; wages vary relatively little from one sector to another (Figure 1.11). In the labour market, while a tripartite framework for negotiation of wages and conditions is the foundation of the model, the government's role is generally limited to providing the framework, while negotiations themselves are conducted together by trade unions and employers only. There is, for example, no national legal minimum wage. But the system can react somewhat as if there were such a minimum wage. In 2004, a legal provision for the extension of collective bargaining agreements to

Figure 1.10. **Vacancy rates[1] and registered unemployment[2]**

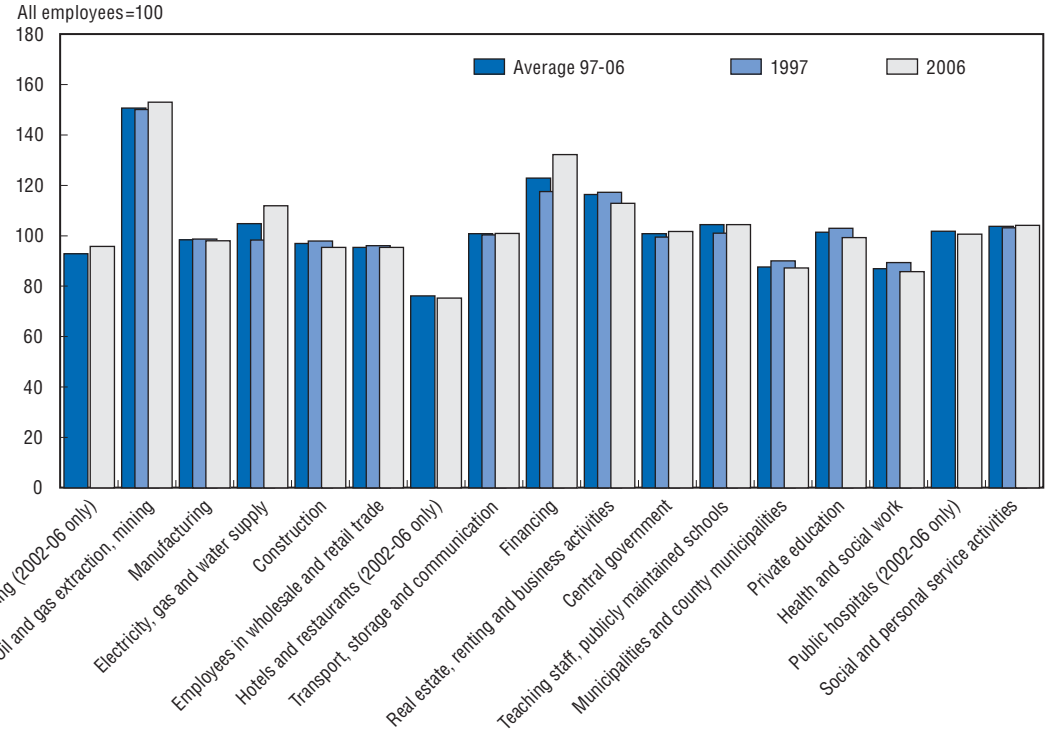


1. Trend-adjusted.
2. Seasonally adjusted.

Source: Norwegian Labour and Welfare Administration (NAV).

StatLink http://dx.doi.org/10.1787/425465510348

Figure 1.11. **Average earnings by industry**



Source: Statistics Norway.

StatLink http://dx.doi.org/10.1787/425466471872

cover groups of workers (foreigners, in particular), that had not been party to the negotiations, which had been in place for some years (since 1994) without ever being used, was activated for the first time to cover seven onshore petroleum installation sites, a second occasion concerned construction workers in the Oslo area.

Since then, the wage extension order for the construction industry has been expanded to cover construction nationwide. The government's declared aim to avoid "social dumping" is part of the justification for these actions. Some, for example employers in the Federation of Commercial and Service Enterprises, have suggested that a more effective way of achieving these aims would be a legislated national minimum wage. Both wage extension orders and a minimum wage would indeed protect immigrants from very low wages, although it seems clear that the workers had willingly agreed to their terms and conditions. Most employers seem also to have been in favour of the wage extensions, despite the resulting higher costs; a side effect may be that they are thus protected from competition by new or foreign entrants to the sector.

The shortage of construction workers in recent years has been fairly clear, and met by both relatively high wage increases and inflows of foreign labour. But there are also worries as to whether there are enough highly-skilled employees to satisfy current needs, and also whether the education system is producing enough for future needs. Here neither higher immigration nor increased wages seem to be the response: the existing immigration quota for highly-skilled people is never filled, and the share of university graduates in areas such as science and engineering is falling (see Chapter 4); this may be a rational reaction to the fact that wages for such graduates are not particularly attractive because of the highly compressed wage structure which is characteristic of Norway. Indeed, science/engineering graduates can expect starting salaries that are not much higher than graduates in sociology or in humanities, subjects which are certainly important but also less adequate to the production needs of the Norwegian economy.

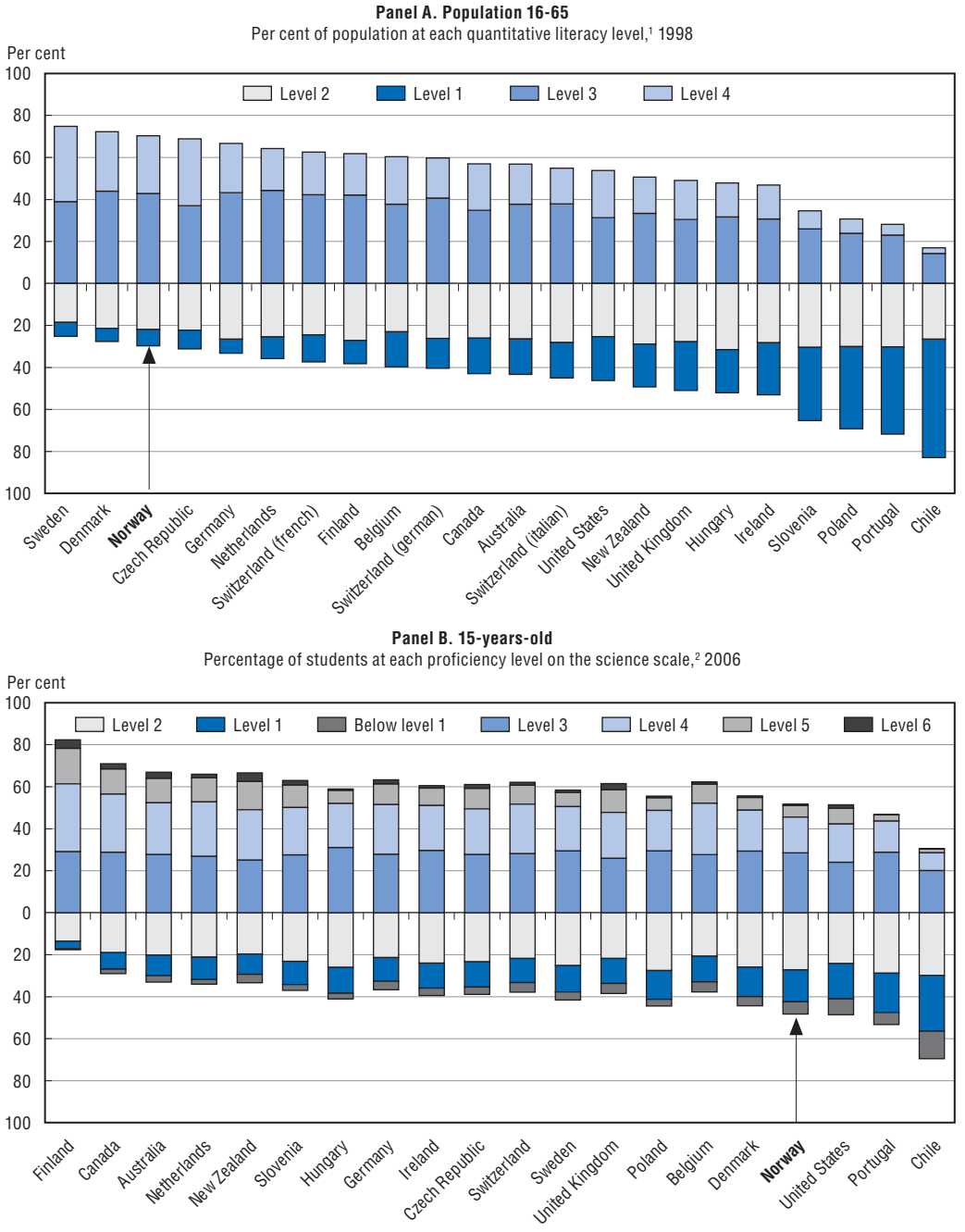
Room for improving cost-efficiency in education

Generally speaking the level of education among adults in Norway is very high, although direct measures to confirm this, comparable across countries, are few. Indirect measures such as the possession of a tertiary diploma or the number of years of completed education show Norway as being among the top OECD countries. The International Adult Literary Survey of 1998, reporting literacy skills in the adult population, shows that Norway ranks with or above the very best countries (Figure 1.12, Panel A). Such results are on the one hand consistent with the observation that productivity in Norway is high and on the other hand comforting: it is widely accepted that as petroleum resources diminish, Norway will increasingly have to rely further on "knowledge based" industries, rather few at the moment, and the Pension Fund, to maintain its standard of living.

For this reason, results from the OECD cross-country assessment of educational achievement among 15-year olds, in the PISA programme, are both puzzling and disquieting (see Figure 1.12, Panel B). These results are puzzling, because Norway spends relatively more than most countries on its educational system and because of the contrast with the adult literacy comparisons. They are disquieting, because of the implications for the efficiency of the education system and the future of the knowledge economy in Norway if relative competence levels really are as poor (and declining) as PISA results suggest.

A relatively poor showing at age 15 is not automatically inconsistent with high performance among adults. It is noteworthy, for example, that while there appears to be a significant problem with students dropping out of upper secondary education (age 16-19), surveys of adults show that many of those who drop out do eventually complete upper secondary education at some time. In other words, the system appears to have some ways

Figure 1.12. **Percentage of the population and students at each proficiency levels in Norway**



1. Quantitative literacy scores, as performed by the IALS (International Adult Literacy Survey) rank from very poor skills (level 1) where the individual can only perform a single and relatively simple operation (usually addition) to higher skills (level 5) where the individual can perform multiple operations sequentially. The graph in Panel A reads as follows: The bars for each country are stacked to 100%, with each share representing the proportion of the population at a given literacy level. By convention, population shares at levels 1 and 2 are shown in the bottom quadrant, allowing much easier comparison of proficiency levels across countries. For example, the adult population with a proficiency level below level 2 is about 30% in Norway against 70% in Poland.
2. Science competencies, as defined by PISA (Programme for International Student Assessment) ranges from the lowest level (level 1) where students possess limited scientific knowledge and can only explain very easy stylised facts, to the highest level (level 6), where pupils' knowledge is good enough to develop scientific reasoning and arguments.

Source: IALS (1998), PISA (2006).

StatLink http://dx.doi.org/10.1787/425577701076

of making up for certain problems. This does not mean that this is an efficient approach, however; for example, the level of mathematical ability in first year university students has declined. This may require remedial teaching that was not necessary in the past.

Since the first PISA results became known, policymakers have been looking for ways to improve the performance of compulsory education. Institutionally, the compulsory education system is quite decentralised, with a lot of independent decision making power vested in schools themselves. Furthermore, the degree of formal accountability seems quite low – the performance of schools is not systematically checked against centrally determined standards, for example. Nevertheless, schools across the country seem to have a quite similar performance, and the influence of parental background on results is lower than in most countries. This would appear to reflect the low level of social inequality in Norway, including a low level of segregation between social districts. On the other hand, within-school variation in pupils' performance is high.

An important question, to which research unfortunately provides no unambiguous answers, is whether it is possible to maintain an emphasis on equity while improving average performance. Finland certainly offers a tempting example in this respect, showing that there is no obvious trade-off between equity and average performance. It should certainly be an important inspiration for the Norwegian system because of the many aspects that the two education systems and, more broadly, the two societies have in common. However, it should not be seen as the only benchmark, because while the Finnish system is by many standards one of the most successful, the drivers of its success are still not fully known. In addition, there are other best-practices in this area that should be carefully studied by Norway. Chapter 4 discusses some of these best-practices and points to some lessons that might be useful for Norway too.

Prompted by the PISA surveys, there is a strong willingness at the political level and among the educational institutions to tackle education reforms in Norway and to improve educational outcomes. This is an asset that the Norwegian authorities can use to promote reforms, although careful thought is necessary since there have been a number of reforms implemented in the last few years; there is a risk of losing credibility both among education professionals and the population. Some of the objectives of these reforms were certainly sound, as for instance the key focus on improved competencies for teachers and better learning outcomes for pupils, which are central in the recent Knowledge Promotion reform. However, the strategy to reach their ambitious goals could be improved. The June 2008 White Paper presents further measures at the national and school level, to improve educational outcomes.

Educational systems are not easy to reform, because of the many actors involved and because many factors shape educational performance. Some issues are also controversial, such as the idea of benchmarking by publishing national test results at school level, which is opposed by some authorities and by some schools themselves. Similarly there is strong resistance in most areas to the idea of linking reward for teachers or school principals to their performance. But the municipality of Oslo, by far the largest in the country, has nevertheless been experimenting on these lines and reports that first results are encouraging; this is an important example because it shows that these reforms are possible in the Norwegian context and not necessarily too politically costly to implement.

Norwegian schools are not only performing below international standards, but they also cost quite a lot because of their small average size and because there are relatively few

students per teacher. These are not the best ways of getting value for money; resources can be saved, or usefully re-directed if ways could be found to close or merge schools so as to better exploit economies of scale, and if Norway would allow relatively fewer teachers but higher teaching hours. Chapter 4 considers these issues, together with the need to invest in strengthening teachers' competencies so as to improve teaching quality, as well as the role that improved accountability can play in reaching the goals of reform.

The environment

Norway has often been in the forefront of international efforts to work towards environmental improvements. An enthusiastic promoter of the Kyoto Protocol, the Norwegian government recently announced that it would in fact over-fulfil its Kyoto commitments by 10 percentage points, corresponding to 5 million tonnes of CO_2. This will be achieved by purchasing more emission reduction certificates than needed to offset the excess of national emissions over the Kyoto target. It will simply neutralise these excess purchases, and thereby reduce the supply of certificates, lowering overall emissions outside Norway. The government has also announced an ambitious plan to become carbon neutral by 2050, or by 2030 if it could be done as part of an ambitious global agreement, in which other industrialised countries also undertook strong commitments. This would entail Norway financing emission reductions abroad corresponding to the remaining domestic emissions in 2030.

Notes

1. Previously called the Oil Fund, it was renamed "Government Pension Fund – Global" to reinforce the idea that the assets are intended to be held in trust for future generations; but in fact there is no statutory or other link between old-age pension liabilities and the Pension Fund.
2. Or rather, any excess of total income over 4% is saved, since an average of 4% of the fund's value is transferred to the state government to finance the budget.

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ANNEX 1.A1

Taking stock of structural reforms

This table reviews recent 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 *Survey* (January 2007)
A. SOCIAL PROTECTION	
Minimise work disincentives in the unemployment insurance system	The special benefit for persons who have exceeded the maximum employment period has been abolished. The maximum unemployment benefit period for temporary laid-off workers has been reduced from 34 to 30 weeks. The period in which persons on vocational rehabilitation (many of whom are formerly unemployed) are entitled to vocational rehabilitation benefits after completing rehabilitation, has been reduced from six to three months. All these measures were introduced 1 January 2008.
Reduce sick leave	Several measures implying a closer follow-up on the person reported sick, by both the employer and the Labour and Welfare Services, were introduced in March 2007.
Tighten disability schemes	No legislative action. A Government report on the disability scheme recommends improving incentives through cutting replacement rates after one year, but also recommends increased expenditure in other areas. The Government has announced that it will follow up this report with a legislative proposal in 2009.
B. LABOUR MARKETS	
Increase flexibility in wage setting	Backwards action: The use of a mandatory extension of wage contracts in certain construction areas to raise freely-contracted wages paid to immigrant workers, with the object of combating social dumping, was extended to construction sites nationwide.
Modernise employment protection legislation	Backward action: the power of unions to veto decisions by companies to use agency workers has been somewhat increased.
Enhance efficiency of job placement services and ALMP	No further action. July 2006 merger of the Public Employment Services and the National Insurance Services still taking effect.
C. EDUCATION	
Improve the assessment of education	Streamlined assessment tests introduced in autumn 2007. School-level results not published. See Chapter 4
Improve the quality of primary and secondary education	In the context of the strategy "Competence Development", funds were allocated to training programmes for teachers. However the funds are largely directed to informal training, and not to training that gives accreditation to teachers. See Chapter 4.
Increase local flexibility in teachers' wage bargaining	Despite the legal possibility of local bargaining, teachers' wages are still essentially fixed by the centralised, national settlement. See Chapter 4.
D. FINANCIAL MARKETS	
Ensure competition in the banking sector	Switching codes are introduced as from May 2008, with the objective of improving the portability of loans, and current accounts, therefore increasing competition in the sector. A public Internet site (*www.finansportalen.no*), was opened in January 2008 to provide updated information on rates, premiums etc. that can facilitate the comparison of offers from all banks and insurance companies In Norway. In February 2008 the Ministry of Finance asked the Competition Authority to undertake a study assessing competition enforcement and efficiency of the sector.

Recommendations	Action taken since the previous *Survey* (January 2007)
E. QUALITY OF PUBLIC FINANCE	
Raise the efficiency of public spending	The 2007 Budget widens experimental treatment of accrual accounting (in principle giving better cost information) with an evaluation planned in 2009.
Tackle ageing issues	The White Paper on pension reform presented in October 2006 presents a well-oriented reform, preserving three key principles: 1) consider all working years in the calculation of pension entitlements; 2) adjust pension entitlements for all cohorts should life expectancy increase, and 3) index pension benefits to the average of prices and wages. It also achieves a more progressive benefit structure (by raising the minimum pension and lowering the benefit ceiling), while preserving the long run fiscal saving (3% of GDP) envisaged earlier. But although discussions have taken place with the social partners, legislation has not been introduced. The recent wage agreement has deferred the life expectancy adjustment to pension benefits for the cohorts born between 1936 and 1952; on that occasion the reform of the AFP scheme (a pension supplement given to early retirees) has also been negotiated, with mixed results as far as incentives to stay in the labour market are concerned. The means testing of pensions against income is abolished for pensioners aged 67, from 1 January 2008.
Reform the tax system	The largely revenue-neutral 2008 budget made several changes to the net wealth tax in order to strengthen its distributional profile. It provides increased tax incentives to second and subsequent children and also reintroduces incentives for private pension saving. The balance of environmental taxation was somewhat further aligned on estimated costs, with increased tax on diesel fuel and on domestic air fuel. The process of "greening" the tax system on cars is continued by reducing the annual tax on cars with relatively low emissions of NO_x and particles.
F. ENVIRONMENTAL POLICIES	
Limit CO_2 emissions	Following the logic of a quota system, CO_2 taxes have been removed from emission subject to quotas. Government announced that it will buy quotas on the international market, but not use them, so as to reduce overall global emissions.
Develop renewable energy resources	Norway will allocate a NOK 20 billion fund to strengthen efforts in renewable electricity production, use of renewable energy and increased energy efficiency.
G. AGRICULTURE AND FISHERY	
Enhance competition in the agriculture market	No action.
Reduce tariffs and increase import quotas in the agriculture market	No action.
Reduce restrictions on transfers of fishing quotas	Transfer of fishing quotas when a vessel is withdrawn from fishing ("structure quotas") reintroduced as of 8 June 2007 (after structural "pause" from 20 Oct. 2005).
H. SUPPORT COMPETITION AND REDUCE STATE AID	
Increase regulatory power of competition authorities	There have been fewer rulings of the Norwegian Competition Authority (NCA) overturned on appeal by the government. Backward action: the government intends to simplify the procedure for political decisions of overturning rulings in merger cases that involves questions of principle or major significance to society. The suggested change is that the King in Council (full cabinet) can reverse an NCA decision without waiting for it to be evaluated by the Ministry of Government Administration and Reform on competition grounds. Cases taken up by the NCA have notably concerned transparency in electricity supply, competition in transport and food distribution.
Increase competition and reduce barriers to entry	The previous intervention against the SAS Group's Frequent flyer program for domestic flights was prolonged by a general statutory provision pursuant to the Norwegian Competition Act.
Reduce state aid, public subsidies and tax distortions	The Norwegian special tax system for shipping was amended in the 2008 budget, and is now mainly in line with the EU tonnage tax systems. As part of the agreement of all tax debt accumulated under the former system must be paid back within a 10-year period. of the accumulated tax debt can be used for certain environmental purposes during a 15-year period. Backward action: certain tax expenditures for agriculture were slightly increased in the 2008 Budget as "compensation" for increases in other taxes.
Reduce state ownership in corporate Norway	No further privatisation. Backward actions: The government has acquired authority of the Parliament to increase state interests in StatoilHydro (merger of Norsk Hydro petroleum activities and Statoil) from 62.5 to 67% but not exercised a purchase. The government took a 30% share, with veto rights, in Aker Holding AS (the holding company that controls 40% of Aker Kvaerner, a supplier of products and services to the energy sector).
Improve state-owned activities governance	A White Paper of December 2006 confirmed the organisation and main principles of state ownership in the business sector. Share options have been abolished.
Improve monitoring of cost-effectiveness of support for innovation and R&D	Statistics Norway's evaluation of tax-subsidy scheme (Skattefunn) shows it performs well on additionality compared to similar schemes in other countries.
I. PRODUCT MARKET COMPETITION	
Promote competition in the postal services	No action.
Reduce barriers to entry in the retail sector	Backward actions: an exception to the Competition Act, allowing booksellers to set fixed prices for educational books, has been extended to July 2008.
Enhance efficiency in transport services	No legislative action. A third airport serving the capital area (Moss Airport, Rygge) opened to civilian traffic as of 14 February 2008.

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Chapter 2

Macroeconomic policies for a soft landing

Norwegian policymakers face challenging times. The economy is operating with great pressure on production capacity, the labour market is tight and there are signs of overheating – which would all argue for a restrictive macroeconomic policy stance. On the other hand, the financial sector is not immune to the global financial turmoil, the housing market shows signs of a downturn, households are increasingly indebted and there are significant downside risks. The authorities responsible for fiscal and monetary policy should therefore remain vigilant and adjust their stance if the outlook changes significantly. Their forward-looking policy framework – flexible inflation targeting and the fiscal rule jointly with the creation of an overseas fund – has proved robust to shocks in the past and should continue to serve them well. Fiscal policy also needs to continue to preserve the long-term sustainability of public finances.

Since the start of the decade stabilisation policy has used a combination of a flexible inflation targeting monetary policy regime designed to anchor expectations, and a fiscal rule designed to limit and smooth the injection of oil money into the economy. In a situation of surging oil prices and a booming mainland economy, together with strong supply shocks coming from favourable terms of trade effects and increasing immigration, macroeconomic policies have proved so far successful.

The current outlook is changing quite rapidly, however, and new challenges for fiscal and monetary policy are emerging. On the one hand, underlying inflation is accelerating, possibly faster than expected, in a context when domestic demand, although slowing, remains strong. On the other hand, financial conditions have tightened and there are emerging macroeconomic imbalances, such as high household indebtedness, which make the private sector particularly vulnerable to a sudden slowdown or monetary policy tightening. Overall, the balance of risks suggests that macroeconomic policies should remain vigilant to changes of inflation and output from their expected paths. Self-correcting forces, such as the moderation of domestic and external demand should be allowed to operate fully and possibly be accompanied by further tightening if inflationary pressures exceed current anticipations. Conversely if financial conditions or macroeconomic imbalances turn out to be more disruptive, *i.e.* lead to a sharper decline of economic activity than expected, the monetary and the fiscal stance might be loosened.

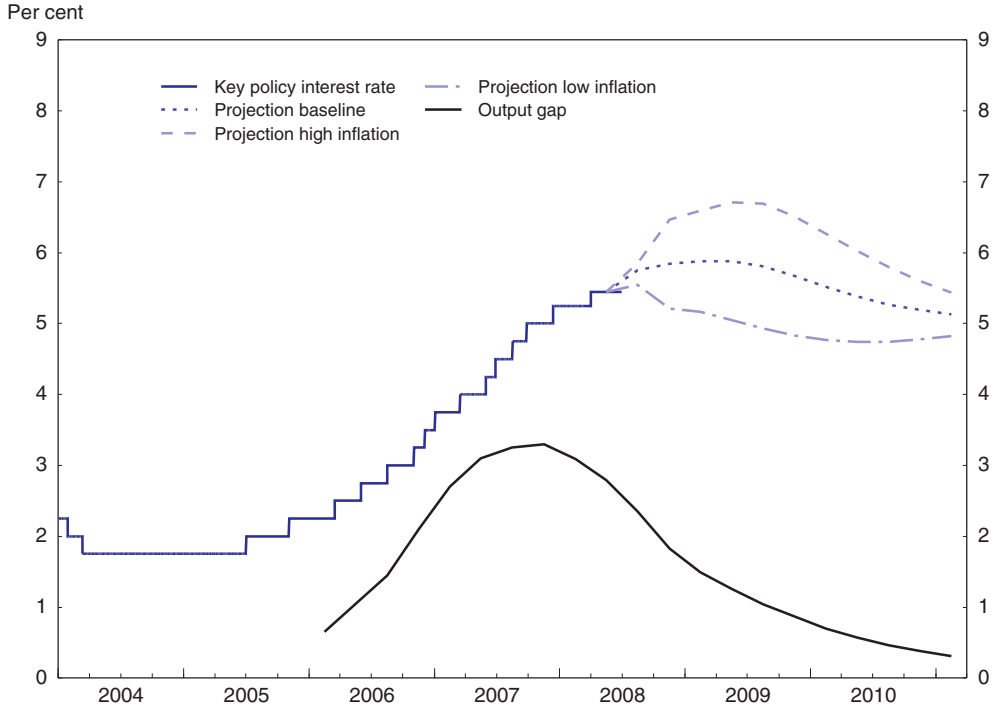
Monetary policy: the tightening cycle is coming close to an end

The operational objective of monetary policy is to achieve an annual increase in consumer prices that remains close to 2.5% over time. The Norges Bank has recently lengthened the horizon at which the inflation target is to be met, in line with the recommendation of the last *Economic Survey*. This horizon was initially set to 2 years and then extended in 2004 to the interval 1-3 years; in 2007 a less rigid formulation – the "medium term" – was adopted, though the practice of continuing to issue forecasts for three years ahead suggests that this is essentially a more flexible way of expressing the 1-3 year period previously used.[1] Such a flexible horizon improves the credibility of monetary policy strategy because it increases the probability that the target will be met, even during periods of disturbances of uncertain duration and size, and therefore enhances the credibility of the policy framework. The target for monetary policy is headline inflation (the CPI index), but Norges Bank looks at several measures of core inflation to gauge current inflation pressures and to filter out, for example, volatile electricity prices as well as changes in taxes and excise duties. Core inflation was very low for a long time. This caused concerns about too-low inflation and resulted in a period of looser monetary policy than would otherwise be implied by strong capacity utilisation in the economy.

A gradual return to neutral interest rates

In the past two and half years, policy rates were raised by 3.75 percentage points in gradual steps, reaching 5.5% in April 2008 (Figure 2.1). This tightening of monetary policy was initiated despite inflation remaining well below the policy target. In retrospect, this preventative tightening of monetary conditions proved to be necessary, as headline inflation has been on a rising trend since 2005. However, the recent acceleration of certain inflation indicators, notably for domestically-produced core prices, suggests that monetary policy may not have been entirely successful in preventing an excessive run-up of inflationary pressures. The combination of fast-rising wages and slowing productivity points to the risk of unit labour costs accelerating towards a pace of growth incompatible with the policy inflation target.

Figure 2.1. **Key policy interest rate**

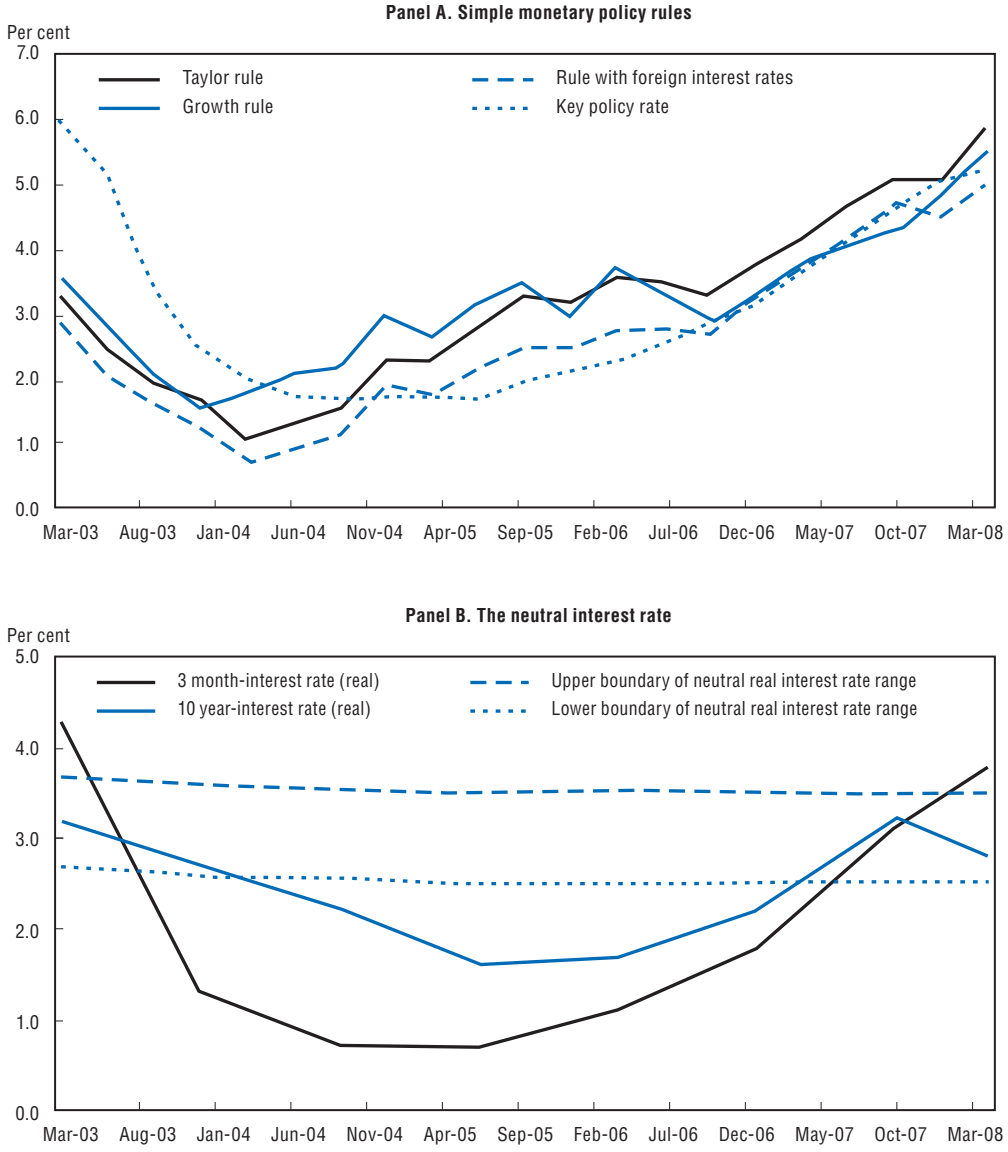


Source: Norges Bank, as published in late April 2008.

StatLink http://dx.doi.org/10.1787/425615805244

The Norges Bank was concerned by the fact that inflation was running well below target for a long time during 2004-06 and thus kept policy rates low, lower than would have been suggested by a Taylor rule, for example. With hindsight, the fear that low inflation would persist may have been exaggerated, so that monetary conditions remained too loose beyond the point at which the economy had turned the corner, although it is too early to draw definitive conclusions. The comparison of the actual interest rate path with simple theoretical rules, which are considered relevant to monetary policy decisions, does point to excessively loose monetary conditions from summer 2005 to spring 2006. Since summer 2007, money market rates have been higher than the simple rules. The Taylor rule suggests that the policy rate could have been set significantly lower in 2004, and raised starting in the second half of 2004, but the actual tightening cycle only began one year later,

Figure 2.2. **Assessing the monetary policy stance**[1]



1. The methodology used to compute the various interest rates shown in both Panel A and B are as follows: The Taylor rule: interest rate = inflation target + equilibrium real interest rate + 1.5 x (inflation – inflation target) + 0.5 x Output gap. The growth rule: interest rate=inflation target + equilibrium real interest rate + 1.5 x (inflation – inflation target) + 0.5 x Growth gap, where growth gap = actual growth – trend growth. Rule with foreign interest rates: interest rate=inflation target + equilibrium real interest rate + 1.5 x (inflation – inflation target) + 0.5 x Output gap + 1.0 x (real interest rate among trading partners – real interest rate in Norway). The Taylor rule, the Growth rule, the Rule with foreign interest rate and the Neutral rate bands are estimated by the Norges Bank.

Source: Norges Bank.

StatLink http://dx.doi.org/10.1787/425631135571

and with only gradual increments. A Taylor rule has of course many limitations, notably the consideration of current instead of expected inflationary and output pressures and the absence of an exchange rate channel which is relevant to a small open economy. Moreover, output pressures are gauged through output gap estimates, which are highly uncertain and which may be misleading for inferring inflation pressures (OECD 2008a). Indeed, other

policy benchmarks, such as a growth rule and a rule focusing on foreign interest rates, suggest that the gaps between actual policy decisions and these alternative rules are smaller than when using a Taylor rule.

Another way of assessing monetary conditions is to look at the difference between the money market rates and an estimated neutral interest rate, which is currently estimated in Norway to be in the lower end of the interval 2½-3½ per cent, in real terms, based on the long-term average of 10-year interest rates. Figure 2.2, Panel B, shows that the money market rates were below neutral until mid-2007, implying an expansionary policy stance well into the period of acceleration of economic growth. Recently, the 3-month interest rate exceeded the upper-bound of the interval for the neutral interest rate; this reflects not only the gradual tightening of the policy stance, but also the increase of spreads between the policy rate and money-market rates, which has affected monetary conditions in Norway after the onset of the global financial turmoil in the same way as in other countries. From this perspective, monetary policy appears to have remained expansionary well into the upswing. However, empirical estimates of the neutral interest rate come with a lot of uncertainty (Bernhardsen, 2005).

Finally, Norges Bank's performance relies partly on its ability to forecast economic developments in real time and over the medium term. According to a number of reports (see Box 2.1), Norges Bank systematically overpredicted inflation since the introduction of the inflation targeting regime up until 2005. This is partly due to Norges Bank's forecasting tools, though it seems to depend to a larger extent on unexpected shocks, notably to the terms of trade, which were particularly difficult to foresee. While Norges Bank's past forecast errors do not seem to have undermined its credibility (Juel *et al.*, 2008), there is scope for improving and extending the set of forecasting models as well as to have an open discussion about their use and limitations (see Box 2.1).

The inflation outlook is deteriorating

Norway's economic outlook is changing rapidly and monetary policy is likely to be confronted soon with new challenges. Until the end of 2007, headline and core inflation were subdued, for three principal reasons: falling import prices for goods bought from emerging markets; a general appreciation of the effective exchange rate; subdued labour costs thanks to high productivity growth and moderate wage rises.[2] Some of these disinflationary forces have recently weakened and the inflation outlook looks less favourable for the period ahead. Import prices have stopped declining and may well start increasing. But the main risk probably comes from the domestic side. The price for domestically produced goods and services has been the main recent positive contributor to inflation (Figure 2.3). During the first quarter of 2008, the prices of consumer goods produced in Norway increased at an annual rate of more than 10%, while services increased at 3% (with services in which wage costs predominate growing at almost 6%) (see Figure 1.7). These two components represent almost half of goods and services consumed by households.

Increasing strains on the labour market, in spite of an abundant inflow of migrants, combined with slackening productivity growth, are behind the acceleration of business unit costs. The unemployment rate has plunged to its lowest levels since the 1980s and the number of unfilled job vacancies has soared in the last two years. In these conditions, wage growth has increased, reaching 5.4 %. in 2007; in the off-shore sector, wage growth reached 6.5% The 2008 wage round is likely to end up with similarly high wage growth, possibly

Box 2.1. **The use of models to guide policy decisions**

Norges Bank makes use of a relatively large number of forecasting techniques and "nowcasting" (*i.e.* assessment of the main macroeconomic variables in real time) tools. For the latter, it relies on surveys carried out through its regional network of 1300 institutions (firms, organisations and municipalities) five times a year. In recent years, the bank has considerably strengthened this network, feeding its inflation forecasting model with an increasing amount of data. Two recent reports observe, however, that a further effort should be made in some areas by Statistics Norway, such as wage and labour market statistics (Goodfriend *et al.*, 2007; Juel *et al.*, 2008). Monthly employment data, with a careful monitoring of foreign workers, as well as improved capacity utilisation data, would be extremely useful to get a more accurate picture of the degree of slack in the economy. Similarly, publication of productivity statistics on a more regular basis than is done at the moment may make it possible to compute unit labour costs on a more regular basis and thus provide complementary information to wages.

