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The economic situation and policies of Norway were reviewed by the Committee on 18 December 2006. 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 3 January 2007.

The Secretariat's draft report was prepared for the Committee by Alexandra Bibbee, Nick Vanston and Benoît Bellone, under the supervision of Patrick Lenain.

The previous Survey of Norway was issued in August 2005.

BASIC STATISTICS OF NORWAY

THE LAND

Area (1 000 km ²):		Major cities (thousand inhabitants, 1.1.2005):	
Total (2005)	385.2	Oslo	529.8
Mainland (2005)	323.8	Bergen	239.2
Agricultural (2004)	10.4	Trondheim	156.2
Productive forests (2003)	74.7		

THE PEOPLE

Population (thousands, 1.1.2005)	4 606.4	Total labour force (thousands)	2 448
Number of inhabitants per km ² (1.1.2005)	12.0	Civilian employment (thousands)	2 369
Net natural increase (thousands, 2004)	15.8	Civilian employment (% of total):	
Net migration (thousands, 1.1.2004)	13.2	Agriculture, forestry and fishing	3.3
		Industry and construction	21.1
		Services	75.4

PRODUCTION

Gross domestic product:		Gross fixed capital investment:	
NOK billion	1 903.8	% of GDP	18.7
Per head (USD)	63 720	Per head (USD)	11 926

THE GOVERNMENT

Public consumption (% of GDP)	20.0	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	4.7	Ships	1.6
Base metals and products	8.2	Raw materials (including fuel and chemicals)	12.7
Machinery and transport equipment (excluding ships)	6.5	Base metals and products	10.4
Mineral fuels	67.8	Machinery and transport equipment (excluding ships)	35.6
Non-oil commodity exports by area (% of total):		Non-oil commodity imports by area (% of total):	
Denmark and Sweden	19.0	Denmark and Sweden	21.7
Germany	10.2	Germany	13.7
United Kingdom	11.0	United Kingdom	7.0
United States	8.0	United States	4.9

THE CURRENCY

Monetary unit: Krone		December 2006 average of daily rates:	
		NOK per USD	6.17
		NOK per euro	8.16

Executive summary

The economy is experiencing a favourable period of robust growth, low unemployment and moderate underlying inflation. This largely reflects the effects of globalisation, of which Norway has been a prime beneficiary, supplying energy and other commodities at high prices and increasingly importing products from low-cost countries. Sizeable labour migration inflows, together with sustained productivity growth, have kept cost inflation at a moderate pace. A tradition of foreign trade openness, domestic competition, a good policy framework and sound macroeconomic management have meant that Norway was well prepared to take advantage of these international trends.

With underlying inflation well below its target, Norges Bank has raised the interest rate in small, not too frequent steps. There are signs of tensions now emerging, notably in the labour market, which could lead to higher inflation expectations if interest rates remain below the neutral level for too long. The central bank has decided to edge up the pace of normalisation of interest rates; an even faster pace may become necessary if wage growth appears to accelerate more than expected.

The fiscal rule has helped to limit the injection of oil revenue within the absorptive capacity of the economy. The budget deficit was allowed to exceed the amount permitted by the rule in the past five years, in part to support the economy. But with the recovery well under way, the budget for 2007 reaffirms the political commitment to the rule, thus bolstering its credibility. An undershooting of the rule should now be envisaged, so as to compensate for past deviations and help cool the economy.

Even though the statutory retirement age is high by international norms, the pension system is not fully on a sustainable footing. Perhaps because oil revenues have allowed distortions in the work-leisure choice, the effective age of retirement has trended down, suggesting that Norway may not in the end entirely escape the “resource curse”. The growing use of social benefit schemes – for the most part sickness and disability benefits and early-retirement – has depressed older-worker participation, lowered working time and brought labour utilisation towards the international average. Reforms are needed to correct such distortions. Norway must resist the temptation of finding in higher-than-expected oil revenues an excuse for delaying the adoption of necessary reforms.

Future economic prosperity will also depend on the pace of technology-driven innovation, which at present remains low by cross-country standard indicators. Although measurement is incomplete, R&D intensity appears weak, patenting is moderate and business surveys report a limited interest for innovative activity. Yet, the level of productivity is high in the mainland economy and its trend growth enviable, showing a capacity to absorb innovation spillovers and undertake organisational and managerial changes. Improving the framework conditions that stimulate innovation, such as strong product-market competition, would go a long way towards preparing Norway for its post-oil future, when revenues from natural resources will make a reduced contribution to fast-rising living standards.

Assessment and recommendations

The Norwegian economy is booming

The economy is in the fourth year of a long cyclical upturn that has brought down unemployment, without so far rekindling underlying inflation. This reflects in large part the effects of globalisation, which have been more beneficial than in most other OECD countries. Norway has been supplying energy at prices driven up globally by the needs of buoyant emerging economies like China and India, and it has been increasingly importing low-cost consumer goods in return. The resulting terms of trade gains have been large both by international and historical standards. Sustained rises in oil prices induced record high petroleum investments, growing demand for business services and other significant spillovers into mainland production. Inflation and wage growth have nonetheless remained low, thanks to declining import prices and large migration inflows of labour. In turn, low inflation has allowed monetary policy to remain accommodative longer than would otherwise have been possible, adding to the forces of recovery and stimulating a housing boom. Natural endowment is not the only reason for this fine outcome. A tradition of trade openness (except for agriculture), a good policy framework and sound macroeconomic management have also meant that Norway adjusted its product specialisation to the challenges of globalisation early on.

Key challenges emerge from threats to good performance

The central bank has kept interest rates low for an unusually long period as a result of muted inflation, but the short-term challenge will now be to reduce the risk of overheating. In the medium term, policies must remain vigilant to avoid possible perverse impacts of the oil wealth, notably an undue crowding out of market sectors by overextension of oil-financed public expenditure. The present fiscal rule has been helpful in this regard, but it nonetheless implies growing injections of oil money into the economy, the more so at the higher oil price. Buoyant petroleum revenues make it more difficult than otherwise to gather popular support for thorough-going reforms of early retirement, sickness absence and disability benefit programmes. Yet, such reforms are essential to bring pension and benefit promises into line with what is affordable over the long run, and thus need to be pursued vigorously. Such reforms can be absorbed more easily when growth is thriving, as at present. To secure Norway's longer term economic future, the economy needs to remain diversified and competitive, productivity gains need to stay robust and innovation will be critical to underpin them. Timely action is required, as petroleum production is expected

to peak at the end of the present decade, at the same time that pension expenditures will start a rapid ascent.

Underlying inflation has remained below target

Since 2003, underlying inflation has remained well below the target of Norges Bank of 2½ per cent. Worried that inflation expectations could become entrenched at a low level, the central bank kept its sight deposit rate at close to 2% from early-2004 to mid-2005. Thus, monetary conditions have remained quite easy for a long time. The central bank has cited various disinflationary forces to explain its policy stance – such as the increasing share of imports from low-cost countries, strong competition in product markets, high productivity growth and a hard-won anchoring of inflation expectations. Large migration inflows of labour may also have reduced the equilibrium unemployment rate because, in activities requiring a mix of skills (such as construction), the availability of skilled foreign workers has made it possible to employ low-skilled resident workers who would otherwise have remained unemployed. Thus, when the recovery started, Norgest Bank decided to tighten in small, not too frequent steps, even though the short-term interest rate was far from reaching its neutral rate interval of 5-6%, and got only about half way there by late 2006.

Monetary policy needs to return to neutrality

However, with growth having averaged 3¾ per cent annually since the recovery started, there are now signs that slack is fast disappearing. The unemployment rate seems headed for 3% – close to the historical danger zone for wage inflation. More industries are reporting hiring difficulties and there are signs that wage claims may grow at a faster pace. Capacity utilisation in the economy is also rising. Thus there are risks that inflation expectations might soon start rising. Meanwhile house prices have kept increasing and adjustable-rate household debts have accumulated. In view of these developments, Norges Bank recently decided to quicken the pace of normalisation. It advanced the expected return to neutrality to 2008. Nonetheless, the new pace of normalisation remains quite gradual. During the last upswing, price and cost inflation surged suddenly at the peak of the cycle, and this feature of the Norwegian economy may well remain present. Whether the forces of globalisation have reduced this risk remains untested. *Hence, Norges Bank should stand ready to tighten faster than it currently envisages if wage growth picks up faster than expected, as could happen with the Spring 2007 wage rounds.* The OECD's latest economic projections suggest that such a faster tightening might indeed be necessary.

Fiscal policy should now undershoot the rule

Conversely, fiscal policy has been running a larger deficit than targeted in each of the first five years of the fiscal rule's existence. This overshooting was initially justified by weak economic conditions and asset prices, thereby helping to stabilise the economy. Once the recovery started in 2004, however, there was no need for fiscal policy to continue providing stimulus, especially with the output gap turning positive in 2006. The spending of oil income in excess of the 4% expected real return on the Fund has gradually been reduced every year since 2003. The 2007 Budget reinstates a strict adherence to the fiscal rule. The

structural non-oil deficit is estimated by the authorities at 4.6% of mainland trend-GDP, which is 0.3 percentage point higher than in 2006, suggesting a modest stimulus. Government expenditure is projected to grow by 3% in real terms, with large increases going to primary education, foreign aid and infrastructure projects. *In view of the strong economic momentum, a slightly more ambitious budgetary stance would have been desirable. Therefore, any windfalls in 2007 should be used to strengthen the budget. Over the medium term, it will be important to undershoot the rule sufficiently to compensate for the cumulative overshooting to date, consistent with the symmetry enshrined in the fiscal rule.* The economic justification is threefold: first, a sharply expanding baseline for the rule, owing to high oil prices, could over-stimulate the already well-heated economy if strictly adhered to; second, there is a large fiscal gap after 2020 arising notably from steeply increasing ageing-related expenditure; and third, boosting spending now, i.e., on more generous welfare programmes, risks adding to the long term challenges of fiscal policy. *In view of these fiscal challenges, the authorities might consider introducing an expenditure rule.*

The effective age of retirement has declined...

In order to respect Norway's obligations *vis-à-vis* all generations, fiscal policy needs to be forward looking in not only a quantitative sense, i.e., by following the fiscal rule, but also qualitatively. This means, above all, using the oil money in ways that do not distort the work-leisure choice. Norway has so far been remarkable in providing incentives for older workers to remain in the labour market and in setting the retirement age at 67. Nonetheless, there are signs that the tradition of relatively late retirement is being increasingly undermined by policy settings. If exits through disability pensions for persons older than 50 years and AFP early-retirement pensions are included, the expected retirement age is now down to 63½, i.e., 3½ years less than the formal age of retirement. This is a sign that welfare policies have a large impact on the participation of older workers. *Thus, any reform of the pension system should restore later retirement incentives and close early exit routes.*

... even though the pension system is not on a sustainable footing

Norway should be no different from other OECD countries that have all instituted pension reforms. It is true that in Norway old-age pensions are partly pre-funded by the oil cushion. Nonetheless, even if the expected income from the oil fund were to be exclusively used to pay for future pensions, this would cover only about 40% of the pension funding gap. The pension system is still immature and the high female participation rate is recent, which obscures the underlying deficit. The combined effects of the retirement of baby boomers, longer life expectancy, maturation of the system and declining labour utilisation imply that the pension system is not on a sustainable footing.

The new White Paper's proposals on pensions should be enacted

A comprehensive pension reform proposal was formulated in 2004, and in May 2005 Parliament reached broad agreement on key elements of the reform, that are

now being put into place. In January 2006, a new mandatory occupational pension scheme was introduced, with a minimum contribution rate, and employers have started to make contributions. The Petroleum Fund was also transformed into a “Global Pension Fund” and merged with the existing NIS fund; although largely symbolic, this step should help convince the public that oil revenues should be saved for future use. The pension agreement in Parliament also included the introduction of a life expectancy factor, benefits based on lifelong earnings and pension benefits indexed on an average of prices and wages after retirement.

A new White Paper on pension reform was presented to Parliament in October 2006. The new White Paper retained the proposal concerning the introduction of a flexible retirement age in the Social security system from 62 years based on actuarial principles. At the same time the government proposed somewhat higher pension credits to people with low to medium earnings than in the former White Paper, while preserving the long run fiscal saving envisaged earlier (3% of GDP). The government also stated its intention to negotiate changes in the present AFP early-retirement system with the social partners, in order to transform it to a supplementary benefit to the Social security old-age pension based on actuarial principles. In order to make this possible, the Government signalled its intention to increase its contribution to AFP in line with demographics. *Continuation of the state subsidies should be conditioned to the social partners reaching agreement on reforms coherent with the objective of securing actuarial neutrality in the overall pension system.*

Health care spending should be curbed

In non-pension welfare areas, reforms are also essential. Health care and long-term care spending is a particular source of concern because its projected increase, some of which is due to ageing, nearly doubles the projected fiscal funding gap. Wide-ranging reforms were launched in the health sector to make greater use of quasi-market mechanisms, eliminate shortages, raise efficiency and improve citizen satisfaction. However, with the introduction of activity-based financing and other related measures, spending accelerated after the reform and, if current trends were to continue, they will substantially add to the required effort associated with ageing.

The sickness absence and disability schemes need to be reformed

The labour market is functioning well, with strong participation rates at all ages. Yet, labour utilisation is not as high as it looks, in part because of the short duration of working time. Annual working time is already one of the shortest among OECD countries. Hence, *the authorities should avoid making steps toward a general shortening of working time, which has led in other countries to lower labour utilisation, without obvious benefits for the workers.* In addition, labour utilisation is depressed by high entry into sickness and disability benefit schemes, which are poorly monitored and therefore popular. Attempts to reform the sickness and disability benefit schemes, including the tripartite agreement, have so far been unsuccessful. In order to curb sickness absences, the government proposed to introduce an employer co-payment of benefits, but this was rejected on the grounds that it might have encouraged employers to screen applicants and discriminate against the less healthy. Likewise, an experiment to provide wage subsidies for the employment of disabled workers

was not successful. New measures will be implemented in 2007 to curb the rise of sickness absences and a commission report on disability pensions will soon be released. *Indeed, Norway needs an ambitious rescaling of its sickness and disability assessment process, with a parallel reduction in these schemes' financial generosity and a tightening in eligibility criteria. Better control of sickness absences as carried out in most OECD countries is needed in Norway. Also, disability entitlements should be initially assessed and thereafter regularly reviewed by NIS doctors.* Thus, to have a real impact, the reform of the old-age pension and early retirement scheme should be complemented by reforms of the health-care system, as well as of the sickness and disability benefit schemes. With well-designed reforms in place, the welfare system would move onto a sustainable footing. It is therefore crucial that Norway resists the temptation of finding in higher-than-expected oil revenues a cause for delaying the necessary reforms.

Activation policies could be strengthened

Norway has developed a very strong activation strategy for people with low labour-market attachment. However, the process of vocational rehabilitation seems particularly long and outflows may be judged disappointing for specific groups. *These programmes should be aimed at speeding up the return of long-term sickness recipients back to work. In addition, in order to curb possible abuse, controls and sanctions to actively participate in job search should be enforced. The recent merger of the Public Employment Services with the National Insurance Administration should help fill this objective, provided that the culture of placing people into jobs takes precedence over the culture of distributing a multiplicity of assistance benefits.* In the medium term, such labour market reforms would halt the deteriorating trend in labour market participation, thereby helping safeguard the Norwegian welfare state itself.

The Norwegian economy is highly productive, despite below-average technology-driven innovation activity

Future economic prosperity will depend not only on greater labour utilisation, but also on innovation-driven productivity growth. Innovative activity seems low by international standards, however, as suggested by below-average R&D intensity. The low level of R&D spending may in part reflect the incompleteness of measurements, which do not cover the oil sector very well, but weak patenting shows that there is less technological innovation activity than elsewhere. By contrast, there are clear signs of intense non-technical innovation – such as process innovation, adoption of new technologies, engineering-based improvement – which goes a long way towards explaining why productivity growth has been satisfactorily high. The traditionally competitive product markets and high wage levels have meant that firms have been forced to adopt new technologies in order to beat rivals and survive. Although Norwegian firms only produce a small share of their technological innovation needs, they are very apt at taking advantage of existing technological opportunities and translating them into greater efficiency.

Public financial support to innovation should be applied carefully

The government has set ambitious goals to promote innovation, hoping to raise the rate of R&D spending, especially in the private sector. It should however be careful as to how it spends public money. So far, the existing schemes to allocate public support to innovation through research grants and tax credits generally seem well designed and regularly evaluated. There have been benefits stemming not only from new technological developments, but also from improvements in traditional activities (such as engineering related to marine services and oil activities or aquaculture). But making an efficient use of additional fiscal support will be challenging. Because the private sector has been so far reluctant to allocate large resources to innovation, it is unlikely that increasing budgetary support alone will make a large difference. More public money may only end up raising the costs of producing research, without correspondingly larger benefits. Consequently, measures should be carefully designed to increase the extent to which they generate additional R&D that would not have taken place in their absence. Furthermore, a higher degree of specialisation in technologically innovative sectors will not necessarily be rewarded; international prices of some of these products have fallen recently – as shown by computer prices – thus leading to deteriorating terms of trade for countries producing such equipment.

Framework conditions should be further improved

If the authorities want to ensure that the benefits of innovation spread further, they should continue to improve framework conditions. *Most importantly, competition policy and its implementation should be strengthened and product market regulations relaxed, together with a continuing reduction of state ownership in market-based production. In this respect, the independence of the competition authority should be upheld.* In the final analysis, firms must be subjected to more intensive competition to encourage them to look to innovation as an obvious way of staying in business profitably. As well, the spread of technological innovation requires adequately-educated workers and the present limited interest for tertiary studies in maths, science and technology is a concern in this respect. Efforts need to start at the level of secondary education, where PISA test scores in sciences are low by international standards. To raise the quality of teaching in maths and science, *salary differentials in favour of teachers of such subjects will need to widen in order to attract the qualified personnel.*

Promote an innovation culture and remove financial barriers to technolog-based entrepreneurship

More public money will not achieve much in the absence of a greater innovation culture; in particular, businesses do need to perceive opportunities in boosting innovation. Several steps could improve the situation. The public research sector has long had a mission in knowledge transfers, but *private-public research links should be strengthened further, which could require additional mechanisms facilitating the commercialisation of university innovations, such as allowing public-sector employees to be seconded to the private sector without exposing them to*

financial risks, including erosion of pension rights. The R&D funding programmes should also be clearly de-linked from the regional policy. The tax credits scheme (Skattefunn) seems to be sufficiently generous for SMEs. Raising the ceiling for larger firms could be considered if the evaluation exercise shows that additionality is significant. There are other steps that would facilitate the financing of innovative firms. Financing of small innovative firms should be encouraged by lifting restrictions on classes of assets that can be invested by insurance companies and pension funds. At the same time, there should be a relaxation of borrowing conditionality for the extension of seed capital while allocating more public funds to a variety of institutions currently channelling venture capital funds to private start-ups.