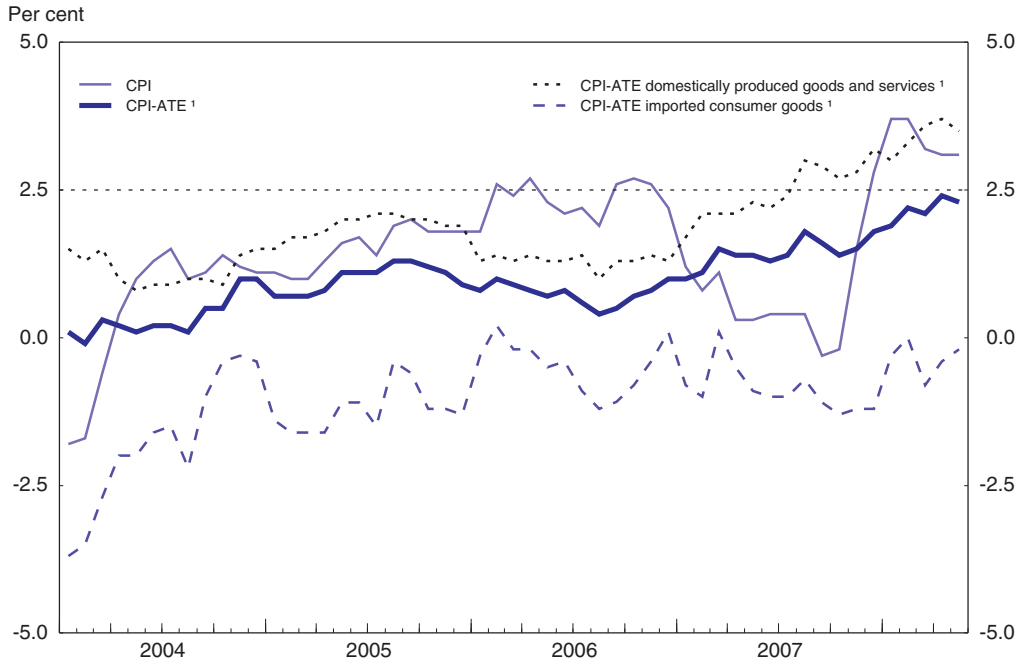
For short-term forecasting, over the first few quarters, Norges Bank uses time-series models (ARIMA and VAR). Long-term forecasts are based on the combination of a structural calibrated model and the statistical models predicting short-term developments, with an important judgmental component. Norges Bank's structural model is a relatively sophisticated model and is based on the IMF's Global Economy Model, which has been adopted by a number of other central banks (United Kingdom, ECB, Canada and Sweden) (IMF, 2004). A much simpler model, used in tandem with the structural model, was recently criticised for having over-predicted inflation and under-predicted uncertainty, and to have performed less well than "pure" forecasting models that, while are not grounded in economic theory, fit actual Norwegian data well.

While the structural model's assumptions could be improved (notably those on wage formation and transmission of imported inflation to the economy,* it is certainly a tool that Norges Bank should continue to use. Together with this model, however, consideration of empirical models where the need to fit observed data has a higher weight might also be envisaged to better inform policy decisions. As suggested in Juel *et al.* (2008), pure statistical models have the advantage of exploiting more quickly and effectively real-time information and their empirical relation to inflation process than what the current core, theoretically-based model can do. It would be thus of interest for the central bank to compare projections between simpler and more sophisticated models and to openly communicate about the range of forecasts that these models produce.

* Specific assumptions that have been criticised are: "1) the exchange-rate forecast rests on the assumption of uncovered interest parity, an assumption that has very weak empirical support generally, not just for Norway; 2) the model incorporates inflation in the import sector in a rather rudimentary fashion, so that the effects of foreign shocks are unlikely to be very well captured, (for example, the model has been unable to foresee the negative impact on inflation in the import sector); 3) the model implicitly assumes a frictionless, atomistic labour market, while the Norwegian labour market is characterized by highly centraliSed wage formation, as mentioned above and 4) there is no role for credit market frictions or asset prices." (Goodfriend *et al.*, 2007).

higher due to stronger carry-over effects and catching-up wages in the public sector. Slackening productivity growth has been a typical pattern at the end of most previous cycles, though more recently there have been exceptions. While future productivity growth developments remain highly uncertain, the productivity-enhancing effects of product market policies adopted in the late 1990s and early 2000s have probably already come

Figure 2.3. **Inflation**
12-month change



1. CPI adjusted for tax changes and excluding energy products

Source: Statistics Norway, Norges Bank.

StatLink http://dx.doi.org/10.1787/425641477864

through. If true, this may imply a need for somewhat tighter monetary conditions than currently envisaged by Norges Bank.

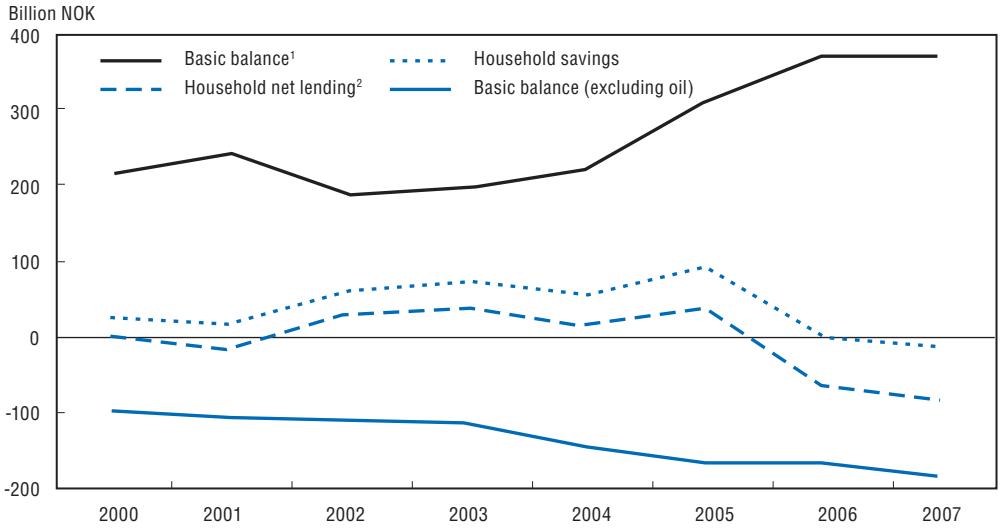
Households' vulnerable financial position

The balance-sheet position of the private sector weakened over the recent past. Reflecting strong consumption growth, and despite high real income increases, the household sector's saving ratio has fallen into negative territory; together with high residential investment, this has implied a fast deterioration of the household sector's net lending position (Figure 2.4). The business sector is also highly indebted, though debt servicing capacity is probably not an issue, thanks to substantial corporate profits and increased equity ratios accumulated in a period of rapid economic expansion. Cheap credit conditions have certainly sustained consumer spending. The ratio of household debt to household (disposable) income has increased steadily over the past ten years. In a context of rising interest rates (first as a consequence of tighter policy, later due to spill-over from the turmoil in the international financial markets) and rising indebtedness, and because nearly all household debt is contracted at floating interest rates, the interest burden has almost doubled in the last three years (interest on consumer debt is now over 10% of household disposable income[3]).

The housing market is finally cooling

The Norwegian housing market has been on a long upward trend, with real prices trebling over the past 14 years. The market accelerated further in 2006, showing signs of increased risk-taking and euphoria. The share of residential investment to GDP has

Figure 2.4. **Private dissaving, government saving**
NOK billion



1. The basic balance is the sum of current account balance and the net movement of long-term capital (direct and portfolio investment).
2. Net lending is defined as savings minus net acquisition of non-financial assets minus capital transfers.

Source: Statistics Norway.

StatLink http://dx.doi.org/10.1787/425714018885

increased substantially, as did the asset price/replacement cost ratio (Tobin's Q), which is one of the highest in the OECD area. After this historical run-up, there are signs that the market may have reached the turning point. There has been a significant moderation of housing starts and building activity and the time required to complete housing transactions has lengthened. However, signs of turnaround remain mixed, and house prices (though not those of apartments) appeared to be on the rise again in early 2008. A number of indicators linked to the financial health of the housing sector give rise for concern: *i)* over the last five years loan-to-value ratios for new loans have been very high (over 80% for the majority of households) and a sharp fall in house prices could create problems for highly leveraged households; *ii)* even if the share of households with a high debt burden is not very high, a increase of interest rate of 1 percentage point would imply a worsening for many households (one third of households would then have an interest burden greater than 20%); and *iii)* a tendency towards longer repayment periods for instalment loans (partly due to an increase in interest-only loans) has been observed over the past seven years.

While Norges Bank should not target house prices for the conduct of monetary policy, the macroeconomic and financial effects of house price developments are one of the risks that should be considered when setting policy rates. A sharp downturn of the housing market would not only bring financial troubles to exposed households, but negative wealth effects could also have a sharply negative effect on consumption and consumer sentiment. Although the household sector's position is significantly better than in the banking crisis of the late 1980s, because of the increased value of housing, their net financial wealth is negative (excluding long-term saving such as in life insurance). There has been a strong increase in housing-related equity release loans, which reached NOK 179 billion in 2007 compared with NOK 1145 billion for traditional mortgages; equity release loans accounted

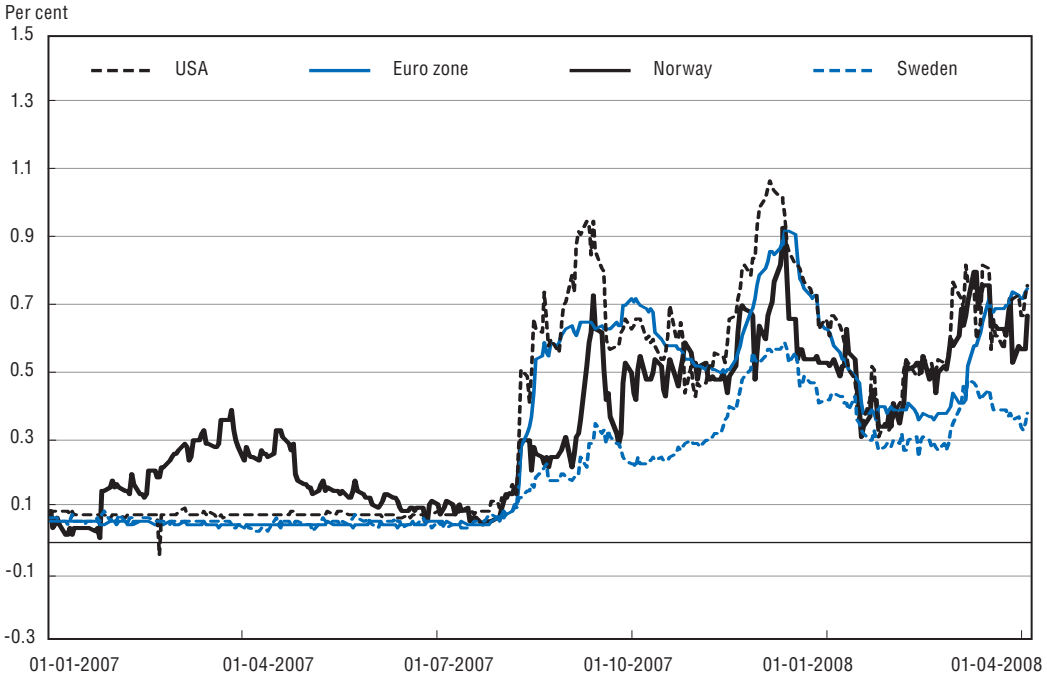
for nearly two thirds of *new* mortgage borrowing (which for households totalled 134 billion) in 2007. There is a danger that this continued borrowing, at floating interest rates, may have overstretched the household sector, now that credit conditions are increasingly tighter. These new type of credit facilities offer a number of advantages to the borrowers (flexible repayment period, loan withdrawals and reimbursements) and, since they are also more risky, they are slightly more regulated than standard loans (*e.g.* the total drawn amount is within the maximum loan-to-value ratio limits, and the latter is set at 75%-80%, lower than for traditional mortgages). Despite greater flexibility for borrowers, equity release loans call for prudent credit standards and careful screening of borrowers and of the quality of the collateral on a regular basis, as the recent report by the Financial Supervisory Authority of Norway argues.[4] It is thus of the foremost importance to exert specific surveillance of non-traditional credit products, even more so considering the liquidity constraints that the market is currently experiencing, as discussed in the next section.

Financial stability not at risk, but signs of tighter lending conditions ahead

There is little evidence that Norwegian banks have been seriously involved in the subprime mortgage crisis. Norwegian financial institutions have not been significantly exposed to structured credit products (although they had begun to refinance some of their own mortgage lending in this way), and recorded only moderate impairments in foreign bond holdings as a result of higher credit risk premiums. Generally speaking, however, Norwegian banks' results in 2007 were good and the return on equity was high. Likewise, Norwegian banks' liquidity situation is satisfactory at the moment: despite high lending growth, banks' tier 1 capital adequacy has been relatively stable. In fact, while deposit-to-loan ratios have rapidly declined in recent years due to rapid lending growth and increasing competition for depositors' funds, the deposit-to-loan ratios rose in 2007, although the share of funding with maturity greater than one year fell for the banks as a whole. The national survey carried out in the fall of 2007 examining banks' funding situation found that, while there are no serious funding problems, the banks did face a challenge in terms of complying with their long-term funding limits. Increasing credit and liquidity risk is reflected in the large increase in the spread between the 3-month interbank rate and policy rate (the nominal sight deposit rate) since the summer of 2007 (spread of about 80 basis points in early May 2008, see Figure 2.5). As in many other OECD countries, the management of liquidity will prove challenging for some time to come.

Norges Bank recently started a Bank Lending Survey. The results for the final quarter of 2007 and the first quarter of 2008 point to a tightening of credit standards on all criteria for both the household sector and non-financial corporations (Figure 2.6). Changes in the general economic outlook as well as banks' increased risk aversion are among the main reasons behind credit tightening. Banks increased their lending margins for loans to households and reduced maximum loan-to-value ratios. For non-financial corporations, tighter credit standards were primarily implemented by increasing equity requirements and lending margins. Tightening of lending standards for the business sector was however stronger at the end of 2007 than at the beginning of 2008. Although lending conditions in Norway seem to have been tightened significantly less than in some other OECD countries (United States, Euro Zone and United Kingdom), there are increasing signs that even the very large banks in Norway are issuing bonds abroad at relatively high interest rates even at times when no significant policy rate decisions are taken.

Figure 2.5. **Spread between money market rates and expected key policy rates**
3-month maturity



Source: Bloomberg, Reuters Eco Win and Norges Bank.

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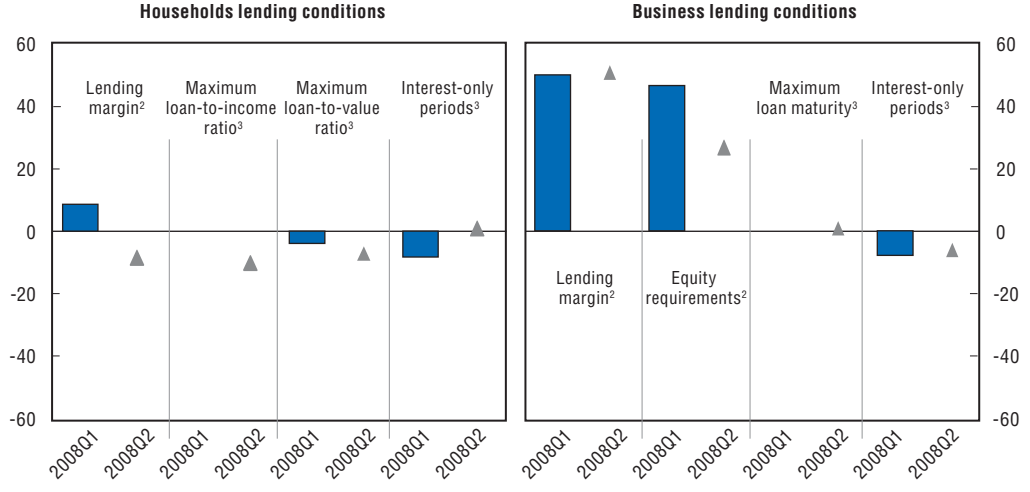
Figure 2.6. **Tightening in lending conditions for households and business sector**
Net percentage balances[1]



1. Net percentage balances are calculated by weighting together the responses in the survey. The bars show developments in lending conditions over the past quarter, while the triangles show the expectations over the next quarter. Interpretation of the changes in net percentage balances varies depending on the lending conditions considered (see note 2 and 3 for the interpretation). The graph should be read as follows: a balance of 46% of loan officers reported having tightened equity requirements on business loans in the first quarter of 2008, whereas 26% of them expected to do so in the second quarter of 2008.
2. Positive net percentage balances for lending margin and equity requirements indicate tighter credit standards relative to the previous quarter.
3. Negative net percentage balance for maximum loan-to-income ratio, maximum loan-value-to ratio and interest-only periods indicates tighter credit standards relative to previous quarter.

Source: Norges Bank and Survey of Bank Lending.

StatLink http://dx.doi.org/10.1787/425844815483

Balancing risks in the current outlook

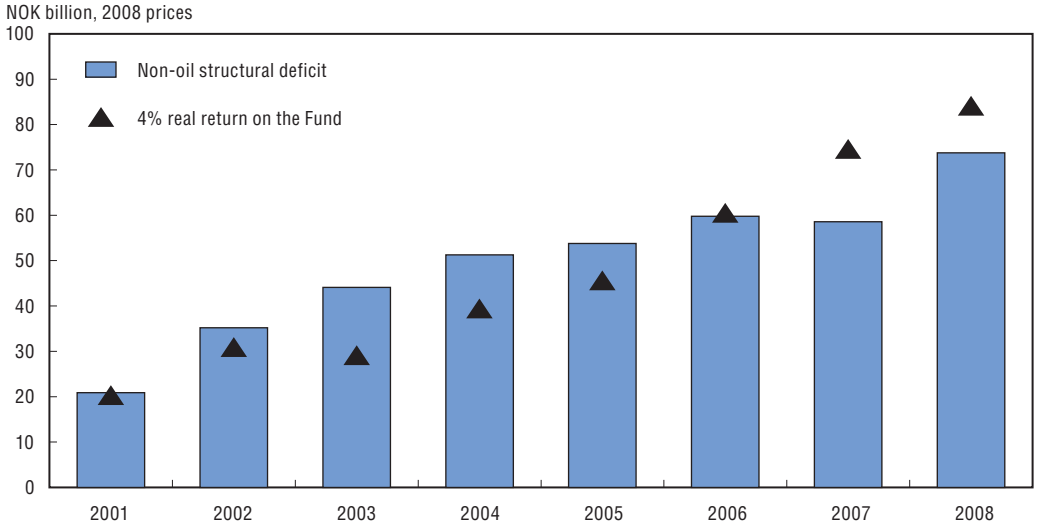
In sum, monetary policy has to strike a delicate balance between continuing tensions on the labour market, which might call for a tighter monetary stance, and the high indebtedness of households and related downside risks. External risks should be taken into consideration too, because they are an important source of instability at the moment. Exchange rate developments too need to be taken into account, with expected interest rates among Norway's trading partners being one of the factors that influence variation of exchange rates. Overall, monetary policy will need to remain tight for most of 2008, and it might need to tighten again before the end of the year if inflationary pressures are not contained. Once domestic demand growth has clearly fallen below the pace of potential growth, some easing could be envisaged.

A fiscal rule to save public resources

Norway has an ingenious fiscal rule that helps to insulate the economy and the budget from swings in world energy prices, gradually phases in the large returns from the exploitation of its petroleum resources into the economy, and preserves a significant proportion of wealth derived from non-renewable resources for future generations. According to this rule, government net earnings from the exploitation of oil and gas resources are transferred directly to the Government Pension Fund – Global. The Pension Fund holds its funds exclusively in foreign assets (thus largely "sterilising" petroleum revenue inflows in the balance of payments). Revenue from the Pension Fund is available to the budget but only under the provisions of the "4% rule", whereby each year's budget is planned on the basis that the structural deficit should be equivalent to a 4% real rate of return on the value of the fund; this rule itself is to apply to the average deficit over the cycle. Deviations from the rule are allowed so as to partially offset large cyclical variations in economic activity or in the value of the fund. Undershooting the rule (*i.e.* a transfer from the Pension Fund of less than 4%) makes sense in periods of strong economic growth and, conversely, overshooting (a transfer from the Pension Fund greater than 4%) during downturns allows discretionary fiscal policy to operate counter-cyclically. Because the rule is expressed with respect to the non-oil *structural* balance rather than to the *actual* balance it also allows automatic stabilisers to work fully, in addition to any deliberate under or overshooting. Not only has the rule the merit of being relatively simple, in addition the authorities have applied it credibly so far.

Since its inception, the 4% rule was overshot every year up to 2005 (*i.e.* more resources were injected into the economy than prescribed) (Figure 2.7). It is only in 2006 that the rule was slightly undershot for the first time. The output gap had become positive in 2005 and was already around 2% of GDP in 2006, so the fiscal stance was probably slightly pro-cyclical in those two years (Figure 2.8). In 2007, planned fiscal policy was restrictive compared with the 4% rule, but with revenues more buoyant than expected, even taking into account rapid economic growth, the rule was substantially undershot (the structural deficit was equivalent to only 3.2% of Pension Fund Value). All in all, the cycle was extremely beneficial for the public finances, because less than NOK 3 billion (or 0.02% of mainland GDP) were actually transferred from the Pension Fund to the budget (Table 2.1).[5] The 2008 revised budget plans to undershoot the fiscal rule (expecting a structural deficit equivalent to 3.7% of the value of the Pension Fund) but is nevertheless quite expansionary with a 0.7 percentage point increase of the structural deficit expressed as a share of mainland GDP (compared with increases of 0.2 and 0.1 percentage point in 2006 and 2007

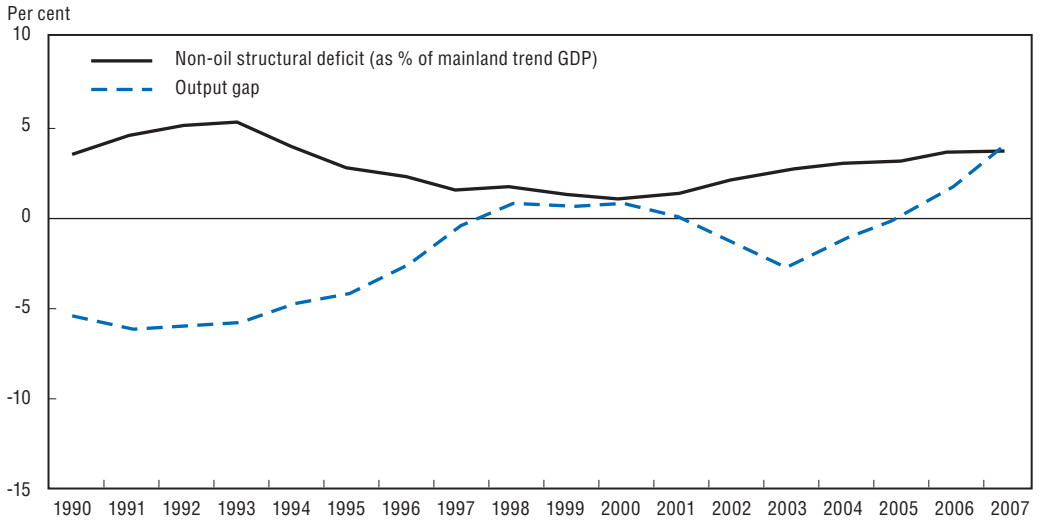
Figure 2.7. **The fiscal rule over the cycle**



Source: Ministry of Finance.

StatLink http://dx.doi.org/10.1787/425845207606

Figure 2.8. **Has fiscal policy[1] been pro-cyclical recently?**



1. The 4% rule was introduced in 2001. Previously, the fiscal framework required a fiscal budget in balance.

Source: Ministry of Finance and OECD Analytical database.

StatLink http://dx.doi.org/10.1787/425855058282

respectively). Giving the signs of overheating in the economy, the fiscal stimulus planned for 2008 might be too large. Unless the output gap narrows a great deal, budgetary plans for 2009 should avoid an increase in the structural deficit.

With the increases in oil prices over the last couple of years, the value of the Pension Fund has risen more rapidly than expected. In fact since 2001 the Pension Fund has on average grown at around 25% per year. Although oil prices may well fall back from recent peaks over the next few years, some scenarios point to higher nominal prices than in current official projections (in the 2008 Budget, the price is assumed to be around $70 per barrel in 2008 and steadily declining to $40 in 2015); under plausible assumptions

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Table 2.1. **The 2007 and 2008 budgets**

NOK billion

	2007		2008
	Initial budget proposal[1]	Final Budget Revision[2]	Revised Budget 2008[3]
Revenues excluding Petroleum activities	641.7	692.7	738.1
– Expenditures excluding Petroleum activities	695.8	694.0	751.1
= Non-oil budget surplus	–54.1	–1.3	–13.0
+ Net revenues from petroleum activities	364.9	316.4	355.7
+ Dividends on the Pension Fund	75.3	78.4	81.6
= Consolidated surplus	389.5	393.5	424.2
Memorandum items			
Structural non-oil budget surplus	–71	–57.8	–73.9
As a per cent of trend mainland GDP	–4.4	–3.6	–4.3

1. November 2006.
2. March 2008, final account figures.
3. March 2008.

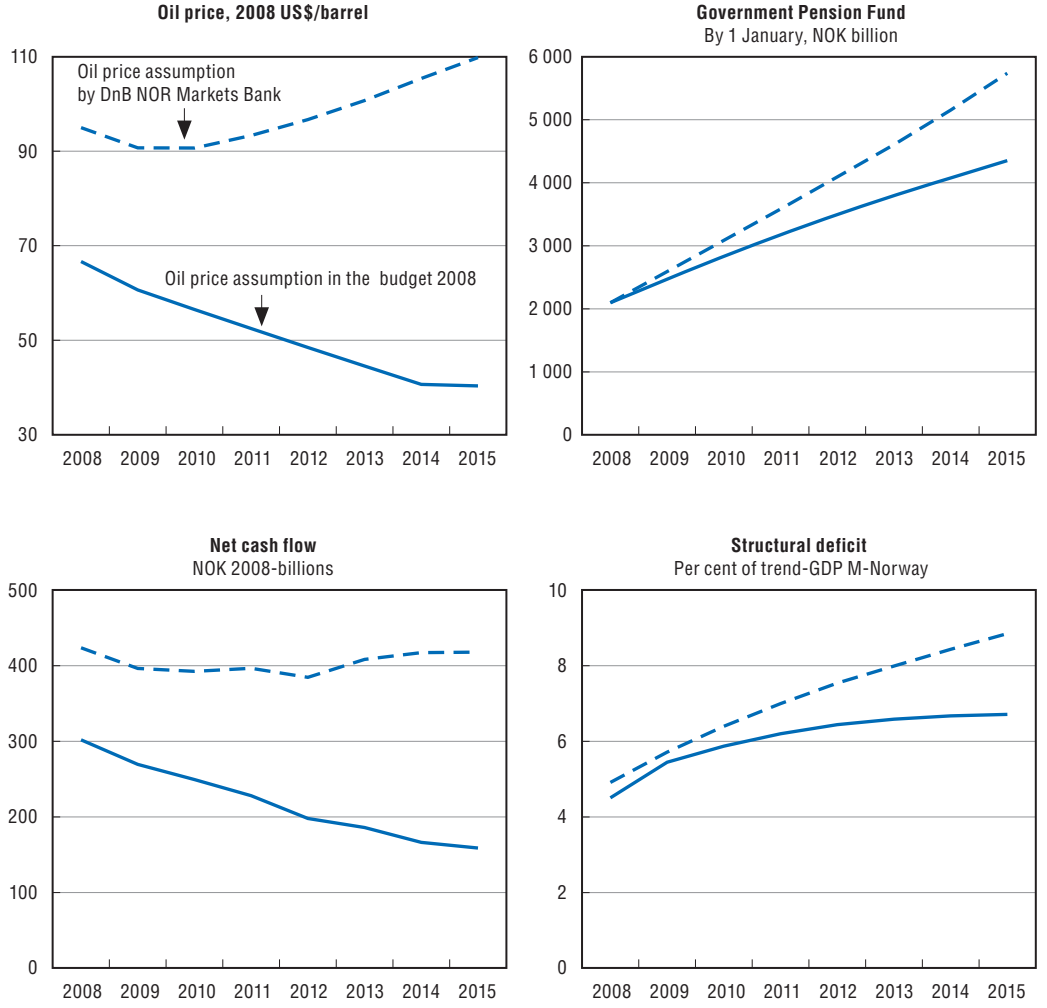
Source: Ministry of Finance.

moderate increases in oil prices could cause net cash flow to be more than double what is currently expected, with a stronger fiscal stimulus (Figure 2.9). At current (June 2008) energy prices, the growth in the Pension Fund over the next few years would be so fast as to threaten continuing overheating of the economy if the structural deficit were to be 4% of the Fund value each year. In the medium term, therefore, there is a strong case for maintaining the structural deficit well below this level and severely limiting its growth so long as there are inflationary levels of excess demand in the economy. Such a policy has a number of advantages: it provides support to monetary policy in a period of upward pressure on interest rates and the exchange rate; it reduces the risk of short term relaxation in, for example, already generous welfare spending programmes with long term fiscal costs and potential adverse incentive effects; and it builds up a greater cushion of pre-funding for the long-term fiscal gap that can be seen under current projections.

A persistent, potentially increasing, undershooting of the 4% rule could be seen as implicitly calling into question the validity of the rule itself. However, first, the rule itself provides for flexible implementation in order to match the ability of the economy to absorb the fiscal stimulus, and a period of undershooting is perfectly credible following the period of overshooting from 2002-05. Secondly, the stable benchmark that the 4% rule provides is valuable and important; provided that it can be applied flexibly to guarantee the substantial medium term undershooting currently required, there is no need to modify it for the moment. Nonetheless, it is clear that current circumstances put the rule itself under strain and there has indeed been some discussion of alternative possibilities (see IMF, 2007). There is no simple alternative; future developments in petroleum prices and progress, or lack of it, in reforms to close the long term financing gap – any rule should obviously be, first and foremost, consistent with long term fiscal sustainability – may have a bearing on how the government may need to adapt the rule in the future.

From a medium/long-term perspective the increasing fiscal stimulus will continue to affect the economy. The 2007 *Economic Survey* argued that, partly thanks to the combination of the Pension Fund and the 4% rule, Norway has successfully avoided the so-called Dutch disease (*i.e.* crowding-out of the traditional trade sector via strong appreciation of the real exchange rate). There is no evidence that Norway has

Figure 2.9. **High oil prices and the Pension Fund**



Source: Ministry of Finance and DnB NOR Markets.

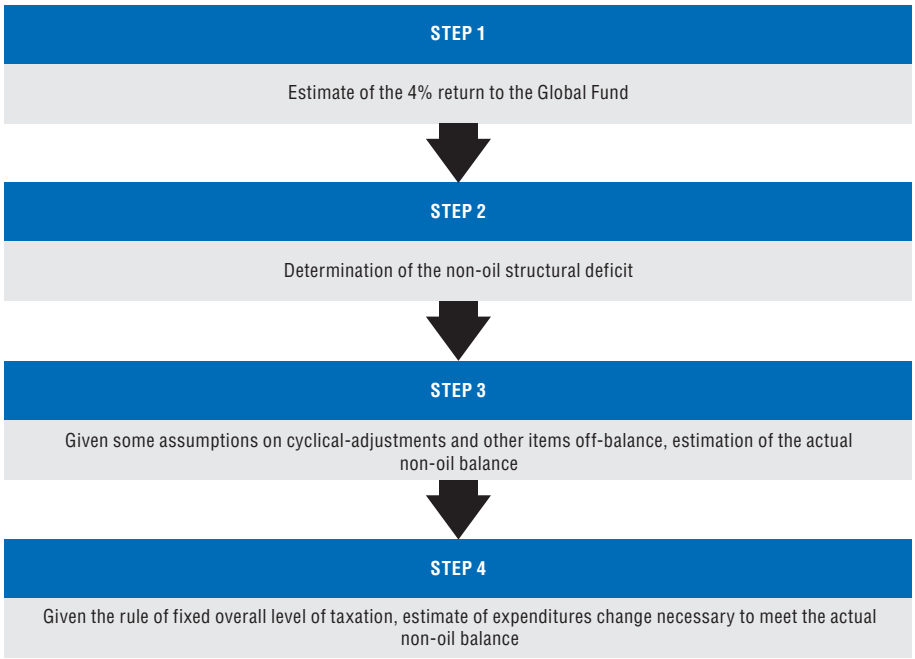
StatLink http://dx.doi.org/10.1787/426008083473

de-industrialised more than other OECD countries, partly because positive spill-overs to the mainland economy have increased manufacturing output in the form of inputs needed to serve oil production and exploration investment. While unsustainable increases in public spending have generally been avoided (though pensions and health care are counter-examples), the rise in the real exchange rate has been gradual enough for the tradable sector to adjust relatively slowly. Yet, avoiding the Dutch disease remains an ongoing issue: high levels of demand and low levels of unemployment mean that wages are bid up across the economy, with consequent losses of competitiveness. In 2007 the wage level for blue-collar workers in Norwegian manufacturing was 41% higher than the average of that in Norway's trading partners. Looking ahead, the exposed sector will, by its nature, find it more difficult to offset these increases through productivity or price increases, and will steadily lose labour and capital to the non-traded sector. Government policy to protect the exposed sector as a whole can only delay the shift of resources, not eliminate it altogether, so long as the injection of oil money under the 4% rule continues.

Alternative fiscal rules?

The current government's fiscal framework also relies on the rule of maintaining overall taxation at its 2004 level. Having reversed the previous government's 2005 tax reductions, the government has subsequently implemented this by requiring tax changes in the budget to be revenue-neutral overall. The current framework thus requires that the overall taxation level remains unchanged; from this and the 4% rule, the determination of overall public spending in the budgetary process can be represented as a series of steps (Figure 2.10). For instance, the revised budget for 2008 aims at a structural non-oil budget deficit of around 4.3% of mainland GDP, undershooting the 4% rule by 0.3% of GDP (given the number of special adjustments that are made, the relation between the planned structural balance and actual outcomes is not straightforward [Table 2.2]). This implies a fiscal stimulus equivalent to 0.7 percentage points, including an increase of real public expenditure growth of 3¼ per cent (1 percentage point higher than in the planned budget for 2008 presented at the end of 2007).

Figure 2.10. **Steps in the implementation of the fiscal rule**



An alternative to the current policy of a fixed overall level of taxation (though there is discretion on the composition of taxes[6]), could be to aim to gradually reduce the level of taxation in the economy. Future governments may want to consider tax reductions in areas where tax pressure is particularly high with respect to the OECD area and where taxes have been shown to be distortionary, such as corporate taxes (which were the lowest in the OECD area for two decades, but now appear to be slightly above average: OECD, 2008b) and income taxes. While decisions in this respect have to be taken in light of distributional considerations too, recent OECD work suggests that switching taxation from mobile factors such as labour and particularly capital, to consumption and especially property taxes, can give significant gains in per capita GDP (Johansson *et al.*, 2008); this suggests that, in the

Table 2.2. **Interpreting the budget, 2000-2008**
Budget outcomes for 2000-07, revised budget 2008 (NOK billion, current prices)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total expenditures, excluding petroleum items	476	491	568	575	604	629	662	694	751
Total revenues, excluding petroleum items	459	490	506	509	524	564	618	693	738
***a)* Non-oil balance**	–7.9	–1.6	–62.4	–66.1	–79.2	–64.8	–44.0	–1.3	–13.0
– Transfers from Norges Bank	–5.8	–6.0	4.5	4.7	4.9	5.1	5.3	5.6	6.0
– Net interest income (non-trend part)	2.6	1.3	1.4	2.2	4.1	2.4	8.0	–5.1	–7.8
– Tax revenues and unemployment transfers, cyclical components	–7.7	–6.3	8.8	25.6	31.0	12.6	16.1	–54.9	–59.8
– Extraordinary transfers	6.7	–2.6	20.8	–1.2	–2.1	–3.0	–4.7	–2.1	0.7
Overall correction	–4.2	–13.6	35.4	31.3	37.9	17.1	–7.6	–56.4	–60.8
***b)* Structural balance, budget excluding petroleum**	–12	–15	–27	–35	–41	–48	–52	–58	–74
Per cent of trend mainland GDP	–1.1	–1.3	–2.2	–2.7	–3.0	–3.3	–3.4	–3.6	–4.3
Change over previous year		–0.2	–0.9	–0.5	–0.3	–0.3	–0.1	–0.2	–0.7
c) Value of Pension Fund at start of year	221	387	619	605	847	1012	1390	1783	2018
d) Expected return on Pension Fund, current prices	9	15	25	24	34	40	56	71	81
e) Excess spending (d-b), current prices	0	0	2	11	8	7	–4	–14	–7
Structural balance, per cent of Pension Fund (4% rule)		3.9	4.4	5.8	4.9	4.7	3.7	3.2	3.7

Source: Ministry of Finance.

current context, reducing income taxation so as to reduce marginal rates on both labour and capital income while reducing public expenditure growth would also give significant gains.

Although concern about excessive demand pressure on the economy, discussed above, leads to a search for alternatives, there are very strong arguments for retaining the 4% rule itself. It has the merit of credibility, allowing for a robust fiscal strategy over the medium and long run while achieving the important aim of reducing the economy's short-term vulnerability to swings in oil prices. Some transfer of resources out of the tradeable sector cannot really be avoided in the longer run except by never spending the petroleum wealth (either by extracting less or allowing the Pension Fund to increase in size much faster and potentially indefinitely) but they are made much less painful by the gradual phasing in that the 4% rule generates. From the current short-term stabilisation perspective, it would be wise to allow for a substantial undershooting if the economy keeps growing at a brisk pace. But for the rule to be consistent with stable taxation levels over the next few decades, as opposed to the next few years, the rest of the public finances have to be sustainable.

Are public finances sustainable?

Despite the current comfortable public finance situation, there are concerns that the future will prove trickier. Figure 2.11 shows estimates of the general government funding gap, which is given by non-oil revenues at current tax rates plus the expected 4% return on the Pension Fund less the sum of pension and non-pension expenditure based on the current policy regime, over the next 50 years. According to this illustrative exercise, tax levels could be left unchanged until 2035; afterwards, there would be a progressive need for fiscal consolidation, which is estimated to exceed 7% of mainland GDP in 2060. This exercise is based on Finance Ministry simulations which, as mentioned earlier, assume oil prices some 40% below the level of early 2008, and exclude positive effects from pension reform that will be implemented in 2010.

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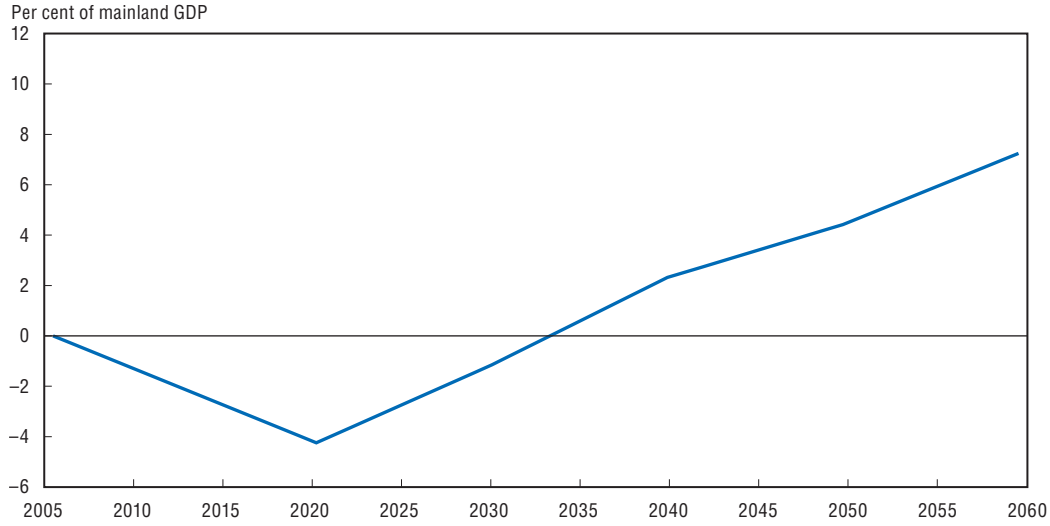
Figure 2.11. **Long term fiscal gap**



1. The fiscal gap is given by the estimated structural non-oil deficit plus the expected return on the Pension Fund and assumes no policy changes.

Source: Ministry of Finance.

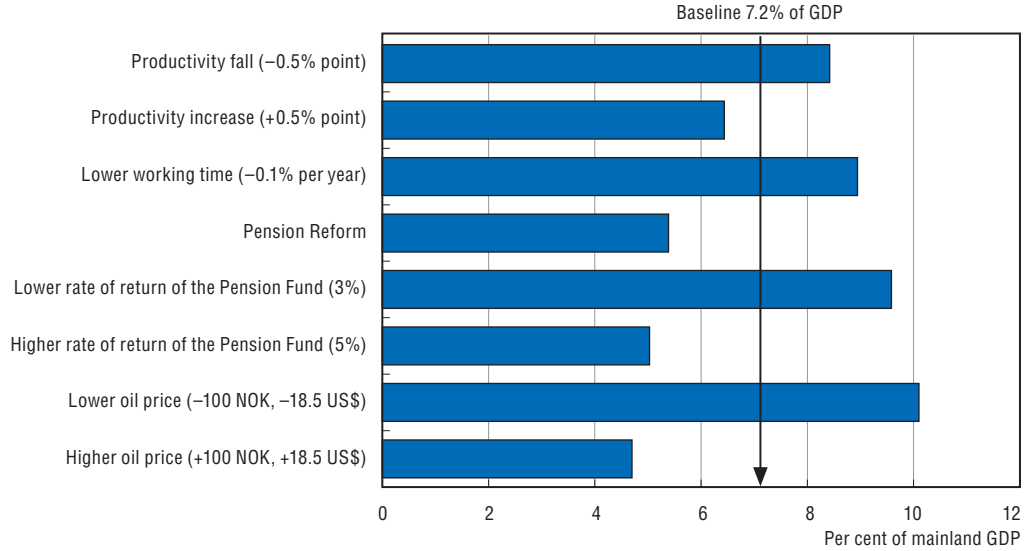
StatLink http://dx.doi.org/10.1787/426031544026

Population ageing has a strong impact on the long-term funding gap, through both health and pension expenditures. But, unlike other OECD countries, the first effects of ageing will fully unfold only after 2020: total public transfers, which now represent slightly more than 15% of GDP, will steadily increase between 2020 and 2040 (rising to over 25% of GDP) and will continue to grow, though at a slower pace, between 2040 and 2060. Though this is a time horizon which is very far ahead in the future, today's policies should take into account the long run needs of Norwegian society.

Government simulations (which refer to the endpoint of the scenario, *i.e.* 2060) around the baseline estimate show how structural policies can have important long run effects on this funding gap (Figure 2.12). Apart from larger leeway in case of higher oil prices (an increase of the oil price by $ 20 per barrel implies a reduction of the funding gap by slightly less than 2% points) both longer working time and higher productivity would lead to a smaller funding gap (10% higher working time reduces the funding gap by 1.5% while an increase of ½ percentage point of productivity growth implies a 1% point reduction).

In this respect, an area where significant progress has been made is in pension reform. In 2004 a pension commission report achieved broad political agreement on a new system and, after a further round of discussion under the new government; most details were agreed in early 2007 on the basis of a 2006 White Paper. The final legislation is due to be in place in 2008, with the new pension system to be phased in as from 2010. With the aim of making the NIS (National Insurance System) financially sustainable and raising the actual retirement age, the pension reform is based on a notional (unfunded) defined contribution system. The retirement age is flexible from 62 years old onwards, based on actuarial neutrality at the margin. Pension benefits are to be based on lifetime earnings (indexed on average earnings) with a contribution rate of 18.1% up to age 75, and calculated based on life expectancy at the time of retirement. On retirement, the pension will be indexed on the average of price and wage inflation. As an effect of the reform, pension expenditures are

Figure 2.12. **Variations on the long-term fiscal scenario**[1]



1. Estimates refer to the financing gap, as shown in Figure 2.10, in 2060, under alternative assumptions on the budget. The official projections in the baseline assume an oil price at $70 per barrel in 2008, declining to around $40 (*i.e.* NOK 230), and do not take into account possible effects of policy changes in labour market behavior.

Source: Ministry of Finance.

StatLink http://dx.doi.org/10.1787/426114813687

estimated to be reduced to about 12% of mainland GDP in 2050, compared with about 15% in the absence of reform.

Despite the agreement on the principles of the reform, getting the details into place has been time-consuming. The reforms will be phased-in, with people retiring in the early years after 2010 being partially protected from the implications of the life-expectancy adjustment, pensions for those aged 46 in 2010 will be the first to be fully calculated under the new system. As has been happening in a number of European countries (both France and Italy, for example), there is strong resistance to the logic of actuarially fair pensions when life expectancy increases are observed to require cuts in pension benefits at any given retirement age, especially when life expectancy increases more strongly than expected, as has been the case in Norway during the last years. Thus, even before legislation had been introduced in parliament this year, negotiations in the wage round led the government to partially defer the previously agreed life expectancy adjustment for cohorts with pension benefits accumulated under the present pension system, as well as to increase its subsidy to the AFP early-retirement scheme for the same cohorts (though obtaining a significant reform of its structure) (Box 2.2). As well as causing non-negligible additional costs for public finances (in present value terms about 6% of mainland GDP), this may be a dangerous precedent with the re-negotiation of certain aspects of the new pension scheme being to some extent between social partners rather than in parliament. To reap the full gains illustrated in Figure 2.12 it is important to reform public sector and disability pensions fully in line with the key elements of the reformed main pension scheme.

In addition to saving resources to cope with future spending of an ageing society, and reducing taxation to improve economic efficiency, there are other good reasons to curb public expenditure growth. One is that the level of public spending in Norway is already

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Box 2.2. **Pensions in the 2008 wage round**

One of the unusual (but potentially deleterious) aspects of the Norwegian practice of generally discussing policy changes extensively with the social partners before introducing legislation in Parliament, is that labour market and fiscal policy can become indirectly part of wage negotiations between employers and unions. In discussions among the government and social partners in 2007 it had been agreed that reform of the AFP early retirement scheme, which is an agreement between employers and trade unions, would form part of the 2008 wage round negotiations.

The AFP scheme had been introduced in another set of wage negotiations in an equally tight labour market in the late 1980s. It gives workers who belong to participating trade unions an early retirement pension if they retire up to five years before the normal retirement age of 67. This allows them to receive the same yearly pension benefit as the one they would be entitled to if they retired at 67. Under pressure to defuse tension in the labour market at the time, the government had agreed to finance about one third of the cost of this scheme, employers financing the rest. It has obvious disincentive effects on labour supply (see Chapter 3).

The current government and social partners agreed that these disincentive effects needed to be eliminated, and the government's aim was to apply the same logic of actuarial neutrality to this scheme as in the reformed main pension scheme.

On the positive side, the agreement now applies an actuarially fair discount to the AFP pension which increases the earlier the pension is taken. Furthermore the payment is received whether a person actually retires or not. In theory, therefore, marginal incentives to work are restored as the scheme effectively becomes a lump sum payment to anyone over 62 which can be taken in the form of an annuity. Although this improves incentives at the margin, the "income effect" of such a subsidy is likely still to reduce participation in this age group, though by less than the unreformed scheme.

On the other hand, in the context of the annual private sector wage negotiations, the government agreed to introduce an additional temporary subsidy to the AFP covering the cohorts born between 1948 and 1953, to be fully phased-out from the 1963-cohort onwards. At the moment the AFP only covers about half the private sector, with separate similar schemes covering public sector workers. At the same time, the government also agreed to partially defer a life-expectancy related adjustment to pension benefits accumulated under the existing scheme.

The Ministry of Labour and Social Inclusion estimates that, taken together, these two concessions have cost the budget the equivalent in present value terms of about NOK 100 billion, or about 6% of current total GDP, reaching a maximum annual cost of 0.2% of GDP in the late 2020s. Of this, about 20 billion is related to the increased AFP subsidy, the rest to the partially deferred life expectancy adjustment.

relatively high by OECD standards while there is evidence that it is not very cost-effective (see Chapter 4 on education and OECD 2007). Consequently, if the public provision of services is not re-organised so as to improve output efficiency, public resources could be spent with rather little improvement in the population's welfare. Similarly, with "too many" resources available to finance spending projects, there is a risk of investing money in public investments which benefit a very limited group of the population in some remote areas, but neither the country as a whole nor necessarily future generations.

Conclusions

Norwegian governments have so far been able to resist many spending pressures by adopting forward-looking behaviour in managing public resources. They have generally planned expenditures in line with cyclical developments, though in 2005 and 2006 they might have underestimated the importance of the cycle and spent more than the cyclical situation justified; while the 2007 budget turned out to have avoided giving much stimulus, the revised 2008 one reverts to significant expansion. Unless the economy slows much more radically than current OECD projections show, in 2009 fiscal policy will need to avoid any further stimulus to allow the economy to go smoothly back to its potential path.

Box 2.3. **Summary of macroeconomic policy recommendations**

Unless inflation falls significantly below its expected path, monetary policy should remain tight for some time ahead, while some easing could then be envisaged as domestic demand falls more in line with potential output. If inflationary pressures turn out to be stronger than expected, there may be a need for further tightening before the end of the year, In addition to carefully monitoring domestic inflation, Norges Bank should also monitor developments in housing markets and credit conditions for the private sector, which are currently the largest risks, to the extent that they affect the outlook for inflation and the real economy.

The 4% fiscal rule should be maintained unchanged for the purpose of medium to long term stabilisation of the economy, but be applied flexibly in the short term; it is a credible, simple and well thought out policy rule. From a short-term stabilisation perspective, if the economy keeps growing at a brisk pace, it would be wise to allow for a substantial undershooting, avoiding any increase in the structural non-oil deficit, until actual output converges to potential.

A relative decline of the tradable sector is probably inescapable given the increasing demand trend led by the growing fiscal stimulus, but **tax reforms, including cuts in marginal tax rates, might be considered as a way of stimulating potential employment and output in the private sector by reducing overall distortions**. In any case, **public expenditure growth must be restricted** to ensure sustainable public finances in the long term, to keep incentives to participate in the labour market high and avoid inefficient use of public resources.

The **pension reforms should be implemented as planned and without extending concessions to younger cohorts**. By the same token, the reform of public sector and disability pension schemes should be consistent with the main objectives of cost-containment and preservation of incentives to supply labour.

Notes

1. "A loosening up of the horizon might indicate that the bank considers inflation expectations to be more anchored than was the case during the first years of the inflationary targeting regime. It might also be the result of the experience that in practice it has been hard to operate with a specified time horizon." (Juel *et al.*, 2008.)
2. A national study reveals that, while in the 1980s inflation was much more strongly influenced by the Norwegian output gap, the role of the global output gap has been increasingly important in the period 1991-2006.
3. Definitions for this ratio vary, the quoted figures are based on the OECD's Analytical database.

4. For long-term credits, the Financial Supervisory Authority maintains that the bank has a right to review the credit and adjust conditions, should characteristics of the borrower change or the value of the property decline (Kredittilsynet, 2008).
5. While the 4% rule is formulated with respect to the structural deficit, the actual transfer of money from the pension to the budget deficit is by construction set as to balance the *actual* (and not the structural) non-oil budget.
6. Thus tax measures in 2007 comprised an increase in the surtax on personal income; an increase in the basic allowance for wage and pension income in the income tax; a broadening of the tax bases in the net wealth tax, including increased tax values for homes and other real estate and for securities, combined with increased minimum allowances; curtailed tax-favoured private pension saving schemes; a reintroduction of regionally differentiated rates in employer's social security contribution; introduction of a tax on NO_2 emissions from 1 January 2007; and an increase in the value added tax rate on food from 13 to 14%. 2008 saw tax policy changes, including: a broadening of the tax base in net wealth tax together with an increase in minimum allowance; tax credits for private pension saving schemes; a new tax regime for shipping and various environmental taxes.

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Chapter 3

The labour market: supply constraints and immigration

The labour market has become very tight as high real incomes and investment in the North Sea have stimulated demand for labour. Increasing real wage growth, some increase in participation and a continuing increase in immigration flows have been the results. Although very low unemployment and high capacity utilisation suggest the economy needs additional labour, further efforts to remove some well-known disincentives to domestic labour supply in welfare and pension policies are needed. The strong surge in labour immigration since 2004 is a new phenomenon in Norway. It seems to have had largely beneficial consequences, although if it continued for long at recent rates it would have a considerable impact on population growth and the response of the labour market in a possible future downturn remains to be seen.

The situation on the labour market in Norway reflects the general performance of the economy. After several years of strong demand growth, unemployment is now very low; since the end of 2006 it has been lower only in Iceland among OECD countries. Productivity has been growing rapidly, but output growth has been further boosted with a substantial increase in employment, partly supplied by immigrant labour. Under this pressure, earnings have been rising rapidly and, although productivity growth has helped to moderate this increase, relative unit labour costs have risen.

Developments in the labour market over the last few years can thus be seen as largely favourable: the transition to low unemployment benefited from the cyclical boom and the influence of favourable terms of trade and world demand, but was achieved with only gradually accelerating unit wage costs, suggesting a decline in the structural unemployment rate; already high participation rates have risen slightly and a quite sudden, substantial inflow of foreign labour has been absorbed successfully.

At the same time, further efforts in reforming policies related to the labour market in the welfare system are required, and remaining issues of reforming the pension system should be carried out as planned by the Government. The official retirement age is higher than in most countries, at 67, but the effective retirement age is considerably lower than this and has been declining over time, although fairly stable since 2000. Sickness and disability schemes are seeing increasing numbers of recipients at younger ages even though there is no obvious sign of deteriorating health in the population; in 2007, 2% of the population aged 25-29 was in receipt of a disability benefit, compared with 1.7% in 2004, for the 40-44 age group the share rose from 6.8% to 7.3%, while among the oldest age groups there was some stability or even small falls in the share, but over a third of the population age 60-67 receives a disability pension. The labour force participation rates are however still high among older workers compared with other countries. The welfare system gives only weak incentives for the sick and disabled to remain at work or seek new employment and thus contributes to a level of average hours worked for those in employment among the lowest in the OECD and tends to depress participation rates.[1] This may be seen in stark contrast to the rather strict conditionality imposed in the unemployment insurance system, which shows that the "Nordic model" need not imply lack of attention to incentives.

While the current boom with very low unemployment certainly makes these problems seem less pressing, they are likely to resurface in less auspicious times and will be important issues in the longer term. Despite its oil wealth, Norway is still expected (on most, but perhaps not all, projections for oil prices) to face a long run funding gap in age-related spending; welfare and pension reform will be necessary to cover this. This chapter reviews the functioning of the labour market and policies that appear to encourage people to withdraw from the labour force, which was dealt with in some detail in the previous *Economic Survey*. It then analyses the contribution that immigration has made in recent years to employment and the wider economy, noting that the successful absorption

of large numbers of immigrants in a boom does not guarantee a problem-free adjustment in a downturn.

High participation, low unemployment

The overall participation rate in Norway, defined on the population aged 15-74[2] is around 73% and unemployment, which has remained very low by OECD standards for a long time, was only 2.1% at the end of 2007, half its 2004 level. Both the inflow of new vacancies and the stock of vacancies notified to employment offices had already reached record levels during 2006 and increased further in 2007 (see Figure 1.10). While the unemployment rate had been slightly higher than estimates of the long-term structural unemployment rate (as proxied by an estimate for the non-accelerating inflation rate of unemployment, the NAIRU) up to sometime in 2005, it has since fallen rapidly and to a level significantly below the NAIRU.

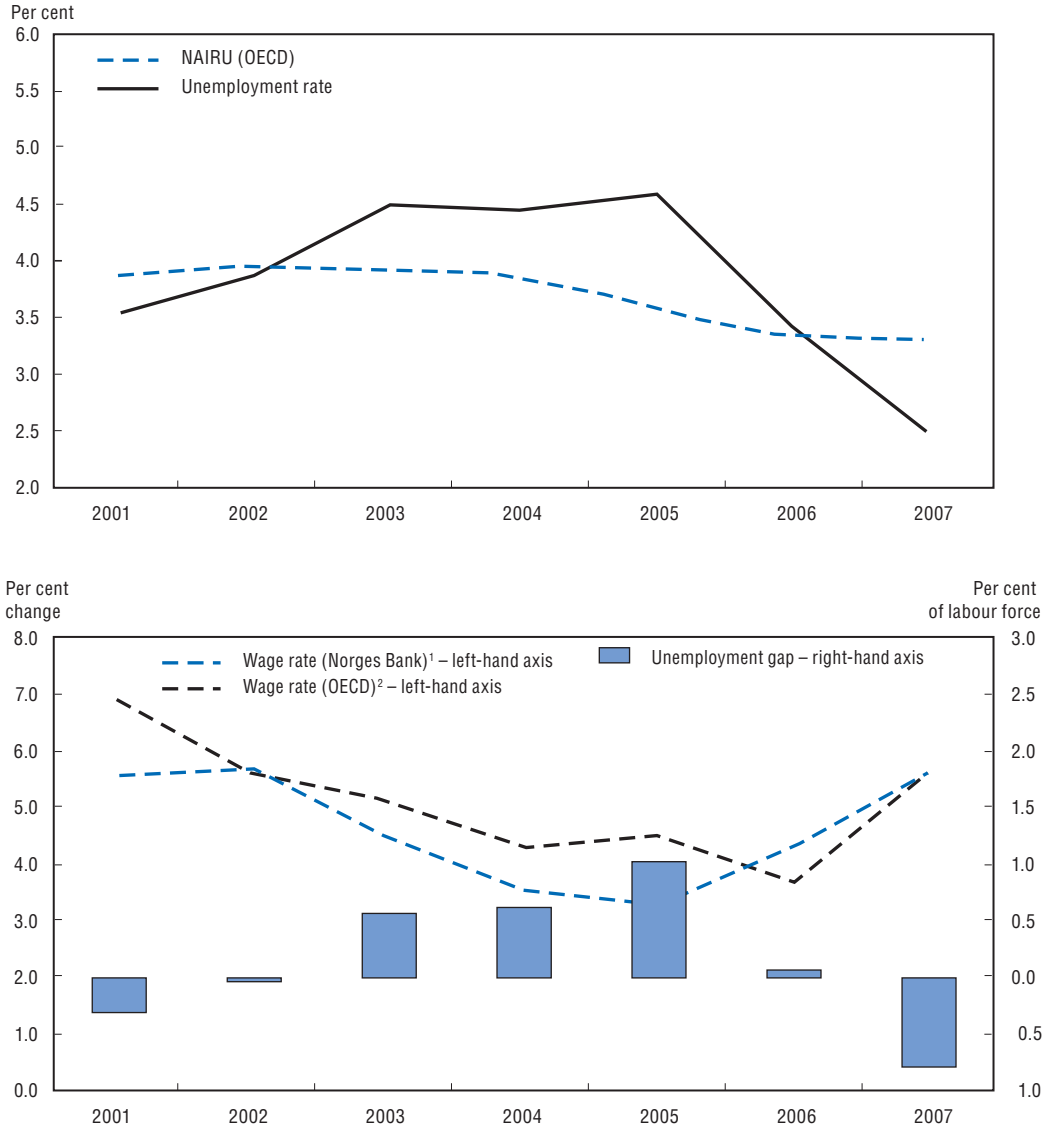
The fall in unemployment has been accompanied by quite rapid growth in the labour force. Population ageing is occurring a few years later in Norway than in many OECD countries so that the native working-age population is still growing, but at a diminishing rate. However, a distinct acceleration in the total population of working age occurred after 2004-05, due to the influx of immigrants from newly-joined countries in the European Economic Area (EEA), mainly from Poland. In fact, in 2006 and 2007, more than half of the increase in population was due to immigration. An increasing proportion of immigration was labour migration, rather than the family migration which had previously been preponderant, so the share of immigrants in the increase in employment was probably even greater than this.[3] The expansion of the EEA and the resulting progressive opening of the European labour market could be expected to increase immigration in most western European countries to some extent, representing a supply shock to their economies. In Norway the phenomenon has been particularly dramatic because this supply shock occurred just at a time when demand for labour was particularly strong.

Pressure on the labour market has been reflected in earnings. Although the centralised wage-bargaining system tends to moderate wage growth, and 2007 was the second year of the two-year wage round, wages were increasing strongly already in 2006 and accelerated in 2007. Further strong growth is expected in 2008 (see Chapter 2).[4] But this acceleration is rather lower than behaviour in the previous decade would have predicted. Even as the labour market has been tightening, the structural rate of unemployment has been declining (Figure 3.1). Increased migration inflows are a result of the tight labour market, too. As a supply shock, immigration has probably reduced wage inflation for some time, but has not prevented the recent acceleration.

Labour shortages, but supply is held back

It is clear that demand pressure has caused an increasingly tight labour market, leading to accelerating wages and strong immigration. Indeed, the economy is felt to "need" immigrants; benefits from immigration certainly exist, although they are not as obvious as is sometimes assumed, as discussed further below. While the economy needs more labour, certain policies act to reduce labour supply, more or less deliberately. The unemployment insurance system itself is well-designed: it has reasonably generous benefits, yet strong incentives to take a job or training if available and the unemployment rate is low. But, as described in detail in the 2007 *Economic Survey*, other parts of the welfare system encourage withdrawal from the labour market. The most important of these are the

Figure 3.1. **The tightening labour market, 2000-2007**



1. Wage rate from the Technical Committee as reported by Norges Bank
2. Compensation rate of the private sector as reported in OECD Analytical database.

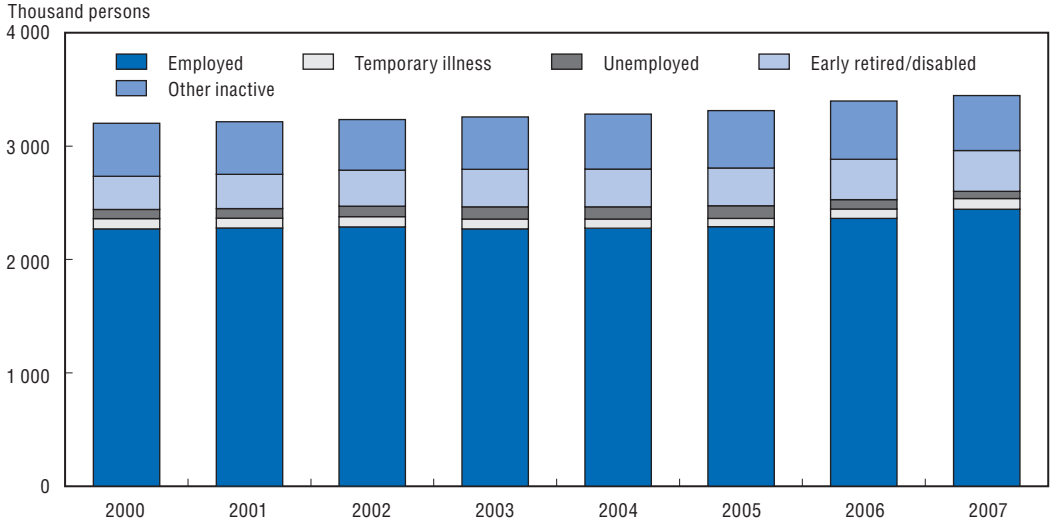
Source: OECD Analytical database.

StatLink http://dx.doi.org/10.1787/426154218451

sickness and disability schemes, and the early retirement programme. Taken together, these schemes account for some 13% of the labour force according to LFS, and the share has if anything been trending up (Figure 3.2).[5] About one fifth of the working age population receives a health related benefit or AFP.

While activity rates are relatively high, average hours worked in Norway are lower than in all countries except the Netherlands and Germany. Some of the variation seems to be related to per capita incomes, as might be expected (Figure 3.3). A better overall measure of how intensively potential labour supply is employed is perhaps average hours worked per person of working age, taking into account the number of people who are employed but also how much they work. Although Norway moves up the ranking on such a measure,

Figure 3.2. **The population of working age, 2000-2007**[1]



1. Before 2006 the labour force population was the age group 16-74 years. After 2006, the age group is 15-74 years.
Source: Statistics Norway.

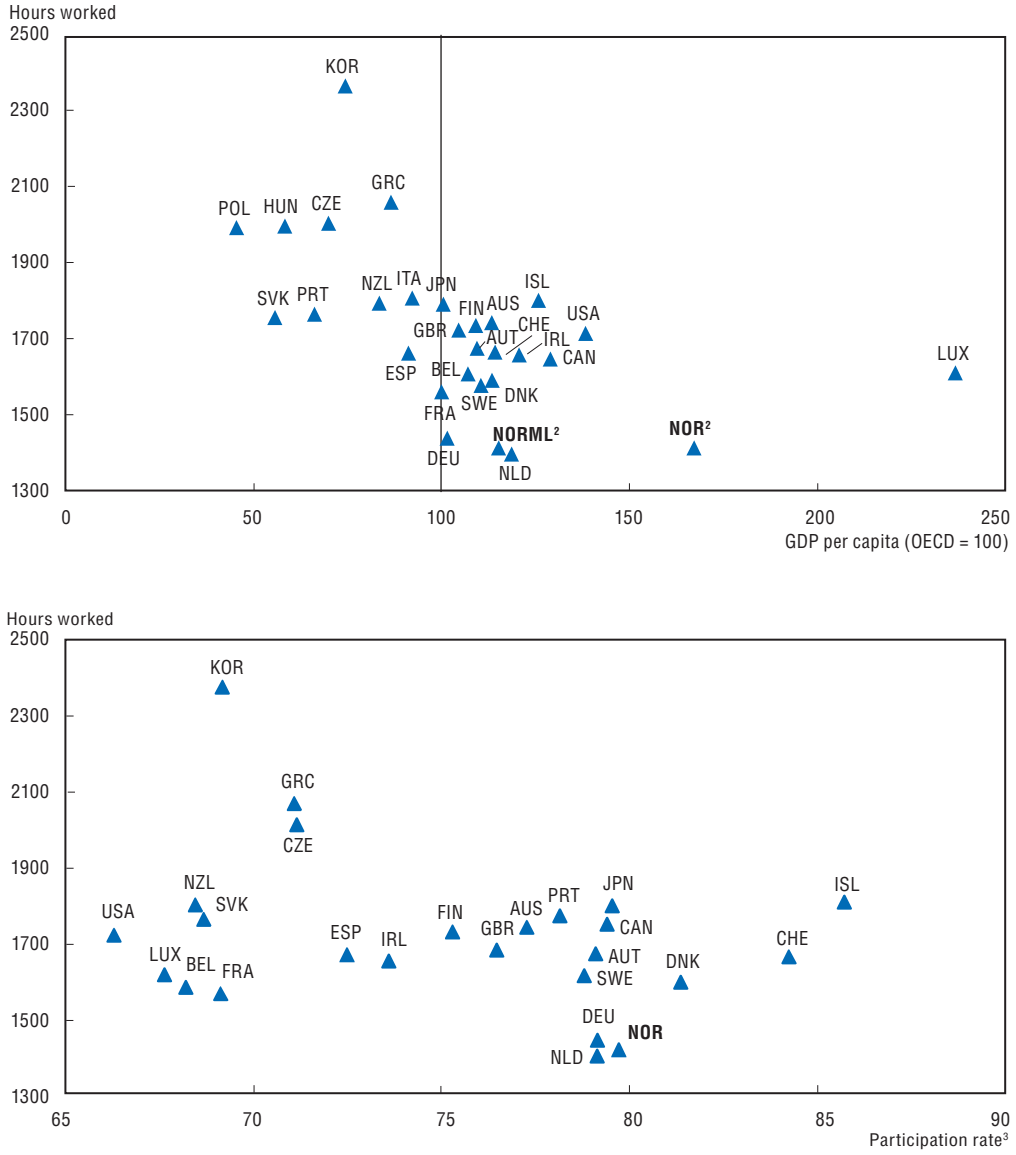
StatLink http://dx.doi.org/10.1787/426217512531

notably above countries such as Belgium, Germany and France, it still appears well below the OECD average.[6]

Figure 3.3 may suggest a certain degree of choice across countries for more leisure with higher income, but it is far from clear what the "normal" trade-off might be. With hours worked, adjusted for income levels, perhaps in line with other countries when considering overall GDP, they are probably rather low if only mainland output is considered. On this, not very scientific, basis, it might be concluded that, despite the best efforts of governments to make it clear that petroleum revenues are temporary (see Chapter 2), the obvious wealth that they are generating does influence collective labour market choices. However, some decisions affecting either hours or participation are clearly at least partially related to policy settings rather than simple choice, as the next section discusses.

Other candidates for inducing low hours worked include taxation. Indeed, marginal taxation on employment income is somewhat higher than in most other countries (OECD, 2008a), as are replacement rates for unemployment and other social welfare benefits (OECD, 2007a). Participation rates have nevertheless edged up slightly in the last two years, probably as the tight labour market encouraged a reverse "discouraged worker" effect: Dagsvik *et al*. (2006) provide evidence of a strong discouraged worker effect in Norway. As Johansson *et al*. (2008) shows, reducing income taxes in favour of consumption (and especially property) taxation, can improve GDP per head, partly by increasing incentives to supply labour. Other work suggests that it is the average tax rate that is important for participation whereas the marginal tax rate is more relevant for hours worked. Furthermore, the effect of marginal tax rates on hours worked tends to be small or unnoticeable for principal earners, but can be important for second earners (Causa 2008).

Figure 3.3. **Hours worked, and GDP per capita**



1. GDP per capita, 2006, current PPP, OECD = 100.
2. NOR: Whole economy, NORML: Mainland only.
3. Employment rates are calculated as the ratio of total employment to the population of working age. The working age population concept used here and in the labour force participation rate is defined as all persons of the age 15 to 64 years (16 to 64 years for Spain and Sweden). This definition does not correspond to the commonly-used working age population concepts for Mexico (15 years and above), the United States and New Zealand (16 years and above). For Norway, national labour force statistics refer to a different working age group from 15 to 74 years old.

Source: OECD Analytical database, SNA.

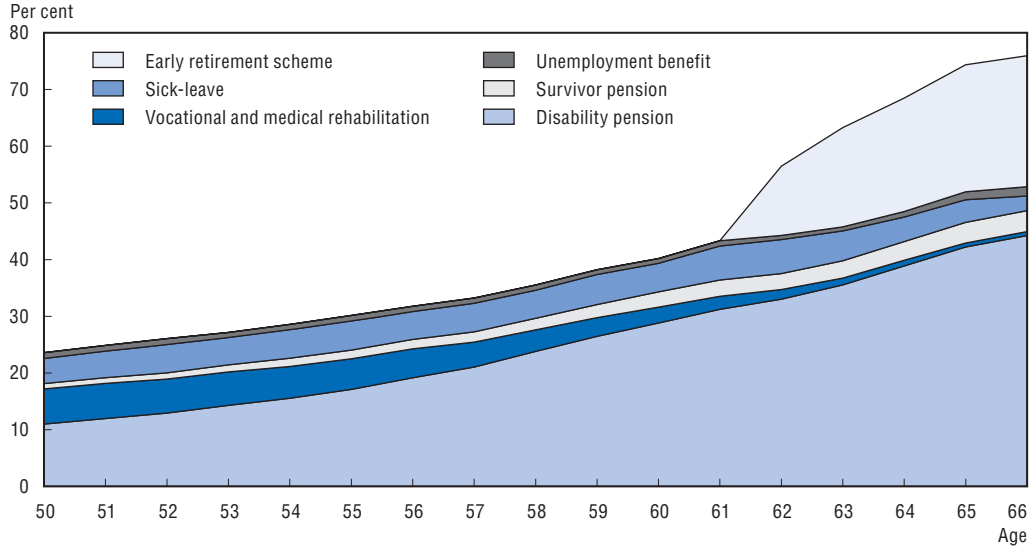
StatLink http://dx.doi.org/10.1787/426221163236

Sickness and disability benefits have been too easily available

A high number of people stay on sick leave and medical rehabilitation and eventually move on to a long-term disability pension. The age-distribution of beneficiaries of different schemes shows that they are mainly used as a route to early retirement (Figure 3.4). Sickness benefits are both generous and too easily certified by doctors. Use of sick-leave

did decline after some tightening of procedures in 2004 and then stabilise. Yet not only has the number of people on disability pensions continued to increase, but a growing proportion of younger people are involved. Abuses of short-term sick leave, though they have a budgetary cost, do not in themselves create any longer term labour market problems. This is not true for disability; once on a disability pension, it is rare for people to successfully re-enter the labour market and too many of them end up with a permanent disability pension. The problem seems to be that the disability scheme has been too ready to accept that a disabled person should be permanently unable to work. Since entry into the disability scheme is largely *via* the sickness benefit system, disability itself may be encouraged by too-easy access to sickness benefit. Once in the disability system, provision for re-assessing the degree of disability, and good incentives to seek employment, even part-time employment, has been lacking. The 2006 OECD report *Sickness, Disability and Work* recommended tightening up in a number of areas (see OECD, 2006). Some of these recommendations have been followed (see Annex 1.A1).

Figure 3.4. **Share of population over 50 on different benefit schemes, 2006**



Source: Ministry of Finance, Norway.

StatLink http://dx.doi.org/10.1787/426235273813

As of 1 January 2004 the disability pension scheme was differentiated into a temporary and a permanent disability benefit. The temporary disability benefit could be granted for a period of one to four years when future work-capacity of the individual in question is uncertain. It is however too early to see how this works in practice. But four years is certainly plenty of time in which to lose touch with the labour market and to become significantly more difficult to employ, regardless of any disability; and there has been no significant change in responsibility for assessing disability, such as to ensure that the decision is made by independent assessors to minimise any difficult conflicts of interest that family doctors, for example, may have.

The increasing tendency of younger people to enter disability schemes may be associated with psychological rather than physical problems. One possibility (unfortunately speculative, there is no research data on this) is that this may be a response

to difficulties that some people with insufficient education face on a labour market with few openings for low-paid (and low productivity) workers; there is no legal minimum wage in Norway but there may be a collective reluctance to see workers earning low wages and the sickness/disability route has become a way of organising this. The main danger in this, apart from the possibility of further expansion of the scheme, is that by disguising a labour market issue as a health issue it may cut off some people from appropriate remedies – certain recipients of sickness or disability allowances may be more in need of skills-related than health-related intervention. A significant number of people do in fact follow vocational and medical rehabilitation programmes (see Figure 3.5); if it is true that poor educational achievement is contributing to increasing use of the schemes by younger people, vocational rehabilitation will need to evolve to deal with this; it also lends more urgency to the problem of the education system discussed in Chapter 4.

To improve incentives for people on sickness and disability benefits to work, OECD (2006) suggested that the 100% replacement rate for long term sickness benefits should be reduced to around 75-80% after a certain length of time and that medical and vocational rehabilitation benefits might also have to be reduced accordingly. Social objectives might be thought to preclude this: a specific objective of welfare policy is that "People who live with functional impairments must be assured living conditions and a quality of life on a par with the rest of the population".[7] However, cutting the replacement rate in cases where a person is judged fit for some kind of work but does not take it (*i.e.* using the same principles as for unemployment benefit, adjusted for the degree of disability) may not infringe this principle. Another suggestion of the OECD Disability Review, to convert part of the disability allowances into in-work benefits would also help to reduce the disincentive to work among partially disabled people, although the impact effect of such changes could increase expenditure at least temporarily, unless there were compensating reductions in benefits for those not in work. Extended wage subsidies for persons with permanently reduced health are now being implemented. Other recommendations in OECD (2006), such as those concerning benefit taxation, relative levels of temporary and permanent benefits, and greater use of partial benefits, would also improve incentives to work.

Social protection measures need to preserve incentives to work

The contrast between the high share of welfare benefit recipients and the low unemployment rate is striking. The unemployment benefit system itself is somewhat more generous than the average OECD country in terms of replacement rates, but not excessively so, although recent reforms in many OECD countries have reduced their generosity relative to Norway (OECD, 2007a). But the Norwegian system has a reputation for being quite strict in its application of conditionality, even though cross-country comparisons of activation policy, for example, show that on paper (in terms of indicators such as the frequency with which job-search effort is monitored) Norway appears relatively relaxed (OECD, 2007b). Of course, an unemployment insurance system is necessarily stricter in terms of labour market conditionality than a welfare system; but with increasing indications that the welfare system has created incentives that affect labour market behaviour, it is necessary to try to coordinate the two, while respecting the fact that they have different aims.