Chapter 1

Norway's economic success and the challenge of preserving it

The development of the petroleum industry and public spending made possible by oil revenues contributed strongly to the rapid growth in the Norwegian economy in the last three decades. But well-functioning institutions seem at least as important to Norway's performance. Liberalisation of a regulated economy, appropriate specialisation, traditional openness to trade, early adoption and diffusion of high technology despite apparently low innovation, and a good macroeconomic stabilisation framework may also explain this success. Norway's supply structure has now made it a chief beneficiary of globalisation. Rapidly emerging countries like China are supplying Norway with low-cost consumer goods while raising world prices for Norway's oil and commodity based products. Moreover, competitive forces in Norway have been strengthened by rising inflows of foreign goods, capital and workers. These favourable structural shocks have enabled monetary policy to deliver strong growth with low inflation. But some clear challenges lie ahead. These include: possible economic overheating via stimulative macro policies and reversals of favourable global supply shocks; high labour costs and the risk of real exchange rate appreciation; and potential damage to work incentives by lax public welfare programmes and exaggerated optimism about long-term income prospects.

There is a puzzle about Norway. How did it succeed in reaching one of the highest living standards among OECD countries from a relatively poor ranking in 1970? Is the Norwegian success all about oil? Why did Norway outclass other oil producers, apparently avoiding Dutch disease and, contrary to most commodity-oriented economies, apparently escape the “resource curse”? How is the economy coping with the current oil price boom and global supply shock? And how will it fare in global competition once oil resources have been depleted?

The first part of this chapter examines the transformation of mainland economic potential during the last two decades, helping to explain why it is doing so well in avoiding oil dependence and reaping gains from globalisation today. The second part looks at the impacts on Norway’s performance of the recent oil price boom, expanding global supply capacity and intensified competition. The concluding section summarises key challenges in relation to risks to future performance, notably:

- possible unwinding of positive supply side shocks and demand pressure from higher oil prices;
- apparent dulling of work incentives in the expanding welfare state; and
- high labour costs in the rich society – potentially mild symptoms of the disease and the curse that continued good policy management can yet counteract.

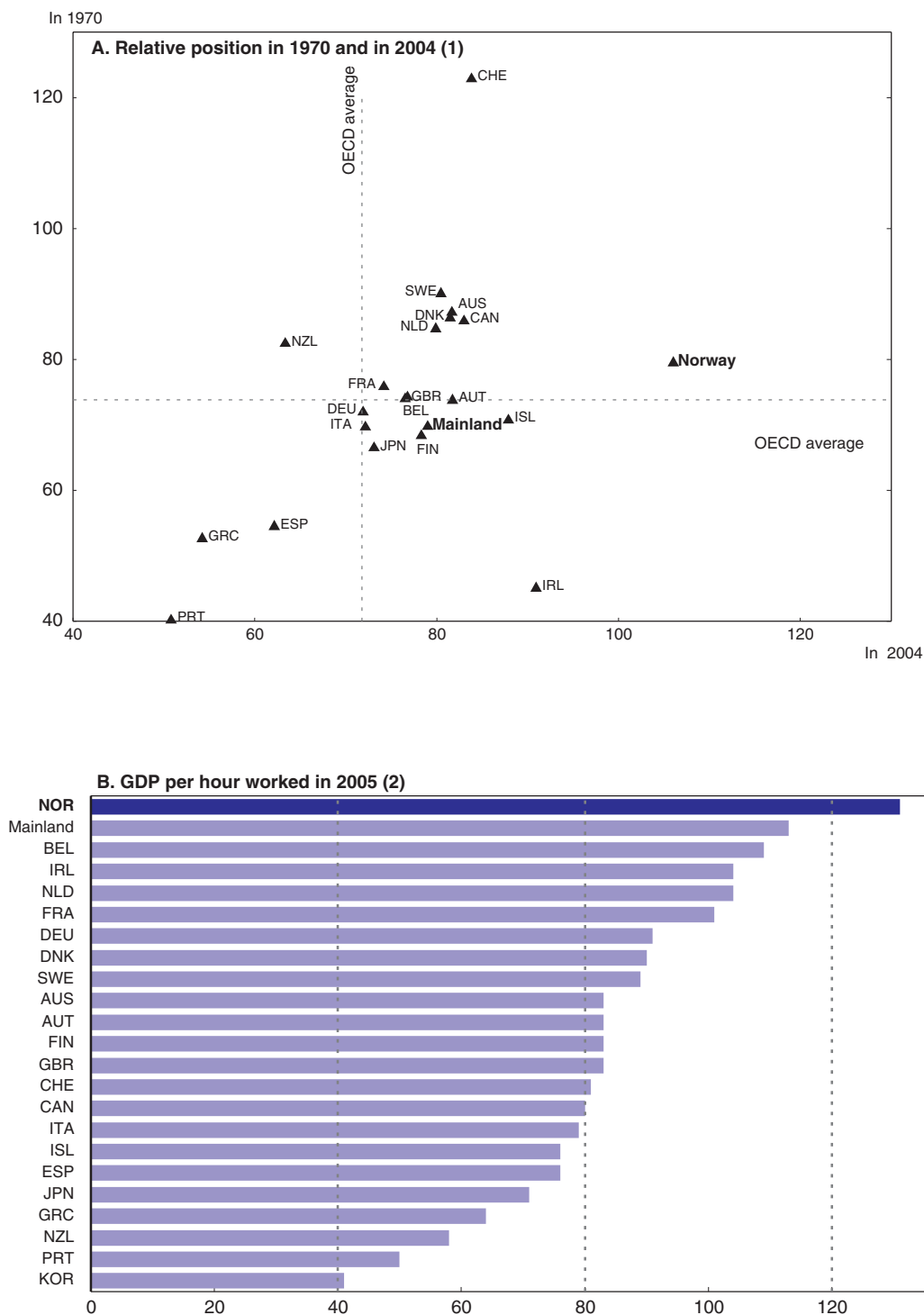
Rapid catch up and moving to the top thanks to oil and good institutions

Norway, which ranked only slightly above the OECD average in terms of GDP per capita in 1970, is today at the top of the income ladder among OECD countries in terms of total economy GDP per capita, and also above average in terms of mainland GDP per capita (Figure 1.1).¹ Measured by either total or mainland² GDP per hour worked, it is also one of the most productive OECD countries. Norway has experienced a particular mix of high productivity gains combined, as in Denmark, with strong terms of trade gains, which in recent years has been sufficient to assure high income growth despite the evident stalling of growth impetus from labour utilisation (Figure 1.2).³ These terms of trade gains are not only due to oil. Command GDP per hour worked,⁴ integrating indirect purchasing power gains through terms of trade effects, shows for instance strong gains for mainland Norway itself, reflecting falling non-oil related import prices and rising non-oil export unit values. These historical gains may come from specialisation in goods and commodities which have experienced relative price increases. Up to now, this specialisation has strongly benefited Norway, contrary to its Swedish or Finish neighbours, where the high export share in ICT products has led to falling export prices.

Strong hourly productivity gains

Over the past three decades, hourly productivity gains in the mainland economy have been strong, reaching on average 2½ per cent annually. The rapid economic development during the 1970s may have been connected to the rise of oil investment and production,

Figure 1.1. **GDP per capita and GDP per hour worked relative to OECD countries**
USA = 100

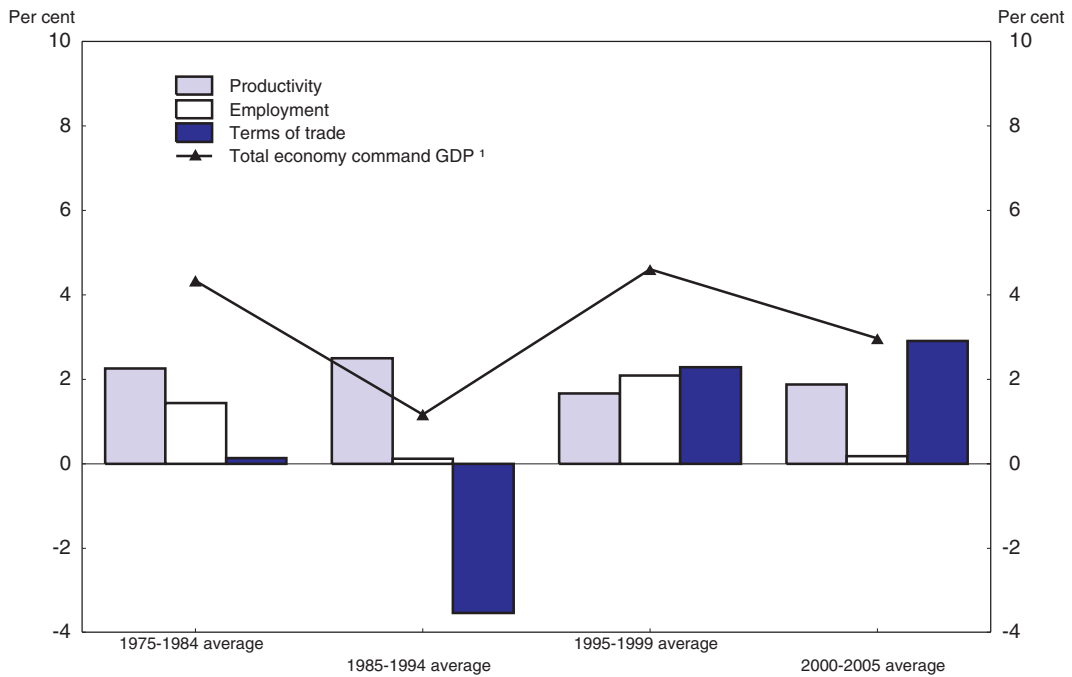


1. GDP per capita expressed in prices and PPP of 2000.

2. Current GDP expressed in current PPP.

Source: OECD, Annual National Accounts, OECD, Productivity database (September 2006).

Figure 1.2. **Sources of real income growth**
Annual growth rates



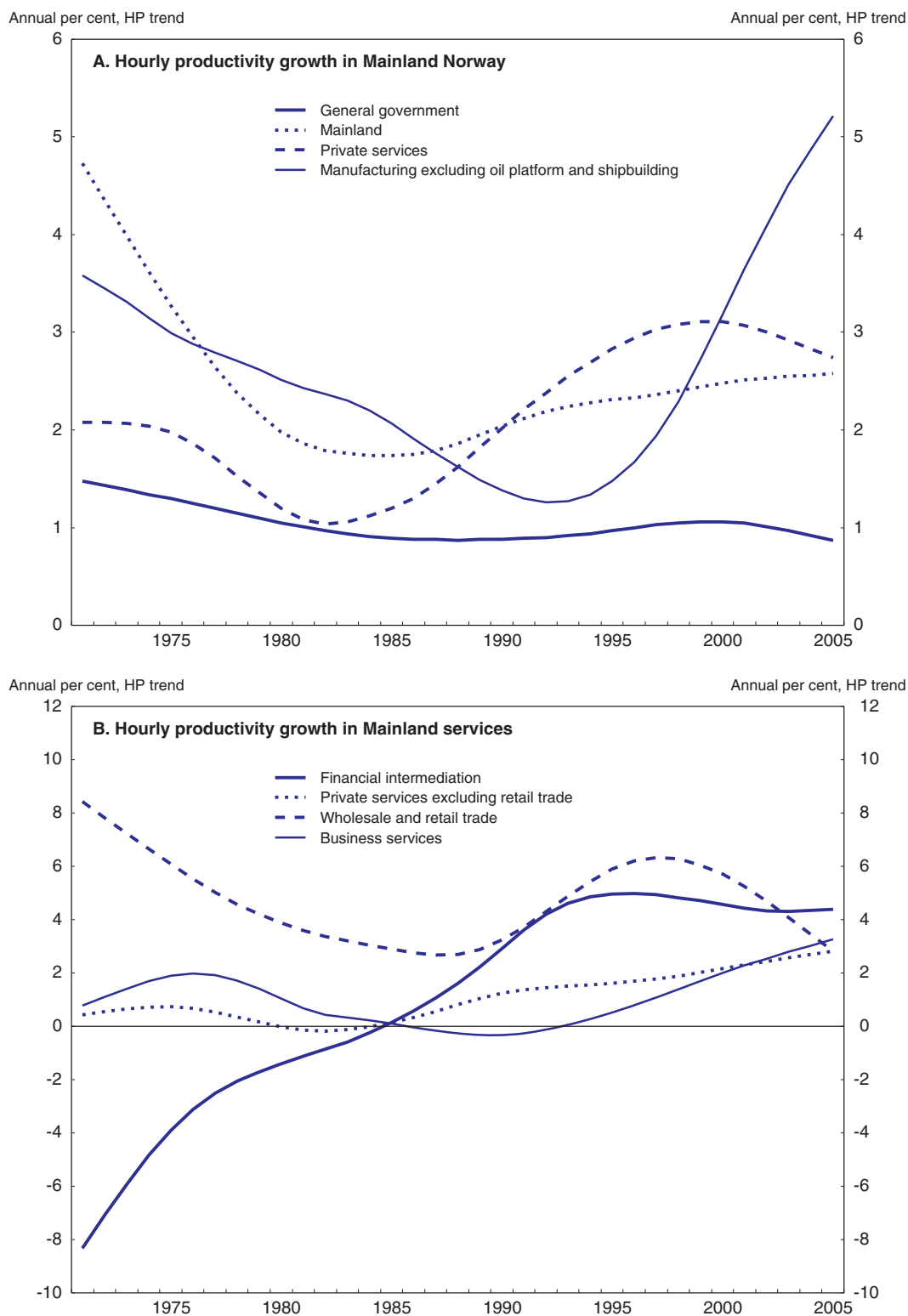
1. Nominal GDP divided by domestic demand deflator.

Source: OECD Analytical database.

which led to strong early productivity gains in the manufacturing sector. Productivity growth in manufacturing grew slowly later on, primarily because of low competition in sheltered sectors such as the processed food industry, but has recovered again more recently under the pressure of intensifying global competition and real exchange rate appreciation, reaching 4-5% in the early 2000s (Figure 1.3, Panel A). Productivity growth in private services picked up impressively around the mid-1980s, reaching 3½ per cent per annum in the 1990s. The high share of public services weighed down on the aggregate service sector results, nevertheless, as hourly productivity in the public sector by definition only grows by 0.5 % per annum.⁵

Norway has enjoyed ICT and structural gains in private services earlier than many OECD countries. Financial services have been ahead in the process of integrating new technology to boost productivity: ATMs were introduced in the mid-1980s, and the banking industry generalised computer assisted management earlier than in the United Kingdom or other European countries. Gains from product market deregulation in the early 1990s and rationalisation in the financial sector in the wake of the banking crisis were also strong. Today, automated processes are developed further in business, financial and transportation services, helping to boost productivity gains in services. Wholesale and retail trade also revealed big gains during the 1990s from increased competition and logistical improvement in the supply chain, but these have seemed to fade a bit more recently (Figure 1.3, Panel B). This apparent success may find its roots in a homogeneous and high level of human capital, which allowed rapid diffusion of best practices and ICT. Many incremental innovations (i.e., process improvements) are concentrated in private services (Menon-Econ, 2006). High real labour costs might have also hampered the

Figure 1.3. **Hourly productivity growth in mainland Norway**
– a sectoral decomposition



Source: OECD calculation based on Statistics Norway, HP filtering with $\lambda = 100$.

development of low-skilled, low-paid jobs, boosting average productivity. Besides, a fast increasing public sector might have crowded out private sector jobs (Chapter 4). Combined with low levels of unemployment, these constraints might have encouraged businesses to enhance their productivity.

A “resource-based” specialisation

Norway’s manufacturing sector has always been small. Contrary to its Nordic neighbours, where manufacturing is a large activity, Norway is a resource-based economy, with a private sector skewed towards small firms and state ownership dominant in important sectors (Box 1.1).

Box 1.1. Norway’s distinctive production structure

The productive structure of the Norwegian economy exhibits several specific features: government and oil related activities make up a large part of the sectoral distribution of value-added. Also, the private non-oil sector is skewed toward small-scale units. There are only a few companies of an international size in Norway. These big companies are more or less linked to the energy, maritime, telecommunication, or financial sectors, many with a still-high state ownership share: notably Statoil, Norsk-Hydro, Telenor, and DnB NOR.¹ Companies in shipping, shipbuilding and offshore supply industries are fully private owned.

Like in other OECD countries, the share of services in value-added has increased relative to the shares of manufacturing and agriculture over the past three decades (Figure 1.4). Within the services sector, government services have grown more rapidly than private services. Education, social and health services are almost exclusively provided by the public sector and, as in other Nordic countries, public services such as child-care or care for the elderly are widespread and cover a large part of social needs.² The number of people employed in the public sector is thus large by international comparison (see Chapter 4).³

The petroleum sector is highly technological and capital intensive. It employs very few workers (strictly speaking 1½ per cent of man-hours worked in 2005; 5½ per cent, if all petroleum-related activities are taken into account), but generates huge revenues and output (29% of value added in 2005; Figure 1.4). Hence, the sector is phenomenally productive. Petroleum exports are likewise the main source of a trade surplus that amounted to 20% of total GDP in 2005 (crude oil, natural gas and pipelines accounting for more than 50% of export value). Excluding oil and gas, mainland exports are relatively diversified, but with a low-tech specialisation. The non-oil trade deficit is very large: non-oil exports of goods and services covered only 67% of imports in 2005.