An improvement in the overall coordination between welfare oriented policies and labour market policies should eventually come about through the merging of the three different governmental organisations involved: the National Insurance organisation and

the National Employment Service at the state level, and the municipally-based Social Welfare System. Starting in the autumn of 2006 with 25 pilot offices, this reform is progressively creating the unified Labour Welfare Organisation (known as NAV); by the end of 2009 all the separate offices should have been replaced by a single NAV office covering every municipality. It is clearly too early to look for visible results in terms of labour market outcomes from the mergers; the opportunity to rationalise different approaches to activation policy should lead to an improvement in the long run, as well as simple cost savings through reduced administrative overheads. Such savings may perhaps depend on the local negotiations that are to decide some aspects of the merger, for example who should be in control of each office. In some cases, the municipalities and state authorities have been unable to agree on this, and the offices are being run with two "leaders", which could easily impede rather than facilitate coordination and efficiency improvements. Efforts should be made to resolve such situations rapidly. More generally, in the process of merging the systems and their cultures, and emphasised in the previous Economic Survey, priority still needs to be given to the need to give precedence to the culture of placing people into jobs over that of distributing a multiplicity of assistance benefits.

The wage bargaining system helps keep unemployment low; could it exacerbate labour shortages?

Wage bargaining in Norway is largely based on a two-year cycle of centralised negotiations; plant level bargaining occurs on top of the central agreements. Central negotiations are between the main employers' and union organisations, but within a framework agreed with successive governments of which one of the central components is the idea that wage growth should not exceed that which can be "tolerated" by the exposed sector. At the same time, the consensus requires that income distribution be relatively flat. Over the years this system has certainly helped to keep unemployment lower in Norway than in other countries. But there are two ways in which it may add to apparent labour shortages at different times. One is its focus on the exposed or tradeable sector, the other the lack of wage differentiation. However, central wage agreements cover a smaller proportion of highly skilled workers in the private sector, where plant level bargaining is much more prevalent.

By focusing on protecting the tradeable sector against too high wage increases, wage bargaining appears to be ignoring the long-term forces that can be expected to lead to its relative decline, *i.e.* the rise in the real exchange rate that oil wealth tends to generate which favours the non-traded sector (see Chapter 2). In practice the policy seems to be steering a reasonable course. Although wages in manufacturing have risen steadily relative to competitors, yet mainland "traditional" sectors have seen some expansion in recent years, apparently not suffering too much from increasing wage costs. However, this is partly due to the needs of the petroleum exploration and extraction industry, where geographical proximity can probably offset significant cost disadvantages, and high world prices for certain commodities favour some other industries in the exposed sector such as aluminium. Concerns about competitiveness may come more to the fore if these advantages diminish in the future.

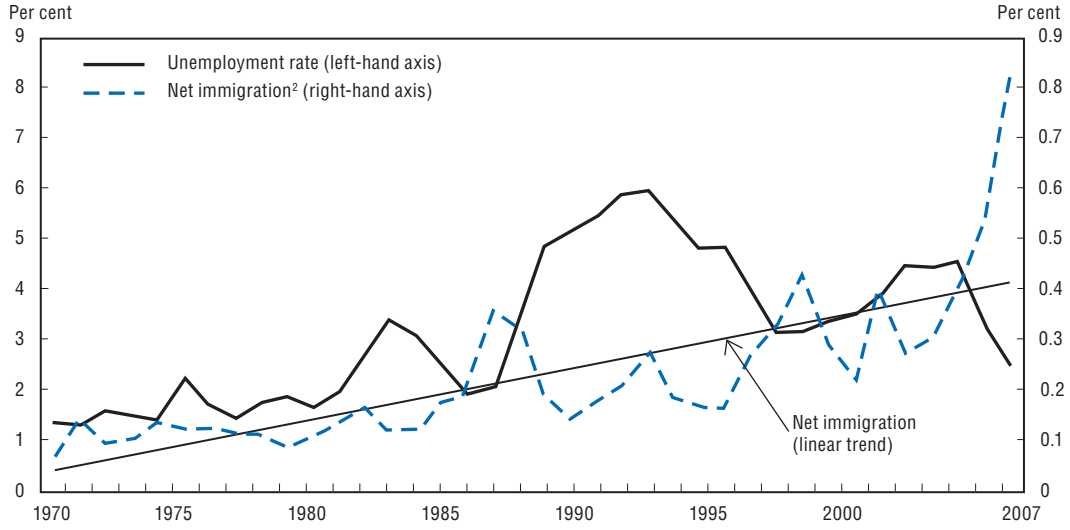
The lack of wage differentiation is certainly quite clear. Wages vary rather little across different sectors (see Figure 1.11); the overall income distribution is significantly flatter than in most countries. Not only are average wage levels quite similar across industries, Figure 1.11 shows rather little movement over the last ten years, the financial sector and

utility supply show gains while certain sectors, mainly local government related, show small declines. This may be interpreted as showing lack of flexibility, although these aggregate figures may conceal more substantial movement in particular jobs or for particular skills.

Migration

Over the past two or three decades another contribution to flexibility of labour supply in Norway has come from the common Nordic labour market (Pedersen and Røed, 2008). With free movement of labour between Norway, Sweden and Denmark (since the late 1950s), there have from time to time been substantial flows of labour among these countries, and there is some correlation between net migration flows and unemployment cycles, though not a very close one (Figure 3.5). Long-term immigration, especially from non-European countries, has been largely limited to humanitarian and family migration, after a brief period in the early 1970s when Norway first became a country of net immigration (which coincided with the first oil production from the North Sea), after which entry to labour migration was essentially restricted to those with a job offer in Norway or certain special categories such as au pairs (Box 3.1). Work-permit figures show that labour migration from non-Nordic countries (Nordic migrants need no work permit) was insignificant until 2004 (Figure 3.6).

Figure 3.5. **Unemployment and net immigration[1] 1970-2007**



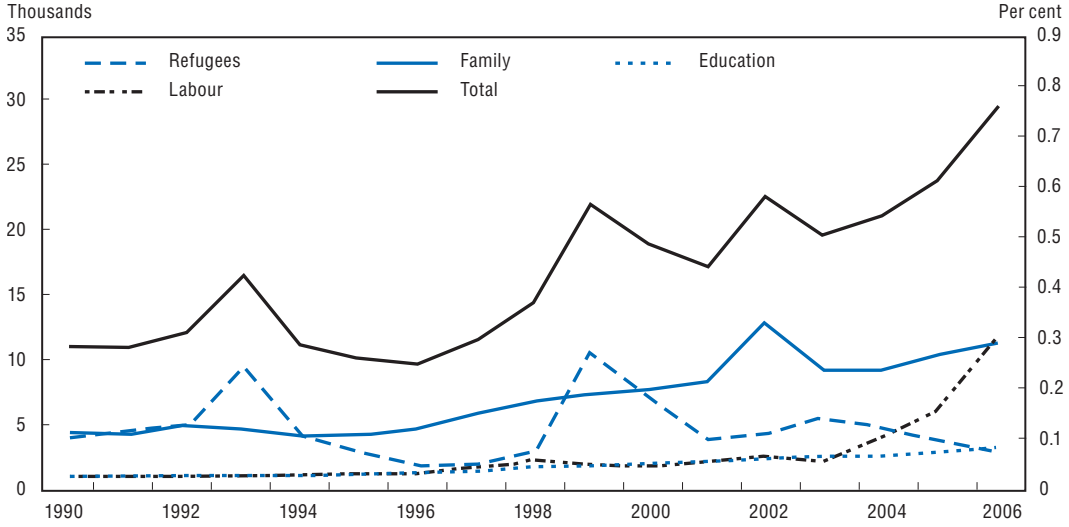
1. Net immigration rate as per cent of total population.

Source: Statistics Norway and OECD Analytical database.

StatLink http://dx.doi.org/10.1787/426253627075

Since the expansion of the European Economic Area in 2004, the nature of migration flows, at least as measured by data on permits, has changed significantly. Low unemployment and high wage levels attracted people from countries who had previously been largely excluded from the Norwegian labour market. Norway adopted transitional rules for 8 of the new EEA members in 2004 and for Bulgaria and Romania in 2007. Although this may have slowed entry from these countries, demand for immigrants rather than "supply" seems to have been the major factor: Sweden, which allowed full freedom of movement immediately, saw very little increase, while booming economies in the UK and Ireland attracted large numbers. While adult family and refugee category migrants are

Figure 3.6. **Immigrant flows by entry category 1990-2006**



Source: Statistics Norway.

StatLink http://dx.doi.org/10.1787/426257338350

generally entitled to work in Norway, foreigners applying for admission under a work permit – *i.e.* including from EEA countries with transition arrangements must already have a job offer before they apply or stay in Norway for up to six months as a work seeker. As from 2008 workers from most of the new EU countries can start working as soon as they have submitted and accurately filled application for a work permit. One reflection of this may be the fact that about 20% of work permits are currently issued to people working for employment agencies, who often recruit directly in the country of origin. Highly skilled workers are subject to this restriction too, and the inflow of such workers (who are not subject to country-specific limits) rarely exceeds one quarter of the annual quota of 5000 people, though in 2007 it was over one half.

Since the EEA expansion, the strong inflow from new EEA members has been overwhelmingly due to Poles, who accounted for some 70% of all labour category entries in 2006-07, and the EEA as a whole accounted for about 85% of all work permits issued. This was probably initially based on contacts with potential employers through migrant seasonal workers and an unknown number of illegal migrants, built up in earlier years, but links are now reinforced through employment agencies that recruit directly in source countries.[8]

The impact of immigration on the labour market

Immigration has already had an important effect on the labour force, allowing employment to expand in 2007 by 4% according to the National Accounts and the labour force by 2.5 %, both of these figures being the highest for many years. Forecasting migration flows is practically impossible. It is well established that the main drivers of migration flows, other than wars and civil strife, are relative levels of unemployment and incomes, and distance, but policy changes make it difficult to use simple analysis to get accurate projections.[9] Norway is a small country with very high incomes and high demand for labour, with a number of countries not far away in Eastern Europe, some in the EEA some not, who could potentially supply large numbers of migrants, just as Poland has done recently. The latest population forecasts from Statistics Norway assume net immigration

Box 3.1. **Immigration policy**

The Immigration Act of 24 June 1988 regulates the entry of foreign nationals into Norway and their right to residence and work. In simplified terms, four categories of immigrants are admitted:

- labour migrants, *i.e.* persons with a concrete job offer;
- refugees and others in need of protection or residence on humanitarian grounds;
- persons with close family links to persons residing in Norway;
- students, trainees and au pairs.

Seasonal workers may also be admitted for up to six months.

Immigrants are admitted with either residence permits (which do not necessarily confer the right to work) or work permits (which also serve as residence permits), which are for one year and usually renewable. After three years, a permanent settlement permit can be issued in most cases.

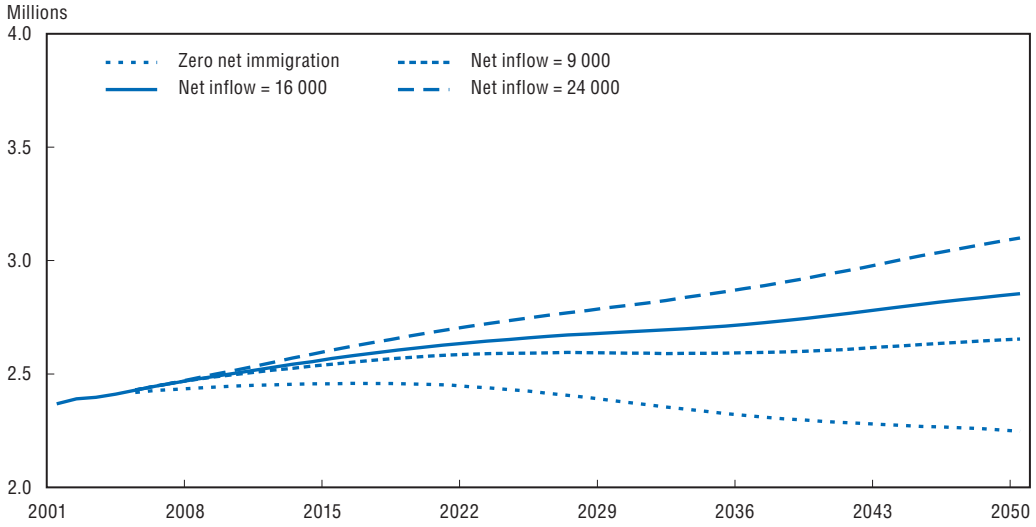
Labour immigrants generally require a concrete job offer before receiving a work permit.

Nationals of Denmark, Sweden and Finland have been able to move freely without any permit for several decades. Nationals of the European Economic Area, with the exception of 10 countries where transition arrangements up to May 1st 2009 (or a date to be determined in the case of Bulgaria and Romania) were invoked, also move freely. In the spring of 2008, the government introduced a White Paper proposing changes in the immigration legislation. No fundamental changes are proposed, although there is some movement in the direction of a slight liberalisation of policy as well as confirmation of the ending of the transitional arrangements in May 2009. The liberalisation is mainly to do with simplifying and streamlining applications, but not entirely. Highly skilled manual workers and professionals would be entitled to enter Norway and look for work and actually start employment before getting a work permit, and there would be provision for non-Europeans to enter Norway and remain for up to 6 months looking for work without needing a work permit. Other aspects of the White Paper are concerned with social integration and avoiding "social dumping."

somewhat above 40 000 in 2009, gradually falling to a stable level of 20 000 from 2040. The figures for the first years are substantially above the range of estimates considered in the White Paper on Migration, which were based on earlier forecasts; in those projections, an illustrative "high immigration" scenario (24 000 a year) would have a major effect on the size of the working population over the next few decades (Figure 3.7). Sustained immigration flows of this order are very unusual, usually because labour markets imbalances are not normally sustained, even if relative income differences are. Successful economic management in Norway, along with the growing fiscal stimulus from petroleum wealth discussed in Chapter 2, may provide the grounds for an exception.

Immigrants can be found working in most sectors of the economy, though the pattern among recent immigrants seems to differ in certain respects from that among immigrants established for much longer. As far as the latter group is concerned, the only significant sectors in which they are over-represented, apart from industrial cleaning,[10] are hotels and catering and communications, they are not particularly important in either agriculture or construction (Figure 3.8). The above average shares in catering and communications are partly accounted for by Nordic immigrants (according to anecdotal evidence, waiters in

Figure 3.7. **Labour force development under different immigration assumptions**[1]

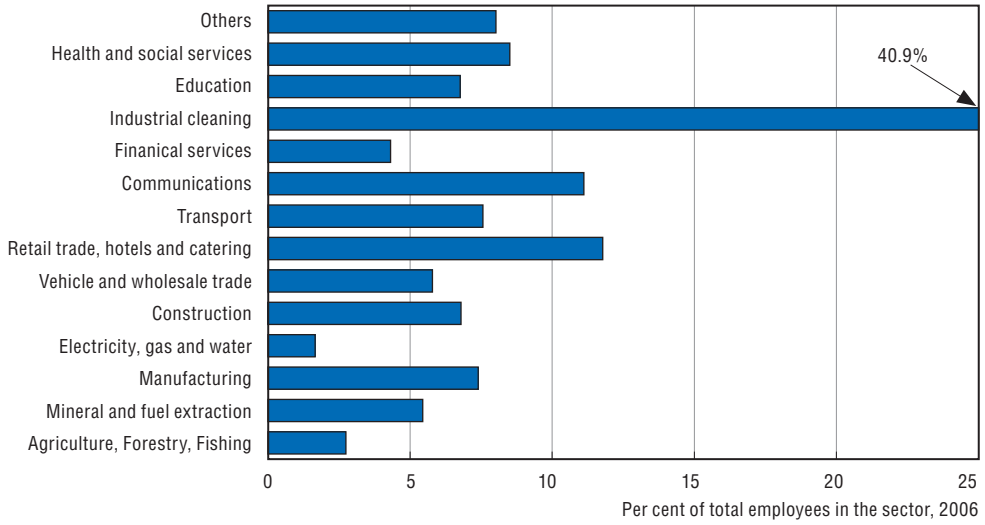


1. Based on the 2005 population forecasts of Statistics Norway.

Source: Statistics Norway.

StatLink http://dx.doi.org/10.1787/426307236071

Figure 3.8. **Sectoral shares of immigrant employment**

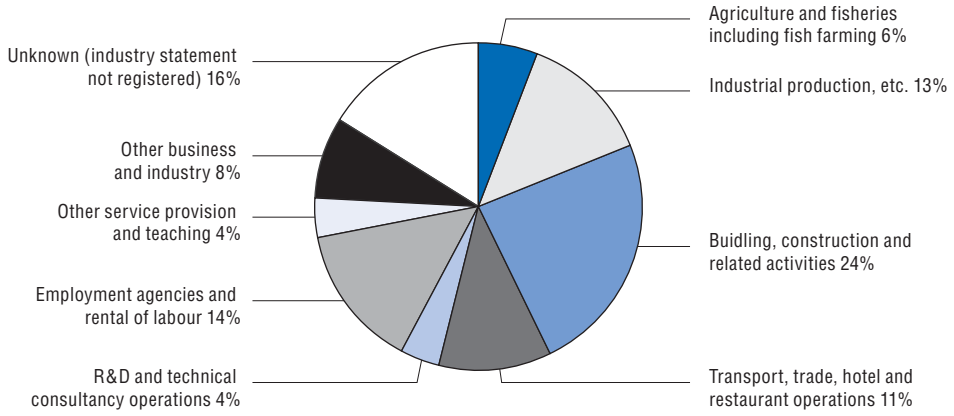


Source: Statistics Norway.

StatLink http://dx.doi.org/10.1787/426310587656

Oslo are more likely to be Swedish than Norwegian). The data shown in Figure 3.8 covers all immigrants, irrespective of when they arrived. As for more recent arrivals, their distribution by sector is not available on the same basis, but work permit data give some information (Figure 3.9). Here agriculture and construction stand out much more, as is common in countries experiencing rapid migration inflows. A significant number cannot be identified by sector because they have come through employment agencies mentioned above, but it is known that these agencies are important suppliers of construction workers too.

Figure 3.9. **Work permits by sector, end 2007**



Source: Norwegian Directorate of Immigration.

StatLink http://dx.doi.org/10.1787/426368838032

The construction sector has taken a disproportionate share of recent immigrants and wages there are thought as a result to have risen by less than might have been expected, given the size of the construction boom (although this is hard to demonstrate statistically). Unions certainly felt this to be the case when they took action to limit the extent of competition from immigrants in the construction sector by using a long-existent but dormant law allowing the compulsory extension of wage agreements to companies and workers that were not party to the negotiations, in a move that is reported to have more than doubled the rates of pay that many immigrant construction workers were receiving.

The benefits from migration

The economic benefits of migration accrue mainly to the migrants themselves, simply because of the (typically) large difference between the income they would have received in their home country and their earnings in Norway, although this assertion depends somewhat on the assumption that immigrants are paid a market clearing wage – similar to marginal native workers – in the host country (otherwise employers could earn a substantial "rent" on low wage immigrants). Conceptually, the consequences for the host economy are in principle relatively simple – the higher labour force allows higher output, whose benefits are split between employers, consumers and the government. There are also some distributional effects as additional labour supply allows more or cheaper services for many people as consumers but it means more competition for some people as workers. There is no empirical evidence on the overall labour market impact of immigration in Norway, but a lot of literature exists on other countries (much of which is summarised in Jean *et al.*, 2007). This literature tends to show that there is rather little negative impact on native workers' wages or labour market prospects in the very long-term. Jean and Jimenez (2007) look at possible shorter-term effects and find that immigration can increase the level of unemployment for as long as 5 to 10 years, even when the full long-term effects may be minimal.

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Employment and wages

There are, however, good reasons for supposing there have not yet been negative labour market effects from the recent immigration surge in Norway, notably the high level of demand and the nature of the immigration process (which meant that labour immigrants from outside the EU and from new EEA members generally had to have a job offer even before they arrived). Since labour demand is already high, any temporary effect on unemployment is likely, up to now, to have simply reduced the growing gap between demand growth and potential output growth, allowing the central bank to be slightly less aggressive in slowing demand than it would otherwise have needed to be.[11]

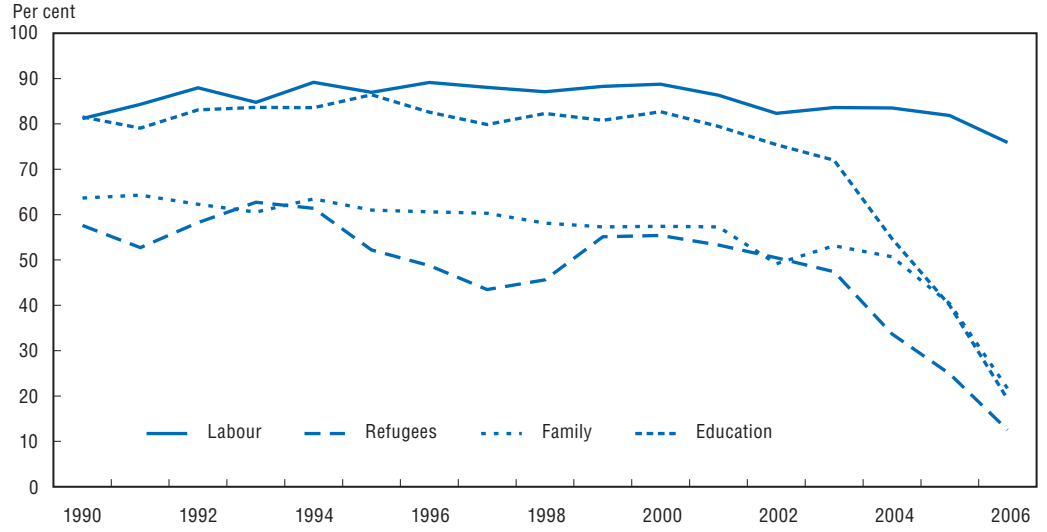
Despite this, unions invoked the wage-extension law mentioned earlier, fearing that wages in construction must be lower than otherwise, and that "social dumping" could undermine wage levels and conditions of work in existing labour agreements. Employers did not oppose this move either, perhaps because this extension makes it difficult for new and/or foreign construction companies to compete in Norway; quite stringent construction site monitoring procedures have also been introduced to ensure that contract extensions are being respected. The need for such monitoring suggests that immigrants do not view the previously lower wages as unacceptable, though those who now have higher wages have certainly benefited; this may be not just a measure against social dumping to protect immigrants, but also a way to protect some Norwegian workers and companies (probably at the expense of consumers or companies who therefore pay higher construction costs).

Unemployment among immigrants

Labour migrants generally have very good labour market performance initially because they are prime age workers and because they are a selected group through the work-permit system. Other immigrant groups, refugees and family immigrants, are less successful (Figure 3.10). Because of the influence of other groups, immigrants as a whole show higher rates of unemployment than natives. Indeed, although unemployment in Norway is lower than in most other countries in recent years, unemployment rates among immigrants are higher, with the gap between the two groups being noticeably larger than average, though similar to countries such as France, Sweden and Denmark (see Jean *et al.*, 2007). For immigrants from most regions, their unemployment also varies more with the economic cycle than the overall unemployment rate does (Figure 3.11). The greater cyclicality does not apply to Nordic immigrants, suggesting that while the Nordics protect natives from some of the unemployment cycle by moving back home when the labour market is slack, some other immigrant groups have a similar effect but through more frequent spells of unemployment than natives.

As far as long-term performance in the labour market is concerned, a previous episode of immigration was more discouraging than Figure 3.10 in terms of whether good performance can be maintained. In the early 1970s, for a short period, Norway was open to flows of relatively unskilled workers, who came largely from southern Asia, principally Pakistan. Research on the employment experience of this group (see Bratsberg *et al.*, 2007) shows that after several years in which they enjoyed employment rates as high as or higher than unskilled Norwegian workers, their employment rate declined dramatically after about six years. The research reaches no clear conclusions as to why this was the case: one might have expected the immigrants to have established themselves relatively well in the labour market after six years. Plausible hypotheses are that in the economic downturn of the second half of the 1970s such workers were less flexible than Norwegians in moving

Figure 3.10. **Immigrant employment rate in 2006 by year of entry**[1]

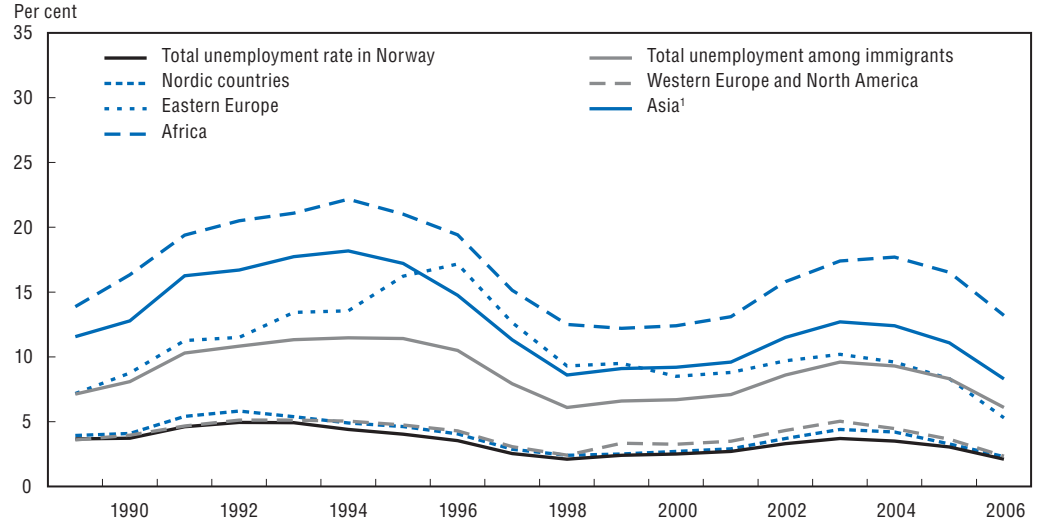


1. This figure should be read as follows. In 2006, 13% of refugees who entered in 2006 were employed and 47% of those who entered in 2003. Of those who entered in 2000 for educational reasons, and were still in Norway in 2006, 83% were employed in 2006.

Source: Statistics Norway.

StatLink http://dx.doi.org/10.1787/426385536388

Figure 3.11. **Unemployment by geographical origin**



1. Includes Turkey.

Source: Statistics Norway.

StatLink http://dx.doi.org/10.1787/426423366456

into different sectors. Disincentives embedded in the social security system may also have contributed to the poor lifecycle employment performance of the immigrant group. Other possibilities such as worse health status than Norwegians, and that racial discrimination in the labour market may make itself felt more in downturns, are difficult to test.

While labour market policies in Norway are strongly oriented towards flexibility combined with inclusiveness and equity, it is clear that this is not so easily achieved with

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immigrants. The better performance apparent for more recent labour migrants is perhaps encouraging for the outlook for the latest wave; however, data in Figure 3.10 cover a period with very low labour migrant entries (other than of Nordics) and the characteristics may be very different from those who have arrived since 2004. However, since the 1990s Norway has acquired some experience integrating people from other cultures, including through the education system. The mix of immigrants may also have shifted towards immigrants from more easily integrated cultures.

Policies that make for good labour market performance

In the longer run, if there is a cyclical downturn and much higher overall unemployment, there may be more grounds for expecting some negative effect on Norwegian natives. As Jean and Jimenez show, countries with more successful labour market adaptation to immigration (in the sense that any temporary effect on native unemployment is milder) also tend to be those with certain types of labour and product market policies. It seems to be the case, as might be expected, that avoiding excessive employment protection and ensuring that product market and competition policies do not discourage the entry of new firms and the formation of start-ups, allows the economic structure to adjust more quickly to the changes in labour supply. Norway seems to be relatively well-placed in these regards, with labour market protection mainly focusing on protecting those looking for work (although doubts remain about the role of sickness and disability in this, as discussed earlier) rather than protecting particular jobs and with product-market policies that score well on most indicators other than public ownership. Such policies are desirable in general, but the growing size of the immigrant population, and the likelihood that sooner or later an economic downturn will test the economy's ability to integrate them, lend more importance to maintaining and improving this flexibility.

The wage agreement extension process is the only sign that labour market policy may change as a result of immigration (the law was first used only in 2004, in the case of construction workers mentioned earlier, though it had existed since 1991). If it is restricted to one sector (though construction is important in terms of immigrant employment and is particularly cyclical) it should affect overall labour market performance very little. However, the logical consequence of a generalisation of wage agreement extensions would be to create a set of sector-specific minimum wages, and if these are set too high then they would tend to cause excessive unemployment among the low-skilled in downturns; despite the implicit selection process, many of the recent immigrants are relatively unskilled or at least employed in low-skill sectors. If strong flows of immigration continue, and if they do change the overall skill mix of the economy, the Norwegian labour market model may be challenged. Centralised bargaining itself should be able to adapt (as it has in the past to different economic circumstances). But the consensus on very flat wage schedules, and especially its consistency with good labour market outcomes, may have depended on relatively homogeneous labour quality. If continued strong migration flows extended to significant numbers of low-skilled immigrants, for example, or even just a set of very different skills from Norwegians, there may be less homogeneity and a potential need to allow differentials to change, if the labour market is to adjust efficiently to future economic fluctuations. However, wage agreement extensions are time-limited, though they can be repeatedly renewed.

Fiscal Impacts

The fiscal impact of migrants is largely determined by their age at entry and their subsequent employment experience. Since migrants are generally relatively young with few children they are net contributors to public finance as soon as they are employed, but their overall contribution depends on their lifetime earnings and employment. Such information is used in generational accounting studies. There are no such studies using Norwegian data, but the general result is that the likely long term impact is substantially less positive than the short-term effect since it takes into account costs that arise as people grow older and receive pensions as well as other transfers such as health benefits. Studies such as Storesletten (2003) for Sweden, probably quite similar to Norway in this respect, show that categories such as humanitarian immigrants can actually have a negative lifetime impact on public finance because of the low average employment rates experienced by such immigrants; the same can be true of family reunification flows, depending on their origin. As far as past migration flows are concerned, there is in fact already a tendency for migrants to be relatively heavy users of social assistance: in 2005, 28% of social assistance recipients had an immigrant background at a time when the foreign-born labour force was only 7% of the total. This can to a large extent be explained by the fact that it takes time for many asylum seekers and refugees to be integrated in working life. But labour migrants, who account for the bulk of the recent increase in immigration, usually have an employment profile not too different from natives (though this is not guaranteed, as the discussion above highlights) and, since the costs of their own education have usually already been financed, they are likely to more beneficial to the budget than the average native with similar earnings.

In the very long run, of course, immigrants have children themselves and grow old and it is perhaps not very reasonable to try to distinguish their budgetary impact. Nevertheless, in one area it makes some sense to look at how migration can affect public finances in the long run – old age pensions. Since the pension finance problem is partly a result of the changing age structure of the population, and labour migration especially is concentrated among young productive adults, it may be expected that migration could make a difference. In general, however, the impact is rather small because even flows of migration that are quite large by historical standards are a small share of the population, and because they start to have children, who use education and health services and so on. Nevertheless, Ministry of Finance simulations do show some impact on the medium to long-term fiscal situation. Immigration sustained at recent high levels could improve the fiscal balance in the year 2060 by perhaps 2 to 3% of GDP, or an amount approximately equivalent to the pension reforms to be introduced after 2010 (see Chapter 2) provided their labour market performance is similar to that of natives. Although this may sound like a significant benefit, the immediate fiscal benefit from increased labour migration is probably not very large. Inflows at a level sufficient to have the impact suggested would be unprecedented, generating a major increase in the size of the population, as Figure 3.7 shows. Furthermore, the pension effect should be purely transitory since the new pension system is designed to be actuarially neutral.

For this reason, fiscal benefits would not be a good basis on which to decide on higher levels of immigration. And future governments would still have the same pension problem to solve, because these gains, though they may last for 40 years, are nevertheless only temporary. Furthermore, there is a negative fiscal impact in Norway that is unusual. A significant amount of future public revenues will come from interest and dividends on

petroleum revenues accumulated in the Pension Fund, and the per capita benefit from this is spread amongst a larger population if immigration is strong for a long time.

To sum up, it is fairly clear that under the tight labour market conditions of recent years, the overall economic benefit from recent immigration in Norway has outweighed possible negative impacts on certain groups, but it cannot be concluded from this that benefits in the long term will be so clear.

Conclusions

Although labour market developments since the last *Economic Survey* have been particularly favourable, the reforms recommended there and in the OECD's *Review of Sickness and Disability and Work* remain important. It is understandable that a country enjoying high incomes and living standards might expect to benefit in terms of leisure time and wish to maintain a generous welfare system for vulnerable people. Furthermore, the tendency to maintain a very flat wage structure that the centralised bargaining system delivers has not prevented impressive productivity growth, while it may have helped moderate wage inflation in this strong upswing.

However, high levels of wealth do not imply that resources, including human resources, should be wasted. The decision to award workers sickness benefits or disability pensions should be based on dispassionate and realistic assessments of their health status or their capacity for work; it should also be subject to quite frequent review, depending on the nature of the problem, and better "activation" policies need to be developed. In the unemployment insurance system, benefits are relatively generous, but they may be withdrawn if the recipient does not take reasonable action to take up available employment (which in this case can include moving to another area) or take advantage of activation policy. While there may be many difficult cases, the welfare system should be able to operate on similar principles, provided its main objectives are not jeopardised. If the NAV reform that unifies the welfare and unemployment insurance systems is successful, it should provide the opportunity for this convergence.

Pension reform may seem to be more a fiscal matter than a labour market issue, once the reforms that introduce actuarial neutrality at the margin in both the AFP and the state pension scheme are fully implemented. However, the AFP scheme is still likely in practice to distort the retirement decision through the income effect of providing an age-related income support already at age 62. Furthermore, making a public subsidy available for only part of the private sector labour force, with a separate scheme for the public sector, is hard to justify.

The immigration of the last few years is a success story for Norway, having brought benefits to the migrants, to the companies and customers in sectors where they work, and almost certainly to the public finances. There are few recommendations for migration policy that depend on essentially economic issues; for example, what is often the main political question of how much control to retain over the inflow of low-skilled or unskilled labour is not one that is easily settled on economic grounds, nor is the issue of how much population growth through immigration is acceptable. The labour market and welfare reforms discussed in this chapter are, however, the kind of measures that are likely to improve long-term integration of immigrants in the Norwegian labour market. They are also associated with better adjustment of the labour market in the short term, with temporary increases in unemployment, if they occur, being less marked. This seems

unimportant at the moment, but will be relevant in the event of any significant downturn in the economy, particularly if many of the recent immigrants settle permanently. As in many countries with significant immigrant populations, efforts to strengthen the integration of immigrants, including combating discrimination, are necessary alongside efforts to improve their employment rates. As for natives, this requires a combination of stringent activation policy backed up by the threat of benefit sanctions to accompany the relatively generous benefit system.

The 2008 White Paper on immigration suggests some changes in policy that will also make these reforms more relevant, but may also call into question the wage structure. To judge by reactions so far to pressure on the labour market in the construction sector, the outcome is quite likely to be an increase in the use of compulsory extension of central wage agreements to prevent immigrants undercutting the existing wage structure. This would help to preserve the Norwegian model, voluntarily reducing some of the gains to Norway from immigration, but may be difficult to sustain.

Box 3.2. **Summary of labour market recommendations**

Reinforce measures to tighten access to sickness and disability benefits, as recommended in the 2007 *Economic Survey*

- Introduce frequent checks of general practitioners' initial sickness assessments and repeat assessments; these checks should be carried out by doctors responsible to the social insurance system. Introduce employers' co-financing of benefits, while considering a reduction in the rate of long-term sickness benefit.
- Transfer responsibility for disability assessments to doctors and vocational experts responsible to the social insurance system.
- Review existing disability entitlement and functional assessments more frequently.

Ensure effective governance of the new NAV agencies, so that the aim of coordinating the different services is achieved.

Avoid any delays to implementation of the full pension reform.

Implement the changes suggested in the 2008 White Paper on immigration, notably those allowing freer movement of labour, bearing in mind nevertheless that the economic benefit to existing residents of increased migrant inflows may not be very significant. Ensure active labour market policies are designed to take into account immigrant-specific problems.

Consider whether compulsory extension of individual labour agreements, at the request of unions, is the most effective way to get the best out of immigration while ensuring social justice.

Consider encouraging the social partners to accept a higher degree of wage differentiation both to ensure an effective response to complaints of skill shortages and to improve the labour market integration of immigrants and less-skilled workers at different phases of the business cycle.

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Notes

1. In economic terms the effects of sickness benefits and disability pensions are essentially the same, but they show up differently in statistics – those on sickness benefit are employed but working zero hours, whereas those on disability pensions are out of the labour force.
2. Until recently the working age population was generally defined as ages 15-64. A shift to the 16-74 definition for statistical purposes is underway but not complete in all countries, so reliable cross-country comparisons are difficult.
3. Regular employment data collected for the labour force survey does not separately distinguish immigrants.
4. Monitoring wage developments through the year is complicated because there is no single widely-accepted summary measure of monthly or quarterly wage developments.
5. These figures are based on labour force survey data, *i.e.* on self-reporting. Sick leave, for example, refers to those reporting that they were temporarily absent from work for the whole week in which the survey was taken. People on temporary sick-leave are still employed and therefore not "inactive" in labour force statistics; this does contribute to reduce average hours worked, however. Disability and early retirement cannot be easily separated: Statistics Norway suspects that some people receiving disability pensions may report themselves as retired early, while some people on early retirement pensions may report themselves disabled.
6. This measure is not shown explicitly since it depends on uncertain comparisons of labour force participation rates.
7. From the website of the Ministry for Children and Equality, March 2008.
8. At least one such company has a network of contact points throughout Poland, including two residential language-training and skills-verification centres. It provides language training and certain other help free, offers its recruits as agency workers to employers in Norway, and expects to break even once its workers are employed for more than about 9 months.
9. Boeri *et al*., 2001, made a careful study of precedents for labour movement in the European Union, and their overall prediction for post-EEA enlargement flows was not far out, but the predictions for individual countries with low transitional entry barriers were substantially exceeded (notably for the UK and Ireland) and substantially undershot in a number of other countries, especially Germany.
10. The very high share for industrial cleaning concerns just under 8000 immigrants, 4% of the total.
11. In some circumstances immigration can actually be expansionary. Increased labour supply warrants a higher investment rate, and immigrants themselves spend more than they earn in the early months as they establish themselves. This is unlikely in Norway as most recent Polish immigrants are clearly intending to return home – whether they eventually will do so is another matter – and save or remit a high proportion of their earnings.