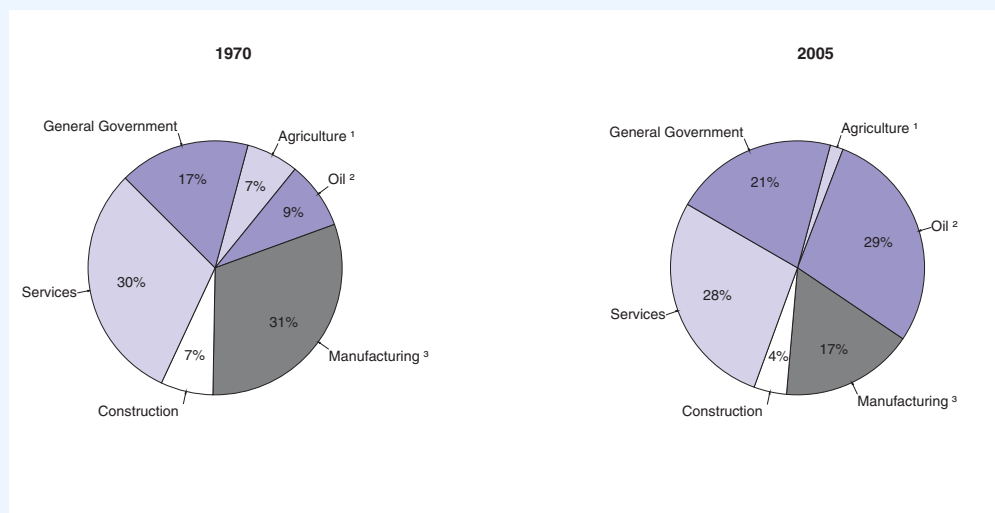
Norway has been characterised as having an economic structure heavily dependent on natural resources, such as oil, fisheries, fish farming, hydro-electricity and aluminium. It has been argued that this is not diversified enough to protect Norway from fluctuations in global demand and world commodity prices. And resources like oil (and even fish stocks) are depletable (OECD, 2004a).

Moreover, a powerful role of the government in key sectors can be detrimental to competition, innovation and growth. Historical path dependence may be partly explain why Norway does not have as many firms of an international size as in Sweden, as Sweden has a history of family owned firms, which favoured the development of large manufacturing companies able to undertake sophisticated technological innovations. In Norway, the shipping sector has been a main recipient of private investment, stimulated by favourable conditions and tax concessions.

Box 1.1. Norway's distinctive production structure (cont.)

Figure 1.4. A diversified economy?

Value added decomposition



1. Agriculture including fishing and mining.
2. Oil and gas extraction including services plus transport via pipelines and ocean transport.
3. Utilities are included in manufacturing.

Source: Statistics Norway, Annual National Accounts.

1. State ownership shares as of June 2006 were: 70.9% of Statoil ASA, 43.8% of the oil and aluminium producer Norsk-Hydro, 54% of Telenor and 34.8% of DnB NOR. Moreover, with an announced upcoming merger of Norsk Hydro oil and gas activities and Statoil, government politicians have signalled plans to increase the state share in the new combined company from 62 to 67%.
2. The access rate to nurseries or day care facilities is close to 80% in Norway compared with less than 10% in most European countries.
3. The share of full-time public employees in total full-time employment is currently around 29% in Norway, among the highest in the OECD along with Sweden and Denmark. As Norway has a comparatively high number of part-time employees, it may be more appropriate to look at hours worked. In that case, the share of public employment in 2005 was 26.9% in Norway, 28.4% in Sweden and 34% in Denmark, but still large compared to most OECD countries.

Traditional trade theory predicts that a country will export goods that are produced with intensive use of the most relatively abundant factor. Because of large endowments of some natural resources, Norway has historically been specialised in commodities and energy-related production such as aluminium, paper and pulp, fertilisers and, more recently, petroleum. Marine industries complete the picture of a country mainly turned towards relatively low-tech export products (Table 1.1). Excluding the petroleum industry, which is highly capital intensive and productive, and to a lesser extent ship building, a specialisation in resource-based and semi-finished export goods may partially account for historically low productivity gains in manufacturing, as these industries run into decreasing returns to scale (Holmøy and Heide, 2005).

Table 1.1. **Export structure: Norway compared to the European Union**

	Mineral fuels, lubricants and related materials	Chemicals and related products, n.e.s.	Machinery and transport equipment	Food, drinks and tobacco	Raw materials	Other manufactured products	Unclassified	Total
Exports in billions of euros								
European Union (25 countries)	43.8	166.0	481.0	52.7	23.3	273.6	30.3	1 070.8
European Union (15 countries)	44.7	180.3	529.8	56.9	25.2	302.7	33.3	1 173.02
Norway	56.5	2.2	6.5	4.2	0.9	9.7	2.9	83.0
Belgium	18.7	77.2	67.9	21.3	7.0	76.0	0.6	268.8
Denmark	7.1	9.3	18.9	12.0	2.6	17.0	1.7	68.5
Germany	17.8	106.8	401.3	33.5	13.7	184.8	22.4	780.2
Greece	1.3	2.0	1.8	2.6	1.0	4.8	0.4	13.8
Spain	7.2	17.6	61.1	19.4	5.0	38.6	1.7	150.5
France	14.4	59.8	160.3	36.7	8.0	84.9	6.0	370.0
Ireland	0.6	40.3	23.1	7.4	1.3	12.1	3.5	88.3
Italy	10.5	31.9	110.8	18.0	4.5	116.5	3.5	295.7
Netherlands	36.3	50.2	107.2	40.5	19.2	66.9	3.3	323.4
Austria	4.4	9.3	42.0	6.1	3.0	34.7	0.5	100.0
Portugal	1.3	2.1	9.9	2.4	1.3	12.9	0.7	30.7
Finland	2.4	3.0	23.8	0.9	3.0	17.3	2.6	53.1
Sweden	5.6	11.8	47.0	3.6	6.0	30.3	0.3	104.6
United Kingdom	29.3	48.5	121.8	15.4	5.8	73.8	13.0	307.7
As a percentage of total exports								
European Union (25 countries)	4.1	15.5	44.9	4.9	2.2	25.6	2.8	100.0
European Union (15 countries)	3.8	15.4	45.2	4.9	2.2	25.8	2.8	100.0
Norway	68.1	2.7	7.8	5.1	1.2	11.7	3.5	100.0
Belgium	7.0	28.7	25.3	7.9	2.6	28.3	0.2	100.0
Denmark	10.4	13.5	27.6	17.4	3.8	24.8	2.4	100.0
Germany	2.3	13.7	51.4	4.3	1.7	23.7	2.9	100.0
Greece	9.5	14.6	12.7	18.7	7.3	34.5	2.6	100.0
Spain	4.8	11.7	40.6	12.9	3.3	25.6	1.1	100.0
France	3.9	16.2	43.3	9.9	2.2	22.9	1.6	100.0
Ireland	0.7	45.6	26.1	8.4	1.5	13.7	4.0	100.0
Italy	3.6	10.8	37.5	6.1	1.5	39.4	1.2	100.0
Netherlands	11.2	15.5	33.1	12.5	5.9	20.7	1.0	100.0
Austria	4.4	9.3	42.0	6.1	3.0	34.7	0.5	100.0
Portugal	4.2	6.9	32.2	7.8	4.3	42.2	2.4	100.0
Finland	4.4	5.7	44.9	1.7	5.7	32.7	4.9	100.0
Sweden	5.4	11.3	44.9	3.4	5.8	29.0	0.3	100.0
United Kingdom	9.5	15.8	39.6	5.0	1.9	24.0	4.2	100.0

Source: Eurostat, New Chronos database.

Despite being the world's third largest oil exporter, Norway's electricity production comes almost exclusively from abundant hydro power. Most hydro power plants are owned by the municipalities, counties, or the state owned company Statkraft. Local authorities affected by hydroelectric development are entitled to buy a proportion (up to 10%) of the power generated. The power intensive industry has traditionally based its power supply on

own production and contracts with Statkraft on terms decided by Parliament. Some of the contracts are very long term, 50 years or so, hence Norwegian industries and households have benefited from rather low prices for a long time. These contracts are due to expire in the years to come, while the market price of power has increased significantly.

Complementary to its intensive exploitation of natural depletable resources, Norway is a world leader in trying to contain greenhouse gas emissions in the petroleum industry and the economy at large (Box 1.2).

Box 1.2. **Environmental policies and petroleum extraction in Norway**

Norway is a pioneer in sustainable development. Since the early 1990s, instruments have been gradually introduced, from taxes to price mechanisms, with a strong desire for stimulating cooperation across businesses and industries: carbon taxes were introduced in 1991, a system of tradable emission quotas has been in place for sometime and agreements on emission reduction have already been concluded by several industries. Norway has come a long way in terms of integrating impact assessment in the land-use planning process. Environmental information is very well developed, as Statistics Norway compiles comprehensive series and analysis of the extraction and use of natural resources. Emission intensities per capita or per unit of GDP are among the lowest OECD wide (OECD, 2004b), largely attributable to ambitious policies but also to an abundant use of hydroelectricity rather than fossil energies.

Norway aims at developing a wide range of policies and instruments to fulfil its obligations under the Kyoto protocol. In October 2006, a commission proposed a strategy for reducing emissions of GHG (Greenhouse gas) by 50-80% by 2050, which implies an ambitious path. Norway defined targets to stop loss of biodiversity within 2010, responding to the objective of the 2002 World summit on Sustainable Development.

The petroleum sector produces large emissions of exhaust gases from combustion containing CO₂ and NO_x. According to the Norwegian petroleum directorate, these emissions account for 29% of total emissions in Norway. Recently, new projects aiming to curb further CO₂ emissions in the process of gas extraction have been launched. Combined power solutions and CO₂ storage have been promoted.

Yet, this project may raise some concerns. The cost of trapping one ton of carbon might largely exceed the market price, suggesting an inefficient allocation of resources.

The impact of oil: on balance highly positive

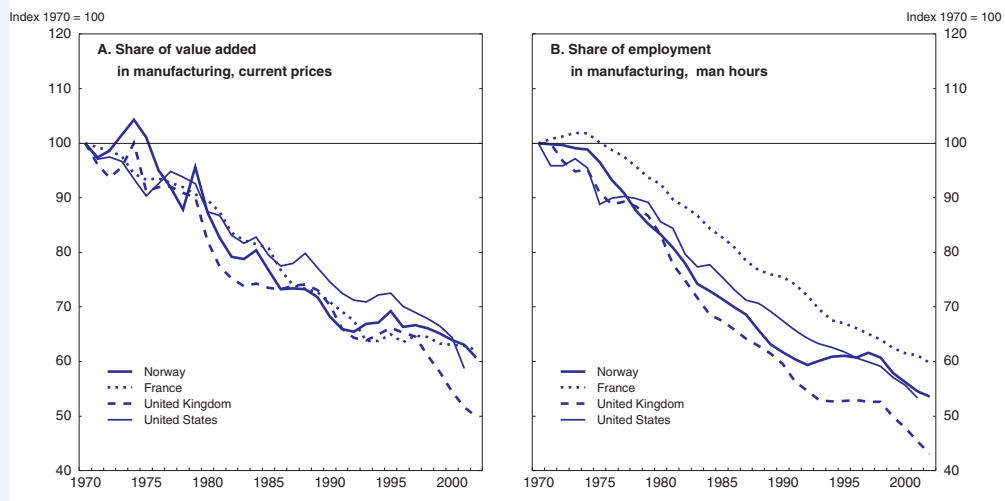
Specialisation in natural resources extraction involves risks. Small open economies are vulnerable to adverse external shocks that may have dramatic economic consequences. Sachs and Warner (2001) provide evidence that natural resources turned out to be a curse, rather than a blessing, for most countries that experienced such specialisation. Large resource windfalls often induce excessive rent-seeking activity, thus pushing out productive activity. The “curse” constrains resource-rich countries to grow more slowly than resource-poor countries. Besides, they may contract a “Dutch disease”, i.e., a crowding out of the traditional tradable sector via appreciation of the real exchange rate. Norway seems to have largely avoided both the curse and the Dutch disease. The decline of manufacturing has not been larger than elsewhere, both in terms of output and employment (Box 1.3). The real exchange rate did not appreciate noticeably until 2001. Up

Box 1.3. The deindustrialisation process: apparently no symptom of Dutch disease

Norway's deindustrialisation process has been similar to that of other OECD countries (Figure 1.5). Job losses in labour intensive industries (such as steel, paper mills, metal refineries, textile manufactures) have followed the removal of trade barriers at an early stage.¹ Job destruction among blue collar workers was offset by job creation in private services and, for the most part, in the public sector. This restructuring may have been a response to income growth, changes in relative prices, new comparative advantages and financial liberalisation (Holmøy and Heide, 2005). These forces were active in all OECD countries faced with growing competition from low-cost emerging market producers, but may have become clearer in Norway sooner because of oil.

Empirical studies find no sign of Dutch disease (Bjørnland, 1998). The opposite may even be the case. Manufacturing output may have actually benefited from both energy discoveries and higher oil prices (Cappelen *et al.*, 2000). Indeed, the offshore oil industry is a high-technology and capital-intensive sector,² likely to deliver the sort of positive spillover effects that other manufacturing activities, such as automotive or aircraft industries, have had in other countries. This probably reflects the particular nature of petroleum extraction in Norway: deep North-sea drilling required a highly sophisticated technology not needed in the more typical cases of land and coastal drilling.

Figure 1.5. Deindustrialisation: is Norway special?



Source: Ministry of Finance.

1. Norway has removed all tariffs on import of goods except on agricultural products and certain textiles.
2. For instance, an input-output analysis indicates that one hour worked in the Norwegian oil sector is combined with a capital stock 33 times that in manufacturing.

until then, wage growth in excess of trading partners – an expected factor movement-effect of oil – was largely neutralised by a weakening of the nominal exchange rate.

Tight public spending limits have been key to the containment of the perverse impacts of oil. Fiscal policy has strived to insulate the budget from wide swings in oil and gas prices and in extraction rates, in turn shielding the economy from oil revenue cycles.⁶ When oil production started in earnest in the mid-1970s, the non-oil budget balance shifted from a small surplus to a deficit corresponding to 5-6% of mainland GDP by the early 1980s (Figure 1.13). The structural non-oil deficit currently corresponds to around 4-5% of mainland GDP, implying that the oil spending shock to a large extent took place in the 1970s. To support a sustainable management of the oil wealth, an oil fund was established in 1990. As oil revenues created a rapidly expanding petroleum fund around the turn of the millenium, there was a need for a transparent and credible strategy for the future use of the petroleum wealth. The fiscal rule and flexible inflation targeting were therefore introduced in 2001, whereby monetary policy stabilises inflation and output in the short run whilst fiscal policy ensures a predictable and prudent phasing in of oil revenues into the mainland economy. This more robust framework has arrested further encroachment of the Dutch disease.

A positive shock from globalisation

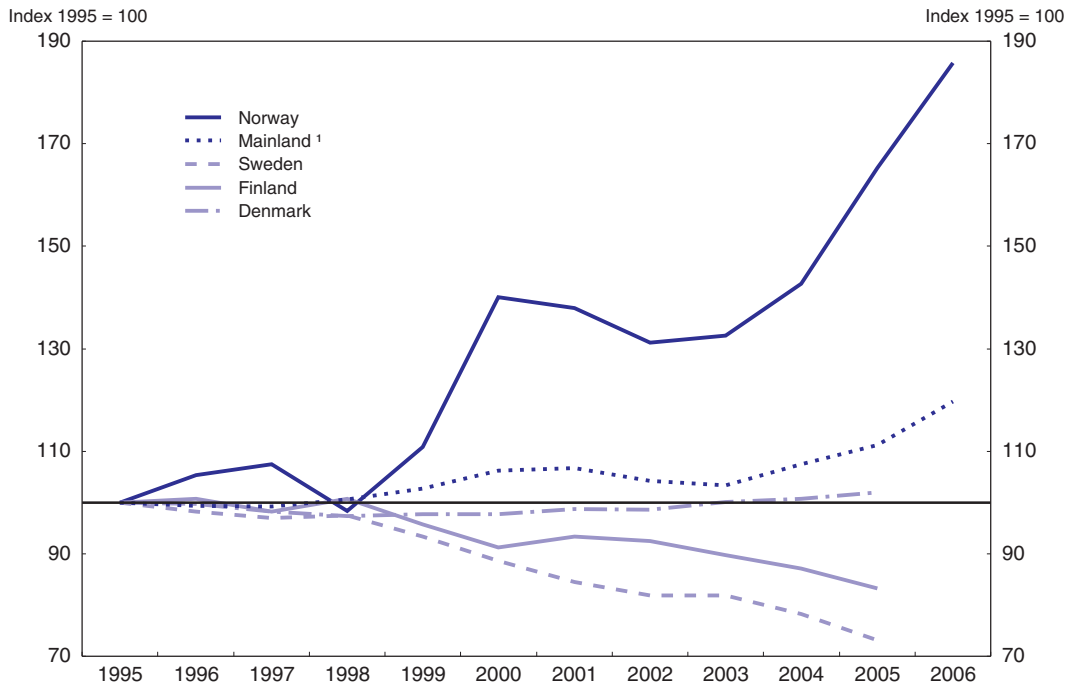
The forces of globalisation have created a near perfect environment for the Norwegian economy. A positive supply shock has emerged from higher oil prices, increasing imports from low-cost countries, and global competitive pressures. This has allowed an expansion of potential GDP, on top of a substantial stimulus to domestic demand. Norway's product mix has implied large net gains from globalisation.

Big terms of trade gains

Norway tends to specialise in products much in demand in emerging booming countries, i.e., oil and other commodities and related manufactures. Moreover, the economy has low specialisation in sectors that are in direct competition with imports from low cost producers. This reflects Norway's tradition of trade openness and its early trade links with emerging economies, like China. Oil induced adjustments, discussed above, also meant that Norwegian industries had to restructure early on in the globalisation process. Increased worldwide supply on the import side coupled with robust global demand on the export side has resulted in terms of trade gains far in excess of the rest of the OECD. Even disregarding oil exports, the "mainland" economy has benefited from above-average terms of trade gains (Figure 1.6).⁷

The terms of trade gain should imply market share losses abroad and at home as trade volumes adjust to the relative price shift.⁸ Indeed, domestic demand has shifted toward imports from low-cost countries (Table 1.2), amplifying the extent of imported disinflation.⁹ The current account surplus is expected to have swollen to 20% of GDP in 2006 and to keep rising for several years before starting to decline after the peaking in petroleum production around 2010 (see Figure 1.13).