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Chapter 4

Making the best of Norwegian schools

Traditionally, the Norwegian compulsory education system has focused strongly on the linked goals of equal opportunities to learn, comprehensive and inclusive education. While some of these objectives have been met successfully, a number of educational outcomes, notably measures of pupil performance at the end of compulsory schooling, are unsatisfactory. Given the significant resources devoted to education, Norway's modest performance on certain measures suggests that resources are used inefficiently. There are many possible routes to improve efficiency. This chapter focuses on teaching quality, school autonomy, accountability and the level and composition of spending. Consistent policy actions should be taken in these areas, taking into account the multi-level structure of governance of the Norwegian education system.

Norway spends 6.2% of GDP on publicly-financed education, compared with an OECD unweighted average of some 5.8%, or 5% when private finance (which scarcely exists in Norway) is excluded. This reflects high income levels, the currently healthy state of the public finances and the importance that Norway attaches to a comprehensive state education system. Inclusion and equity are key goals of the Norwegian education system. Every pupil should receive education in accordance with her capabilities and needs, and an equal opportunity to learn and develop skills for life should be given to everybody, irrespective of their socio-economic conditions and geographical location. Such indicators as are available do indeed show that education contributes to the egalitarian nature of Norwegian society and its relatively high degree of social mobility.

Norway can afford relatively expensive public education, but it should not neglect value for money; education must provide the human capital needed to sustain growth in the future, including maintaining and improving healthy innovation processes. Since the publication of the first PISA results in 2001 showing only average performance in Norway, and even more so with evidence that relative performance has been declining since then, policymakers have recognised that there may be a problem. Responsibility for the management of compulsory education rests with municipalities, as well as most of funding, so that direct action by central government is restricted. This can intervene in certain areas such as teachers' training standards, but crucially it can set the environment in which municipalities and schools operate. Recently, the freedom of municipalities to choose their methods has allowed an experiment in potentially radical change in Oslo.

This chapter, concentrating on the years of compulsory education, which absorb two thirds of education expenditure, takes a look at how Norway spends its money and investigates how the structure of incentives and accountability may have generated insufficient focus on students' performance, leading to deteriorating outcomes even though many people in the system (pupils, teachers and administrators) believed it was performing well. An introductory section gives a brief outline of the education system, and discusses indicators of educational attainment and measures of efficiency. Subsequent sections look at the quality of teachers, teaching, and teaching time before discussing the incentives faced by teachers and schools, and the structure of accountability within which they operate. It concludes that there may be ways of designing incentives to spend money better so as to get improved outcomes with existing resources, as well as room for cuts in expenditure which would not impair educational outcomes and which could release resources for use elsewhere in the system. These conclusions are supported by the results of an econometric exercise, presented in detail in the annex of this chapter, which looks at the main policy determinants of learning outcomes in OECD countries, as measured by PISA scores.

The main features of Norwegian compulsory education

Norwegian compulsory education is very comprehensive, there is no streaming or other educational tracking before the upper-secondary schools (Box 4.1). An equal importance is attached to guaranteeing the same conditions for studying in every part of the country: almost all local communities have their own school, sometimes with very small classes or classes pooling different grades. Pupils generally attend the closest school to their residence, even if in principle they can apply to a different school. Few families use this option because in practice the choice is very limited.

Box 4.1. **The Norwegian primary and secondary education system**

Children start primary school, *Barnetrinnet* (grade 1 to 7), at the age of six, and lower-secondary school, *Ungdomstrinnet* (grade 8 to 10), at age 13. Pupils go to school 38 weeks a year, five days a week and take on average 19.2 (primary) and 22.4 (lower secondary) 60-minute lessons per week. There is a minimum total number of teaching hours (5 120 in primary schools, as from Autumn 2008, 2 556 in lower-secondary, over the 10 years of compulsory schooling) but many municipalities offer more hours than the minimum. Compulsory schooling is fully comprehensive, with no tracking, neither according to ability nor to subjects studied, and neither between nor within schools. Up to grade 7, assessment of pupils is mainly qualitative (pupils receive a quarterly report with a descriptive evaluation of their performance), while from grade 8 onwards explicit grades are awarded, though promotion from one year to the next is automatic. Final exams with marks are carried out at the end of lower-secondary level; again, there is no concept of "failure" in these exams.

Since 2003, when the maximum class size rule was abolished, pupils are organised into "pedagogically suitable groups". In practice, since the Parliament had stressed that this rule was not meant to reduce resources for schools, the average class size remained substantially unchanged. Given the geographical variation of the school districts, there are marked differences in the average size of classes/groups across the country. Geographical variation is also reflected in school size; slightly less than 10% of total students are enrolled in schools with less than 100 pupils and 53% study in big schools (which in Norway mean schools with more than 300 pupils). About 25% of schools are so-called "combined schools" offering both primary and lower-secondary education.

Upper-secondary education comprises two paths: general education (lasting three years), which is more academically-oriented, and the vocational training track (lasting three or four years) which aims at more immediate entry into the labour market. All people between 16 and 19 have a statutory right to upper-secondary education and there are a number of possible pathways for older youths to return to the post-compulsory system if they initially drop out. Today more than half of upper-secondary students are enrolled in vocational education, and the trend of the last ten years is on the rise. Assessment in upper-secondary education relies on continual assessment and end-of-year examinations (generally externally set and marked). The latter also condition promotion to the following year.

In the last ten years the number of pupils in compulsory school increased by 10%, with the numbers in primary schools increasing by about 7%, while those at lower-secondary level grew more than 20%.

Norwegian education is under the responsibility of both central and local authorities. The Ministry of Education and Research is responsible for setting the general guidelines of the education system and for overall supervision. Management and administrative responsibility in compulsory schooling is exercised by municipalities, while counties have an analogous role for upper-secondary system. The general framework for curricula, including goals, priorities, structure and organisation of learning, is established at central level but responsibility for implementation is left at local level. All primary and lower-secondary schools are publicly funded and a very small minority (4.5%, 2% of total students) is privately managed. Funds are provided by the State to lower-level government as a block-grant which covers education and other social expenditures (notably health care, child and elderly care), while local authorities are free to decide on the allocation of resources to schools. On average municipalities spend 38% of their budget on education, with a minimum of 15% and a maximum of 71%.

In the last ten years Norway has undertaken a number of reforms of the education system.The most recent, known as Knowledge Promotion, was launched in 2006 and is to be implemented over the years up to 2009 (Box 4.2). The reform, together with other national initiatives,[1] addresses some of the main weaknesses identified later in this chapter, planning to redefine curricula, strengthen teachers' and principals' competences, improve benchmarking and deepen the treatment of Mathematics, Science and Technology subjects. As with some of the earlier reforms, however, measures to meet the targets seem insufficient, and some of the targets themselves lack focus. In the White paper from June 2008 the Government presents goals that should be pursued from national level to school level (see Box 4.3).

Box 4.2. **The "Knowledge Promotion" reform**

The ongoing reform "Knowledge Promotion" was launched in 2006, with the objective of developing "fundamental skills that will enable pupils to participate actively in Norwegian knowledge society". The reform covers both compulsory schooling and upper-secondary education. It aims at further strengthening adapted learning on an individual basis, through new curricula with clearly defined competence goals, more emphasis on basic skills (the ability to read, the ability to do arithmetic, the ability to express oneself in writing; the ability to make use of information and communication technology), but leaves local discretion within a nationally determined framework of subjects and tuition time.* The new syllabuses have been worked out for all subjects in the 10 years of compulsory school and for the common subjects in upper-secondary education and training; the new syllabuses specify goals for what pupils should know in various grades. These, however, appear to be flexible: "In assigning such skills targets, the subject syllabuses are expressing high academic ambition for all pupils, who *in varying degrees* should be able to reach the targets that have been set." (emphasis added.) The new national curriculum also strengthens "basic values and the view of humanity underlying education". Overall, while the new curricula shift the focus on improving average performance, the principles of equitable and inclusive education continue to be pervasive in the reform. The old curriculum did not define clear standards for average outcome, and the system did not seem to be very ambitious. The new reform is a good step forward to change this culture. However the twofold goal of improving overall performance and preserving equity of education might be very ambitious to reach, and probably more costly.

Box 4.2. **The "Knowledge Promotion" reform** *(cont.)*

The main expenditure programme developed under the Knowledge Promotion Reform is the "Kompetanse for utvikling" (Competence for development), a programme which is essentially meant to strengthen teachers' and principals' competences, through in-service professional training. The competency development programme is financed by the central government, with money transferred to municipalities and counties on the basis of the number of teachers (85% of funds), the number of schools (10%) and a fixed fund per county (5%). Municipalities and counties freely decide how to allocate this money, within a national priority framework (in 2007 pupil assessment was added as national priority). Activities undertaken in the context of competence development programme are planned through a document (produced by the municipality/county) which establishes local needs and assigns funds accordingly; these activities are also the subject of a yearly report to the Regional governor. From 2005 to 2008, more than a billion NOK have been allocated to this programme, The competence for development programme has been evaluated by an independent institute (FAFO) in three different stages of its implementation. Overall, the results of this evaluation are mixed (see The Education Mirror 2006 and the section below for a discussion).

* The new curriculum establishes the distribution of teaching hours across grades of instruction; it also gives local authorities the power to reallocate 25% of teaching time. Teaching time can be changed by principals when "it is likely that it will help pupils attain the goals for their subject as a whole". Any change is conditional on pupils' and families' agreement.

Box 4.3. **White Paper on Quality in Education**

The new government White Paper "*Quality in Education*" was launched in June 2008. The white paper addresses the relatively low performance of Norwegian pupils in reading, maths and science. The different initiatives proposed are important necessary steps to improve the quality and efficiency of the Norwegian compulsory education. They are to a large extent in line with the recommendations of this chapter.

Resources and performance assessment for early intervention

Research consistently emphasizes the importance of early intervention in order to improve learning outcomes (Heckman 2007, Tayler *et al.* 2007, OECD, 2007b). Policy measures intended to increase the use of early intervention are proposed, including mandatory diagnostic tests in reading and math in grades 1-3, and financing additional teaching resources for following up unsatisfactory results in reading and mathematics. The funding will be combined with a new regulation requiring municipalities to strengthen teaching for students with poor performance in these subjects.

Teacher Quality and School Leadership

The White Paper highlights the importance of teacher quality and school leadership and proposes the systematic use of in-service education of teachers and school leaders, with high priority to training that leads to formal accreditation.

Performance Assessment and Local Accountability

The White Paper proposes measures to further develop and expand the national assessment system, such as national tests in reading, maths and English at grade 9 in lower secondary education, in addition to the present tests at grade 5 and 8. Mandatory diagnostic tests in reading and math will be introduced in the first grade in upper secondary education. In addition, steps are taken to facilitate the use of performance information at the local level. The White Paper also includes proposals for increased local accountability and state support to schools with low performance. Municipalities are required to prepare an annual report on the results of their schools.

The current stock of human capital is high by OECD standards; will the relative advantage be maintained?

High attainment levels in the adult population

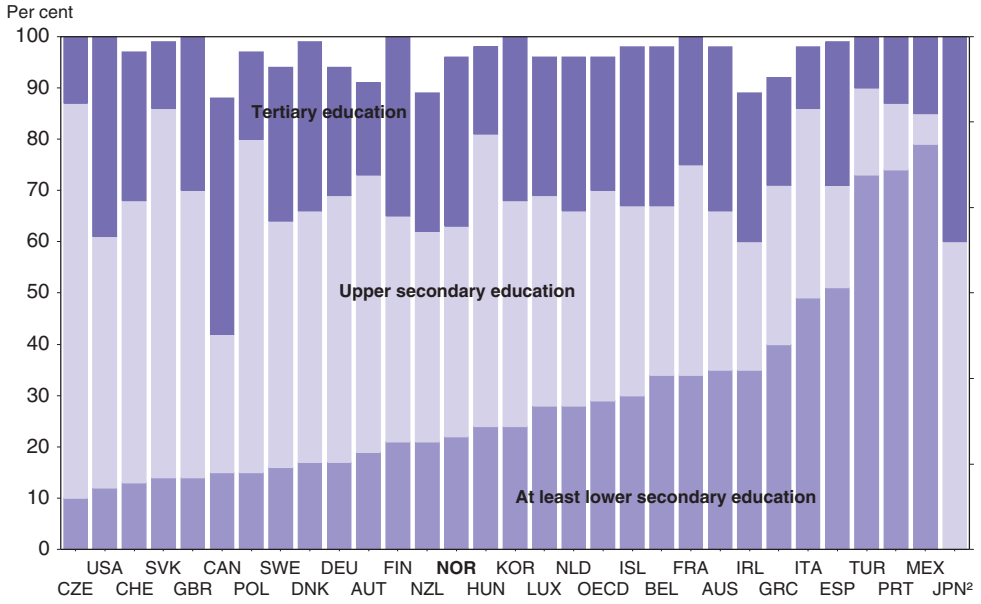
On various – admittedly indirect – measures, the stock of human capital is substantial. The average completed years of schooling for the population aged 25-64 is around 14, two years higher than the OECD average. One person in three in the adult population has a tertiary degree (versus one in four for the OECD average), but the number of people with an upper-secondary education is also considerable (Figure 4.1). By comparison with other OECD countries the relatively high average attainment level is mostly due to the larger share of educated people in the oldest groups of the population (but, as elsewhere, the elderly are on average less educated than young people in Norway). Norway also stands out for having high current graduation rates at upper-secondary levels (and particularly so for general *versus* vocational programmes). Norway is also one of the countries where gender disparities in educational attainments are the lowest (both for the stock and the flow of human capital).

But only modest average performance at age 10 to 15

With the exception of two surveys (Bonnet et al., 2002 and the Civic Education Study) which showed good results in English and democratic competence, the majority of international assessment surveys have consistently found that Norwegian pupils perform modestly in various core subjects, like mathematics, sciences and reading (TIMMS 1995, 1999, 2001 and 2003; PIRLS 2001 and 2006; PISA 2000, 2003 and 2006). According to the

Figure 4.1. **Education attainment in the adult population**[1]

OECD countries, 2005



1. Distribution of the 25 to 64 year old population, by highest level of education attained. The category at least lower-secondary includes both primary and lower-secondary. The category "post secondary, non-tertiary education" is not included in the chart; therefore the sum is not always 100 per cent.
2. For Japan, upper secondary education is not available as a separate aggregate.

Source: OECD, *Education at a Glance 2007*.

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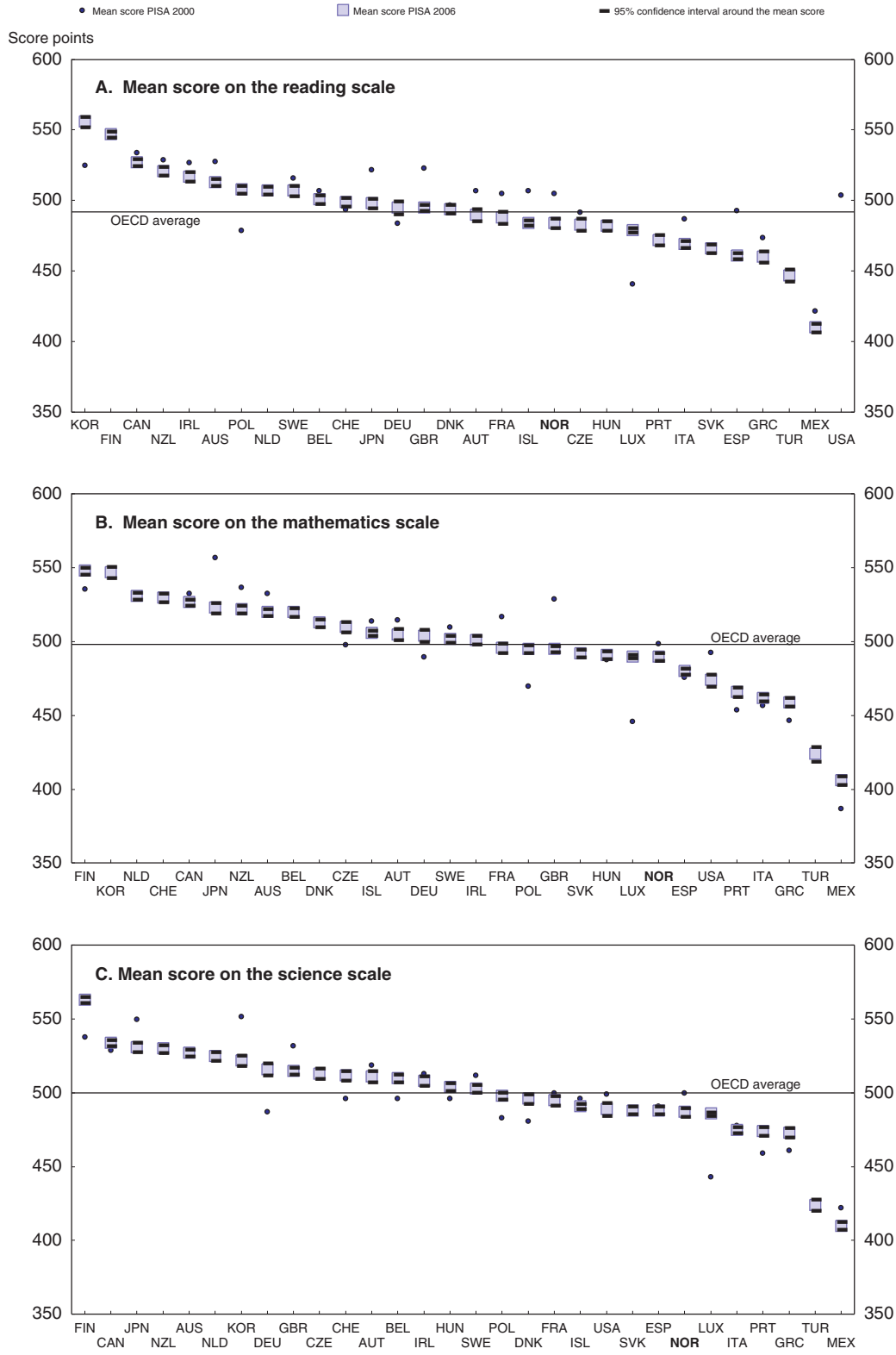
latest available OECD survey (PISA 2006), Norwegian 15-years old pupils score about 13 points lower in the combined science scale than the OECD average. This is equivalent to saying that the average Norwegian pupil is nearly one third of a school year behind their average OECD counterpart. This is not true at all ability levels: Norway does not have more low-achievers, but rather it has fewer higher-achievers than other OECD countries. The number of pupils at the highest proficiency levels is 50% lower than in the OECD area average; for the second-highest and third-highest levels the gaps are 30% and 20% respectively. Even compared with its Nordic neighbours, and despite the marked similarity of their educational systems, there is a significant performance gap. While Sweden and Denmark perform around the OECD average, Finland is ahead of Norway by the equivalent of two years of school.

Most surveys also suggest that there has been a decline in relative performance in recent years. Reading skills of Norwegian pupils went down by 20 PISA points over the last six years, *i.e.* by the equivalent of more than one half of a school year, whereas in Sweden and Denmark the 2000 scores are not significantly different from those of 2006 (Figure 4.2). In mathematics the fall was much smaller and not significantly different from zero, though the time interval over which the comparison takes place is shorter. The TIMMS[2] 2003 report also highlighted a worsening since 1995 for students of both grade 3 and grade 7 students (respectively 10-year old and 14-year old pupils) in both mathematics and sciences. Finally, PIRLS 2006,[3] which tests reading abilities among grade 4 pupils, shows a decline among low-achievers and high-achievers, but little overall change since 2001 (with performance level around the PIRLS scale average, but much below Sweden and Denmark). However, these results should be interpreted with the caveat that, when the PIRLS test is administered, Norwegian pupils are one year younger than Swedish and Danish peers. Correcting for the age-difference would thus significantly reduce the observed performance gap between Norwegian pupils and the two other Nordic countries. [4]

Despite indicators of low educational achievement among children in reading, mathematics and science, both IALS 1998 (International Adult Literacy Survey) and ALL 2005 (Adult Literacy Learning) indicate very high levels of ability among Norwegian adults. In IALS 1998, for instance, Norway was among only six countries where less than 15% of the population were at the lowest proficiency level. In ALL 2005, Norway was the best performer.

Two possible explanations have been put forward to explain the apparent inconsistency between children's and adults' abilities.[5] One is that there has been a deterioration in the quality of education, so that the relative performance of adults will soon begin to decline. The alternative explanation is that the comprehensive and inclusive nature of Norwegian education may give poor results on certain comparisons early on, but that it pays off later, giving individuals motivation and self-confidence for keeping-up skills and competencies. For the moment it is difficult to weigh these alternative explanations. For example, because of their cross-sectional nature, international assessment surveys cannot distinguish the effect of being educated in a particular period (the "cohort" effect) from an effect due purely to age. The only empirical study on the quality of Norwegian education over time does not find any evidence of a significant deterioration (Hægeland *et al.,* 1999). The second, more optimistic view has some support, such as the significant participation of adults in training and life-long learning (see AES, 2007). But, without more conclusive evidence on this (that might be gained through the new OECD adult skills survey planned to be come out in 2013), it would be a mistake to

Figure 4.2. **Comparative PISA scores**



Source: OECD PISA database 2000, 2006.

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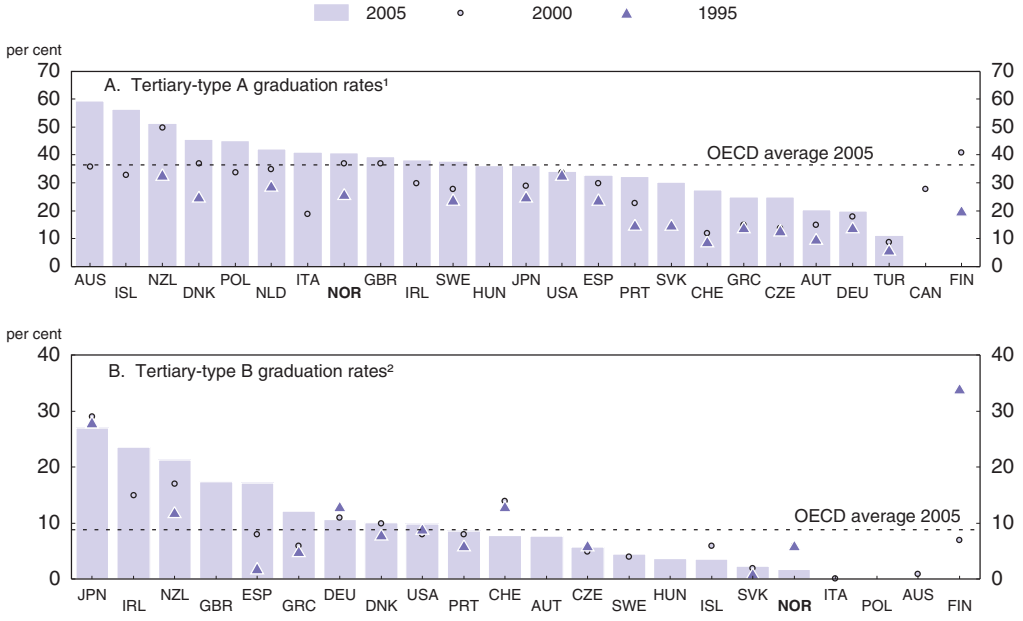
conclude that poor PISA performance can be ignored. Delaying effective investment in human capital is not without cost. Insufficient competence at entry to higher education might be one of the reasons behind long duration of tertiary studies.[6] Thus, deficient compulsory education may lead to both increased direct and opportunity cost of education.

Slowing tertiary graduation rates, declining interest in maths, science and technology

Whether or not weaknesses in compulsory education are a cause, investment in tertiary education has been accumulating at a slower pace than the OECD average in the last few years, with the overall tertiary graduation rate falling increasingly behind other countries (Figure 4.3). The number of graduates from theoretical programmes has been rising by 4% yearly, but this is 2 percentage points lower than the OECD average and lower than other Nordic countries. Though there has been a move towards theory-oriented tertiary programmes away from vocational programmes, as well as an increase in the effective length of tertiary studies, Norway is one of the few OECD countries where the number of engineering graduates is decreasing (Figure 4.4). It is also among the countries with the lowest increase in science graduates and the lowest number of tertiary science graduates in the population (1% *versus* 1.7% in the OECD area and 1.9% in the other Nordic countries). From a labour market perspective, this trend might not be particularly worrying if there were no visible signs of a corresponding skills shortage. While there is evidence that unfilled vacancies are currently higher for engineers (Chapter 3), it is harder to assess

Figure 4.3. **Graduation rates in higher education**

Percentage of students that complete tertiary-type A and B programmes for the first time,



1. Graduation rates of tertiary-A programmes are calculated by summing the graduation rates by single year of age in 2005 for Australia, Austria, Denmark, Finland, Germany, Iceland, Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Sweden and Switzerland.
2. Graduation rates of tertiary-B programmes are calculated by summing the graduation rates by single year of age in 2005 for Denmark, Finland, Iceland, New Zealand, Norway, Portugal, Slovak Republic and Sweden.

Source: OECD, *Education at a Glance 2007*.

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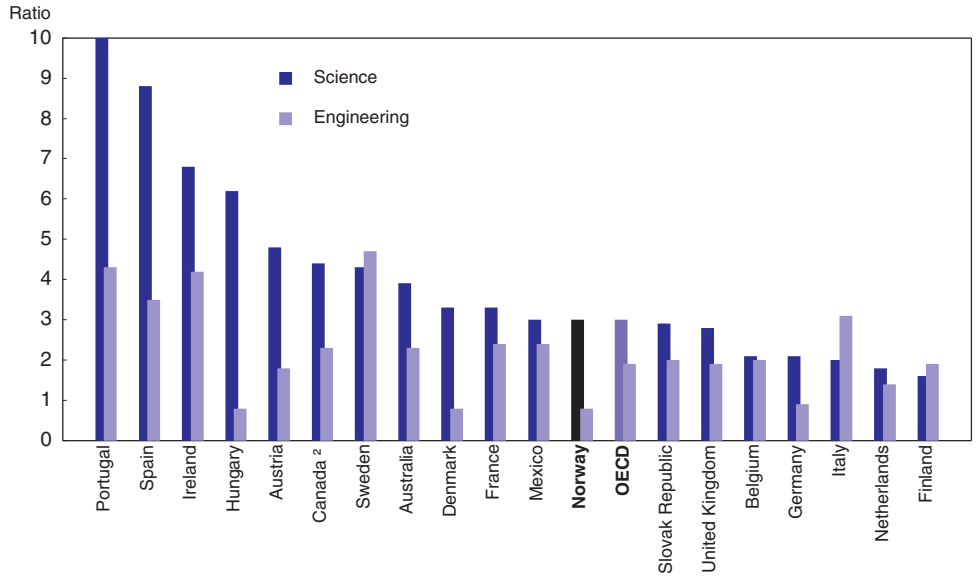
Figure 4.4. **Generational differences in science and engineering, 2004.**
Change in share of population with high level education[1]



1. Data show the ratio A/B, where A is the proportion of people aged 25-39 with a higher or advanced education diploma (ISCED 5A or 6) and B is the proportion with this level of qualification in the 55-64 age group.
2. Year of reference 2001.

Source: OECD, *Education at a glance 2007*. Table A1.5.

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whether these shortages are structural. As argued below, however, the very compressed wage structure in Norway transmits inefficient signals as to what the economy needs. So, even though at the moment wage differences between new graduates from different fields of education are relatively small (Table 4.1), there might well be a long-term lack of qualified labour in scientific and technological fields. Finally, graduates in maths, science and technology (MST) are considered to be extremely important for driving innovation and growth, it must not be forgotten that Norway attaches a considerable importance to innovation policies and practices. The alternative would be to import qualified labour force (in scientific subjects) from emerging economies, but the fact that the current quota is far from being filled suggests that, unless specific migration policies are put in place to attract skilled workers, it would be hard for Norway to cover the gaps that the current education system is producing.

The low number of sciences and engineering graduates may reflect the relatively low importance given to mathematics and sciences in the curriculum. In the PISA sample, only 30% of 15-year-old pupils report having regular lessons in mathematics for more than 4 hours a week (and 7% for sciences), compared with 51% in the OECD area (and 35% for sciences); this is so even though, according to PISA's pupil questionnaire, Norwegian students seem to be relatively interested in mathematics and sciences, at any rate as much as in other countries.

Aware of these weaknesses, the last two governments have put in place some initiatives to promote the development of MST in Norwegian education. These strategies aim to reinforce MST at all educational levels and over the working life and to improve

Table 4.1. **Average gross monthly salary for full-time employed graduates by field of education, six months after graduation. Spring cohorts 1995-2005.**

		1995	1997	1999	2001	2003	2005
Post-graduates, all		100	109	118	132	137	144
Humanities and aesthetics		98	104	112	122	135	137
Social sciences		99	108	116	126	132	142
Law		97	104	117	132	133	143
Business and admnistration		109	117	132	163	153	141
Nat. sciences, craft and technical subjects		101	111	120	136	136	145
	Physics and chemistry	104	110	118	128	137	142
	Mathematics and statistics	102	113	119	137	129	151
	Computer sciences	107	119	134	157	143	148
Health, welfare, sports		103	118	129	142	151	155
Primary industry studies		95	100	109	118	125	127
Engineering (bachelors)		88	101	111			137

Note: Salaries are nominalised to the level of "post-graduates-all categories" in 1995 which is set equal to 100.
Source: Graduate Survey, NIFU-STEP, various years.

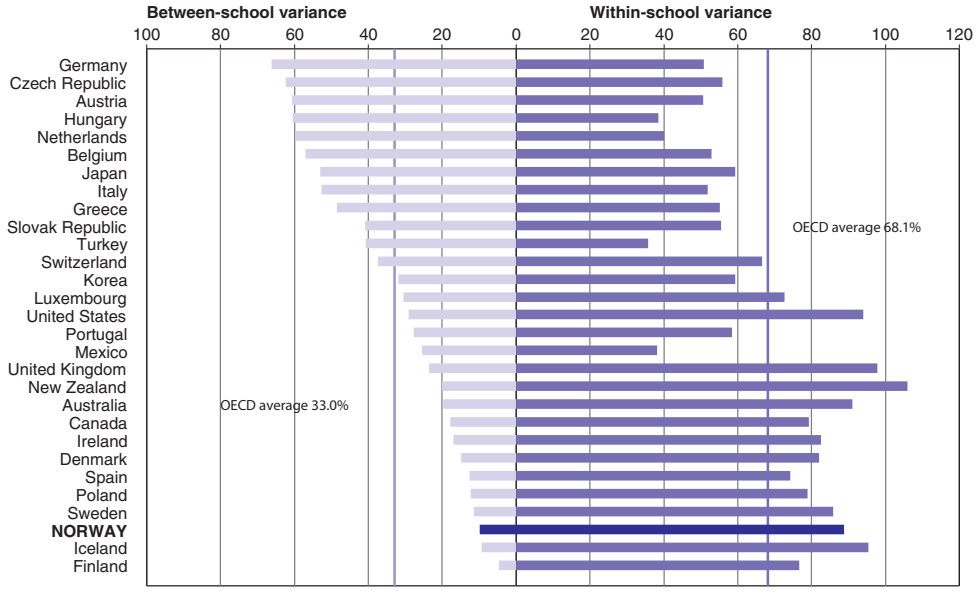
teachers' qualifications and training in MST. However, they are not strongly focused on developing an MST culture early – already in primary and lower-secondary school – and, despite some ambitious targets, it is unclear what concrete actions are effectively envisaged. In addition there is a potential lack of long-term incentives to study MST subjects at the tertiary level, shown by low wage differentials between scientific and non-scientific professions at the beginning of careers, which tend to persist through working life (Hægeland and Møen, 2007), which would suggest that any institutional effort to develop MST culture in Norwegian education is bound to be ineffective, if the labour market does not become more competitive.

Equity and social goals

Average attainment is not the only standard by which to judge educational systems. Norwegian legislation on primary and lower secondary education arguably attaches more importance to broad notions of equity than to attainment as measured by studies such as PISA (see also OECD, 2004). On a number of indicators, at all levels, the system is relatively successful in fulfilling goals of inclusion and equity. For instance, nearly 86% of 18 years-old were in upper secondary education in 2005; this participation rate has been falling, but is still above the Euro area average of 80%. The proportion of early leavers in the 18-24 age group (many of whom nevertheless complete upper secondary education at some time) has been falling.[7] International surveys confirm that Norwegian schools are quite successful in creating a safe and inclusive social environment at school. Levels of bullying are low, and pupils generally enjoy going to school.

Another aspect of equity shows in comparing PISA results across schools. The variation in average performance between schools is almost the smallest of all OECD countries, *i.e.* there is, compared with the situation in other countries, relatively little advantage in going to one school rather than another (Figure 4.5). Furthermore, the system manages to offset the inevitable influence of family background on educational outcomes more than many other countries (Figure 4.6).[8] The capacity to integrate non-native children is another indicator where Norway performs well (see OECD, 2006, and OECD, 2007). Strong participation in lifelong learning at various ages may combine with the

Figure 4.5. **Low between-school variance, high within-school variance**



1. The between-school variance measures PISA scores dispersion between-school within a single country. The within-school variance measures PISA scores dispersion within a representative school in a given country.

Source: OECD PISA 2006 database.

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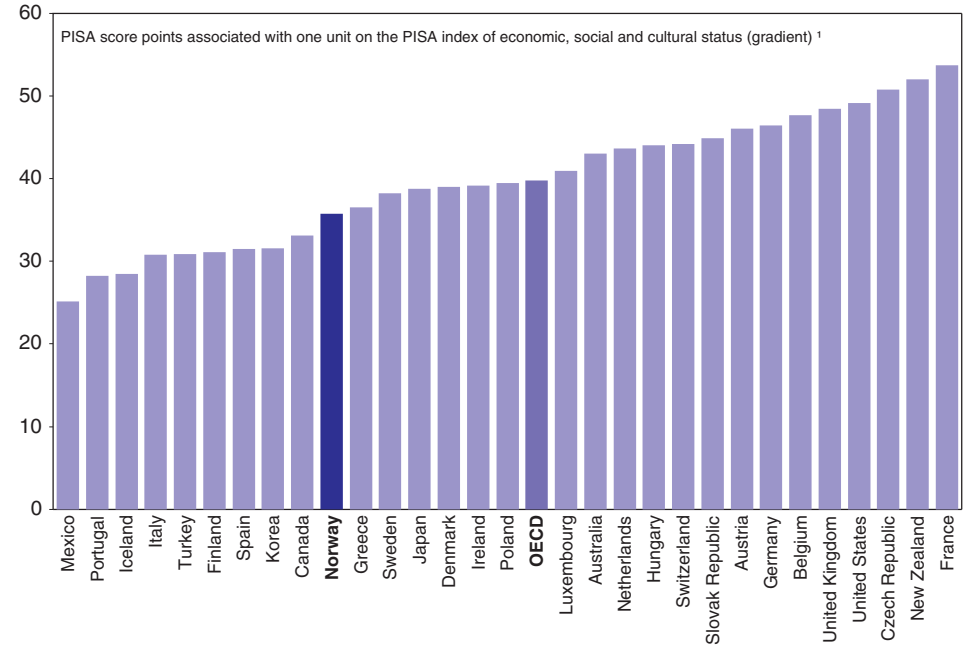
Figure 4.6. **Below-average impact of socio-economic background on PISA scores**



1. Student performance is measured by PISA 2006 score in science.

Source: OECD PISA 2006 database, see OECD (2007) for details.

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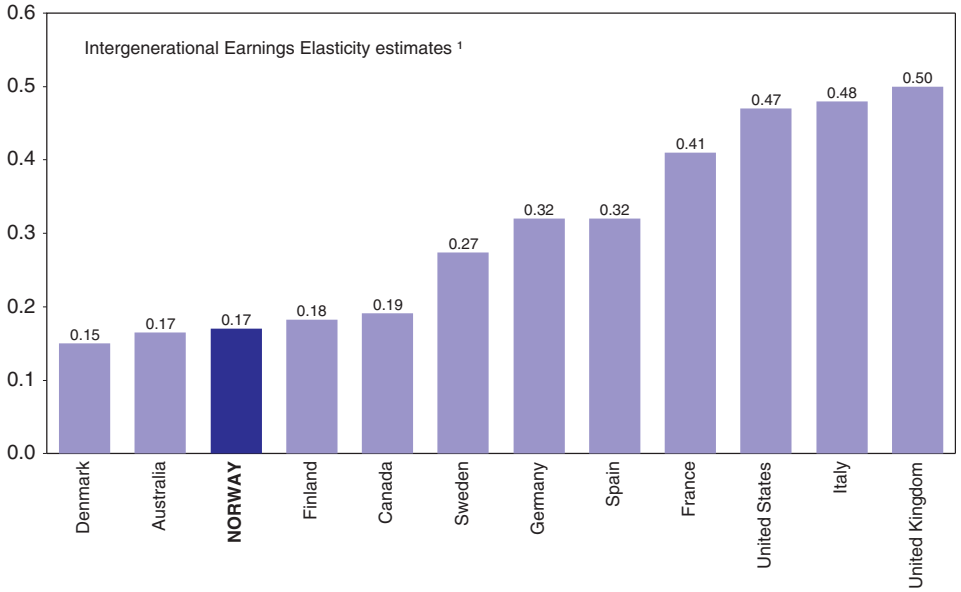
Figure 4.7. **High social mobility**



1. The height of each bar represents the best point estimate of the intergenerational earnings elasticity resulting from the extensive meta-analysis carried out by Corak (2006). The higher the parameter, the higher is the persistence of earnings across generations and thus the lower is intergenerational earnings mobility.