The terms of trade gain should also entail a nominal exchange rate appreciation as the current account grows. As noted, this mechanism is interrupted in Norway by the transfer of most oil revenues abroad in the form of long-term foreign portfolio investments, which reached 15% of mainland GDP in 2005. But, as an asset price, the exchange rate also

Figure 1.6. **Terms of trade in Nordic countries**

1. Proxied by traditional goods terms of trade.

Source: Statistics Norway, Datastream.

Table 1.2. **Import patterns**

Norway's imports by country of origin (in % of total imports)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
OECD-total	88.0	87.4	87.2	87.8	87.0	85.2	85.6	75.8	83.8	83.1	81.9
<i>Of which</i>											
EU15	71.0	70.7	69.7	69.3	68.5	63.5	66.6	60.7	67.0	66.3	64.5
Non-EU15	17.0	16.7	17.5	18.6	18.4	21.7	19.0	15.1	16.9	16.8	17.3
Non-OECD	12.0	12.6	12.8	12.2	13.0	14.8	14.4	15.0	16.2	16.9	18.1
Non-OECD America	2.9	2.2	2.7	2.3	2.7	3.0	2.6	2.0	2.8	2.4	2.6
Non-OECD Asia	5.1	6.5	5.4	5.5	6.0	6.6	6.8	8.4	8.1	8.9	9.5
Non-OECD Europe	2.9	2.5	2.9	3.0	3.2	3.7	3.8	3.5	4.1	4.3	4.5
Non-OECD Middle East	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3
Non-OECD Oceania	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
World	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: OECD, Monthly Statistics of International Trade database.

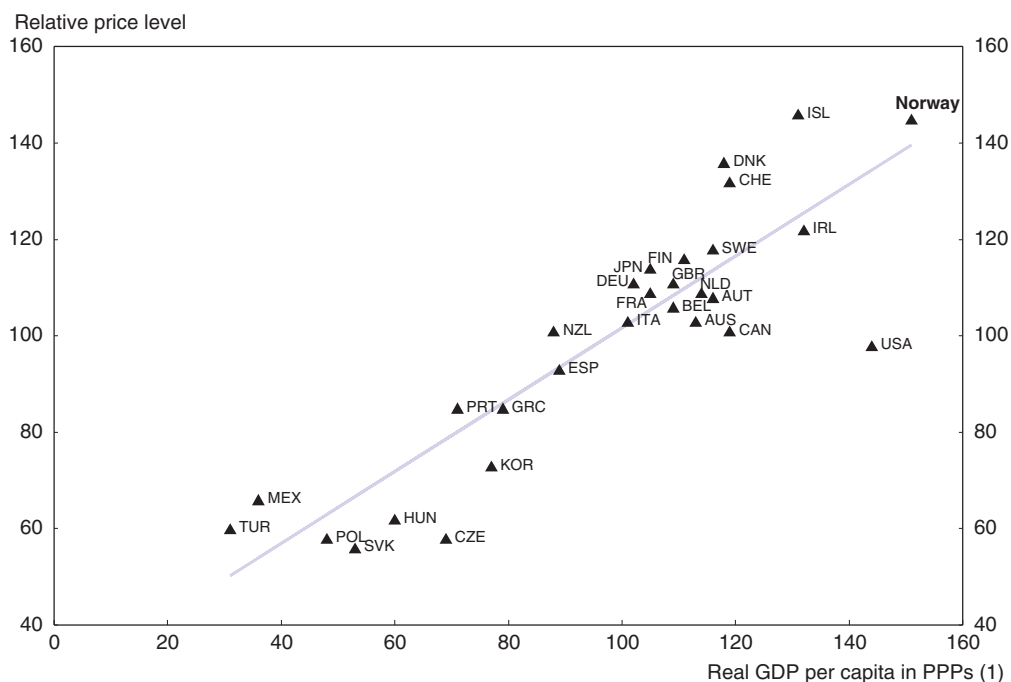
incorporates expectations of future developments. Thus, the krone on the whole appreciated as from 2004 as oil prices rose, which also tended to amplify the decline in import prices.¹⁰ Nevertheless, given the amplitude of oil price movements, the exchange rate response has been quite muted.

Competitive pressure modifying wage and price behaviour

Globalisation has also enhanced domestic competitive pressures. Industries exposed to import competition have been unable to raise their prices. Cross-border inflows of workers

and FDI have also intensified the competitive pressures. Norway has one of the highest price and wage levels in the OECD (Figure 1.7), and even if this reflects its high per capita GDP, there is room for competitive forces to bring the level of prices towards international levels.

Figure 1.7. **Relative price and productivity levels**
In 2005, OECD = 100



1. 2000 constant prices, 2000 PPPs.

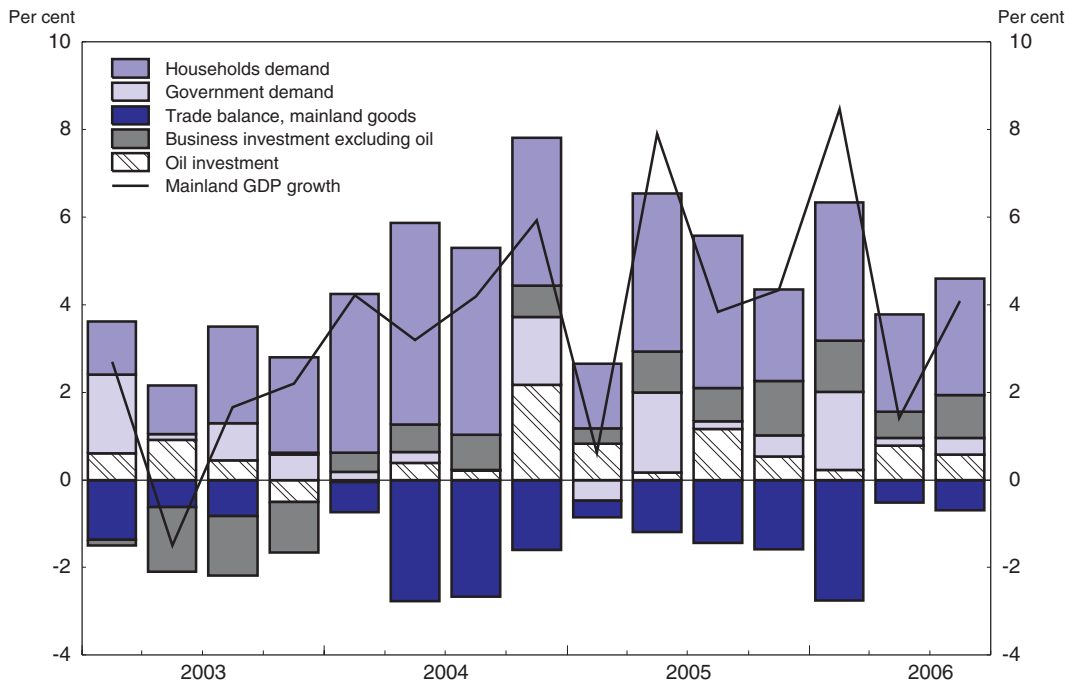
Source: OECD, Purchasing Power Parities database.

In the past few years, Norway has received significant inflows of EU accession country workers, as well as people from other Nordic countries. The threat of outsourcing has also become more real following EU enlargement – competitor countries close by and within the single market, with low wage, highly educated and skilled workforces. Such structural changes impart discipline to wage demands, which together with terms of trade gains buffer the impact of exchange rate appreciation on exposed sector firm profitability. Such changes also encourage firms to seek wage restraint, make efficiency improvements and reduce the pass-through of energy price increases into the production chain.¹¹ Foreign direct investment entry into particularly banking has further stimulated higher productivity gains (for instance, *via* consolidation) and moderated price rises. A substantial reduction of domestic airfares has also been facilitated by entry of a new player, while restaurants and hotels have kept price rises moderate even in the upswing, thanks to competition from global tourism.

Improved growth/ inflation trade-off

Since the turn of the millennium, real per capita incomes have surged with the terms of trade (Figure 1.2) giving a large exogenous boost to domestic demand. Declining import prices boost consumer purchasing power and allow much lower interest rates than

Figure 1.8. **Source of GDP growth**
Contribution to growth



Source: Statistics Norway (2006), *Quarterly National Accounts*.

otherwise. High real oil prices boost oil sector profits and fiscal revenues providing a further impulse to mainland activity through diverse channels: oil investment, business services and, over time, public spending. All categories of demand have been booming, with a trend that has been helped by monetary policy lending strong support since late 2003 (Figure 1.8). Household consumption and housing investment have been particularly robust, thanks to real disposable income growth and increased borrowing (falling net savings), while investment has responded to rising profitability, cheap finance and demand optimism. Employment has been slow to respond, but took off dramatically in 2006.

The positive supply shocks stemming from globalisation have served to keep inflation very moderate considering the strength of demand (Box 1.4).¹² Consumer price inflation has fallen from 7¼ per cent per year on average during 1980 to 1991 to just 2% since then.¹³ Prices of imported goods and services rose by 5¼ per cent each year on average over 1981 to 1989, but then by only around ¾ per cent on average since then. Core consumer price inflation, here defined as CPI-ATE, has fallen to below 1% since 2003 whereas non-energy import price inflation has been negative. Domestic prices participated in the disinflation trend. In fact, domestic and overall consumer inflation have been slower to pick up than has import price inflation (Figure 1.9).

Sustaining strong performance: problems and policy issues

The strong performance of the Norwegian economy carries within it some seeds of risk. The terms of trade shock has allowed more expansionary macro policies than otherwise, at pre-existing policy rules, while it is not clear how much of the productivity

Box 1.4. Are global factors important drivers of inflation in Norway?

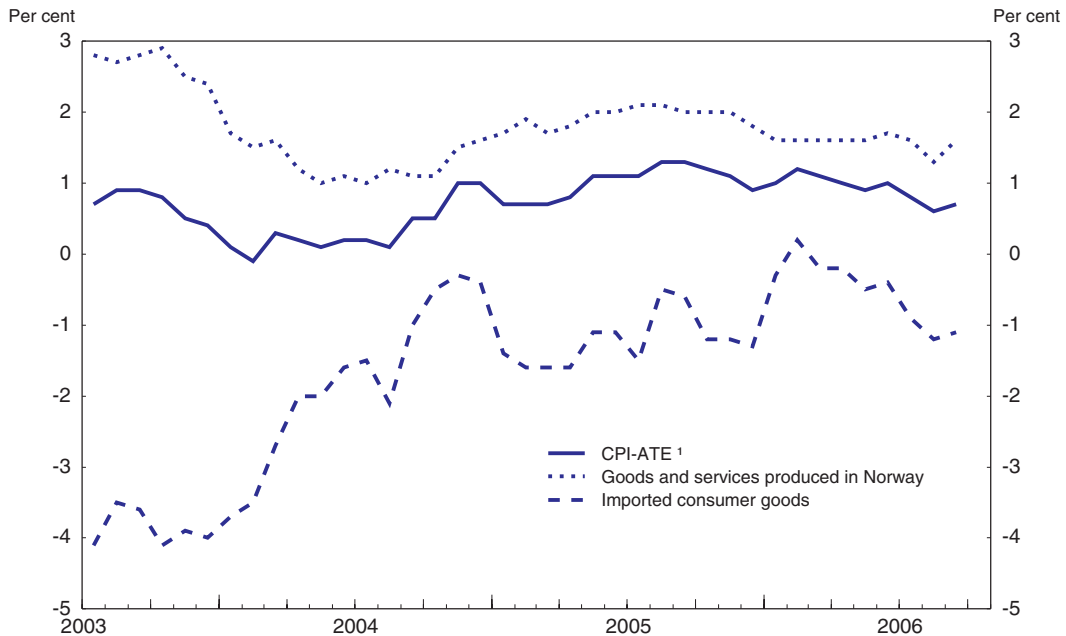
A cross-country analysis by the OECD (2006b) provides estimates of the one-off inflation impacts of globalisation, both directly *via* the impacts on import prices and import penetration and indirectly *via* competitive pressures. The estimation is based on an error correction model relating domestic consumer prices to import prices, unit labour costs and the domestic output gap. It finds the following:

- The average long run “elasticity” of domestic inflation with respect to import prices in Norway is 0.63 over the period 1980-2005, the highest among OECD countries. It has risen through time though less so than in any other OECD country (except for Switzerland which rose by the same amount) – suggesting that Norway has always been one of the most open countries where domestic pricing takes into account foreign competition, but also that other countries are now catching up or even surpassing it in terms of openness (Netherlands).
- Applying the elasticity estimated for the 1995-2005 sub-period (0.66) to the average deceleration in import prices implies a cumulative 3½ per cent point fall in domestic inflation since 1992, *viz.* roughly ¼ per cent point per year on average, stemming from direct and indirect impacts of import prices.¹ This leaves around 2 percentage points of the cumulative decline to be explained by domestic factors.
- “Inflation persistence”, conversely, is on the low side but seems to have risen through time. It may reflect the traditional model of Norwegian wage bargaining whereby the exposed sector leads and gears its wage claims to competitor wages. This outward-oriented model may have weakened somewhat as petrodollars and public sector wage negotiations achieved greater prominence and influence after 1995.²
- The sensitivity of inflation to the output gap has declined over time as a counterpart to rising influence of external factors, and is now among the lowest in the OECD. Thus, even though globalisation has greatly assisted monetary policy inflation control, the stakes are now higher since the central bank would have to induce a stronger slowdown (*ceteris paribus*) in order to lower inflation in the event that it goes above target.
- Other factors that are not directly captured by the estimations, such as immigration, FDI, monetary policy credibility and competition policy, may have also contributed to the decline in inflation.

1. This rough calculation ignores the more precise impact of variable lags that would be obtained by a full model simulation. Nonetheless, it gives a result very close to that obtained in Simulation 1 in OECD (2006b).
2. Indeed, the wage surge of 2001, which provoked a sharp monetary policy tightening and led to a subsequent exchange rate appreciation in 2002, largely originated in the public sector (OECD, 2005a).

gains induced by global competition are merely one-off. A collapse of non-oil commodity prices would reveal the tradable sector’s underlying weakness: high unit labour costs. The problem would be exacerbated by a real exchange rate appreciation in response to a more rapid fiscal expansion, or if monetary policy should tighten sharply in response to unexpected wage pressure. These risks suggest that even higher productivity growth would be needed to justify high wages, allow non-inflationary absorption of higher budget revenues and counteract any reversals in globalisation. But this would not suffice to maintain high potential growth in the future. Work incentives are being undermined by expanding public welfare schemes and arresting this trend will be crucial in order to maintain the labour base for growth. A recent reversal of the earlier tax cutting programme could amplify these effects. All this points to continuing efforts to contain Dutch disease

Figure 1.9. **Domestic and imported inflation**
12 month rise, per cent



1. CPI-ATE: CPI adjusted for tax changes and excluding energy products. A further adjustment is made for the estimated effect of reduced maximum day-care rates from January 2006.

Source: Norges Bank.

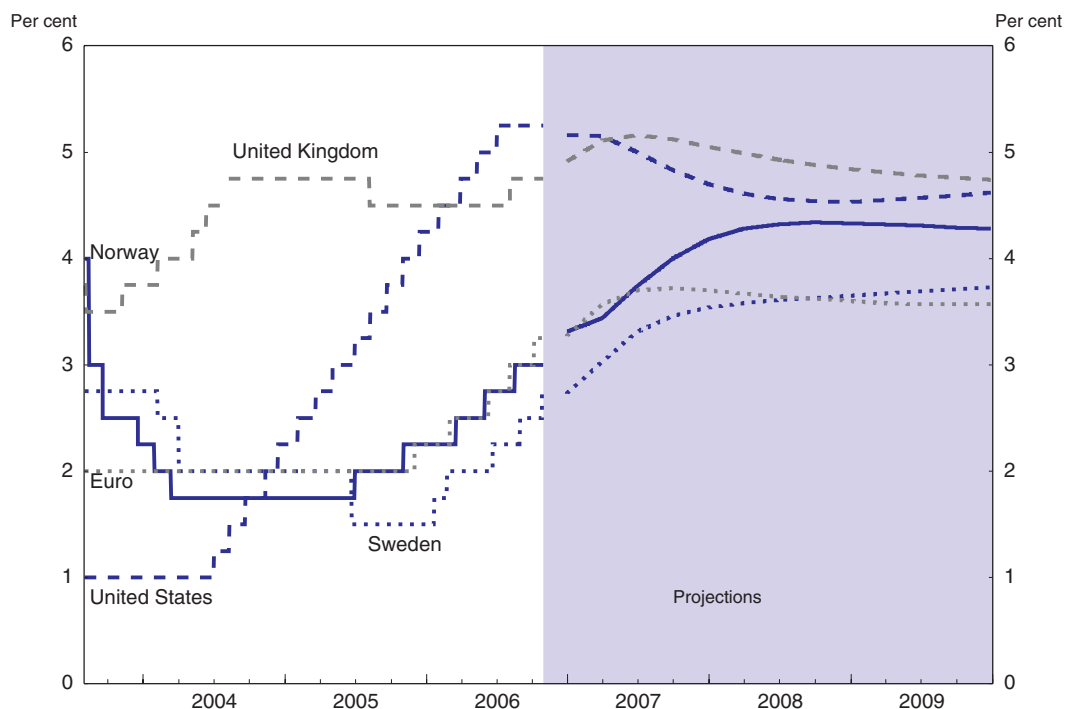
and to maintain structural policy impetus on innovation and work effort as key issues for Norway to keep performing well.

Strong policy stimulus

The sharp increase in the terms of trade has profoundly affected macroeconomic policies. Imported disinflation have given monetary policy substantial scope to be more expansionary, while the large oil price rise implies a large permanent boost to fiscal spending. This may be “double-edged sword” however. The new policy context amplifies the growth creation aspects of globalisation but also raises problems. The policy rules taken at face value may end up being excessively pro-cyclical.