Source: Based on Corak (2006) for all countries except Italy, Spain and Australia. For these countries, estimates are as in Leigh (2006) for Australia, Hugalde (2004) for Spain and Piraino (2006) for Italy.

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emphasis on equity in education to contribute to high social mobility in Norway (Figure 4.7). It is reasonable to believe that success in equity and social goals requires a lot of resources, which may explain some of the apparent inefficiencies as measured by average attainment in core subjects.

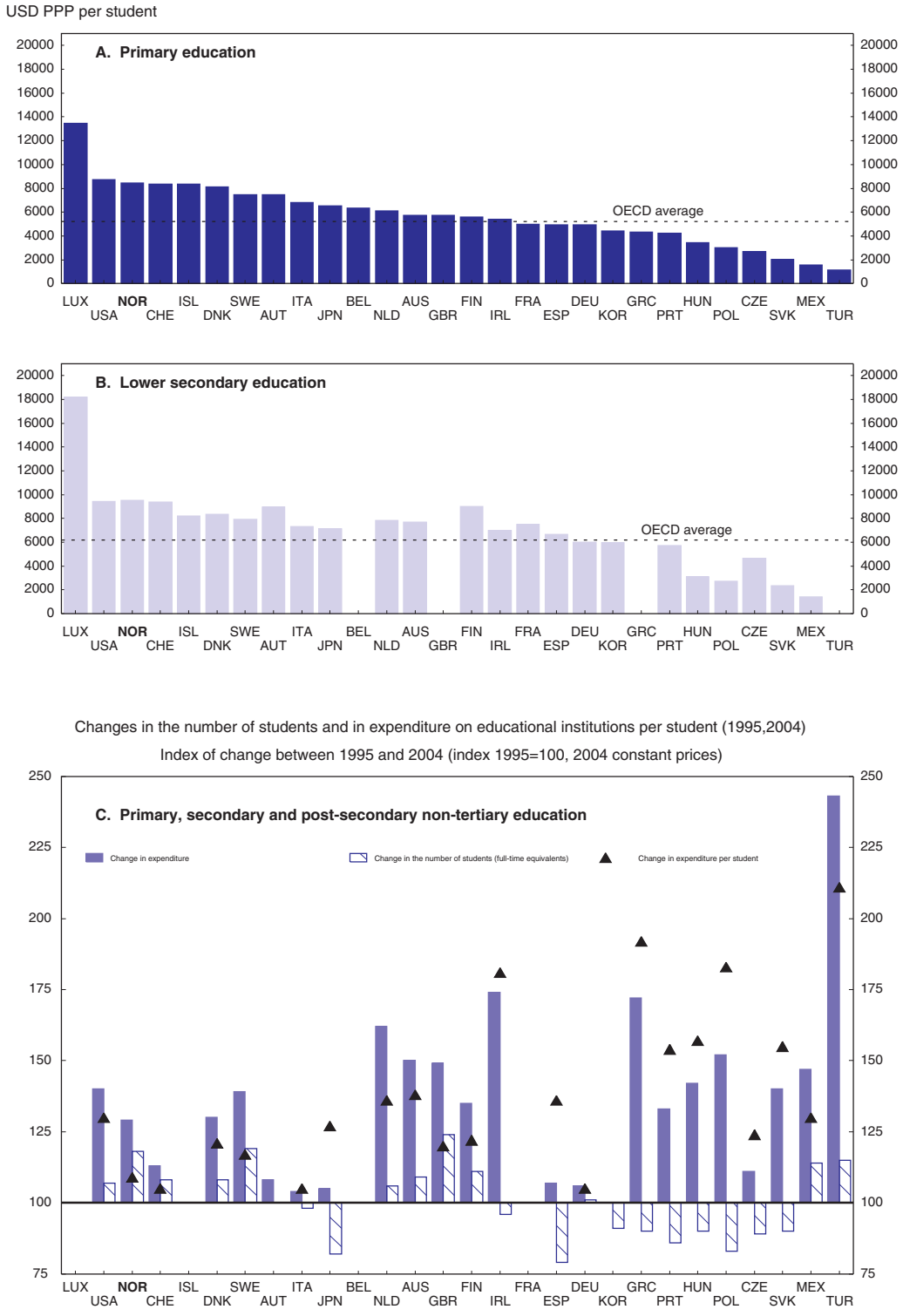
How efficient are Norwegian schools and teachers?

The disappointing level of average educational outcomes in reading, mathematics and science in compulsory education in Norway is surprising in the light of the high level of expenditure devoted to the sector – though quite how to measure this is not always obvious. As a proportion of GDP, expenditure on primary and secondary education is perhaps one tenth higher than in the OECD average. If this were taken as a percentage of *mainland* GDP, the gap would be much higher. A common way to make comparisons (see Sutherland *et al.*, 2007a, for some discussion of this) is to express per-student expenditure using a purchasing power parity (PPP) correction. On this basis the gap between Norway and the OECD average for all of non-tertiary education is as much as 40%, while it is 10% when compared with other Nordic countries (Figure 4.8). However, in the last decade, aggregate spending in education has increased much less than in other OECD countries, with an almost unchanged expenditure per pupil (OECD, 2007).

Education is a top priority on the agenda of many OECD countries spending less than Norway. High average income per capita, the central bargaining model for wages and a relatively strong teachers' union may have been important factors behind high education spending in Norway.[9] According to Falch and Rattso (1997) the very rapid increase in spending per student during the 1980s came in the wake of a substantial demographic

Figure 4.8. **Expenditure per student**

Annual expenditure on educational institutions per student for all services



1. Countries are ranked in descending order annual expenditure in primary education.

Source: OECD, *Education at a Glance database* and OECD, *Education at a Glance* 2007.

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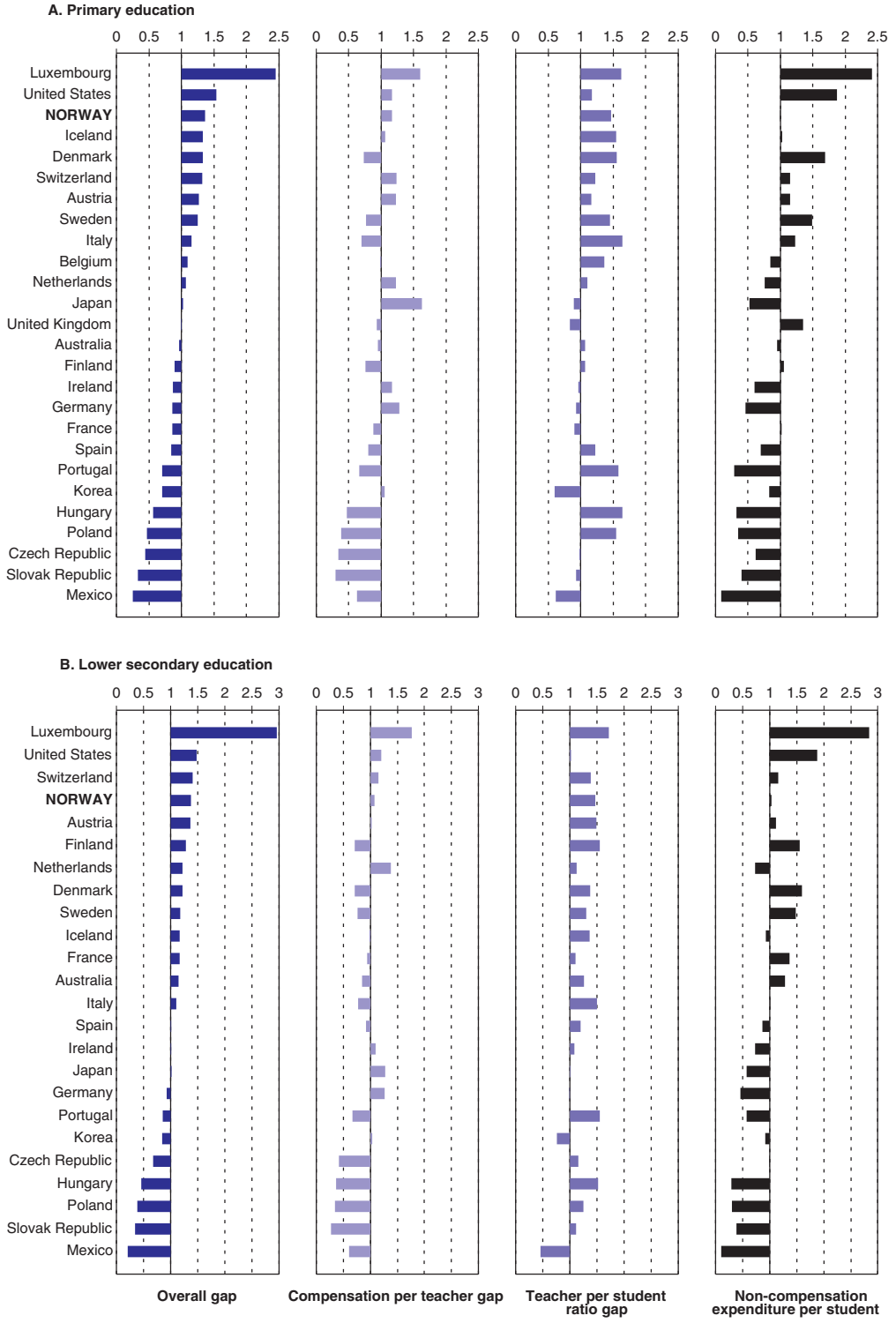
Figure 4.9. **Decomposition of expenditure per pupil relative to OECD average, 2004**



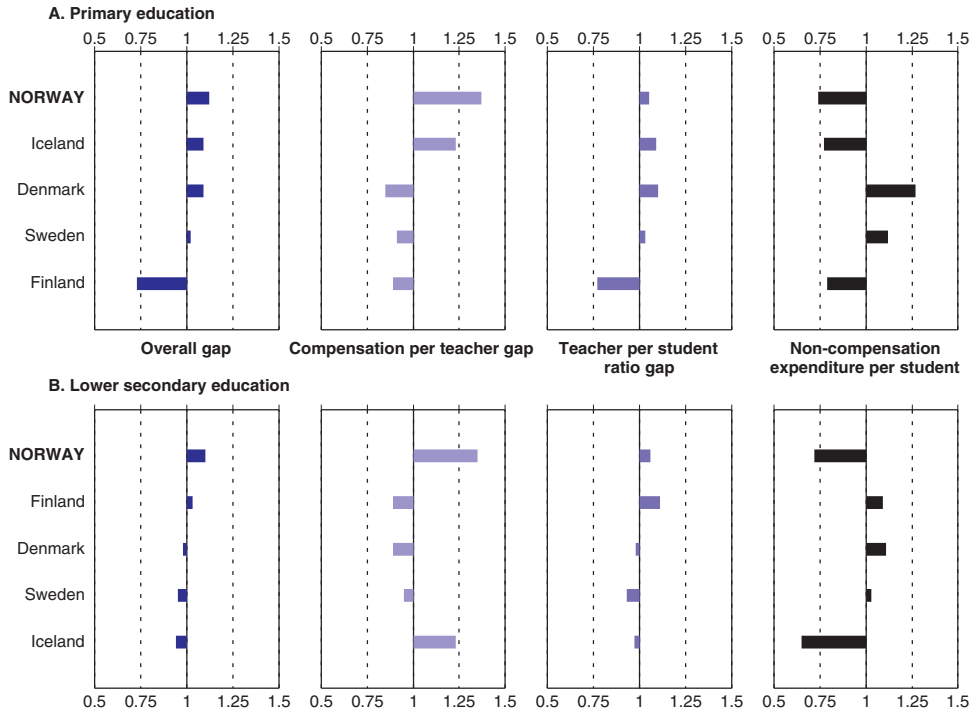
1. Canada and New Zealand are omitted from the dataset due no availability of expenditure datasets. Turkey and Greece are omitted from the dataset due to lake of data. Belgium and United Kingdom have no available expenditure data for lower secondary. For Germany, Hungary, Iceland, Japan, Netherlands and Poland, 'Compensation per teacher' covers also compensation to other educational personnel. See Annex 4.A2 for more technical details on the decomposition of expenditures per student.

Source: OECD calculations, Education database.

StatLink http://dx.doi.org/10.1787/426712116074

decline in the number of students, which was not however followed by an equal reduction of teacher numbers. Spending thus remained entrenched at high levels, and teachers' unions accepted wage moderation in exchange for high employment and lower working hours. Indeed, separating overall expenditure into its main components – teachers' average wage, the teacher per student ratio, and expenditure on items other than teachers' compensation – it can be seen that, at all education levels, the main driver of higher spending per pupil is the teacher per student ratio (Figure 4.9). In primary education, for instance, the teacher per student ratio is 50% above the OECD average (*i.e.* there are 12 students per teacher in Norway, compared with 18 in the OECD area) while salary costs per teacher are 20% higher. There is no difference between non-wage expenditures in Norway and the rest of the OECD area. With the exception of the upper-secondary level, differences are less pronounced between Norway and the other Nordic countries (Figure 4.10).

Figure 4.10. **Decomposition of expenditure per pupil relative to Nordic average, 2004**



1. Countries are ranked in descending order of the overall gap in respectively primary and lower secondary education.

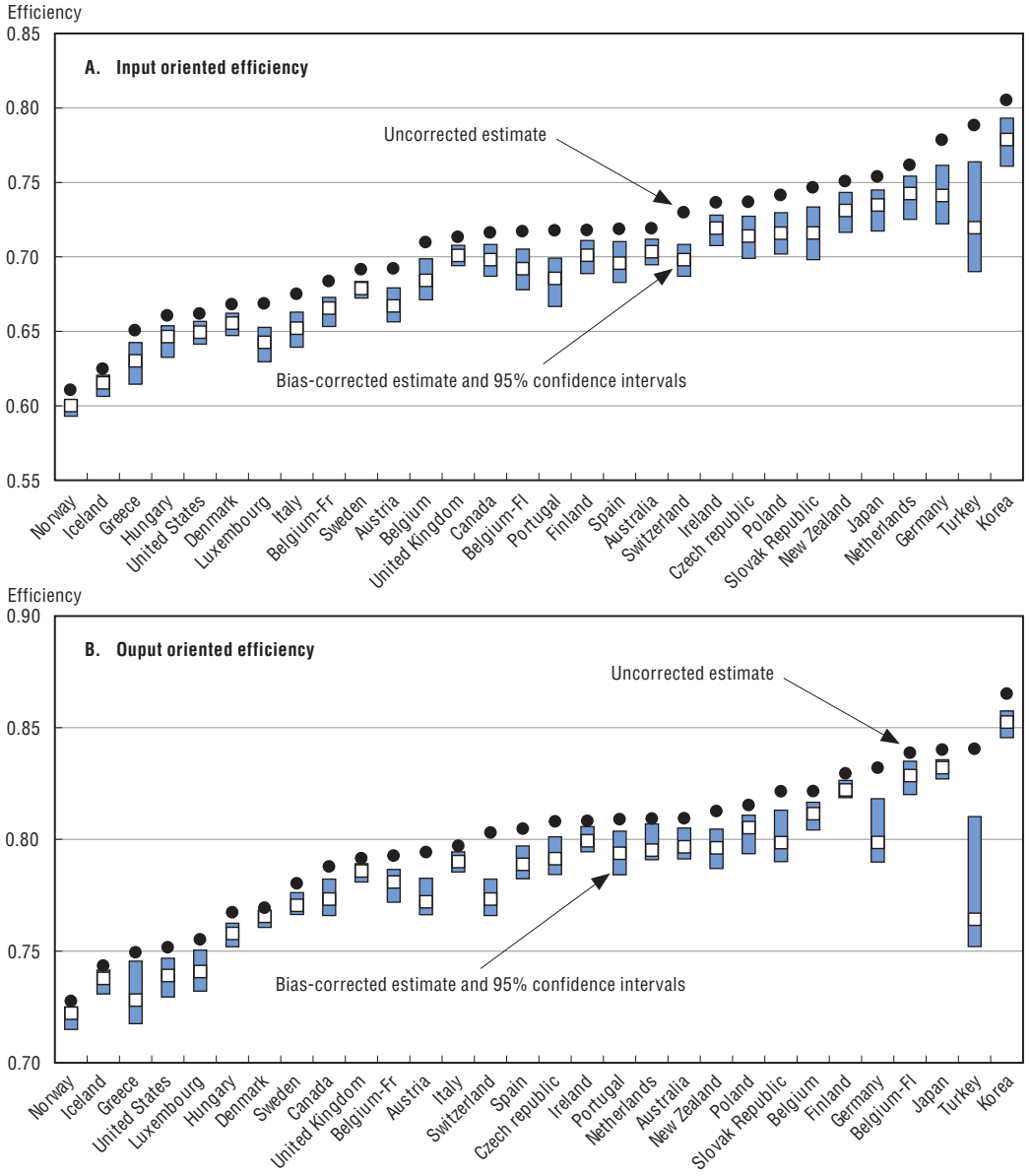
Source: OECD calculations, Education database.

StatLink http://dx.doi.org/10.1787/426725587422

Higher spending does not necessarily lead to better educational outcomes

It is commonly observed that there is no clear link between financial resources devoted to education and educational outcomes. Norway is thus no exception. In fact recent cross-country studies show that the Norwegian education system is one of the least efficient in the OECD area (Sutherland *et al.* 2007a; 2007b), with the median Norwegian schools appearing among the least efficient (Figure 4.11). This is true whether comparing Norwegian inputs with those of other countries with a similar level of performance, or

Figure 4.11. **Input and output efficiency of median schools[1] in OECD countries**



1. Efficiency estimates are obtained though a DEA (Data Envelopment Analysis) performed with 4 inputs (teaching and computing resources, socio-economic status of students and language background) and one output (average PISA score).

Source: Sutherland *et al.* (2007)

StatLink http://dx.doi.org/10.1787/426741634006

comparing Norwegian performance with that of other countries using a similar level of inputs). This study also finds that even the high-performing Norwegian schools in the PISA sample perform poorly with respect to the best schools in the OECD area, which may suggest that there is a large potential for learning from the best OECD countries.

A national study on efficiency, looking at both municipalities and individual schools, paints a picture consistent with this story (Borge and Naper, 2006).[10] Only 14 out of the 426 municipalities examined appear efficient according to this study; the average

municipality could raise its efficiency by around 14% if it did as well as the best performers, with one quarter of them 30% less efficient than the best. This study also shows that efficiency varies significantly across municipalities and that efficient municipalities attain their good performance by using fewer inputs, rather than by obtaining better school results. This holds irrespectively of the number of students in the municipality. These results confirm the observation that between-school differences in educational performance are low, but it also suggests that there are schools which use fewer resources and yet get good educational outcomes.

In practice, it is quite difficult to look at aggregate data to analyse policy setting, including different kinds of expenditure, to see how they affect educational outcomes. While there is an obvious trade-off on the budgetary side between the number of teachers employed and their average salary, what are their respective impacts on outcomes? There is no consensus view on the precise nature of such a trade-off, but there is evidence that student learning is likely to benefit more by increasing average teacher salaries than by using extra resources to increase the teacher per student ratio.[11] Sutherland *et al.* (2007b) also found average teacher salaries to be positively correlated with indicators of efficiency, while teacher-per-student ratios are not. However, other studies suggest that teacher-per-student ration matter at the lowest grades and particularly so for students from disadvantaged backgrounds (Gustafsson 2003).

Some further evidence of compositional effects of spending on educational output is also provided by cross-country regressions using PISA 2006 data. Controlling for a wide range of determinants of pupils' performance at individual and school level, regressions show that at age 15 lower student-per-teacher ratio is not associated with higher performance of pupils (see Annex 1.A1). This finding is robust across various models estimated. On the other hand, pupils' achievements appear to be more sensitive to teachers' wages, though the elasticity is small and varies with the measure used for teachers' wages. Higher wages may increase teaching quality in two ways: first they may attract prospective students into the profession; secondly they can motivate teachers to perform well throughout their career. It must be said, however, that salaries are an imperfect proxy for quality: as discussed later in the chapter, substantial financial rewards are only one of many incentives that may attract good people into the teaching profession, and may be low on the list of ways to make good use of them once they are there. The following sections of this chapter look at some of the influences on the efficiency with which resources are used before returning to cost-consolidation.

Teaching quality matters

Though this is a very complex and relatively recent field of research, there is a lot of agreement that the quality of teaching and learning matters more than everything else for pupils' achievements (Rivkin *et al.*, 2000; OECD, 2006). The quality of teaching and learning is given by the interaction of three broad sets of factors:[12] teachers' competencies, teaching and learning practices and school environment. It is not easy to assess the respective importance of each of these factors, not least because most of them are imperfectly measured. Quality of teachers for instance depends on, admittedly imperfect, observables (teachers' knowledge of the subject, pedagogical competencies, teaching experience) but also on latent dimensions (communication skills, classroom skills, motivation and commitment, etc.). Teaching and learning practices also cover many things, such as instruction time, curriculum, forms of interaction between students and teachers,

academic standards and assessment practices, and the institutional framework. Finally, the school environment is given by the degree of involvement of various stake-holders (parents, local government, etc.), by the average socio-economic background of pupils in a given area and by the quality of facilities.[13] Norway does relatively well in some of these areas, but there are some critical dimensions of teaching and learning that appear to be problematic.

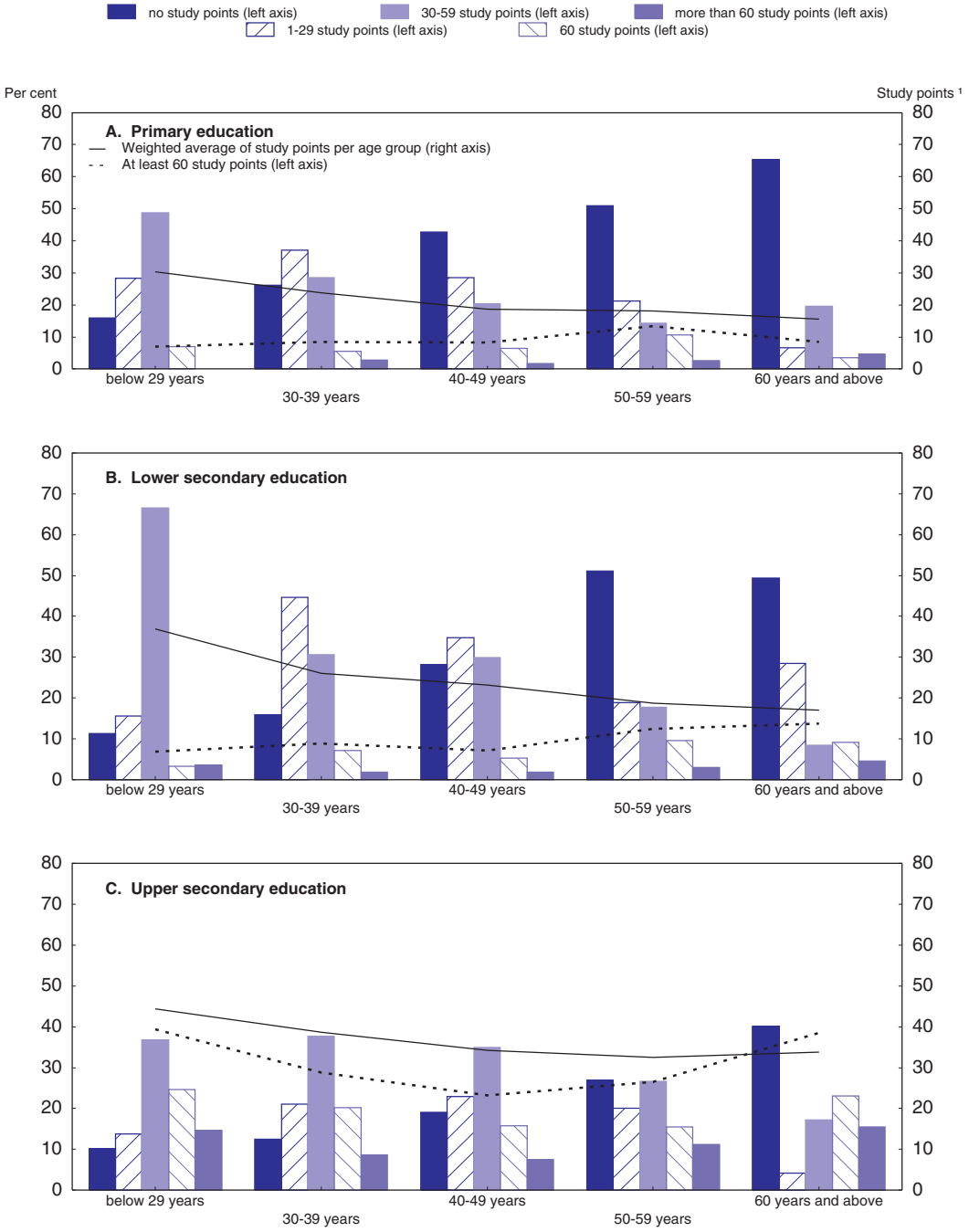
Are teachers in primary and lower-secondary education sufficiently qualified?

As in many other countries, there is evidence in Norway that good teachers produce better learning outcomes (Falch and Renee Liper, 2008). Though there are some methodological caveats to the interpretation of these results,[14] this study finds that formal teachers' competencies have a positive impact on pupil's results (national tests and final exams). It is thus worrying that many teachers in Norway have no formal competence in the subject they are teaching.

Lagerstrom (2007) finds that less than 10% of primary and lower-secondary teachers have a thorough knowledge of mathematics (defined as at least 60 ECST credits, the equivalent of one year of higher education full-time workload), while around 40% of primary school teachers have no formal qualifications in mathematics; this share is slightly less in lower-secondary schools but still over 30% (Figure 4.12). A similar picture is observed for sciences and environmental studies. The survey also shows an age-pattern with declining teachers' average competencies for the intermediate cohorts, but identifies a possible recent reversal of this trend among the youngest teachers: the overall share of teachers in compulsory education with no formal competence at all in maths and sciences has fallen dramatically due to the extension of compulsory education and the concomitant assimilation of qualification standards for primary and lower-secondary education. The number of teachers with at least 60 credit points in maths has tended to decline, especially among lower-secondary school teachers. The most recent generation of teachers (under 30), however, is more qualified than the others – an encouraging trend if confirmed; but there remains a need for policy intervention to enhance the skills of the large majority of the teaching working force (*i.e.* between 30 and 59 years old) which is low qualified, especially considering that ten years from now the most qualified age groups of teachers will retire. The situation looks better in upper-secondary education, where both average competence and the share of more highly-qualified teachers have been rising. Criteria for qualifying for upper-secondary education are more stringent (*i.e.* teachers have to possess an in-depth formal knowledge of the subject in which they teach).

Part of the reason why in-depth knowledge of specific subjects is limited among teachers in primary and lower-secondary school is that the compulsory education system mainly relies on generalist teachers, *i.e.* teachers that up to now have been formally qualified to teach all subjects in grades 1-10. Notably, this means that a generalist teacher has been formally qualified to teach mathematics to 16 year olds, without necessarily having studied mathematics at all after high school. The high number of generalist teachers in Norway has certainly to do with the peculiarities of the school landscape of the country, where classes in remote areas often pool pupils of different grades. But there could also be a wrong incentive for trainees to qualify as generalists, because the Generalist Teachers Education (GTE) programme offers the highest employability across primary and lower-secondary education level. A report also found that municipalities are not eager to hire specialists in mathematics or science.[15] Specialists (*i.e.* university degree

Figure 4.12. **Mathematics knowledge of Norwegian teachers**



1. Study points represent the number of time spent in studying higher education subjects, with 60-study points being equal to one full-time year of higher education.

Source: Statistics Norway, Lagerstrøms (2007).

StatLink http://dx.doi.org/10.1787/426758324028

holders) might also have been attracted to other segments of the labour market, because of the stagnant earning perspectives of teachers as well as the number of hours worked (see below). There is also evidence that teacher shortages vary across regions, with the economic cycle and across subjects taught. While in the past specific benefits have been

offered to attract teachers in outlying districts of the country (wage premiums, extra paid leave, reduction of student loans, moving allowances and tax reductions), the 2003 move towards decentralised wage bargaining for teachers was meant to replace those benefits. However, since decentralisation of negotiation of teaching conditions has not effectively materialised throughout the country, the mismatch of demand and supply of teachers in some regions, as well in some subjects, continues to be a problem. Though it is fiercely resisted by teachers' unions, wage differentiation across subjects taught might be the only viable solution to cope with these specific shortages.

Recruiting and training good teachers

To improve the average qualification level of teachers over the long term, it is necessary to strengthen the initial training of teachers. Pre-service teacher education requirements in Norway are less stringent than in other countries. While the duration and the broad features of programmes (share of theoretical *versus* classroom training), are fairly similar in Norway and the rest of the OECD area, there are some noticeable differences in their selectivity and competitiveness. In Norway entry requirements for teacher colleges are low and there was essentially no selection at all before 2005, when some minimum requirements were introduced. A telling comparison in this respect is between Norway and Finland (see Box 4.4) with the system in Finland taking thorough account of the motivation and skills of applicants to teachers' education. In Norway, not only do candidates not need to show any particular attitude or ability to teach but, with the exception of some very competitive university colleges, teacher training institutions have accepted candidates with lower grades in recent years in order to fill their vacancies, given the declining number of applicants.

Overall, it is necessary both to train more specialists, at least for the lower-secondary level, and to raise standards specific to each schooling level, especially for scientific subjects, in the absence of any post-graduate certification exam. The recent government initiative, entering into force in 2008, to raise qualification standards for lower secondary level certainly goes in the right direction requiring 60 credits (1 year specialisation) for new lower secondary school teachers in mathematics, Norwegian and English.

While measures reinforcing initial teacher training are needed, they need to be accompanied by incentives to attract prospective students. Some incentives may be envisaged to encourage entrance to teacher training (as for instance more generous financial help), but they will not probably be effective if they do not go together with higher structural incentives to take up and remain in the teaching profession.[16]

A substantial body of research suggests that salaries and alternative employment opportunities strongly influence the decision to become a teacher; this is true immediately after graduation as well as for decisions to return to the profession after a career interruption or to remain a teacher.[17] Norwegian studies also suggest that one of the possible reasons behind a decline in the average competences of Norwegian teachers is indeed the poor financial attractiveness of the profession. Klette and Møen (2003) show the age-profile of earnings for bachelor and master holders, working in either the private sector or as compulsory schooling teachers. Differences between earnings levels in the private sector and teachers' ones are significant at all ages, suggesting that teaching jobs pay considerably less than other sectors for a comparable level of qualification. The lifetime profile of teachers' pay is also flatter. More general evidence about the difference between returns to schooling in the private and public sector is contained in Santiago

Box 4.4. **Teacher education in Finland and in Norway: vocation *versus* residual choice**

In Finland the competition for becoming teachers is very severe (Kansanen, 2003), with only 15% of applicants being accepted. "Classroom teachers" (*i.e.* primary and lower-secondary education teachers teaching all subjects) study education as the major subject and begin their studies in a teacher education programme. Prospective specialist "subject teachers" attend an undergraduate course in their respective subject of specialisation and join teacher education generally after two years. The selection of classroom teachers takes place in two phases. A short-list of 3 to 4 times the number of available places is selected from among the applicants on the basis of their results on their matriculation examination (BAC) and their accumulated school marks. The second phase has three components, beginning with an examination based on textbooks. It then continues with a task whereby social interaction and communication skills are observed and a personal interview where the reasons why candidates are applying are elucidated. The selection of subject teachers is similar, with a teaching simulation task and personal interview. The status of the teaching profession is high in Finland, and shortages of applicants are recorded only in a few subjects (such as maths and physics). The high academic level of teacher education makes it possible for teacher education graduates to be employed in other sectors, if they decide not to become teachers in the end. While the programme of classroom *versus* teacher education is different, the academic level is the same for all teachers from elementary to upper-secondary schools.

In Norway there is little competition for entering teacher training. Today three pathways exist to qualify as a teacher of core subjects in primary or lower secondary school: *a)* General Teacher Education (GTE) training, lasting 4 years and mainly covering educational theory, three compulsory school subjects, a choice of optional school subjects and some cross-curricular topics and teaching practice; GTE requires minimum admission certification from upper-secondary school in terms of points obtained in the upper-secondary final assessment and minimum grades in Norwegian and mathematics. *b)* the Post-Graduate Certificate of Education (PCE) which can be obtained after having graduated from a theoretical or vocational higher education programme (with 1 to 2 subjects studied in-depth). *c)* from 2003 an integrated master's education lasting 5 years, covering one or two main teaching subjects. The OECD Country Background Report on Norway for "Teachers Matter" project also noted that requirements for teacher education programmes are substantially lower than for other forms of professional education.

The number of entrants to GTE in Norway is much higher than in Finland (2 000 *versus* 800, *i.e.* 0.46 per 1 000 inhabitants *versus* 0.15); however drop-out rate in Norway is relatively high. About 20% of education graduates in Norway work outside the education sector.

(2005): Norway is one of the European countries with the highest difference between returns in private and public sector and this difference increases with the income quintile (so it is likely to be larger for skilled workers).

Unfortunately there are no studies to assess whether Norwegian teachers have always been paid less than other professions, or if this trend has become stronger in the recent years.[18] There is, however, some evidence that other aspects of working conditions may have deteriorated in relative terms. In the last twenty years the downward trend in number of working hours was indeed less marked for teachers than for the public sector as whole

and for the private sector. In other words, it is likely that the relatively high "leisure value" of teaching has diminished quite significantly and this may help to explain why fewer prospective students have decided to become teachers.

Career structure and perspectives, opportunities for professional development and their acknowledgement, merit-based incentives and the status of the profession can be as important as direct financial incentives. Norway appears badly placed under all these headings. According to OECD, (2006), career perspectives are more limited than in other countries, both in terms of financial rewards and in those of responsibility and tasks. After 15 years of experience, Norwegian teachers in compulsory school earn 20% more than at the start of their career; this is less than the half of the corresponding seniority premium in the OECD area. At the end of their careers, Norwegian teachers may at most earn 24% more than when they started, *i.e.* almost three times less than the OECD average. In addition, formal teaching tasks remain the same throughout the teachers' working life and only limited opportunities exist to move into higher responsibility activities (like coordination or coaching of young teachers; supervising teachers, etc.) apart from becoming a school principal. This is not a popular option, however, considering the imbalance between additional responsibilities and related financial reward. Professional development is possible, notably through in-service training; however formal acknowledgement is insufficient, as discussed further below.

Finally, strengthening teachers' professional status is an important issue which is not easily in the power of governments, but there are both direct initiatives (*e.g.* advocacy on the importance of teachers, dissemination of success stories and best practices) and indirect initiatives (*i.e.* improving incentives for excellence in the profession) which could be useful.[19]

Many steps to attract and retain teachers can be taken without changing salary levels. Many things need to be taken into account in thinking about the appropriate level of teachers' salaries, including the "Nordic model" which hesitates to use significant wage differentials as an economic signal. But the econometric evidence of an association between salaries and system performance, although needing to be interpreted with care, should not be ignored either. It may be necessary to improve teachers' relative earnings, provided efficiency gains can be obtained from reducing other costs, for example through higher proportion of time teachers spend in classrooms or lower teacher-student ratio.

Increasing the skills of the existing teaching work-force

Strengthening the initial qualification of new teachers is certainly required to raise the average competencies of the future teaching workforce. However, these policies will not produce their effects for some time, and should be supported by measures that could have some impact more quickly. In-service training for teachers is relatively developed in Norway and conditions for training are quite favourable (Table A.1, OECD 2006). Professional development may take the form of individual or group training in subjects or teaching methods, attendance at externally-arranged courses, participation in professional networks, etc. Professional development may result in explicit accreditation (increase in salary, seniority or career bonus) or not. However, the completion of professional development activities is not required for certification or promotion of teachers.

In-service training policies have been a crucial measure of the Knowledge Promotion reform. In the context of the Competence Development strategy, around NOK 1.4 billion were allocated in 2005-2008 to training programmes for teachers and principals. A recent report suggests that teachers feel that their professional development opportunities have increased significantly.[20] The same report finds, however, that participation ratios have increased for informal training, but not for formal courses, which are likely to be more effective because informal training activities are neither subject to assessment/examination nor organised around national benchmarks. In fact only training leading to the award of formal qualification (but not necessarily to credits) is assessed, though this is done by examinations carried out by the institutions responsible for training, with modalities and standards open to their discretion.

Another limitation of current training policies is that they are not necessarily targeted on the specific lack of competencies in some disciplines: principals and municipalities, who have the main responsibility for deciding which training programme teachers should attend, seem to focus more on practical and pedagogical kind of training, rather than on courses which specifically aim at improving teachers' knowledge in taught subjects. Substantial funds have been allocated since the beginning of the reform to informal training activities, possibly inefficiently; many of these funds should be re-directed to formal types of training, concentrated on subjects (and to some less degree to methods) where pupils' needs are the highest.

Teachers' workload

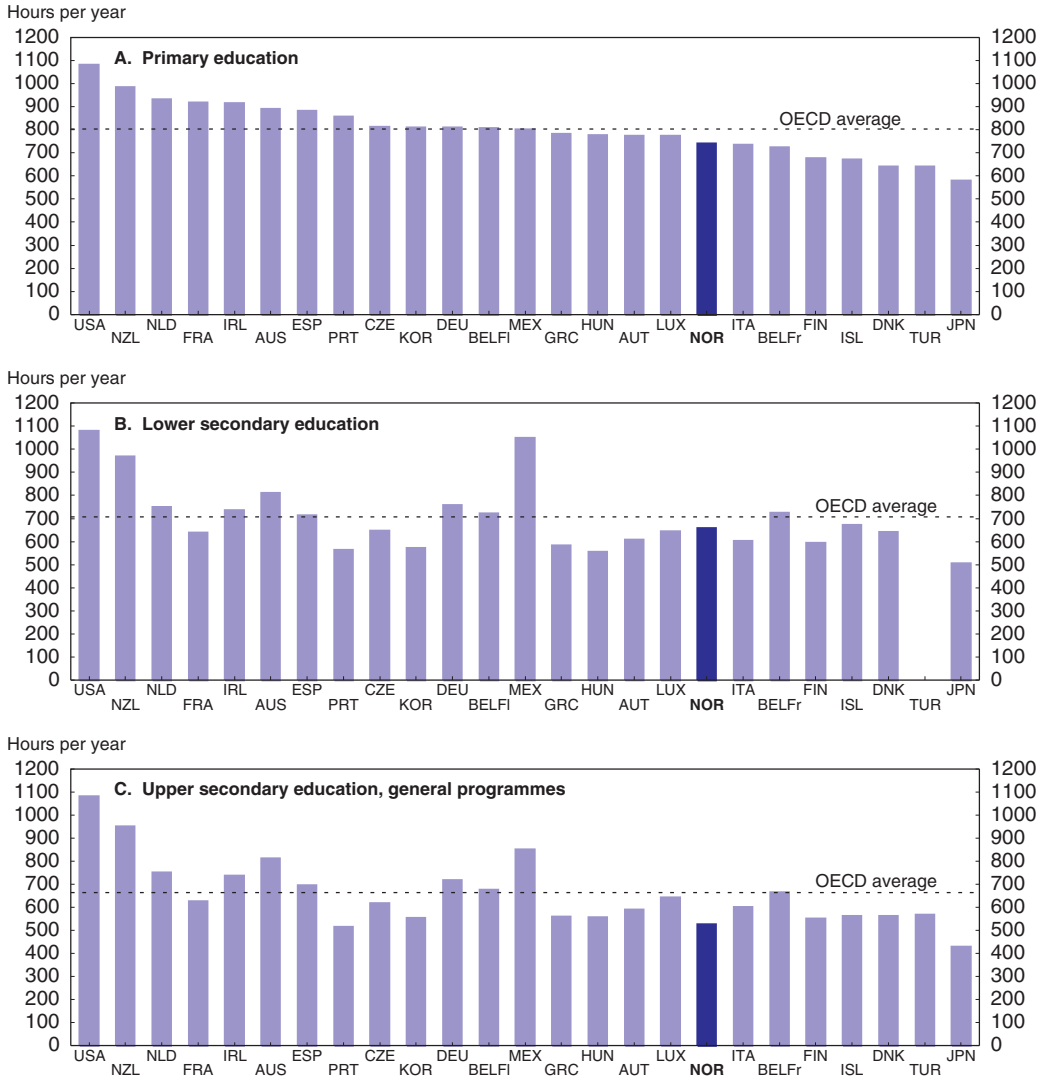
Despite the high teacher per student ratio, tuition time in Norway is not very high by international standards.[21] Together with those in Finland, pupils in Norway have the lowest number of total instruction hours, spending around 15% less in classrooms per year than in the rest of the OECD area. This is equivalent to more than one year when cumulated over the period of compulsory school. Many studies have shown that total learning time has a substantial impact on results, both regular teaching time (*i.e.* classroom work) and homework (*e.g.* PISA 2006, Wößmann *et al* 2007, Santiago 2002 for a review). According to PISA 2006, one additional hour of instruction time per week increases performance by 9 points, implying that if Norway were to increase tuition hours for 15-years-old pupils up to the OECD average (*i.e.* by 1.5 hours per week), it could increase its performance by 13 PISA points lifting Norway to around the OECD average; (see also Annex 1.A1 for further discussion). A very encouraging set of initiatives has been taken by the government in recent years, leading to a progressive increase in instruction hours in lower grades of compulsory education. Moreover, as from autumn 2008, the tuition time in core subjects will be increased by 5 to 6 hours a week at primary level.

Norwegian teachers also have lower teaching time than the OECD average (Figure 4.13). The total statutory working time for primary and lower secondary teachers is 1 680 hours per year (*i.e.* practically the same as in the average OECD primary and lower-secondary schools of, respectively 1 695 and 1 687 hours); slightly more (less) than half of this is spent in direct contact with pupils through regular teaching at primary (lower-secondary) level. For this reason, the number of teaching hours per year in primary and lower-secondary education is around 10% lower than the OECD average.

Norwegian teachers have to be at school for preparing their lessons, carrying out other pedagogical activities and attending in-service training, for about ¾ of their total working time. The proportion of time spent in schools is thus sizeable, though it remains smaller

Figure 4.13. **Teachers' normal teaching time**[1]

Net teaching time in hours, 2005



1. Countries are ranked in descending order of the number of teaching hours per year in primary education.

Source: OECD, *Education at a Glance 2007*.

StatLink http://dx.doi.org/10.1787/426873665684

than in other OECD countries where teachers spend the totality of their working time in schools (*e.g.* in England, Scotland and United States[22]). Increasing time spent in schools may increase the interaction with other teachers as well as with the principal. This is the reason why Norwegian municipalities are currently considering extending the time that teachers spend in schools. Considering that Norwegian pupils receive a relatively low quantity of instruction, that there are more teachers per student than in many other OECD countries but that, as argued above, a higher aggregate teacher/pupil ratio is not generally associated with better learning outcomes, it is likely that Norway is not making the best use of the teaching labour force and that a higher teaching time should be envisaged (whether in absolute terms or as a share of the total teachers working time).

Curriculum and teaching methods

On top of the overall quantity of tuition time, many studies have emphasized the importance of the relative time devoted to core subjects and the curricular focus on these disciplines. Norwegian 12 to 14-year old pupils spend about the same time on core subjects as the OECD average, except for science (where they spend only 2% less of their total time) (OECD, 2007). In Norway, however, a lot of emphasis is given to subjects unrelated to academic performance: pupils spend only twice as much time studying mathematics as religion, and less time in science than in physical education (and 16% of time is spent in "other subjects", including home economics). While this time allocation certainly reflects historical and cultural factors, the question of whether the timetable is still appropriate must be raised.

Net teaching time gives a measure of potential teachers' effort. But it is not an exhaustive measure because teaching methods may well differ in their effectiveness. Classroom practices may vary in the extent to which they make use of interaction between teachers and students, materials and resources used the nature of learning tasks and methods for assessing students' progress (Santiago, 2002). While research on the relative importance of these factors is still very much in progress, there is evidence that students whose teachers use high-order thinking type of tasks (critical thinking, applying concepts to problems, simulations, etc) rather than low-order thinking tasks (rote learning, solving problems that are similar to others, etc.) get better results (Weenglinsky, 2000).

The Norwegian curriculum has been reformed quite substantially in the last decade to move exactly in that direction. Taking account of modern pedagogical theories, a major effort has been made to move the system away from traditional forms of teaching (criticised as insufficiently tailor-made and relying too much on "dominating" patterns of interaction with students) towards progressive types of classroom work. The latter mainly builds on self-regulated learning, the idea being that encouraging children to develop their own learning tools and meet their individual learning needs gives better results in the long run. So-called "Individual work plans" have been increasingly adopted by schools; they organise certain parts of students' work around two to three week periods with a relatively specific assignment and a set of learning objectives that pupils should reach at its completion. These very ambitious learning methods are intended to allow teachers to follow students with higher needs more closely and in general to give the right support to each pupil, depending on their capabilities and skills. A number of thorough classroom studies have been carried out to assess the effectiveness of work plans.[23] While methodological limitations of this kind of studies have to be borne in mind, the results are fairly clear: in practice pupils are unable to work properly within the work plan framework, they do not understand the objectives assigned and they work discontinuously on subjects. There appears to be a serious lack of communication between teachers and pupils during this classroom work and an ambiguous understanding of where the teaching and learning responsibilities lie.

Work plans do not occupy all the time spent in classrooms, representing on average 40% of tuition time in mathematics, 10% in sciences and 35% in Norwegian. However they do crowd-out traditional lecture-style teaching since some parts of curriculum are not taught by teachers but are covered only through work plans. Work plans are challenging not only for pupils, from whom they require a strong dose of discipline and commitment, but for teachers themselves who need to be specially trained for this form of teaching

which can involve the quite demanding job of teaching the same thing in a number of different ways. The fact that they continue to be used, in spite of reports that they may be ineffective, at least without more care being taken in their implementation, suggests that feedback from educational outcomes does not have sufficient influence on teaching practices. The central government should systematically promote and disseminate research on the effectiveness of teaching methods, such as work plans, to make sure that final education outcomes reach the standards targeted by the government.

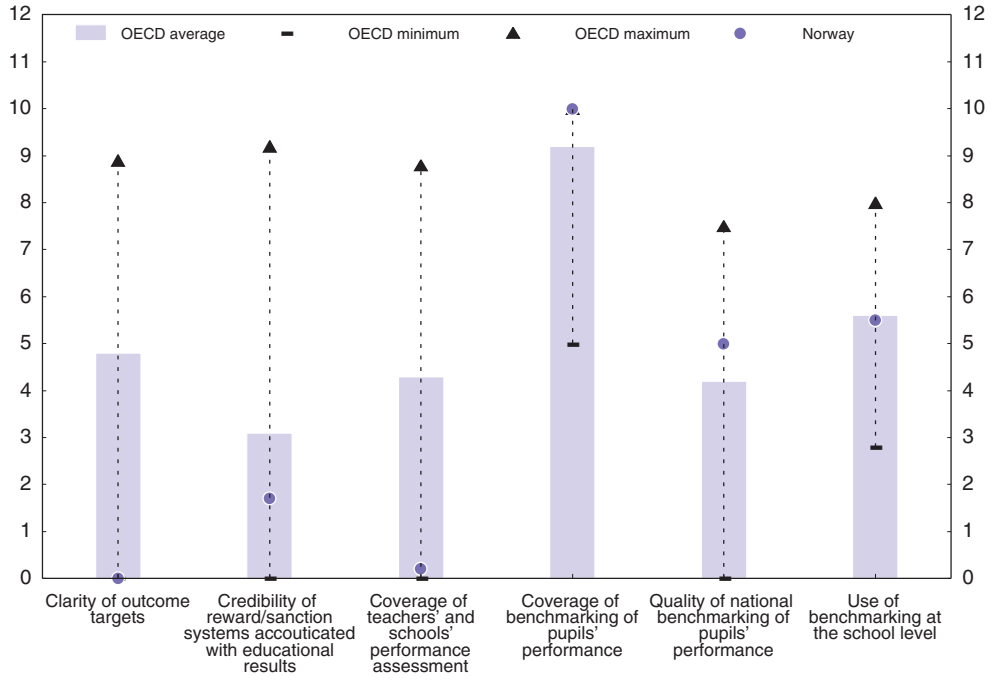
Better schools: making information an asset and setting the right incentives

Beyond their level of basic training, teachers' performance crucially depends on a number of professional attitudes, efforts and skills. Many of these, such as presentation skills, organisation of classroom work, learning methods, etc. are ideally acquired during initial or in-service training and developed further with experience. However, since teachers have also to be motivated to foster these skills throughout their careers, an important question is whether the current institutional set-up of the Norwegian education system is sufficiently supportive of this motivation. Another question is whether the system helps teachers to make the best use of their competencies, for instance by giving the relevant feedback on their effectiveness in terms of actual pupils' achievements. Since the quality of teaching depends on the broader learning environment of schools, and since school leaders are responsible for teachers' performance, the general question is whether and how schools use information and incentives to reach learning goals. These questions are particularly important because of the degree of autonomy enjoyed by municipalities and schools in Norway. Autonomy can be good since it allows schools to respond to local needs and to detailed information on performance, but without the right information and incentives its benefits may be limited or non-existent (Wößmann *et al*, 2007).

On the presumption that incentives and feedbacks may improve teachers' and schools' performance, a number of OECD countries have recently moved in the direction of increasing accountability of teachers and schools. "Accountability" can be understood as a set of institutional rules which define objectives to achieve for various school stakeholders, with related responsibilities and arrangements attaching consequences to the measured achievements. Thus accountability comprises three different important dimensions: outcome-focused targets, benchmarking and assessment of performance with associated rewards/sanctions.[24] The principles of accountability are present in the Norwegian education framework; however, their practice seems somewhat sporadic, rather than continuous and generalised. In particular, Norway makes some use of benchmarking and has just recently proposed outcome-focused targets in a white paper to the Parliament, but makes no use at all of performance-related rewards (Gonand *et al.*, 2007 and Figure 4.14), though the effectiveness of the latter is somewhat controversial, as discussed below.[25]

Formal precise benchmarking was first introduced in Norway in 2005, as one of the measures meant to build up a quality assessment system. It consisted of standardised national tests carried out yearly at the end of grades 4, 7 and 10 in Norwegian, mathematics and English.[26] These tests were conducted for two years but were then suspended following strong criticism, both from researchers – based on methodological limitations – and from teachers. The government has reintroduced a streamlined, improved version of these tests in the autumn of 2007 with a long-term commitment to their use. The tests are now carried out on pupils at the beginning of grades 5 and 8; they are published by national authorities at national and municipal level, though not at school

Figure 4.14. **Institutional accountability indicators for Norway**



Source: Gonand *et al.* 2007.

StatLink http://dx.doi.org/10.1787/426885055432

level (unless the municipality decides to do so). The results at school level are made available to municipalities for their own schools and for schools at a password-protected website. Municipalities are obliged, according to the Education Act, to follow up the results and take necessary action to cope with poor results. Within the school the test results are to be used by the principal and the teachers in their work to improve the quality of teaching. Schools are asked to inform parents about their childrens' results.

This represents a step forward to making information an asset for schools' and teachers' work, but there are still aspects of the benchmarking system that could be improved. First, since results are not published at school level, the emergence of best practices that may inspire other schools and provide guidance to the system as a whole, is hindered. Second, moving forward tests by a few months (from the end of the grade 4 (7) to the beginning of the grade 5 (8) implies a subtle, though extremely relevant change in the use made of these tests. The new tests are well conceived to see where the pupil stands in terms of learning, so as to provide him or her with the necessary follow-up; however, since these results are not automatically given to teachers of previous grades who were responsible for those pupils, no relationship can be established between pupils' learning outcomes and teachers' performance. The accountability value of these tests is thus reduced.

Publishing results from national test

Public posting of pupils' results at school level has a positive and relatively high impact on pupils' performance, as shown by regressions on PISA scores presented in Annex 4.A1.[27] This is also in line with previous studies in this field. In Norway it has been argued that

publication of results at school level, especially when not accompanied by proper interpretation and consideration of other important drivers of school performance such as social intake, might be distorted and lead to an "unfair ranking of schools". Certainly, non-adjusted results are misleading because they do not give information on the school's net contribution to pupils' achievements, while adjusted indicators are not easy to compute. It is also true that benchmarking should not be reduced to a simple horse race (though it could nevertheless be that competition among schools does lead to quality improvements).

However, benchmarking could and should be used to help schools and teachers learn from others. This requires that some guidance should be provided on how to use the results of these tests and how to share best-practices between schools and teachers. This should certainly include the development of "value added" indicators of school performance. In this respect, the OECD report Improving School Leadership (Hegtun and Ottesen, 2007) notes that schools in Norway currently see it as a problem that many resources have been used to build up a national assessment system, but a great deal less have been devoted to develop competencies in interpreting the type of information that is produced by benchmarking devices and in converting this into effective development of schools. A further effort in developing these competencies (at local or central level) is thus needed.

Information, properly presented, should be an asset for pupils too. Traditionally, pupils (and their families) get insufficient feedback on their attainment and difficulties. The national tests are the first initiative to facilitate systematic information flows between pupils and the school. As found in PISA 2006, Norwegian pupils stand out as having an unusually large mismatch between perceived and demonstrated capabilities – they believe that they are much more competent than their test results imply. Since their motivation is not significantly different from that of students in other OECD countries, the gap between self-assessment and performance may be indicating that learning pressure is not sufficiently high, which is line with research findings and results from surveys of pupils. This may reflect a general lack of ambition of the system (*i.e.* few incentives for students to provide adequate effort), differences between the curriculum and what is actually taught, but also a poorly designed curriculum by international standards.[28]

The differences between the theoretical and the actual curriculum reflect the mismatch between accountability and autonomy in the Norwegian system. Schools are responsible for implementing and partly deciding curriculum contents, but the limited accountability of both teachers and principals provides no strong mechanism to ensure full adherence to national curriculum guidelines. This is only one illustration of the potential perverse effects of an institutional set-up where autonomy is not constrained and guided by accountability (see also Wößmann *et al.*, 2007; Wößmann, 2003; PISA, 2006).

Accountable teachers

A crucial issue is how to motivate teachers to make the best use of information on their pupils' progress and how to link this information to incentives. There is a very little tradition in Norway for formal assessment of teachers (see Table 6.5, OECD, 2006 and Gonand *et al.*, 2007). Formal appraisal interviews are a right but not an obligation (they can be requested by teachers for promotion or by principals following a complaint which is very rare, however); in practice they are used by only half of principals of schools in grades 1-7, and one third in grades 8-10.[29] While these interviews provide a basis for assessing

teachers' performance and agreeing on its development, these remain informal and private, with no external reviewer or standards to which the principal must adhere.[30] While in principle it is not difficult to relocate or dismiss teachers in Norway, in practice principals do not have sufficient tools (and willingness) to initiate such processes.[31] Finally, as mentioned earlier, even national tests, which in principle could provide an interesting starting point to evaluate teachers, are not effectively used to give feedback to teachers and help improving their performance. Reassuring results come, however, from the 2007 national tests, where the large majority of teachers found the tests useful to improve their own teaching and could identify the specific aspect of teaching that needed improvement.

Making teachers accountable requires giving them incentives to perform well. Which incentives should be given, is however a tricky question. There is indeed a quite controversial debate on the effectiveness of performance-based reward programmes. These may differ in the criteria used for teachers' evaluation and in the consequences attached to that evaluation (Box 4.5). The apparently poor effectiveness of these programmes is likely in many cases to be

Box 4.5. **Types, virtues and shortcomings of performance-based programmes**

Following Harvey-Beavis (2003), performance-based programmes can be classified into three broad families: merit-pay programmes (teachers' monetary reward is based on students performance-adjusted for a number of factors); knowledge and skills-programmes (teachers' monetary reward is based on acquired qualifications and demonstrated knowledge and skills); school-based programmes, where rewards accrue to schools, which often have the power to pass them on to teachers.

Many arguments have been raised in favour of performance-based reward: *1)* a performance-based system increases motivation of teachers to perform well; *2)* a system rewarding only experience and formal qualification is unfair because it may ignore actual performance; *3)* performance-based rewards improve governance of schools (through a better resource allocation); *4)* appropriate performance-based systems can increase collegiality between teachers and administration; *5)* performance-pay systems increase political and public support for education systems; *6)* performance-based systems can be cost-neutral investment strategies to increase the quality of teaching.

Against performance-based reward it has been argued that: *1)* fair and accurate evaluation is difficult; *2)* school administration becomes hierarchical; *3)* monetary incentives are inadequate to motivate teachers; *4)* in inappropriate systems there is a risk of reduced co-operation between teachers; *5)* curriculum might become too narrow and focus only on the selected outcomes that are easier to evaluate and to reward (*e.g.* tests); *6)* performance-based programmes might be expensive.

A recent study from the Australian Department of Education, Science and Training finds that key-conditions for successful performance-based programmes are: being conceived after extensive consultation with stake-holders (teachers in particular); being context-specific; using multiple, credible and objective measures of teachers skills and student progress; establishing a clear system of significant rewards recognised as additional pay and rewarded in a timely fashion; allowing adequate time and funding for implementation; being aligned with overall school goals; being considered in conjunction with comprehensive reforms of teacher compensation and other organisational changes to improve teaching; emphasising the importance of continuous, focused learning; recognising the need to adjust the details based on early experience; exploring innovative methods of knowledge and skills assessment to reduce the workload of teachers; being supported by ongoing and comprehensive performance management and support in the local school setting.

due to their poor design and implementation. Other difficulties are the multidimensional aspects of teachers' work as well as measurement difficulties in this area.[32] Although a recent study from the Australian Department of Education, Science and Training is quite optimistic about the positive impact of performance-based programmes-conditional on some key-design features, the debate is still very much divided on the desirability of these programmes, especially when they only consist of merit pay for teachers. Two more encouraging policy routes appear to be programmes targeting the group (which may be the whole school) rather than individual teachers and those relying on a mix of teachers' knowledge-skills credit system (*i.e.* relying on formal assessment of teachers' knowledge, typically completed by external review) and of pupils' achievements indicators.[33]

In recent years Norway has created the conditions for introducing some components of a performance-based reward system, by decentralising teachers' wage bargaining in 2003 and by devolving staffing responsibility to municipalities and schools. Thus, increases in salary related to teachers' performance are in principle possible. However, so far there has been very little use of performance-related rewards, with the exception of Oslo municipality (see Box 4.6). One of the interesting aspects of the experience in Oslo is

Box 4.6. **Oslo quality assessment policies**

Oslo started quality assessment policies in 2002. These policies are carried out in the context of the Knowledge Promotion Reform and are partly funded by the Developing Competencies strategy (see Box 4.2). There are outcome-focused policy targets (success rates in completing both lower and upper secondary education and minimum number of drop-outs) which are set as a percentage improvement for each school. In addition, much attention is paid to pupils' results, both in the national assessment tests and in the final exams at lower-secondary education level. Oslo is also setting-up its own test for formative assessment and accountability purposes. Indeed Oslo encourages publication of results at school level, distinguishing Oslo from the large majority of other municipalities which publish results at the aggregate level (*i.e.* for all schools in their municipality). At the same time Oslo has invested a lot in the construction of value-added indicators so as to disentangle schools' contribution to pupils' learning from that of other individual and social drivers of achievements. Oslo is also developing some dedicated tools to analyse value-added indicators and use them to assess school performance (at teacher and at principal level) as well as to promote benchmarking and sharing of best-practices among schools within the municipality.

Quality assessment policies in Oslo are also increasingly making use of performance-based rewards tools which are targeted on both teachers and principals. Performance-based reward schemes for teachers consist of merit-pay only, merit being defined according to criteria which may vary from one school to another and that are usually agreed by the principal and the municipality. These criteria include pupils' results (corrected for the influence of socio-economic background), teachers' involvement in non compulsory school activities (mentoring of teachers, administrative responsibilities) and others. Performance-based reward schemes for principals also consist of merit-pay, but are based only on pupils' results (adjusted for socio-economic background).

Although robust empirical evidence on the impact of Oslo's policies is lacking at the moment, a study shows that pupils' results at the national assessment test and at final exit exam seem to be higher than in other municipalities (Haegeland *et al.*, 2005).

the rather comprehensive definition of teachers' performance which has been used by Oslo principals who are using a performance-based system.

There is some preliminary evidence that policies to enhance quality of teaching and learning in Oslo have produced their expected results, as shown by results to national assessment tests adjusted for a number of other determinants of pupils' achievements. Although more research in the future is needed to corroborate these initial good results, Oslo's experience has yet to be fully evaluated, but if it turns out to be as a success story in the Norwegian context, other municipalities should find it a good source of inspiration to put in place similar policies. Overall, local negotiation of teachers' pay and working conditions should be strongly encouraged.

Good principals are an asset

Effective principals can lead to better schools. According to the Education Act (1998) and accompanying legislation, principals in Norway are responsible for leading and developing instruction in schools. In practice principals have staffing responsibilities (sometimes shared with the municipalities), curricular responsibilities (within the framework of centrally defined guidelines) and financial ones. From the Knowledge Promotion Reform onwards, the leaders' role has indeed been increasingly identified with quality development of schools. However, it is unclear how well quality policies at school level have been successfully embedded in leaders' practical responsibilities. This is partly related to the limited use of benchmarking and of tools for directly assessing teachers' performance, as argued above.

Following devolution of responsibilities from the central to the local level, principals' duties expanded considerably (at least in theory).[34] Moreover, the overall burden on schools increased because of the disappearance of some support functions (*e.g.* the pedagogical guidance services) and a layer of governance at local level.[35] Although there is an increasing number of leadership agreements signed between principals and municipalities containing provisions for educational and economic management of the schools, these practices are not uniform across the country and to date there has been no assessment of how they work in practice.

Like teachers, principals perform better if they have the right competences. Currently, the large majority (90%) of principals hold a bachelor degree or a teacher college degree, very few of them hold a masters degree. In fact there are no formal competence requirements for principals and, apart from a recently introduced Masters studies in leadership, there are no full higher-education training programmes. This is also true in the majority of OECD countries, but Norway, unlike many countries, does not even have special induction programmes for newly-appointed principals. In the recent White Paper the government has introduced a new formal training program for newly appointed principals.

Accountability across the board

Effective school inspection also has a role to play. However, there is no national school inspectorate in Norway and the current legislation holds municipalities responsible for schools' results. The ministry is however responsible for supervision at national level and control of activities pursuant to the Education Act. These two responsibilities are in practice delegated to the County governors. If conditions are detected that are in violation of the Act, or regulations pursuant thereto, the County governors may order the correction of such conditions. In addition, a joint national inspection is held every year, focusing on a

specific area or areas of the legislation, to ensure that local authorities' understanding of the relevant legislation and ensuing actions are as uniform as possible across the country. The results from the inspections are reported back to central government. For instance, the national inspection programme carried out in 2006, show that only a minority of assessed municipalities met the requirements indicated in the Education Act, and that municipalities' responsibility for schools assessments was exercised to a very small extent. The audit concludes that "70% of examined municipalities do not have adequate systems for ensuring that pupils' rights are secured".

Following the 1992 reform of local government, some municipalities adopted a three-level model and others a two-level model; the essential difference for education was that two-level municipalities devolved more responsibilities to schools and significantly reduced their own level of competence in education. According to Møller *et al.* (2006), municipalities organised as two-level models tended to focus more on the budgeting and economic management aspects, while those organised as three-level models ("sectoral forms of organisation") paid more attention to pupils' performance. An encouraging sign is that municipalities seem to be responding, and are strengthening school-related competences at municipal level after observing that the transition from three to two levels was disadvantageous for school development and performance reporting.

Overall, accountability of municipalities should be further encouraged because, despite a proper regulatory framework, incentives for ensuring school performance are currently too weak. Merit pay for principals is an important policy tool that must be considered in this respect, and is less controversial than teachers' merit pay, given the importance of managerial skills for principals. As discussed in Box 4.6, the municipality of Oslo is rewarding principals according to their schools' performance. Although this is part of a larger set of quality policies, there was less resistance to principals' merit pay than for teachers, not least because principals are less unionised than teachers. For the same reason, other municipalities may want to consider introducing these incentives for school leaders to improve performance.

Despite a general orientation towards quality development and, more generally, goals of effective and equitable learning, behaviour is not converging yet to a systematic effort to improve educational outcomes, and in this respect there remain many differences across municipalities. This is changing now as there is increasing awareness of weaknesses in the education system and a strong political willingness to cope with them. But care must be taken to ensure consistency of tools and policies, in particular given the apparent contrast between the wide freedom left to local actors and the low provision of accountability devices. Given the progressive decentralisation of the management of education, the absence of a well-established framework of objectives and instruments (*e.g.* paucity of incentives for teachers and principals), may have contributed to Norway's modest performance on measures of cost-efficiency.

Could Norway spend less or differently?

Previous sections have discussed policies that could improve performance. Some of these have potential costs. Quality-enhancing policies which consist of enhancing teachers' wage profiles or performance-based rewards would require additional resources, unless they were implemented with offsetting reductions for less well-performing teachers at the same time. Policies that aim at changing the institutional framework, for instance by

increasing benchmarking, are in principle less costly, though there may be considerable upfront costs. The increase in instruction hours could be made cost-neutral if obtained through higher teaching load, but this in turn might not be possible without financial compensation for teachers, which might be difficult if resources are constrained.

OECD work already discussed, however, implies that there should be a number of ways to free resources by reducing expenditures with little or no impact on performance (Sutherland *et al.*, 2007a). Norway is one of the countries which spend relatively little at central level (only a quarter of initial funds come from central government compared to one half in the average OECD country (OECD, 2007). This, together with differences in the settlement patterns and in local government preferences, results in a wide dispersion of expenditure across municipalities. Cost-consolidation policies have thus to be designed against this background.

According to the Ministry of Education, most variation in expenditures is due to matters beyond "direct municipal control", such as scattered settlement and the number of pupils in the catchment area. Using needs-adjusted expenditure (*i.e.* correcting for the number of), the variance between municipal needs-adjusted operating expenditure is 75% lower than the variance between the non-adjusted expenditure. The residual 25% could be due to political preferences and other structural factors. The scattered settlement and the low population density are however factors under (central government's) policy control to the extent that specific regional policies are carried out to maintain the current pattern of settlement unchanged: grants to municipalities (which are not earmarked to education in particular, but cover health and welfare expenditures too) do take into account population density and thus compensate for the low number of public services users. In the absence of such regional policies, there would be a less scattered population so that many policies, including education, would be less expensive.

Some national studies show that the main underlying source of variation in expenditures across municipalities is the teacher-per-student ratio, which is itself related to school size. This is in line with an allocation model of school spending within districts estimated by Falch *et al.* (2008), which finds that the effect of school size on cost is strong, particularly so for small schools. The study estimates that merging schools could be a way to reduce overall costs. According to these estimates, merging two schools with 50 (200) students would reduce teacher hours per student by about 18% (9%) of average resource used. The study also estimates that in very small schools the cost reduction at the margin is the highest (in a school with 10 students, an additional student would imply a 13% cost reduction at the margin). Based on the same estimates, Bonesrønning *et al.* (2008) found that increasing the average school size from the current value of 200 to 400 (slightly higher than in Denmark) would reduce costs by 6%. These figures provide an indirect illustration of how costly regional policies are in Norway in the field of education.

Other particularly significant drivers of cost are children with special needs and children with a minority background (on average 55-80% extra resources are allocated to minority students and 65-130% extra resources are allocated to students with special needs). Since these two last cost factors are not under direct policy control, reducing the number of teachers per student by merging small schools could be the only important route to cost consolidation. In fact Norway has already been moving in that direction, as shown by the declining numbers of schools in the last decade while total pupil numbers have been increasing.[36] The average size of schools has thus been increasing over the last ten years: in this period, the number of large schools has increased by 7% and small schools

(with fewer than 100 pupils) have decreased accordingly. As a result of this, the number of pupils in large schools has increased, and the fewer pupils are in small and middle sized schools. Since the school year 2002-2003, more than 50% of pupils attend large schools.

Among the arguments raised against merging of schools there is, on the one hand, the potential impact of class size increase on pupils' achievements and, on the other, the welfare losses implied by higher commuting and possible harm to regional culture and diversity. The former should not be a reason of concern though, since many studies have shown that, for most pupils, the impact of class size on pupil attainment is relatively small.[37] Thus, changes in teacher training, incentives and accountability discussed earlier should permit improved performance even with larger class sizes. Furthermore, some long-term cost reductions should be obtained from school mergers through reduced overhead costs even if class size were unaffected. The wider welfare arguments deserve careful consideration but unfortunately sound cost-benefit analysis encompassing economic and non-economic consequences of merging schools is lacking at the moment. Again, accountability measures such as a good benchmarking system would provide valuable information for such analysis.

It has been argued that the debate on possible restructuring of schools has been "polluted" by political interests, not always to the benefit of citizens. According to Falch and Rattso (1999), small school size is the result of strong political lobbying at local level by representatives of municipalities. Their argument is that spending pressure decreases with municipality size, because educational services are a larger source of direct (through grants) and indirect (through income taxes) revenues for small municipalities than for larger ones, so that the former have a stronger incentive to keep small schools open.[38] Politicians may thus resist schools restructuring decisions more than citizens. Keeping schools open in very small communities that otherwise will disappear is a sensible policy only if that corresponds to informed public demand.

Incentives have to be given to municipalities to restrain education expenditure. Transparency in cost-effectiveness of services delivered may be a part of this incentives framework. Local property taxes might be a promising policy in this respect, as shown by a number of national studies which, both in the context of education and other services, show that school quality increases in municipalities where public services are financed through property taxation.[39] This research supports the view that having a visible and controversial local tax related to property stimulates voter interest in local government activities and thereby may help cost control. The results from these studies have to be however interpreted with some caution, because a similar literature on other countries, notably the United States, found controversial results.

Conclusion

Norway needs to adopt policies that make better use of existing resources and improve their quality. The current level of spending is already relatively high and the political room for direct cost reductions may be small so that attention needs to be focused on cost-neutral measures. Resources should be redirected towards quality-enhancing inputs (as for instance teachers' training in specific skills) and away from inputs with less impact on educational attainment (non-core subjects, teacher per student ratio). Finally, policies to resist spending pressures at local level should be considered. National surveillance of

municipal spending, perhaps particularly for small communities, could include actively disseminating information on those which appear to be particularly inefficient.

In addition to specific areas where it is clear that expenditure could be redirected, it is important to ensure that institutional reforms support a continual search for improved performance and for cost-efficiency. This means that autonomy should be accompanied by accountability, which itself depends on developing a benchmarking framework for information on performance and costs. It is clear that, given the sensitivities on performance-based rewards and possible perverse effects, this kind of policy should be adopted with care; the lessons from current experience in Oslo should be particularly useful in this respect. Box 4.7 presents some recommendations in more detail.

Box 4.7. **Summary of policy recommendations on education**

Increase average competencies of Norwegian teachers in primary and lower-secondary education, particularly in math, science and technology (MST). This should be achieved by making selection and graduation criteria for teachers more stringent, particularly for scientific subjects. At the same time, the number of specialists should be increased by streamlining qualification requirements for entry to teaching and making these appropriate for each level (primary, lower or upper secondary). In addition, **formal training programmes to improve competencies throughout careers should be strongly encouraged.**

Consider making the teaching profession more attractive, by improving career opportunities within the profession, with tracks associated with increased responsibilities, and by increasing professional development opportunities, with recognition of increased competencies when these lead to formal certification.

In the light of analysis of the outcomes of the use of such incentives in Oslo, **consider increasing incentives to teachers' excellence beyond initial qualification**, by considering merit-based reward schemes at school level. Promote the development of locally determined criteria for performance and merit and encourage local negotiation of teachers' pay and working conditions. **Include school performance in the criteria that determine school principals' rewards.**

Increase instruction time through higher teaching load and teaching time spent in classrooms. At the same time focus more on MST subjects from early grades of instruction, and systematically promote and disseminate research on the effectiveness of teaching methods, such as work plans, to make sure that final education outcomes reach the standards targeted by the government.

Where there is autonomy, ensure accountability. Publish results of national assessment tests at school level, complemented by value-added indicators so as to facilitate performance monitoring. Evaluate teachers' effectiveness and provide feedbacks to pupils and families. Communicate national tests results to teachers of previous grades and include their pupils' learning outcomes in assessments of teachers' performance. Continue central auditing of school performance at municipality level and consider sanctions, such as publishing information, of local authorities with poor performance and inadequate school monitoring and support mechanisms. Continue to publish information on spending per pupil and educational outcomes at municipality level, so as to enhance transparency on cost-effectiveness of education services across the country.

Envisage further reductions in the number of schools, so as to free resources that can be invested to improve teaching quality.

Notes

1. As for instance the establishment of the National Assessment System in 2004 and the Strategy for Maths Science and Technology in 2005.
2. TIMMS (Trends in International Mathematics and Science Studies) test mathematics and sciences achievements for pupils in 4 and 8 grades. Unlike PISA which is designed to assess 15-years-old abilities to use the knowledge and skills they have acquired without a specific correspondence to the studied curriculum, TIMMS tests what students are taught and learn in school.
3. PIRLS (Progress in International Reading Literacy Study) tests reading skills among 4 grades pupils.
4. Gustavsson (2008) also shows that there is a two and half months difference between the average age of Norwegian pupils tested in 2001 and that of those tested in 2006. That difference is however not big enough to account for performance differences over time, which confirms the relative stability of PIRLS scores between the two waves of the survey.
5. Other explanations are historically high participation rates in education in Norway, and low inflow of migrants (who may contribute to low literacy among adults in other countries).
6. A simple regression of duration of tertiary studies where demand and supply factors are controlled for, shows that a low level of PISA score results in longer study duration.
7. It fell from 11% in 1999 to 7% in 2005 compared with a drop of 2% (2.4%) points in the EU area (EU 27 countries) from 2000 to 2005.
8. This is also in line with national studies finding a moderate family's impact on pupils' achievements (Hoegeland *et al.*, 2007).
9. Falch and Ratsso (1997) show that school spending growth is driven by income-elastic decisions about teacher wages and working conditions at national level. The local public sector have inelastic response to these national cost factors, and thus they are not able to hold down the spending growth.
10. The study uses grades obtained to the national assessment and exit exams results at the end of lower-secondary education, adjusted for family background. From a methodological point of view, the national study provides a more accurate estimate of the schools' contribution to the efficient use of resources (since it nets out the impact of social intake at individual and school level before the efficiency analysis). In fact Borge and Naper (2006) show that the traditional method on which cross-country studies rely (using a number of inputs including social intakes) estimates larger inefficiency scores, with almost half of the schools being considered efficient, compared to the 19 out of 426 municipalities in the baseline.
11. Teachers matter, OECD 2006. The report also observes that policies increasing wages might be more effective than those increasing teacher per student in countries facing teacher shortages, since increased demand for teachers from reducing the student-teacher ratio is likely to exacerbate supply problems. This seems to fit well with the Norwegian context.
12. Santiago, 2002.
13. Factors which are not under policy influence, as the socio-economic background of pupils, will not be discussed in the rest of the chapter.
14. The study uses a cross-section of data and does not control for teachers' experience.
15. Rambøll Management (2006).
16. According to Hanushek and Pace (1995), relative earnings matter for becoming teachers after relevant training has been attended, rather for enrolling in teacher education *versus* another college course.
17. See Dolton, 1990 ; Wolter and Denzler, 2003 ; Dolton *et al.*, 2003 ; for returning to teaching profession Murnane, 1996 and Beaudin, 1993. See Santiago (2004) for a review and OECD, 2005.
18. The only available piece of evidence from Hoegeland *et al.* (1999) shows that, in the 1990s, returns to education have been increasing in Norway with the only exception being the public sector employees (as a whole and without further distinction between teachers and other professional categories). Aggregate statistics, which do not control for a number of individuals' characteristics, notably education and age, point to a mixed picture. On the one hand, average relative earnings by sector show no sign of decrease between 1997 and 2006. On the other, cumulated growth in teachers' salaries between 1990 and 1999 was low (36.6% against an average of 44%).