Low imported inflation has helped to drive core inflation to well below the 2½ per cent target, in turn sending interest rates to their lowest levels in 175 years. The Bank has been slow to raise interest rates, following a path that closely mirrors that of the Swedish Riksbank and the ECB. But the “neutral” level of nominal interest rates is probably higher in Norway than in these other regions suggesting that future tightening has a longer way to go (Figure 1.10). The Bank has feared to push up the exchange rate and thus drive core inflation even further below target, perhaps even destabilising expectations and risking a 1930s or Japan-style deflation. By mid-2005, the tightening process was finally launched against a background of fast disappearing economic slack and waning deflation concerns. But the pace of the tightening remained cautious as inflation kept surprising on the downside despite bullish economic data: by autumn 2006, interest rates were little more than half way to the estimated natural rate of 5-6% while indications of labour and housing market heating up were mounting.

Figure 1.10. Policy interest rates in Norway and abroad

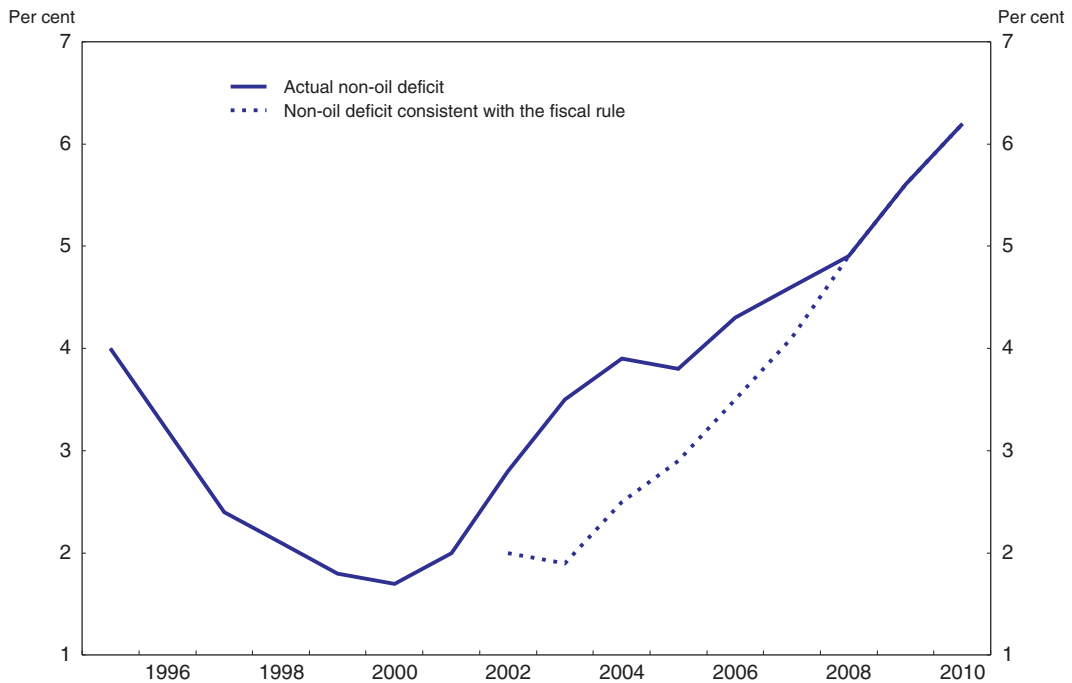


Source: Norges Bank.

On top of that, the Bank's ability to push up long term rates – a main channel of the transmission from policy rates to domestic output and inflation – has been hampered by subdued risk aversion and ample liquidity on the global scale, which have reduced spreads everywhere via compressed risk and time premia. There has also been pressure from pension funds to buy long term assets, plus some weakening of US and global growth expectations, further reducing rates at the long end. Even if Norges Bank steps up the pace of tightening, as it seems to be now doing, the previous prolonged period of low interest rates could have unintended lagged effects on inflation, especially if there were also a surprise increase in import prices or any other reversal of globalisation's benefits. Hence, monetary policy faces some tough dilemmas (Chapter 2).

The massive oil money transfer from the rest of the world to Norway (accounting for one-tenth of the global amount to oil exporters) is causing a rapid expansion of fiscal revenues, which are put into the oil fund. According to the fiscal rule, 4% of the capital value of this fund is supposed to be transferred back to the annual budgets within a medium term perspective. Such transfers in fact averaged 6% of fund value during 2001-06, rising from 2 to 4½ per cent of mainland GDP (Figure 1.11), and reflecting for much of this period a smoothing of cyclical and financial market weakness. At current oil prices, however, the fund is accumulating so fast that even spending only 4% of its capital value henceforth implies a sharp sustained jump in fiscal spending rather than a smooth phasing in of oil revenues as intended by the rule. Assuming that the oil price stays at around \$60 per barrel (in line with OECD, 2006a), baseline spending would rise by some ¾ per cent of GDP per year over the next 6 years, at the end of which the fund would stand

Figure 1.11. **Spending under the fiscal rule**
As a percentage of mainland trend-GDP

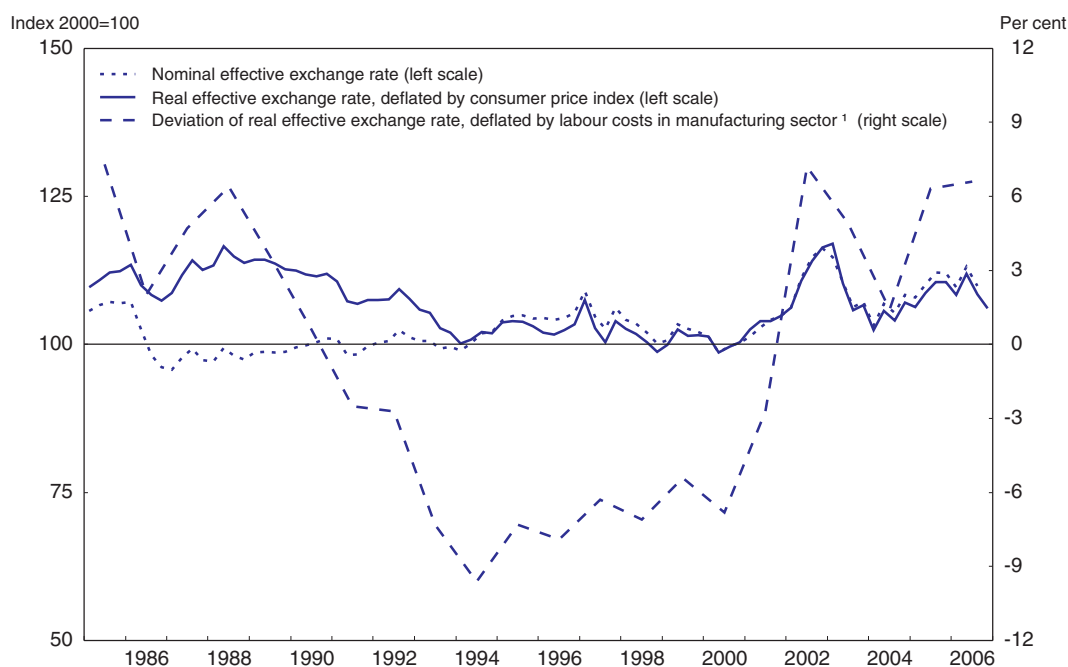


Source: Ministry of Finance.

at nearly 200% of mainland GDP, compared with around 110% currently, and the primary fiscal deficit would have almost doubled to 8% of GDP (and rise further to about 10% at its peak around 2020). Such a large fiscal bonus is unprecedented in OECD experience, and it is not clear whether such a large rise in public spending in so short a time can be absorbed efficiently. In other words, injecting too much money into the economy via mechanical adherence to the fiscal rule could, in the absence of a counterpart rise in supply, end up creating inflation and waste. This then constitutes a key policy challenge (Chapter 3). Too rapid an expansion of fiscal policy combined with tightening monetary policy could also push up the exchange rate, complicating the competitiveness problem of the traditional sector.

Underlying competitiveness problem

The fiscal rule, by smoothing and committing to the level of public spending through time, has acted to stabilise the real exchange rate (Figure 1.12). This, in turn, may have been an important part of the exposed sector's continued ability to adjust and thrive, and to maintain adequate incentives to invest in that sector. However, it also remains the case that the recent non-oil commodity cycle boom has boosted profits enormously in the traditional exposed sector, essentially masking the inherent disadvantage of high wages operating via the factor movement effect. Consequently, the coming probable downswing in that cycle will constitute, on top of a likely continuation of high oil prices,¹⁴ another important test of the stabilisation framework. In the longer run, it seems vital to prevent shrinkage of the tradable goods sector to less than the sustainable level needed to maintain an industrial basis for future dynamism and growth. Perhaps the most serious damage

Figure 1.12. **Effective exchange rates**

1. Deviation from average 1970-2005, data for 2006 are based on projections in the baseline scenario in Inflation Report 03/06.

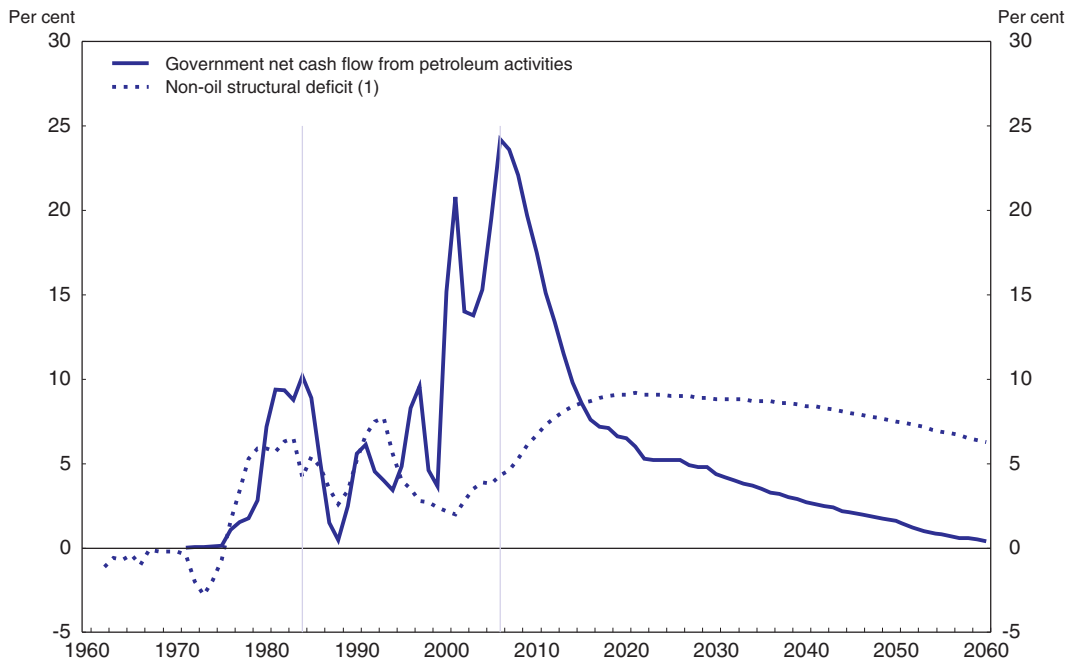
Source: OECD Economic Outlook 80 database and Norges Bank (2006), *Inflation Report 3/06*.

would be done by way of deteriorating human capital that is often associated with exposed sector innovations.

Norway's highly centralised wage bargaining and income coordination scheme has helped limit factor movement and real appreciation. However, annual wage growth exceeded the corresponding growth among trading partners (measured in common currencies) by an average of 1.5 percentage points over the period 1994-2005. On this measure, the international competitiveness of Norwegian industry deteriorated by close to 15% over this period (Figure 1.12). Using unit labour costs as the comparator, the deterioration was even larger¹⁵ – suggesting that productivity growth, good as it was, was still not sufficient relative to trading partners to justify the high wage rate. As a result, the volume market share of manufacturing exports declined by 14% between 1990 and 2000. In a prospective exercise using a calibrated general equilibrium model, Holmøy and Heide (2005) calculate that manufacturing employment would be halved within 20 years if the observed real wage growth were to continue. Meanwhile, the oil resource base will have been largely depleted and income from the oil fund would have started to decline as a percentage of GDP.

The evident competitiveness problem could well become a handicap in the medium run when commodity prices fall, as some have already begun to do. Wage moderation and exchange rate stability should be cultivated by minimising monetary policy mistakes (Chapter 2) and preserving credibility of the fiscal rule (Chapter 3); and by sustaining productivity growth through stepped up innovation spurred *inter alia* by strong market competition (Chapter 5). Norway's response to globalisation via large scale shift of

Figure 1.13. **Oil income and expected real return on the Fund**
Per cent of mainland GDP



1. Actual through 2006 and real expected return on GPF (4%) thereafter.

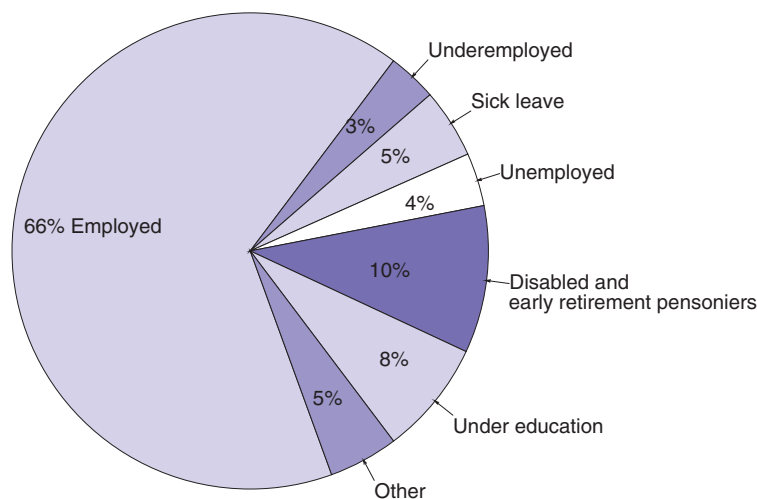
Source: Ministry of Finance.

employment from exposed to public sectors – rather than to the market services sector that is increasingly exposed to international competition as in other dynamic OECD countries – could in fact be a weak form of Dutch disease which reinforces the challenge of boosting innovation capacity.

Weakening work incentives

Another function of the oil fund is to preserve the benefits of oil wealth for all generations of Norwegians to come.¹⁶ By allowing each generation to spend only the real return on the fund, this means that all generations including the present one should share more or less equally in the oil bonanza. Thus, even as oil activity and budgetary oil revenues decline as they must, oil fund income should eventually stabilise at around 6% of GDP with demographic changes. Distorting taxes can to that extent be lower for any given level of social spending, benefiting both growth and welfare. It will be very important not only to follow the fiscal rule in a consistent way over time, but also to implement the long-awaited pension reform. Otherwise, there is a high risk that the capital in the fund would be drawn down merely to pay off pension promises to the current generation. Health costs are also set to rise markedly with demographic change (Chapter 3). Thus, high sustained growth will be needed to generate enough taxes to pay for ageing. Welfare reforms could bring the double benefit of lowering public spending and boosting growth due to better work incentives.

Perhaps the most difficult challenge facing Norway is to maintain strong incentives to work, study hard and strive to innovate while so much wealth is piling up, all the more so

Figure 1.14. **Important to mobilise the work force**

Source: Statistics Norway.

with a high oil price. Labour utilisation should even increase from today's level in order to help meet the ageing challenge. The low unemployment rate in Norway, though clearly admirable and based on fine labour market institutions, may obscure the fact that other forms of non-work are rising, notably sickness absences, disability and early retirement (Figure 1.14), as well as curtailed hours and days for those at work. Moreover, even though marginal income tax rates were lowered significantly with the last major tax reform, average tax rates and tax progressivity have been increased more recently, not only making room for more social spending but also perhaps further deteriorating incentives. An increasing political economy challenge is to pursue non-populist and far-sighted policies, in particular to enforce limits on easily dispensed social benefits (Chapter 4). There is a real danger that the favourable current financial situation for the government and for the economy may confuse the public with respect to long run consumption possibilities.

Notes

1. With the exception of Luxembourg whose position must be related to an underestimated denominator base which distorts GDP per capita measurement (there are many non-resident workers in Luxembourg), Norway exhibits the highest GDP per capita in the OECD. Correcting for oil, as most of oil revenues are sterilised by the Government Pension Fund Global, it is in fourth place, behind the US.
2. Mainland Norway consists of all domestic production activity except from exploration and extraction of crude oil and natural gas, services activities incidental to oil and gas, transport via pipelines and ocean transport. This national account measure is preferred by the Norwegian authorities to total GDP, as most of the oil value-added is insulated through taxation and saving into the Government Pension Fund (GPF).

3. A negative contribution of labour input in the early 1990s was a result of the financial and economic crisis.
4. To approximate effects from terms of trade changes on the purchasing power of domestic income, nominal exports can be deflated using the import price deflator, to create an indicator called command GDP. It is calculated as follows: Command GDP = TDDV + XGSV * (PXGS/PMGS) – MGSV, where TDDV is real domestic demand, XGSV and MGSV are, respectively, volume exports and imports, and PXGS and PMGS are the export and import deflators. The right hand side may be further approximated by GDP/PTDD, where PTDD is the total domestic demand deflator.
5. Aggregate productivity growth for the general government was nevertheless around 1% per annum during the last three decades (Figure 1.3, Panel A) because of composition effects.
6. Jafarov and Moriyama (2005) provide econometric evidence that oil price increases have not been an important driver of public spending increases.
7. Excluding mainland petroleum “re-exports” (refined products), though, the gains would be only half as large and similar to Denmark’s. See Andreassen (2006).
8. The terms of trade can be expressed as $P_x/(P_x^*/e)$ where P_x and P_x^* are domestic and foreign export prices and e is the exchange rate expressed as foreign currency price of domestic currency. The real exchange rate is equal to $e(P/P^*)$ where P and P^* denote domestic and foreign price levels (GDP deflators). Assuming the extreme case of complete specialisation in the export good, the two concepts are identical.
9. On the export side, little volume adjustment would be expected in the cases of petroleum and non-petroleum commodities in response to price increases themselves driven by higher demand.
10. According to empirical estimates in OECD (2006b), the exchange rate pass-through into import prices tends to be high in Norway.
11. See Bean (2006).
12. Technological progress contributed to declining prices of consumer electronics independently of globalisation *per se*, but the emerging economies of Asia were quick to capitalise on such trends and thus to reinforce them.
13. The level of inflation dropped to below 3% in the recession of 1992 and stayed low thereafter except for a temporary increase to slightly above 3% in the cyclical peak of 2000 and 2001.
14. The OECD inflation model discussed in Box 1.2 also estimates a separate world commodities price block. It finds that rising global demand and share of non-OECD exports ratchets up oil prices to levels where they may stay even if demand subsequently stabilises, whereas other commodity prices tend to fluctuate up and down with demand.
15. The dichotomy between the real effective exchange rate as measured by CPI versus unit labour costs can be explained by low import price rises and strong demand shifts in favour of low cost imports. See OECD (2006a).
16. This is unique in the international context. Russia’s oil fund, for example, is strictly tied to stabilisation of oil price volatility, a kind of buffer fund. See OECD (2006c).