19. A study by Treiman (1977) found that, as in many other countries, teacher professional status in Norway was well above average, as compared with other professions. More recent empirical evidence is lacking, and though there has been a decline in the number of applicants to teacher education in the last decade, this is still one of the most popular alternatives in Norwegian higher education. In 2008, 9 percent of the applicants chose teacher education (kindergarten through high school teacher) as their first choice.

20. Fafo Report, 2008 forthcoming.

21. The number of teachers per student, the average class size and the net teaching time per teacher determine the total number of instruction hours per student:
$\frac{\text{Students}}{\text{Teachers}} = \text{Average Class Size} * \frac{\text{Teachers' teaching load}}{\text{Average Number of Instruction Hours}}$ with the latter term corresponding to the average number of classes per teacher. Teacher per student and average class size are not equivalent, because of variations of teaching loads, teaching assignments and class size rules. See also EAG 2007 for a discussion of actual differences between teacher per student ratios and class size in OECD countries.

22. "In England, Scotland, and the United States, the total working time for which teachers are required to be available at school is specified, although in the United States it is typically specified by state and local authorities. Total working time is defined as net teaching hours plus nonteaching time associated directly with teaching, although net teaching hours sometimes includes nonteaching time associated with other activities such as counseling students. Scotland and the United States specify the proportion between net teaching hours and those for nonteaching duties, while England specifies the total number of working hours required at school. Scotland also specifies the total statutory working hours for teachers." (Education Indicators: an International Perspective, IES, *http://165.224.221.98/surveys/international/intlindicators/index.asp?IndicatorNumber=84&SectionNumber=4*.)

23. Bergrem (2008a, 2008b).

24. See Wößmann *et al.*, 2007 and Gonand *et al.*, 2007. A larger notion of accountability encompasses ethical and professionalism standards (see OECD, 2007).

25. There are some municipalities which are an exception to this (see Box 4.5 on Oslo).

26. Before national standardised tests, schools were formally required to conduct school-based assessments, however in practice assessments practice differed quite a lot in terms of their regularity and quality (OECD, 2007).

27. This result is robust to possible endogeneity bias because of the methodology used in the analysis, which is cross-country (see Annex 4.A1 for more details and Wößmann, 2005).

28. Though the available empirical evidence on the impact of curriculum of pupils' achievements is limited (Schimdt *et al.,* 2001), the recent new curricula designed by the Ministry of Education has not taken stock of any international benchmarking.

29. Møller *et al.* 2006.

30. Other kinds of informal practice used by principals include colleague counselling and mentor schemes.

31. Hegtun and Ottesen, 2007.

32. As argued above, pupils' achievements depend on a complex range of factors, of which only some are about teaching quality. Not always these factors can be disentangled and their relative importance appreciated. Moreover, teachers' performance can be evaluated on criteria other than pupils' performance, for instance willingness to perform administrative tasks, steering of young teachers, etc.

33. For instance the Singapore and UK programmes.

34. For instance, principals are now responsible for interpreting and implementing curricular guidelines taking into account pupils and community's context. Principals are also in principle responsible for teachers' monitoring, on top of standard staffing tasks. Budget responsibility is delegated to principals to a different extent (in municipalities where principal reports to the municipal education executive, school finances and budget balances are agreed upon by the principal and the chief municipal education officer; in municipalities where principals report to the chief municipal executive, principals are assigned a clearer responsibility because principals must find out how many employees the budget can accommodate).

35. After the Local Government Act of 1992, many municipalities shifted from a three-level governance model to a two-level one (in the three-level model principals refer to the municipal education executive, while in the two-level model they refer to the chief municipal executive). Advantages of two-level model are that municipal administration has become more streamlined in the middle, and there are more direct lines of communication and decision making between municipal top management and schools. A shortcoming is that some relevant knowledge of schools' situation has been lost in this leaning process, and that quite a lot of administrative back-up for schools was abolished.

36. From 2005 to 2007, fifty schools were closed down (forty-five primary and lower schools and five special-needs schools). About one in five closed schools underwent some organisational restructuring, merging for instance with other schools. In the same period of time, thirteen primary and lower-secondary schools were opened, six of them due to organisational restructuring.

37. Causal effects of class size on student achievement have proved very difficult to measure (see Santiago 2002 and Wößmann 2003 for two comprehensive reviews). Major early research tended to conclude that smaller classes do not necessarily lead to better educational outcomes; these have been however challenged by an increasing number of scholars. Recently, consensus has been reached on the following points: *a)* since class size reductions are beneficial in specific circumstances and broad class size reductions are expensive, class size should be targeted at those who benefit the most; *b)* the effectiveness of investment in class reduction should be compared to the effectiveness of other investments leading to higher educational outcomes (notably those on teachers' quality).

38. The strength of political coalition is also found to be inversely related to pressure spending, because political strength holds back interest groups pressure. This is line with Borge 2000 and 2005, which shows that political strength contributes to lower user charge and lower budget deficit: strong political leadership is better equipped to resist pressure from external interest groups to increase spending (in turn financed by higher user charges and/or higher budget deficit).

39. Compared to most other countries, the system of financing is quite centralised. Around 95% of local taxes are regulated income and wealth taxes where effective limits on tax rates have been in place for 25 years. The opportunity to influence current revenues is thus limited to property taxes and user charges.

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ANNEX 4.A1

What drives learning outcomes? A multi-level analysis of PISA scores in OECD countries[1]

Modelling pupils' performance

Following a relatively standard approach in the literature, pupils' performance in international assessment surveys such PISA can be analysed by estimating an educational production function (Hanushek, 1996; Wößmann, 2003; Wößmann *et al.*, 2007). In this approach, educational outcomes are measured by test results and inputs include a wide range of potential determinants of pupils' achievements, comprising policy and non-policy variables. This chapter follows closely the empirical exercise carried out in the PISA 2006 report, making use of the same statistical analysis (multi-level data estimation) and, to a large extent, of same explanatory variables. Differently from PISA 2006, estimations are carried out on OECD countries only.

The specification of the model relies on individual and school factors which have a bearing on pupils' performance, as found by a number of empirical studies in this field (see PISA 2006 for a review). A distinction can be drawn between factors under direct educational policy influence and those which are out of policy control. Among the former, PISA 2006 identifies six groups of factors: admission, grouping and selection; school management and funding; parental pressure and choice; accountability policies; school autonomy; educational resources. Only the last three were tested in our empirical analysis because they correspond to the policy issues discussed in the chapter and relevant for the Norwegian context. Indeed this empirical exercise was carried out to provide empirical support to some of the policy recommendations contained in the chapter. In this respect, the main innovative aspect with respect to PISA 2006 is the test of composition effects of spending in education that was absent in the report.

This analysis only looks at the influence of educational policies on average learning outcomes and does not investigate the role of the latter for equity. However, Wößmann *et al.* (2007b) as well as the initial international report for PISA 2006 (OECD, 2007) find that accountability and autonomy arrangements do not have a detrimental impact on equity of achievements.

Empirical strategy

Multi-level analysis

PISA measures 15-year-olds' achievements in selected subjects and at the same time collects many pieces of information on socio-economic characteristics of pupils and their

learning environment. One of the characteristics of the PISA dataset is that data are sampled at two levels: pupils and schools. The structure of the dataset requires an appropriate statistical tool for empirical analysis, as discussed in OECD 2003. As a result of the sampling strategy used,[2] the residuals are generally not independent,[3] violating a conventional assumption of Ordinary Least Squares estimators. Concretely, this means that achievement of students within a school is likely to be more similar than would be the case in a simple random sample because students in the same school share peer characteristics, teaching and learning conditions and common neighbourhood. As a result, the calculated standard errors of coefficient estimates are biased downwards (though the coefficients estimates themselves are consistent).

As in PISA 2006, pupils' performance is analyzed as the result of set of variables at three levels: pupils, schools and countries. The specific specification of multi-level modelling retained in this exercise is the "random intercept model". This means that, at all levels, slopes of coefficients are fixed (*i.e.* homogeneous across individuals, schools and countries) and only the intercept is randomised (which allows predicting the PISA scores for an individual *i* in the school *j* in the country *k,* as a function of deviations of school j and country k from the respective country and international average effects).

Variables

Outcome variables

The main analysis is carried out using the PISA 2006 Combined Science Scale scores (five plausible values) as dependent variable, so as to use the latest topical PISA learning outcome measure. In a separate set of regressions, the same specifications discussed below were tested on math scores as a robustness check.

Explanatory variables

Based on both theoretical considerations and previous empirical findings, several school and system-level explanatory variables were selected in order to examine their association with student performance. Many studies have looked at the impact of institutional characteristics and resources on educational outcomes. The bottom line of these studies is that institutional variables are central determinants of student achievement, while resource variables have been found to be much less important (*e.g.* Wößmann, 2003; Hanushek, 2003). The model developed by Bishop and Wößmann (2004) provides a theoretical background to empirical studies on the determinants of pupils' achievements. In this model, institutional characteristics such as accountability and autonomy affect student achievement because they affect the incentives of actors in the education system (namely schools, teachers, parents and students) to perform at their best. Thus, policymakers need to set the right incentives for the different actors.

Empirically, central exams have proven to be important in raising the level of student achievement (*e.g.* Bishop, 1997; Jürges *et al.,* 2005). Making achievement data publicly available is another example of an accountability system that has been found to be an effective means of raising student performance (*e.g*, Hanushek and Raymond, 2004). Besides testing and public reporting of students' results, school accountability systems typically include rewards or sanctions based on some measure of school performance or improvement. Some have however criticized the latter measures by noticing that differences in resources between schools are not always taken into account (Ladd and

Walsh, 2002) or that problems of measurement error undermine their objective of raising student achievement (Kane and Staiger, 2002). As discussed in the main chapter, it is crucial to develop good value-added indicators as to counter this criticism at least to some extent.[4]

Wößmann (2003; 2005) emphasises the role of different aspects of school autonomy for student achievement. Recent evidence suggests that a combination of school autonomy and accountability by means of central exams is beneficial for student performance (*e.g.* Fuchs and Wößmann, 2006; Wößmann *et al.*, 2007).

In this exercise, we mainly follow Wößmann *et al.* 2007 and PISA 2006 for selection of explanatory variables, including both non-policy (background) variables policy and policy ones.

Background variables

Demographic and socio-economic background variables, which are less likely to be amenable to school and system-level factors, were selected based on previous empirical findings. Controlling for background variables allows the net effects of school and system-level variables to be examined. The background variables used in the model were:

- At student level: PISA index of economic, social and cultural status (ESCS); gender; language spoken at home; immigrant status; grade.
- At school level: School average PISA index of economic, social and cultural status; school's percentage of native students; school size; school location.
- At system level: GDP per capita measured using PPPs.

Policy variables

Taking stock of the literature summarized above, three sets of policy variables are tested: educational resources, accountability and autonomy. These policy dimensions are retained so as to illustrate the potential gains associated with policy choices relevant for Norwegian education, as discussed in the chapter. Following a very similar specification to Wößmann *et al.* (2007) and PISA 2006, the following main variables are tested:

- Educational resources: the level of education spending (in absolute terms or as a percentage of GDP per capita); the composition of spending, either using teachers' wages or the teacher per student ratio; the composition of spending, controlling for its level. The importance of learning time in science (tuition time in classroom and homework) is also tested.
- Accountability: existence of central exams in science (at the end of lower-secondary education), set-up with national standards; schools posting achievement data publicly.
- Autonomy: budgeting autonomy, staffing autonomy, curricular content autonomy; a composite index of autonomy encompassing these three dimensions; various types of staffing autonomy (to dismiss teachers, decide their starting salaries and to decide salary increases).
- Interaction between accountability and autonomy.

Specification of variables

All variables including both background and explanatory variables were centred on the grand mean. The grand mean centring is a linear transformation of variables by subtracting the overall mean of all 29 countries from the value proper. Note that, for fixed coefficients, it does not make a difference for the estimated coefficient whether a variable is grand-centred or not centred. Only the interpretation of the intercept changes when centring by the grand mean. In all models, the intercept is to be interpreted as the achievement score in science for a student who has the international mean in all variables included in the model.

Results

Background model

The results of the background model are presented in the first column of Table 4.A1.2 (Standardised coefficients, that are comparable across variables expressed on different units, are shown in Table 4.A1.3). In line with previous literature, pupils' achievements are strongly positively influenced by socio-economic background, both at individual and at school level. The former result may be driven by a number of different (possibly concomitant) factors: parents' income, parents' education transmission of genetic capital, etc. (see PISA 2006 for a discussion). At school level, the importance of social economic-background concerns peer effects and social segmentation in schools. These effects are also well-established in the literature, and may vary considerably from one country to another (as documented in PISA 2006). Immigration background of pupils has bearing on pupils' achievements at individual level only: native students score on average 18 points higher than non-native students, pupils speaking the same language at home and school also do significantly better than those who do not. Schools in rural areas do better than schools in small cities, which do better than schools in large cities (this latter effect is however not statistically significant). Pupils attending bigger schools also display a better performance than pupils attending smaller schools. Finally, regressions find that girls have a lower performance than boys and that the performance is positively (negatively) related to the degree of pupil's grade anticipation (delay) in the educational system.

Educational resources

The impact of educational resources is tested here in many ways. Following a standard approach in the literature, educational resources have been first expressed as levels of spending (at lower-secondary level, or as the cumulative spending for a 15-years-old from primary to lower-secondary level) in final consumption PPPs, or as a share of GDPs per capita. Consistently with previous studies, none of these measures reveal a relationship between average pupils' achievements and aggregate financial resources spent on in education (regressions are not shown).

In order to test for the effects of the composition of spending, educational expenditure per pupil has been decomposed into two terms: teachers' wages and the ratio of teachers per student. The former can be measured in various ways, and Table 4.A1.2 presents the results of regressions with various proxies.

In a first regression, teachers' wages (excluding employers' social security contributions) are associated with higher PISA performance (Column 2). This effect is not

Table 4.A1.1. **Descriptive statistics of variables used in the model**

Variables	Observations	Min.	Max.	Mean	Std	% missing
System level						
Student-teacher ratio	29	8.88	27.06	13.38	3.70	–
Central exams in science	29	0.00	1.00	0.59	0.46	–
Teachers wages in lower secondary education	29	9.10	88.67	35.37	14.88	10.34
Teachers wages in lower secondary education, relative to GDP	29	0.67	2.51	1.31	0.47	10.34
GDP per capita (per 1000 US-$ PPP)	29	7.21	64.84	28.42	10.95	–
School level						
Index of autonomy in staffing	8 911	–1.16	1.61	0.01	1.00	1.79
Index of autonomy in course contents	8 911	–2.30	1.03	0.00	0.99	1.79
Index of autonomy in budgeting	8 911	–2.91	0.77	0.01	0.99	1.79
Autonomy in firing	8 911	–1.00	1.00	0.09	0.93	1.79
Autonomy in determining starting salaries	8 911	–1.00	1.00	–0.48	0.82	1.79
Autonomy in determining salary increases	8 911	–1.00	1.00	–0.47	0.81	1.79
Index of overall autonomy	8 911	–1.18	0.82	0.00	0.49	1.79
School informing parents of children's performance relative to other students in the school	8 911	0.00	1.00	0.53	0.50	3.01
School informing parents of children's performance relative to national benchmarks	8 911	0.00	1.00	0.45	0.50	3.48
School informing parents of students' performance relative to other schools	8 911	0.00	1.00	0.25	0.43	3.61
School posting achievement data publicly	8 911	0.00	1.00	0.37	0.48	3.21
School using achievement data for evaluating principals	8 911	0.00	1.00	0.29	0.45	4.10
School using achievement data for evaluating teachers	8 911	0.00	1.00	0.42	0.49	3.58
School using achievement data for allocating resources to schools	8 911	0.00	1.00	0.29	0.45	3.77
School with achievement data tracked over time	8 911	0.00	1.00	0.63	0.48	3.80
Student-teacher ratio	8 911	0.27	73.43	13.38	5.45	6.93
School size (per 100 students)	8 911	0.05	100.00	7.43	5.50	3.42
School average index of economic, cultural and social status	8 911	–3.13	1.75	0.00	0.64	0.00
School in city (100000 or more people)	8 911	0.00	1.00	0.32	0.47	2.11
School in a small town or village (15000 or less people)	8 911	0.00	1.00	0.32	0.47	2.11
Percentage of native students at school	8 911	0.00	1.00	0.91	0.16	0.00
Student level						
Learning time for self-study or homework (science), hours per week	246 562	0.00	7.00	1.42	1.45	3.09
Learning time for regular lessons (science), hours per week	246 562	0.00	7.00	2.98	1.96	3.62
Student's language at home is the same as language that the test was taken in	246 562	0.00	1.00	0.91	0.28	3.84
Student has no immigration background	246 562	0.00	1.00	0.89	0.31	2.11
Student index of economic, cultural and social status	246 562	–5.67	3.35	0.00	1.00	1.09
Student attends grade 7	246 562	0.00	1.00	0.01	0.08	0.23
Student attends grade 8	246 562	0.00	1.00	0.05	0.21	0.23
Student attends grade 9	246 562	0.00	1.00	0.36	0.48	0.23
Student attends grade 10	246 562	0.00	1.00	0.49	0.50	0.23
Student attends grade 11	246 562	0.00	1.00	0.09	0.29	0.23
Student attends grade 12	246 562	0.00	1.00	0.00	0.05	0.23
Student attends grade 13	246 562	0.00	1.00	0.00	0.00	0.23
Student is a female	246 562	0.00	1.00	0.49	0.50	0.23

Source: OECD calculations.

large in absolute terms (the elasticity is around 0.1), but it is of comparable size to that of other PISA determinants in the regressions (See Table 4.A1.3). When teachers' wages are normalised by GDP per capita, or/and when they are measured through compensation per teacher (*i.e.* including employers' social security contributions) (Figure 4.9), they do not show any significant effect on pupils' achievements (Columns 3-4). The teacher per student ratio is found to have no effect in all three specifications.

The compositional effects of spending have also been tested by controlling for a given level of spending (with the idea of measuring the potential trade-off between number of teachers and their wages under a given budget constraint). Results presented above are robust to the inclusion of this additional control.

Finally, learning time for regular lessons is found to increase pupils' achievements by 10 points for each additional hour per week. Homework, however, does not have a significant influence, unlike in the PISA 2006 analysis.

Accountability

Various measures of accountability are available in the PISA dataset. We present and discuss here two measures which have a particular relevance in the Norwegian context. One is benchmarking, as measured by the public posting of pupils' achievements at school level. As discussed more broadly in the chapter, benchmarking in Norway is now done only at municipal level, while there is some resistance to publish data at school level. As shown in Column 5 of Table 4.A1.2, publishing performance information at school level is associated with higher performance in the PISA sample: pupils attending schools which make use of benchmarking perform 4 points higher on the PISA score. It is unlikely that this estimate suffers from an endogeneity bias (*i.e.* capturing the fact that better students attend those schools publishing results), because the estimates are cross-country and thus use data where the institutional characteristics of the schools do not vary with pupils' characteristics, but are due to (exogenous) different legislation across countries.

The effect of publishing results at school level is relatively small compared to the importance of external standardised national exams in sciences at the end of lower-secondary level. In countries where such national external exams do exist (they do not in Norway), pupils display a higher PISA performance (22 points). These two accountability variables are of a different nature: the benchmarking variable is based on self-reporting by schools in the PISA sample; the national exam variable is defined at the country level.

Autonomy

Previous research from the field has shown that managerial autonomy might have an ambiguous influence on pupils' achievements (see for instance Bishop and Wößmann, 2004; Wößmann *et al.*, 2007). On the one hand, there are some aspects of autonomy that are unambiguously good (for instance autonomy of staffing) while others are bad (autonomy of budgeting). On the other, research shows that autonomy has to go hand in hand with accountability for its effects on pupils' achievements to fully show up. In this chapter autonomy has been measured in different ways, by looking at specific dimensions and sub-dimensions of managerial freedom and also by testing a composite index, which encompasses various dimensions. Columns 6 to 8 of Table 4.A1.2 show that there is no evidence that autonomous governance *per se* improves pupils' achievements. This is in line with PISA 2006 which finds no impact of autonomy at school level. The PISA report shows,

however, that autonomy in setting educational content of learning and in budgeting is good at country-level, meaning that in countries with a large number of schools reporting autonomy as regards curriculum and budget, pupils' performance is higher, for given overall resource use.[5]

Autonomy and accountability

As highlighted more than once in the chapter, autonomy may delivers good outcomes if accountability devices are also in place. This idea finds support in previous research (Wößmann *et al.*, 2007; AER paper). The effect of combining autonomy and accountability on pupils' achievements is also tested in this analysis. Column 9 shows that there is a positive interaction effect between the two which is not, however, statistically significant. Various other specifications with different measures of autonomy and accountability have been tested: in none of them did the positive interaction between accountability and autonomy turn out to be statistically conclusive.

A combined model

Following Raudenbush and Bryk (2002) and Snijders and Bosker (1999), a build-up strategy was pursued to combine the different policy variables discussed above. This results in a combined model shown in the last two columns of Table 4.A1.2 In line with specifications mentioned above, pupils' achievements are found to be positively related to accountability (national and school level). The aggregate teacher per student ratio is found to have no influence on educational output, while teachers' wages (relative to GDP per capita or in absolute terms) are associated with higher PISA scores.

Discussion

Consistently with PISA 2006, this empirical exercise found that accountability policies at school and national level, respectively consisting of publicly posting pupils' achievements and having central exams in sciences, are associated with higher pupils' scores. Autonomy was not found to have an influence on pupils' results, not even when it goes hand in hand with accountability. This result should be however put in perspective with PISA 2006, which finds that autonomy at country level (still based on schools self-reporting, however) has a positive impact on pupils' performance. Finally, educational outcomes are not affected by the number of teachers per student, while teachers' wages seem to exert a positive impact. The latter result is not however statistically robust and should thus be interpreted with caution. In a robustness exercise (results not shown but available upon request), similar findings were obtained when using the maths score as the dependent variable, instead of the science score. As discussed above, this analysis neglects some other educational policies, such as grouping and streaming, freedom in choosing schools, etc. The effects of these policies are discussed in depth in PISA 2006 and Wößmann *et al.* (2007a). These studies also find that the impact of accountability, autonomy and educational resources is robust to consideration of these additional educational policies.

Caveats and limitations

While offering many interesting insights on the relationship between educational outcomes and individual and schools characteristics, this approach has some limitations that have to be borne in mind when interpreting results. First, estimates rely on a number

Table 4.A1.2. **Three-level regressions on PISA 2006 scores, selected specifications**

	1	2	3	4	5	6	7	8	9	10	11
Constant	499.26	502.23	501.67	501.00	498.78	499.61	499.93	499.86	499.77	499.38	498.70
System level											
GDP per capita	–0.71	–2.13			–0.56	–0.75	–0.76	–0.74	–0.75	–2.35	
Student per teacher ratio		–2.18	–1.15	0.41						–2.79	–2.17
Teachers' wages		1.37								1.38	
Teachers' wages/GDP per capita			15.39								20.47
Teachers' compensation/GDP per capita				–4.52							
Accountability, central exam in science					21.72					17.88	24.40
School level											
Index of economic, social and cultural status	47.60	41.91	41.85	41.82	47.26	48.73	48.82	48.62	48.28	47.37	47.29
School in a large city	–4.01	15.20	15.32	15.35	14.30	14.19	14.69	14.92	14.92	14.16	14.37
School in rural area	7.96	6.98	6.95	6.94	7.84	8.02	8.03	7.91	7.79	7.92	7.88
School with high percentage of native	14.41	–3.65	–3.61	–3.60	–3.86	–3.79	–3.80	–3.80	–3.60	–3.98	–3.92
School size	0.82	0.79	0.79	0.80	0.78	0.79	0.79	0.80	0.76	0.78	0.78
Accountability, publicly publishing pupils' achievements					5.41				5.65	5.31	5.28
Autonomy, dismissal of teachers						–1.69	–1.21				
Autonomy, starting salary of teachers						–0.58	–0.25				
Autonomy, teachers' salary increase						–3.39	–3.02				
Autonomy, Budgeting						1.01					
Autonomy, curricular content							–2.34				
Autonomy (composite index)								–8.16	–8.36		
Accountability (publicly publishing results) and autonomy (composite)									1.20		
Student level											
Index of economic, social and cultural status	17.75	16.02	16.02	16.02	17.75	17.75	17.75	17.75	17.75	17.75	17.75
Native students	17.86	17.28	17.28	17.27	17.86	17.87	17.88	17.88	17.88	17.86	17.86
Students speaking at home the same language than in classrooms	20.16	20.14	20.14	20.14	20.16	20.13	20.12	20.12	20.12	20.16	20.16
Female	–8.30	–10.33	–10.33	–10.33	–8.30	–8.30	–8.30	–8.30	–8.30	–8.30	–8.30
Grade 7	–105.17	–96.46	–96.46	–96.47	–105.09	–105.31	–105.23	–105.17	–105.11	–105.15	–105.15
Grade 8	–77.88	–71.03	–71.04	–71.04	–77.82	–77.93	–77.88	–77.84	–77.79	–77.84	–77.85
Grade 9	–34.46	–31.72	–31.73	–31.74	–34.43	–34.48	–34.46	–34.47	–34.44	–34.42	–34.43
Grade 11	17.46	17.15	17.16	17.15	17.41	17.49	17.50	17.50	17.47	17.41	17.42
Grade 12	47.02	49.23	49.24	49.24	46.98	46.95	46.97	47.00	46.99	46.98	46.99
Grade 13	125.27	97.48	97.50	97.49	124.89	124.92	125.12	125.28	124.89	124.90	124.92
Learning time in sciences, regular lessons		9.77	9.77	9.77							
Learning time in sciences, homework		–0.33	–0.33	–0.33							

Note: Coefficients which are statistically different from zero are in shade.
Source: OECD calculations.

Table 4.A1.3. **Standardised coefficients in the combined model (specification 10)**

	(A)	(B)
	Coefficient	
Constant	499.38	
System level		
GDP per capita (per 1 000 US-$ PPP)	–2.35	–25.73
Student per teacher ratio (effect of one standard deviation of the index)	–2.79	–15.21
Teachers' wages (in 1 000 US-$ PPP) – (effect of one standard deviation of the index)	1.38	20.53
Accountability: central exam in science	17.88	17.88
School level		
School average index of economic, cultural and social status (effect of one standard deviation of the index)	47.37	30.32
School located in a city (100 000 or more inhabitants)	14.16	14.16
School located in a small town or village (15 000 or less people)	7.92	7.92
Percentage of native students at school (effect of one standard deviation of the index)	–3.98	–0.64
School size (100 additional students) – (effect of one standard deviation of the index)	0.78	4.29
Accountability, publicly posting student achievement data	5.31	5.31
Student level		
Index of economic, social and cultural status	17.75	17.75
Student has no immigration background (student and parents were born in country of assessment)	17.86	17.86
Student speaks the test language or other national test language most of the time or always at home	20.16	20.16
Student is female	–8.30	–8.30
Student attends grade 7	–105.15	–105.15
Student attends grade 8	–77.84	–77.84
Student attends grade 9	–34.42	–34.42
Student attends grade 11	17.41	17.41
Student attends grade 12	46.98	46.98
Student attends grade 13	124.90	124.90

Note: Column A: Coefficients are shown in specification 10. Column B: Standardised coefficients calculated as follows: regression coefficient if the independent variable is coded as dummy and coefficient times the standard deviation if the variable is continuous. Coefficients in shade are significantly different from zero.

of parametric assumptions for which there are few priors. Second, the PISA dataset has some limitations. Notably:

- Given the cross-sectional nature of the data, policy variable effects cannot necessarily be interpreted in terms of causality (see technical issues below).
- 15-year-olds' performance is certainly the result of a cumulative learning process which starts much earlier in life; however, the impact of the learning environment from earlier ages is not taken into account.
- While weights are used to control for potential sampling variance bias, the PISA survey covers only a limited number of schools in each country (300 schools on average).
- Since the majority of explanatory variables rely on survey data, there are potential measurement errors.
- Interpretation of country-level variables must be done with caution because of potential omitted variables (*e.g.* the culture of learning, the attitude to the efforts, etc.) at country level.
- The meaning of policy variables when measured by self-reporting at school level may be different from when it is based on "objective" national policy settings.

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Technical issues

Level estimation and potential biases of resources estimates[6]

PISA is a single cross-section of observations, it is thus not possible to control for individual ability and previous student achievement, that is, to estimate value-added or panel data models. The latter, however, would be more appropriate if explanatory variables changed over time or if they were not exogenous to school or student performance. The coefficients shown in Table 4.A1.2 are unbiased only to the extent that the institutional and resource variables of interest are uncorrelated with other unobserved characteristics that in turn have an impact on student performance (the grade variable, used in this way in most research, may not meet this requirement). Finally, we try to reduce the risk of omitted variables bias by including a large set of regression controls at the country, school and student level. However, to the extent that a country's institutions and resource endowments are related to unobserved, *e.g.* cultural, factors which in turn may be related to student performance, caution should prevail in drawing causal inferences and policy conclusions from the presented results.

Assumptions made on educational resources variable deserve a specific comment. Differently from other institutional variables, the impact of resources variables is tested only at country level. The disadvantage of this is that only the aggregate effect is captured in the estimation, and one cannot strictly infer the effect of having richer or poorer schools. An advantage is instead that, measuring educational resources at national level makes it possible to avoid endogeneity problems (Wößmann, 2003).

Advantages and shortcomings of multi-level modelling

Other regressions techniques are in principle possible for analysing multi-strata data (*e.g.* robust errors OLS). However, no other technique allows taking into account the variability of data at various levels of nesting.[7] This statistical approach thus makes it possible to disentangle causal effects at various levels, from the most detailed (individual level) to the least detailed (country-level).

Moreover, the estimation technique needs to take into account that the effective sample size and the degrees of freedom vary with the variables being measured at different levels (the student, school and system level). As mentioned above, there are 246 562 observations at the student level, while there are data from 8 911 schools at the school level and only 29 observations at the level of countries. The analysis in this annex thus rests on a multi-level modelling approach which is able to take this data structure into account.

Correlation among predictors can be more problematic in multi-level analysis than in simple linear regression analyses. At the least, the problem of multicollinearity makes it difficult to distinguish the effect of one variable from another. At worst, multicollinearity can cause the solution algorithm to fail to converge. For this reason, it is common in MLM to choose a relatively small number of relatively uncorrelated predictors, based on a strong theoretical framework. Raudenbush and Bryk (2002) and Snijders and Bosker (1999) recommend a build-up strategy for MLM analyses. For building the multilevel model, a step-by-step approach was then adopted, starting from the student level upwards to the country level, following the approach suggested by those studies.

Significance Tests

Throughout the multilevel analysis, an effect was considered statistically significant if the p-value was below 0.1 at country level and below0.005 at school level. Different criterion values were chosen for the two levels to balance between significance and statistical power. In particular, at the country level, where there are only 29 cases, statistical power is rather low, which is why a higher significance level was chosen. In contrast, there are almost 9 000 observations at the school level and so a rather low significance level of 0.005 was chosen.

Student weights

For the multilevel analysis, data files were weighted at the student level with "normalised student final weights", which were computed based on the student final weights (W_FSTUWT) in the PISA 2006 dataset.

The student final weights (W_FSTUWT) were normalised at the international level including 29 participating countries to

i) make the sum of the weights across the 29 countries equal to the number of students across the 29 countries in the dataset;

ii) maintain the same proportion of weights as in the student final weights (W_FSTUWT) within each country; and

iii) ensure that each individual country's contribution to the analysis is equal by introducing a country factor (*i.e.* the sum of the weights within each country is the same for all 29 countries).

Treatment of missing data

The proportion of missing values for the variables considered in the analysis is presented in Table 4.A1.1, Column 8. Even though the missing rate was less than 5% for most of the variables, a leastwise deletion of all observations that have a missing value for at least one variable would have reduced the sample size by 28.21%, since more than 30 variables were included in the models. Therefore, missing values were imputed in order to include the maximum number of cases in the analysis.

Since the missing rates were not high for most of the variables, a simple imputation approach was used to circumvent the problem of missing data: predictors at the individual and school level were imputed using a dummy variable adjustment (Cohen and Cohen, 1985). Missing values for system-level variables were replaced by imputed values.

It is known that this imputation method generally produces biased estimates of coefficients (Jones, 1996), and that standard errors of those variables that contain missing values are underestimated since they do not account for the uncertainty introduced through imputation. However, given the fact that for only 1 out of 33 variables, more than 5% of the data were missing (Table 4.A1.1, Column 8), this bias was considered negligible.

As a first step of the imputation, a so-called "missing dummy" variable was created for all variables with missing values regardless of whether a variable was continuous, categorical or dichotomous. A missing dummy variable was set to 1 if the data were missing on that variable and it was set to 0 if the data were not missing.

As a second step, missing values were imputed for continuous variables. Missing values were replaced by the weighted school average of the variable. If all data on the

respective variable were missing in one school such that the weighted school mean could not be computed, the weighted country mean was imputed. If all data on the respective variable were missing in a country, the weighted international mean was imputed. When a missing value was replaced by the country or school mean, the weights were proportional to the sampling probability (weighting factor W_FSTUWT from the PISA 2006 dataset). When a missing value was replaced by the international mean, each country was given an equal weight. Categorical variables were re-coded into a set of dummy variables.

For each category or for combined categories, a dummy variable was created with the value of 1 if the observation belongs to the respective category and 0 otherwise.

Missing values in dummy and dichotomous variables were replaced by 0.

Algorithm

The multilevel analysis was performed using Hierarchical Linear and Nonlinear Modelling (HLM). The commercial software HLM 6.06 (developed by Raudenbush, Bryk and Congdon) was used. A three-level regression analysis was carried out, with students serving as level 1, schools as level 2, and countries as level 3. The model coefficients and statistics were estimated using a full maximum likelihood procedure.

Data sources

The data file used for the multilevel analysis was the international data set of the Programme for International Student Assessment (PISA) 2006. Data from 246 562 students and 8 911 schools in 29 OECD countries were selected. Data from 29 countries (all OECD countries except France) were used for the multi-level analyses. France was excluded, because there, no data were collected on school-level variables from school principals.

Teacher per student ratio, teachers' wages and compensation per teachers are based on our calculations on the OECD Education dataset.

Notes

1. This work reported in this Annex was carried out jointly with Elke Lüdemann (Ifo Institute, Munich).
2. This is a two-stage stratified sample design, with the first stage consisting of schools with 15 years old students, and the second stage consisting of students within the sampled schools.
3. The intra-class correlation is a measure that can be used to assess whether the assumption of independence of errors holds. On PISA dataset this assumption is rejected.
4. The PISA questionnaire does not include a good question to measure the impact of reward measures for teachers and principals on pupils' achievements. For this reason, the current exercise does not provide a direct test of these measures, while other measures of accountability are considered.
5. This model could not be estimated due to multicollinearity problems induced by a smaller sample than in PISA 2006.
6. This section draws extensively from Wößmann (2003).
7. The peculiarity of multilevel modeling is to consider that the outcome variable has an individual and a group aspect. This is true for explanatory variables as well (this notably means that the mean of one explanatory variable in one group, say one school, is different from the mean in another group. The consequence is that explanatory variables will have a positive between-group variance, because the composition of groups with respect to a variable may differ from another one.

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ANNEX 4.A2

The decomposition of expenditures per student

Following Falch and Rattso (1997), expenditures per students are decomposed as follows:

$$\frac{\text{Total expenditures}}{\text{Students}} = \frac{\text{Wages expenditures}}{\text{Teachers}} * \frac{\text{Teachers}}{\text{Students}} + \frac{\text{Non - wage expenditures}}{\text{Students}}$$

Definition and sources of the main components

Ratio of students to teaching staff: The ratio of students to teaching staff is calculated as the total number of full-time equivalent students divided by the total number of full-time equivalent educational personnel. *Source: OECD Education dataset.*

Teaching staff: Teaching staff refers to classroom teachers (ISCED 0-4) and Academic staff (ISCED 5-6). Classroom teachers include professional personnel directly involved in teaching students, including classroom teachers; special education teachers; and other teachers who work with students as a whole class in a classroom, in small groups in a resource room, or in one-to-one teaching inside or outside a 15 regular classroom. Teaching staff also includes chairpersons of departments whose duties include some amount of teaching, but it does not include non-professional personnel who support teachers in providing instruction to students, such as teachers' aides and other paraprofessional personnel. Academic staff subcategory includes personnel whose primary assignment is instruction, research or public service. This staff includes personnel who hold an academic rank with such titles as professor, associate professor, assistant professor, instructor, lecturer, or the equivalent of any of these academic ranks. The category includes personnel with other titles (*e.g.* dean, director, associate dean, assistant dean, chair or head of department), if their principal activity is instruction or research. It does not include student teachers or teaching/research assistants. Teaching staff covers only part of instructional personnel. *Source: OECD Education dataset.*

Wages: Wages means gross wages of educational personnel, before deduction of taxes, contributions for retirement or health care plans, and other contributions or premiums for social insurance or other purposes. *Source: OECD Education dataset.*

Staff compensation: Expenditure on staff compensation includes gross salaries, expenditure on retirement plus non-salary compensation (fringe benefits). *Source: OECD Education dataset.*

Educational personnel: The classification is based on primary or major functions and organises staff into four main functional categories. The classification is: *i)* Instructional

personnel; *ii)* Professional support for students; *iii)* Management/Quality control/ Administration; and *iv)* Maintenance and operations personnel. Teaching staff (teachers) and teachers' aides make up the category instructional personnel. For the purposes of the ratio of students to teaching staff, only teaching staff is taken into account. *Source: OECD Education dataset*.

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