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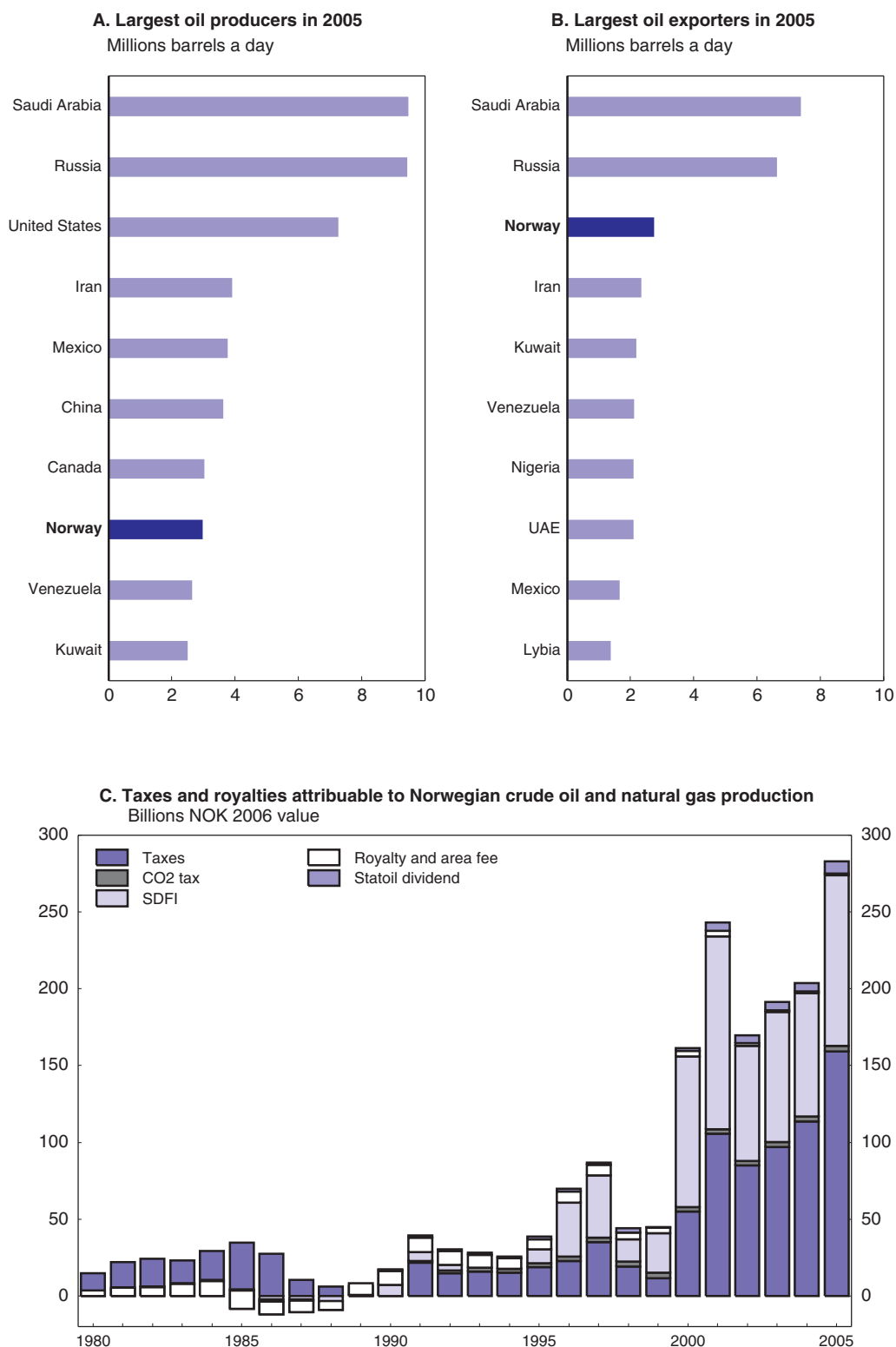
ANNEX 1.A1

*The petroleum sector and its impact***The petroleum sector**

Oil exploration started in the late 1960s and production of oil in 1971. Petroleum activities, including exploitation of both oil and gas resources, through nearly 40 years of operation have created values in excess of NOK 5000 billion at 2005 prices, that is close to 350% of total Mainland GDP. Norway is today the third largest exporter in the world, mainly serving European countries,¹ and belongs to the ten biggest oil producers (Figure 1.A1.1, Panel A). In 2005, the sector accounted for 25% of value added, and was the largest industry in Norway. The state is entitled to collect most of the value created from the petroleum activities (Box 1.A1.1). In 2005, the sector generated 33% of government revenues. The net government cash flow from petroleum activities can be divided into corporate taxes, carbon tax and fees, direct ownership revenues (through the State's Direct Financial Interest SDFI) and dividends from the partly state-owned petroleum company, Statoil (Figure 1.A1.1, Panel C).

Since the start of production, only approximately 30% of the expected total resources on Norwegian continental shelf have been extracted. According to national authorities, petroleum production is expected to increase gradually until 2011, and to fall gradually thereafter. Oil production has already reached a peak in 2000 at 181 standard cubic meters. Gas production is expected to further increase to a level of around 130 bcm early next decade. Accounting for 35% of the total Norwegian petroleum production today, gas production is expected to reach a share of about 50% in 2013, increasing gas exports by 49% to reach 130 billion standard cubic meters at this horizon. These estimates could be pushed out with discoveries of new fields or wells. Constraints on new exploitations, such as in the Barents Sea, are both political (international boundaries) and environmental.

Although direct revenues from the petroleum sector are channelled out of the mainland economy into a foreign asset fund and employment in the sector is less than 1% of the economy's total, petroleum investments and other linkages with the mainland economy make Norway to some extent dependent on the petroleum sector. Oil production in the long run will diminish in line with the decrease in non-extracted reserves, but in the medium term it could crowd out other sectors unless policies proactively contain this risk.

Figure 1.A1.1. **The net government cash flow, oil producers and exporters**

Source: Ministry of Petroleum and Energy (2006), Facts: The Norwegian Petroleum Sector 2006.

Box 1.A1.1. Organisation of the Norwegian petroleum sector

The institutional framework

From the start, the national authorities established administration and controls over the petroleum activity, as a fundamental requirement to maximise value for Norwegians. In this model, foreign companies started to carry out all petroleum activities on the Norwegian continental shelf. During the 1970s, Norway launched a state – owned company (Statoil), and Saga and Norsk Hydro joined in petroleum activities, allowing Norway to secure substantial revenues from the sector and develop its own skills and technological know-how.

The current resource management model is built on two principles: predictability and transparency. All oil companies are responsible for the actual operation of petroleum activities on the Norwegian continental shelf, in a competitive and cooperative framework. The approval of the authorities is required in all stages of petroleum activity: exploration drilling, plans for development and decommissioning plans. But agreements and licenses are attributed in a very flexible and innovative way. The authorities award production licences to a group of companies instead of just one company. The most important decision criteria include understanding the geology, technical expertise, financial strength and the experience of oil company. Based on the applications, the Ministry of Petroleum and Energy establishes a licensee group, in which companies must exchange ideas and experience and share the cost and revenues associated with the production license.

Major development projects or matters of great public importance must be discussed and approved by the Storting (the national parliament). The Storting, for instance, has recently enacted decisions to launch large individual investment projects in Snøhvit, Ormen Lange and Langeled, that should be delivered in the course of 2007. The government holds the executive power over petroleum policy. The Ministry of Petroleum and Energy is mainly responsible for resource management and the sector as a whole.

The petroleum tax system and oil revenue management

- Petroleum taxation is based on Norwegian rules for ordinary corporation tax (28%), supplemented by a special tax rate (50%), due to the extraordinary profitability of those resources. Tax deductions are also granted to cover costs associated with exploration, R&D, net financial, operating and decommissioning expenses.
- The CO₂ tax, introduced in 1991 to reduce carbon dioxide emission is the other tax linked to petroleum activities.
- The SDFI, previously managed by Statoil, is the second most important source of state revenues from petroleum activities. This is a special arrangement, decided when production licenses are awarded, in which the state owns interests in a number of oil and gas fields, pipelines and onshore facilities. Since Statoil's partial privatisation, the SDFI has been transferred to a state created trust company, Petoro.
- As owner of Statoil, the state receives dividends (in March 2006, the public shareholding amounted to 70.9%).

Assessing the impact of oil production and revenues on mainland

During the last three decades, Norwegian GDP per capita has increased from 90% to 150% of the OECD average. Unemployment has been low except for a short period around 1990. The Norwegian government has considerably increased its net financial assets; erasing a net debt of close to 60% of GDP in the 1970s to build a Government Pension Fund

that exceeded 100% of mainland GDP at the end of 2006. Compared to other OECD countries, economic growth has on average been half a percentage point higher annually over the past 30 years and real wage growth much higher. What role did petroleum play in Norway's economic development? How much is mainland subject to oil demand and real price swings?

The Petroleum sector and the catch-up process

There is today a consensus in the literature that Norway operated its catch-up process towards the frontier (i.e., GDP per capita of the USA), thanks to the oil discovery. The actual increase in Norwegian GDP per capita relative to the OECD average has been shown to be very oil related (Cappelen *et al.*, 2000). In the same way, Norway had trailed its similar neighbours (Denmark and Sweden)² until the early 1970s, as there existed some underperformance partly linked to historical choices in specialisation (Røed Larsen, 2004). However, in the 1980s, having found oil, the country caught up and passed them briskly, and continued this relative growth advance after oil permeated the economy.

This thesis is largely confirmed by Eika and Magnussen (1998), showing through an analysis of the natural experiment of the 1979-1985 oil price shock that Norway received a windfall gain from the increase in oil prices, despite a negative effect through world trade that should have impacted on such a small economy. Under an alternative low oil price scenario, the authors show that the impulse had provided a long term stimulation of close to 25% of GDP to Norway. Because oil production is mature and stable, the petroleum activity might channel into the mainland economy through direct and indirect effects of oil investment, and impacts of real oil revenues mainly due to price swings. How are these factors likely to stimulate the economy?

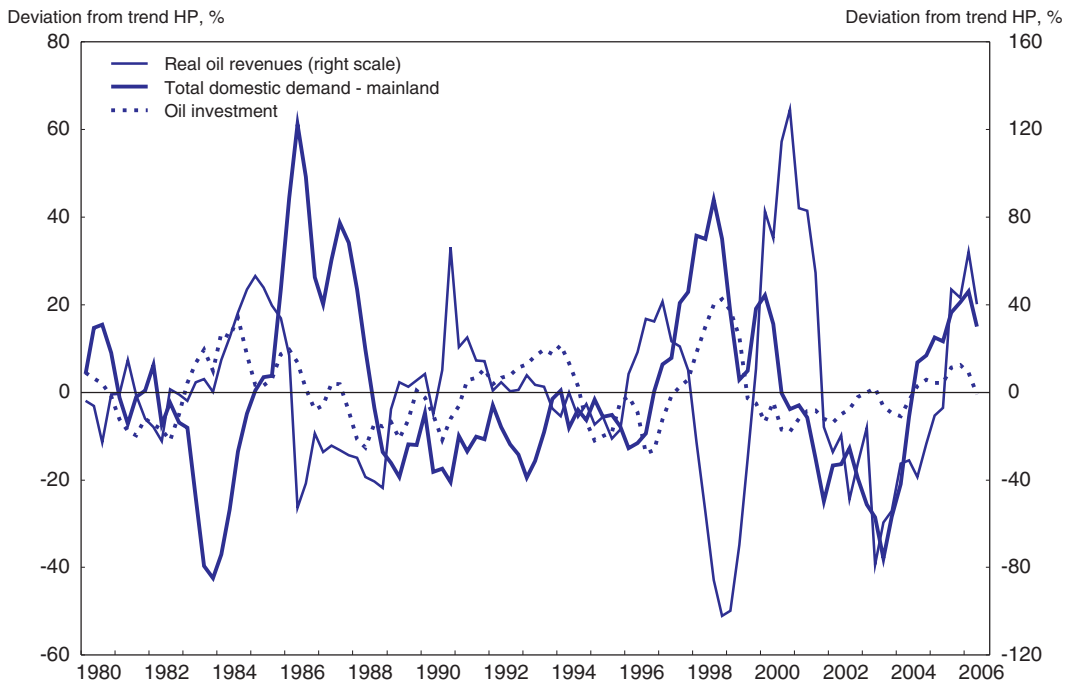
Is mainland insulated from oil cycles?

A small oil-exporting economy as Norway should be stimulated by an adverse oil price shock.³ Surprisingly, cycles in real oil price, real oil revenue cycles or oil investment are little correlated to mainland fluctuations (Figure 1.A1.2). However, this result may be driven unduly by past episodes of supply driven oil price increases, namely the OPEC I and OPEC II shocks, which depressed worldwide demand. When increases are demand driven, like in the current global cycle, oil price increases may exacerbate mainland fluctuations. The Norwegian business cycle may thus be far more influenced by global macroeconomic shocks and cycles. Fiscal expenditure fluctuations also exhibit little correlation with real oil revenue swings. Jafarov and Moriyama (2005) confirms these results, showing through a VAR analysis that government expenditures do not react to an energy boom and that policies have successfully insulated the mainland economy and the budget from real oil revenue fluctuations since the mid 1980s. In a context of an unprecedented current account surplus and inflow of real oil revenues, this may be reassuring.

However, these results do not imply that, in the long run, real oil revenues do not impact total and mainland Norwegian GDP per capita. Besides, if oil price and oil investment cycles have not been the major driver of domestic cycles, they may strongly contribute, when synchronised with these cycles, to stimulate the domestic economy. Table 1.A1.1 reports indirect effects of oil investment on mainland GDP. An impulse of one percentage point of mainland GDP in off-shore investment would boost mainland GDP by 0.6%. The impact is strongest on the manufacturing and construction sectors. For instance, indirect effects of oil investment on mainland (such as onshore construction, manufacturing production or business services provision indirectly related to oil) may have

Figure 1.A1.2. **Cycle of mainland output and oil**

HP filtering on smoothed series, lambda = 1600



Source: OECD calculations.

explained close to 10% of the cumulated growth over the years 2003-2005,⁴ which clearly supported part of the current boom.

Table 1.A1.1. **The effect of an increase in oil investment equivalent to 1 percentage point of mainland GDP**

	GDP	Employment
Manufacturing	0.6	0.4
Construction	1.5	0.7
Transport	0.3	0.0
Other services	1.2	0.3
Mainland GDP	0.6	0.2

Source: Ministry of Finance.

Norway without oil: a counterfactual scenario

Cappelen et al. (2000) have estimated the effects of petroleum production on the Norwegian economy using a large-scale macro-econometric model. Conveying a counterfactual analysis, through a multi-sectoral input-output model (MODAG), the authors show two major results. From the early 1980's to the present, the petroleum sector has demanded resources that have accounted for close to 14% of mainland GDP, of which half has been investment goods. In some years, petroleum investment amounted to one-third of total fixed capital formation in the total economy. In spite of the strong impulse coming from the resource movement effect,⁵ the spending effect operating through the

public arm has been as important. Without oil revenues the current account and government budget would have run into severe deficits during the last twenty years or so unless domestic spending had been cut down severely.

Table 1.A1.2 confronts the counterfactual scenario to the baseline (observed) growth path. According to these results, oil has brought low unemployment and higher real wages to the economy. It has stimulated, on average, consumer spending, real public consumption and real GDP by almost 1½ percentage point per year. Growth in real wages would have been a third lower in a world without oil.

Table 1.A1.2. Economic development in Norway (actual, with oil) and counterfactual (without oil)

	EU15	Norway, historical	Norway, without oil
Total growth in real hourly earnings in manufacturing (1974-1998)	7.4	47.1	32.5
Standardised rate of unemployment, 1998	10	3.3	6.3
	(Percentage of nominal GDP, 1999)		
General government balance	-1.6	4.9	-3.0
General government net financial assets	-55.6	48.5	-65.8
	(Average growth rates 1974-1999)		
Real GDP	2.2	3.3	1.8
Real private consumption	2.4	2.7	1.4
Real public consumption	2	3.4	2.1

Note: EU15, except Greece, Ireland, Luxembourg and Portugal.

Source: Cappelen *et al.* (2000).

This counterfactual analysis shows that the accumulation of financial assets, mainly in the government sector, would not have taken place and net debt would have been of the same magnitude as in other European countries at the turn of the 21st century. Besides, oil specialisation has crowded out non-oil exports only marginally and increased import shares. According to these simulations, the size of the manufacturing sector has expanded because of oil by close to 25% relative to the baseline scenario. These results converge to the conclusions of Røed Larsen (2004): Norway without oil would have performed in line to its closest neighbour such as Denmark and to a lesser extent Sweden.

Notes

1. The most important petroleum importing countries from Norway are the United Kingdom, Germany, Netherlands, France, USA, Sweden, Canada, Denmark, Spain and Italy.
2. The author used these two countries as counterfactual because the three Scandinavian countries are similar: they share common history, language and culture, and almost identical institutions. Besides, they constitute a fluid Nordic labour market, allowing rapid factor reallocation and stable equilibriums.
3. Although VAR analysis shows that in the long run the effects should be most likely zero (Bjørnland, 1998).
4. Between 2002 and 2005, mainland GDP in volume terms grew by 9%. Applying elasticities of indirect effects of oil investment leads to a cumulative growth impact of 0.8% of mainland GDP over this period.
5. In the early stage of oil production, a resource movement from old sector to the petroleum sector occurred, due to factor demand (capital and labour). During this period, the import shares related to oil investment was very large, crowding out domestic demand (Cappelen *et al.*, 2000).

ANNEX 1.A2

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 <i>Survey</i> (October 2005)
A. SOCIAL PROTECTION	
Minimise work disincentives in the unemployment – insurance system	The unemployment benefit period for temporarily laid-off workers has been reduced from 42 to 34 weeks since 1 January 2006.
Reduce sick leave	The reduction of sickness absences registered in 2004 was short-lived. However, the Inclusive Workplace-agreement was prolonged to the end of 2009. In connection with the recent budget resolution for 2007, several measures to bring down sick leave have been proposed.
Tighten disability schemes	A governmental appointed commission has been formed and should issue an report in Spring 2007.
B. LABOUR MARKETS	
Increase flexibility in wage setting	No action
Modernise employment protection legislation	No action
Enhance efficiency of job placement services and ALMP	The Public Employment Services and the National Insurance Services have been merged since 1 July 2006 and cooperation of this new organisation with the municipal social welfare service was enhanced, in order to improve the collaboration between agencies administering different benefits and placement services.
C. EDUCATION	
Improve the assessment of education	Systems for national tests in primary education are presently being revised and there is a ongoing work on improving supervision of education. In tertiary education there is an ongoing evaluation of performance-based criteria for allocation of public funding for education and research.
Improve the quality of primary and secondary education	The Ministry is currently introducing new curricula that insist on basic skills, with distinct learning targets and evaluations over the 2004-2008 period.
D. FINANCIAL MARKET	
Ensure competition in the banking sector	No action.
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.

Recommendations	Action taken since the previous Survey (October 2005)
Tackle ageing issues	Mandatory occupational pensions were extended to all firms in January 2006. A new White Paper on pension reform was presented in October 2006. It preserves the three key principles agreed to in May 2005, namely to: 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. Remaining issues include <i>inter alia</i> adjustments of AFP early retirement, disability, and public occupational pension schemes to make them coherent with the new more actuarially fair old age pension system. To "buy" reform of the AFP, the government has signalled its intention to increase AFP subsidies in line with demographics, contrary to previous OECD recommendations to scrap or severely streamline them. A governmental appointed commission has been formed to tackle the issue of disability pension system.
Reform the tax system	The 2007 Budget reverses the 2005-2006 tax cuts and devotes the extra resources to increased social spending. The tax system is also being made more progressive mainly by raising the wealth tax (overturning the planned phasing out by the previous government), revaluing properties, lowering the threshold for the top income tax rate, and increasing allowances for lower incomes. The VAT on food is raised from 13 to 14% and new CO ₂ taxes are introduced. Regionally differentiated employers' social contributions are reinstated, and new tax credits are granted to agriculture, R&D spending, poorer pensioners paying wealth tax, and other subjects.
F. ENVIRONMENTAL POLICIES	
Limit CO ₂ emissions	The Norwegian government has decided to allow the linking of its domestic emissions trading scheme with the EU version through the European Economic Area (EEA) agreement in March 2006. In October 2006 a commission proposed a strategy for reducing Norway's greenhouse gas emissions by two-thirds by 2050. The 2007 Budget widens the scope of CO ₂ taxes to household gas heating, and devotes resources to developing new emissions curbing technologies in gas plants. CO ₂ emissions have been included in the basis for calculating the motor vehicle registration tax, and parts of petrol comprised of bio-ethanol has been exempted from the CO ₂ tax.
Develop renewable energy resources	Norway will allocate a NOK 20 billion fund to strengthen efforts in renewable electricity production, use of renewable energy and increase energy efficiency.
G. AGRICULTURE AND FISHERY	
Enhance competition in the agriculture market	The national competition authority's (NCA) preliminary enquiry about Tine, the Norwegian dairy producer, found that Tine may have abused its dominant position by entering into an exclusive supplier agreement with Rema, a super market chain. Tine could be subject to a fine of up to NOK 45 billion. Backward action: the government allowed the acquisition by Prior Norge BA of its main competitor in the egg and poultry market, contrary to an earlier intervention by the NCA.
Reduce quotas and tariffs	Fodder quotas for salmon abolished as from January 2005.
H. SUPPORT COMPETITION AND REDUCE STATE AID	
Increase regulatory power of competition authorities	Backward action: The Ministry of Government Administration and Reform, which is the superior body to the Norwegian Competition Authority, has overruled four merger decisions made by the Competition Authority over the past year. The appeal system requires a clear distinction between the challenging of merger decisions on political grounds as opposed to competition grounds. In one case the King in Council overruled a merger decision on political grounds. The King in Council is the only body that under certain circumstances can challenge a decision by the Authority on other objectives than competition. In two other merger cases the Ministry disagreed with the Competition Authority's competition analysis under the Competition Act. The last case was challenged on procedural grounds.
Increase competition and reduce barriers to entry	The registration fee for refinancing of loans was lowered on January 2006, making it cheaper to switch loans to another bank, following NCA recommendations.

Recommendations	Action taken since the previous Survey (October 2005)
Reduce state aid, public subsidies and tax distortions	Backward action: Shipping subsidies were broadened as from July 2006 and new tax expenditures for agriculture were introduced in the 2007 Budget.
Reduce state ownership in corporate Norway	Privatisation pursued in Cermaq ASA, fish feed and farming (sell off from 79.4 to 45.3%), 50% of BaneTele AS (nationwide fibre-optic network, formerly 100 pct. state-owned) transferred to Bredbåndssalliansen AS as an equity issue. Backward actions: the Norwegian State increased its interest in Nammo AS (ammunition) from 45 to 50% in February 2006. The government has signalled that they will maintain their present shares in Telenor, Norsk Hydro, Statoil and DnB NOR and maintain Statkraft, Statnett and Statskog as fully owned state company. More recently, Norsk Hydro gas and Statoil have announced an intention to merge. Government politicians have signalled that the state's share of the new combined entity will rise from 62 to 67%.
Improve state-owned activities' governance	No action.

I. PRODUCT MARKET COMPETITION

Promote competition in the postal services	Backward actions: the decision by the former Parliament of a full liberalisation of the postal market in Norway as of 1 January 2007 has been reversed. The Ministry of Transport and Communications has decided to maintain current remaining exclusive rights of Norway Post.
Reduce barriers to entry in the retail sector	Backward action: an exception to the Competition Act, allowing booksellers to set fixed prices for educational books, has been extended to July 2007.
Enhance efficiency in transport services	The first competitive railway passenger contract (Gjøvikbanen) assigned in spring/summer 2005, has been operating from June 2006. Backward action: Ministry of Transport and Communications announced that the Government will stop any new tenders of railway passenger transport.

Chapter 2

Monetary policy under low inflation

Norway has a robust macroeconomic policy framework to manage the potentially destabilising impact of its oil wealth. Nonetheless, emerging macroeconomic imbalances due to the unusually large terms of trade shock may require flexibility in adaption of policy rules. The current strong growth in the real economy and the positive output gap must be seen against the back-drop of sustained low core inflation, reflecting monetary policy trade-offs inherent in the flexible inflation targeting regime. Still, monetary policy is faced with a difficult trade-off, as bringing inflation quickly up towards the inflation target may conflict with stable developments in production and employment. While a structural boost to potential growth may explain the past period of strong growth and low core inflation, this is hard to ascertain. Policy should assume that the structure of the economy has not really changed, and withdraw monetary stimulus relatively quickly, aiming at anchoring inflation expectations on target and at the same time stabilising the real economy.

The present monetary policy challenge is to manage the risks attached to globalisation's benefits. Monetary policy needs to make sure that institutional mechanisms for preserving low trend inflation are robust to possible setbacks in the future course of globalisation (Rogoff, 2006).

Macroeconomic risks and tensions

Risks may paradoxically be high when times are good.¹ Unlike the case of a positive supply shock which has arisen from domestic structural policy reforms, one that has been generated abroad exposes the economy to unpredictable reversal in any of its elements (commodity prices, Chinese inflation, value of the dollar, etc.). Besides, much of its impact may have been one-off rather than permanent, as the world trading system adjusts to a higher non-OECD share of trade that eventually levels off. Monetary policy has reacted to these shocks by allowing expansion in the real economy as a trade-off against the sustained low core inflation. Should these shocks level off, inflation is likely to pick up and the monetary policy stimulus should be withdrawn accordingly. There is still a risk that inflation will pick up faster than currently envisaged which in turn would require a faster monetary policy tightening.

Unwinding of positive supply shocks

Norway may be vulnerable to the next world downturn for the very reason it benefited so much from the upswing. A pronounced slowdown is being cited as a non-negligible risk for 2007 or 2008 by many forecasters, given possible global multiplier effects of a cooling US housing market and perhaps disorderly correction of external imbalances. This could entail a collapse of commodity prices recalling that the last major US recession in the mid-1980s gave a rude shock to oil price expectations at that time. Non-oil commodity prices are predicted to soften substantially even in the central scenario.² A second external risk is higher Chinese inflation once the productivity miracle there ends, although this may be still some way off and other countries like India may take up the baton. Bean (2006) suggests that high oil prices are but the "flip side" of low manufactured import prices from developing Asia, implying that the risks on both sides may be correlated. Materialisation of these risks would reverse the presently favourable terms of trade for Norway. A protectionist backlash in the OECD could also precipitate such a shock.

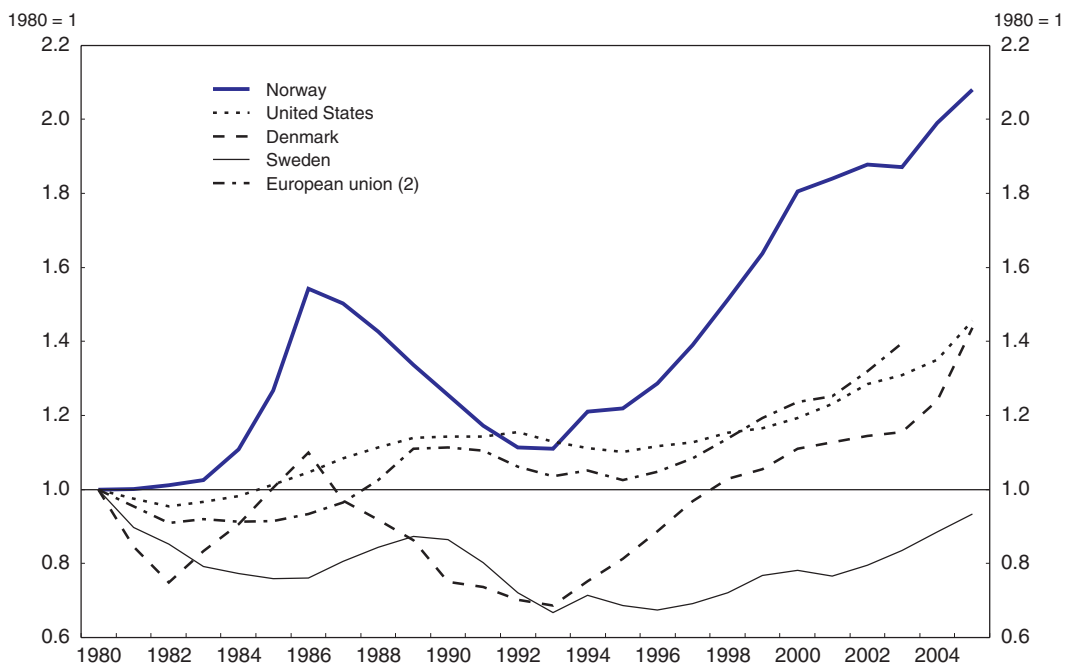
Domestic productivity gains arising from the pressures of global competition could be largely one-off and exposed to global reversals, unless solidly grounded in domestic competition policies and dynamic market forces. Meanwhile, the government has overruled four merger decisions made by the Competition Authority over the past year and signalled that state ownership will be upheld in major companies, in contrast to OECD recommendations and trends (Annex 1.A2). This might reduce the chances for installing more dynamic forces of competition and innovation in the economy. A mainstay of productivity growth has been in the oil sector, but its resource base is being slowly depleted and oil production is close to starting its long descent, increasing the importance of

vigorously enforced competition policy as a driver of continued productivity growth and low domestic inflation.

Housing market imbalances

Structural changes in the Norwegian economy and high income growth can to a large extent explain the sustained high growth in housing prices since the early 1990s. In the past few years, however, lower interest rates and the decline in the expected level of mortgage rates is likely to have reinforced this trend. Household debt levels (nearly 200% of disposable income) already exceed those of the pre-crisis late 1980s.³ Measuring asset price against replacement cost (Tobin Q), Norway is situated at the high end of an already highly valued OECD-wide housing market (Figure 2.1). House prices grew by 15% in the first 9 months of 2006, up from 9% in all of 2005. Hence, as elsewhere the liquidity flooding the system seems to have gone into supporting a house price surge rather than goods and services price inflation.^{4, 5} House rent inflation has fallen due to a shift in demand towards ownership of homes, due *inter alia* to factors such as the relatively low interest rate, moderate CPI-growth, a strong labour market and a generally optimistic household sector. The shift in demand away from rental dwellings may, paradoxically, have pushed down the CPI even more.⁶ This raises the question of whether resources are being well allocated in Norway, especially since tax policy heavily favours housing. It also raises social equity issues as less well-off and younger first time buyers may be hard pressed to find affordable housing – yet feel pressured to buy, fearing further house price rises, taking on perhaps unhealthy levels of mortgage debt. On the other hand, in Norway the rental market functions fairly well compared with other Nordics, so that even if rising house prices have

Figure 2.1. **House prices relative to construction costs**¹



1. Nominal house price index divided by the deflator of gross fixed investment residential.

2. Average index of Denmark, Finland, Germany, Ireland, Netherlands, Spain, Sweden, United Kingdom.

Source: OECD Analytical database.

raised entry barriers for first-time buyers such people could still find proper housing in other segments.

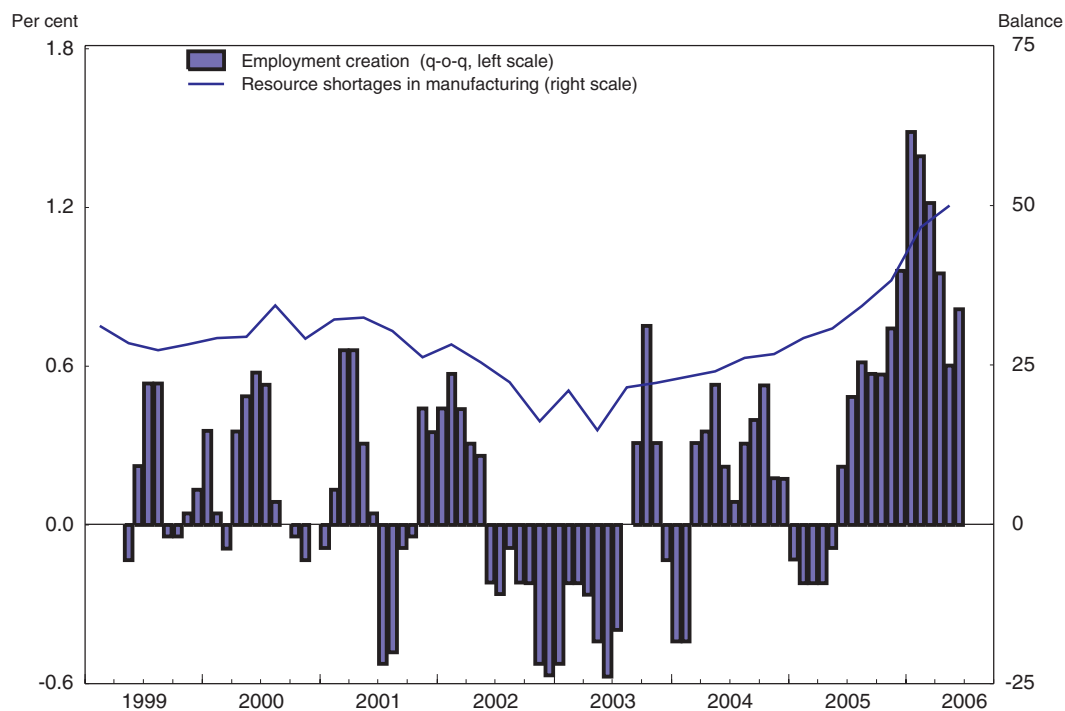
Most worrying, the real and financial imbalances that could be generated by the housing boom have adverse implications for future output. Rising interest rates will – to the extent that the increase is unexpected – trigger an adjustment of these imbalances, but since mortgages are overwhelmingly flexible rate, this too could quickly tighten borrowers' budget constraints and produce financial distress for vulnerable groups.⁷ A house price bust would amplify the shock while reducing perceptions of wealth more generally.⁸ Even if prices stabilise, rents could suddenly catch up with past price rises as speculative fervour subsides.⁹ Financial conditions may be much less fragile than in the early 1990s, but still might constrain the central bank as it tightens. On the other hand, a too slow tightening might exacerbate the boom and its implicit risks. Still, the bank should take into account impacts of house prices only to the extent that they affect the outlook for inflation and the real economy.

Possibly mitigating these risks, some structural changes might explain part of the strong expansion of housing demand and mortgage debt. Socio-demographic changes imply a large increase in single households which raises the demand for housing on a permanent basis. There has also been a strong domestic migration toward the big urban centres, notwithstanding the extensive regional policy, in turn increasing demand for new housing. The higher inflows of foreign workers and immigrants also boost housing demand, though less so than their numbers might suggest as they tend to share accommodation. There have also been major structural changes in the financial sector suggesting a higher tolerance to risk by both banks and households. The shift to Basle II has made mortgage lending more appealing to banks since it gets a lower standard risk rating than lending to firms. Hence banks are competing fiercely for mortgages, and have reduced lending margins and designed new mortgage products to facilitate borrowing (such as no downpayment and long repayment periods without capital amortisation). The banks are also able to unload credit risks from their balance sheets by the use of derivatives.

Economy-wide overheating

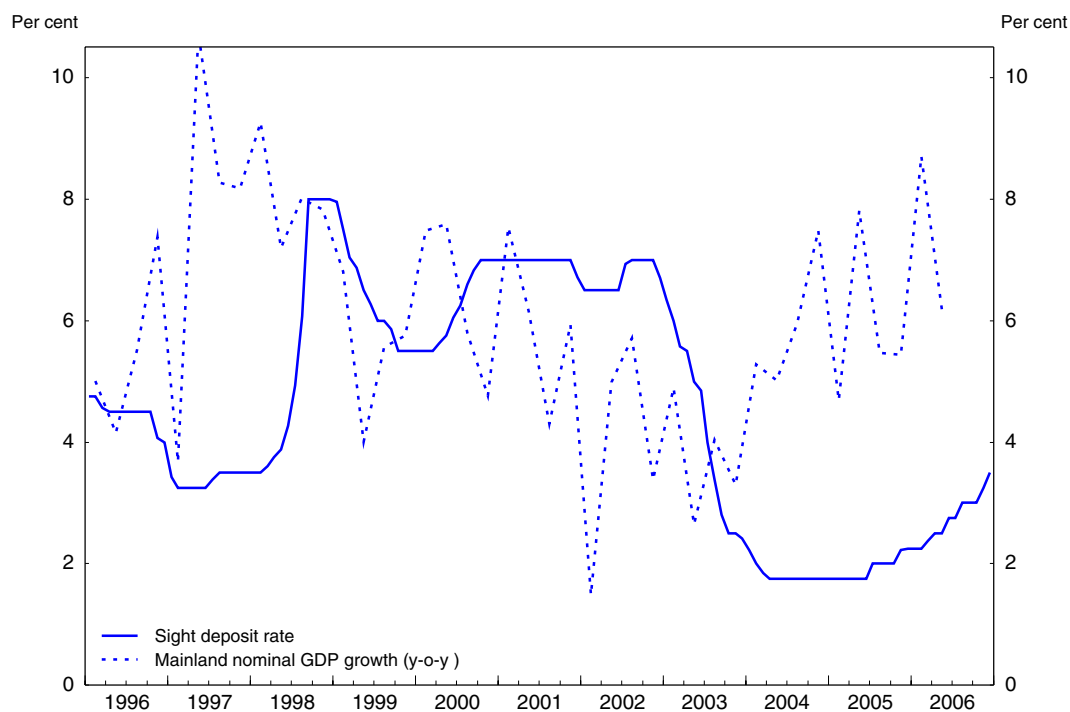
Protracted monetary stimulus has been necessary to bring up inflation and safeguard inflation expectations on target. Consequently, clear signs of resource tightness have emerged in 2006 (Figure 2.2). The unemployment rate fell to 3.3% by Q3 2006, and headline inflation already reached 2½ per cent in mid-year. Core inflation, however, did not pick up and remained low through 2006. A wide gap between the nominal interest rate and nominal GDP growth may suggest latent inflation pressure even though core inflation is still significantly below the inflation target (Figure 2.3). Inflation dynamics may already be set in motion, appearing in the form of wage drift in the latter half of 2006. Past experience suggests that a positive output gap and unemployment significantly below the 4% mark (NAIRU)¹⁰ is likely to provoke wage push, higher margins and inflation, with a lag.¹¹ Thus, just as the slowdown in economic activity in late 2002 and early 2003 contributed, along with declining import prices, to the subsequent slowdown in domestic inflation, so are the sizeable positive output gap predicted for 2006-08 and tighter labour markets, together with the possible – but hard to predict – waning of so-called structural factors of low imported inflation and increased competition, likely to herald coming inflation pressure. A sudden wage surge would presumably be met by a sharp monetary response, possibly leading to an appreciation of the exchange rate and hurting the exposed sector as in 2002, though with the possible added dimension of a housing market shock.

Figure 2.2. Resource tightness



Source: Statistics Norway, Norges Bank, Gallup business survey.

Figure 2.3. Latent inflation pressure



Source: Norges Bank, OECD Economic Outlook 80 database.

The stabilisation framework

The current macroeconomic stabilisation framework assigns to monetary policy the task of anchoring inflation and stabilising growth, while fiscal policy looks after the real exchange rate (Box 2.1). The framework has performed rather well thus far. Norges Bank

Box 2.1. The institutional framework for macroeconomic stabilisation

The institutional framework for macroeconomic stabilisation in Norway rests on four pillars: flexible exchange rate, the oil fund mechanism, flexible inflation targeting and the fiscal rule. The first two pillars were introduced in the 1990s and the latter two in 2001. The new strategy has proved successful in reducing macro volatility in its first decade of existence. It has also been adaptive, rather than rigid.

Flexible exchange rates and inflation targeting

Macroeconomic policy management in Norway has long been implemented against a background of a centralised and outward-oriented process of wage formation that was geared to maintaining international competitiveness (formalised in the 1992 “Solidarity Alternative”). Like in many other small open economies, monetary policy was initially geared towards stabilising the exchange rate, while fiscal policy had a main responsibility for stabilising the economy.

Around the mid-1990s, however, as bigger oil money receipts and liberalised capital flows made it harder to target the nominal exchange rate, there began a *de facto* shift to a flexible exchange rate policy. In March 2001, flexible inflation targeting was formally adopted. This regime seeks to provide a nominal anchor to the economy in the form of stable inflation expectations, while also stabilising output. The nature of the shocks that disturb the economy is pertinent. A demand shock moves prices and output in the same direction; hence, monetary policy can bring them back to their equilibrium values rather quickly. A supply or terms of trade shock moves them in opposite directions, however, so that a trade-off emerges and monetary policy must correct deviations of inflation from target in a smoothed and gradual fashion so as not to jerk real growth and employment around too much in the process.

The oil fund and the fiscal rule

Shortly before flexible exchange rates were adopted, an oil fund mechanism was set up, investing oil export revenues abroad so as to neutralise their exchange rate impacts and minimise disruptions to the real economy.¹ When inflation targeting was formally adopted, a fiscal rule was also created and made effective as of 2002, specifying a gradual phasing in of oil money into the fiscal budget. That is, 4% – the assumed long-run real rate of return – of the fund’s capital value at the start of each year would be transferred back to the budget within a medium term perspective. The objective was to make predictable and stabilise as far as possible future fiscal spending pressure, and thus stabilise real exchange rate expectations and the current exchange rate which incorporates such expectations. A longer run objective was to save the oil wealth for all future generations of Norwegians, while allowing the current generation to spend the income being generated by the fund.

Has the new framework reduced macroeconomic volatility?

Macroeconomic stability in the short to medium run is a necessary foundation for strong growth in the long run. Transition costs of output and especially of employment volatility are considerable, while a nominal anchor is essential for avoiding endemic high inflation, or conversely deflation, either of which could distort resource allocations severely. Excessive real exchange rate volatility might cause heavy disruption in a small open economy such as Norway’s, and deter investments in the exposed sector. The new policy framework seems to have done well in this regard: inflation volatility has declined and inflation expectations have stabilised around target since the introduction of inflation targeting (Figure 2.4). Exchange rate volatility has increased but this may be the converse of greater inflation stability. Output volatility has diminished, but this is also true elsewhere as all central banks have become more independent and forward-looking, so Norway’s relative standing is about the same (Table 2.1). Norway is also susceptible to real oil price cycles even though the foreign investments in the State Pension Fund may to a certain degree neutralise the impact of such cycles (see Annex 1.A1).

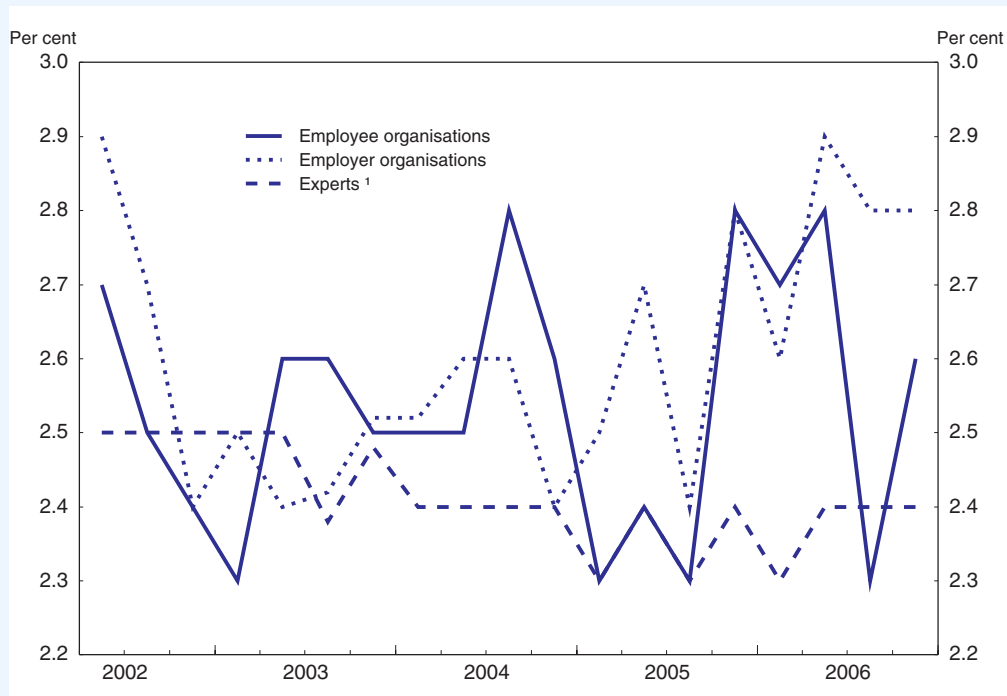
Box 2.1. The institutional framework for macroeconomic stabilisation (cont.)

Is it robust?

The framework has adapted as circumstances require, and flexibility is an important component of its robustness:

- Globalisation has diminished policy control over long-term rates. Hence, starting in 2005, Norges Bank took the risk of publishing its own policy interest rate path in an effort to better influence market expectations of future rates. Its communication of how it sees the economy functioning and how it arrives at policy conclusions are increasingly transparent.² It is careful to explain inflation forecast errors to maintain credibility, and has widened the field of underlying inflation indicators it examines to improve forecasting ability. The success of this approach can be seen in declining market reactions to policy pronouncements.³ Moreover, market interest rate expectations are well aligned with the Bank's forecast in the first three to four quarters. Implied market forward rates are, however, below Norges Bank's further out on the curve (see Figure 2.6). It is hard to ascertain whether this reflects differences in expectations or risk premia.
- The oil fund mechanism does not specify the actual use to which the money should be put in future, and its recent renaming to Government Pension Fund Global is only indicative and not a legal obligation. The fiscal policy rule is likewise vague about the extent and duration of deviations from the 4% spending rule that are permitted under conditions of market or economic volatility. This approach may intentionally leave a margin for compromise and manoeuvre that helps hold at bay political/populist temptations to raid the fund.

Figure 2.4. **Inflation expectations**
Expected consumer price inflation, 5 years ahead



1. Employees in financial industry, macro analysts and academics.

Source: TNS Gallup.

1. See OECD (2005a) for a complete description of the Government Petroleum-Pension Fund.
2. See OECD (2005a) for a description of past progress in Norges Bank communications and transparency.
3. See *Inflation Reports* 2/06 and 3/06.

Table 2.1. **Output, inflation and exchange rate volatility**
Standard deviation of annualised growth rate

	1980-1990			1990-2000			2000-2005		
	Output ¹	Inflation ²	Effective nominal exchange rate	Output ¹	Inflation ²	Effective nominal exchange rate	Output ¹	Inflation ²	Effective nominal exchange rate
France	1.8	4.5	6.9	1.7	1.1	4.7	1.7	1.0	3.6
Norway	4.1	4.4	6.1	4.7	3.5	6.0	3.8	3.2	9.0
Netherlands	4.9	3.8	7.9	2.5	1.9	5.9	1.7	2.0	4.7
Sweden	6.0	3.8	8.4	3.3	5.3	12.5	1.6	2.2	7.4
Finland	5.5	3.6	5.7	4.6	2.5	10.8	3.0	2.7	4.1
USA	3.9	2.5	14.6	2.2	1.2	11.1	2.0	1.0	8.7
UK	3.5	3.3	15.4	2.2	2.8	11.8	1.0	1.1	6.9

1. Mainland GDP in volume.

2. Calculated from consumer price deflator.

Source: OECD calculation.

has earned a high reputation for its conduct of monetary policy and is considered an exemplary inflation-targeting central bank. The current imported low inflation has provided a golden opportunity to consolidate its credibility, by keeping inflation impressively low without the need for any restriction. Fiscal policy has held in reasonable check the pressure to spend more of the oil revenues and the oil fund mechanism is often considered a world-class model for managing oil revenues. The current oil price hike has likewise given fiscal policy a golden opportunity to consolidate its credibility, allowing respect of the deficit target without the need for restriction. It will be critical to further build up credibility while global conditions are favourable. Globalisation's shocks pose challenges even to such a highly successful policy framework.

Monetary policy facing high uncertainty

The Norwegian central bank has set its interest rate path so as to promote a “soft landing” for the economy, while deferring attainment of the inflation target: endogenous cyclical slowing in housing, oil investment and foreign demand should be sufficient to offset continuing, albeit diminishing, policy ease. The OECD expects that such a benign scenario will come about only with a more aggressive tightening (Table 2.2). The success of the gradualist strategy, especially as interest rates remain so low for so long, requires an adequate assessment of the state of the economy and a good knowledge about the policy transmission mechanism. Such an understanding is challenged by major structural changes related to intensive global competition and financial market innovations. With new uncertainty about the functioning of the economy and the exogenous shocks affecting it, Norges Bank faces several sharpened dilemmas.

Inflation forecast uncertainty

At the outset of its inflation targeting mandate, Norges Bank emphasised CPI-ATE (CPI excluding energy price and indirect tax changes) as a measure of underlying inflation. However, low inflation as measured by CPI-ATE may be providing misleading signals insofar as rising world energy prices and falling manufactures import prices are complementary aspects of the same globalisation process.¹² If equilibrium oil and electricity prices have shifted upwards due to permanent higher global energy demand but

Table 2.2. **Economic projections**

	2003	2004	2 005	2 006	2 007	2 008
	Current prices NOK billion	Percentage changes, volume (2003 prices)				
Private consumption	720.0	4.7	3.4	3.9	3.2	2.9
Government consumption	354.2	2.2	1.5	2.0	2.7	2.6
Gross fixed capital formation	276.6	8.1	10.9	6.7	6.1	2.6
Final domestic demand	1 350.9	4.8	4.5	4.1	3.8	2.7
Stockbuilding ¹	14.3	1.2	0.2	0.4	0.0	0.0
Total domestic demand	1 365.1	6.1	4.6	4.5	3.7	2.7
Exports of goods and services	637.4	0.6	0.7	1.8	3.4	3.8
Imports of goods and services	425.8	8.9	7.4	7.9	4.9	4.3
Net exports ¹	211.6	-2.2	-1.8	-1.4	0.2	0.6
GDP at market prices	1 576.7	3.1	2.3	2.4	3.2	2.7
GDP deflator	–	5.6	8.4	7.7	2.0	3.8
<i>Memorandum items</i>						
Mainland GDP at market prices ²	–	3.8	3.7	3.7	3.0	2.6
Consumer price index	–	0.5	1.5	2.2	1.7	2.6
Private consumption deflator	–	0.9	1.2	2.2	2.1	2.6
Unemployment rate	–	4.5	4.6	3.6	3.3	3.4
Household saving ratio ³	–	9.6	12.4	5.2	5.6	5.9
General government financial balance ⁴	–	11.4	16.2	19.3	18.0	18.1
Current account balance ⁴	–	13.6	16.6	20.0	20.2	21.5
Short term interest rate	–	2.0	2.2	3.1	5.0	5.6

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).

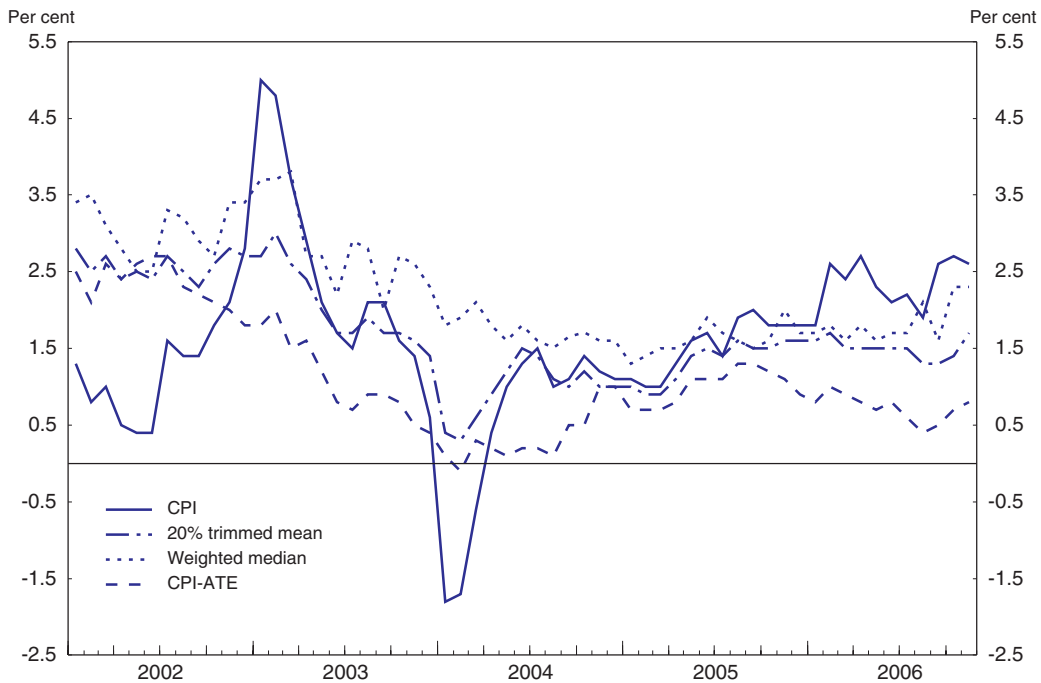
1. Contributions to changes in real GDP (percentage of real GDP in previous year), actual amount in the first column.
2. GDP excluding oil and shipping.
3. As a percentage of disposable income.
4. As a percentage of GDP.

Source: OECD Economic Outlook 80 database.

non-energy import prices have shifted downwards (especially for Norway, see Chapter 1) due to a higher global capital stock and expanded worldwide labour supply, then the wedge between CPI and CPI-ATE has been disturbed by a major shock which may take a while to close. It could even take longer than the horizon of the Bank's inflation forecasts.

Norges Bank has begun to publish alternative measures that strip out price components with large fluctuations (Figure 2.5).¹³ The indicators suggest somewhat higher underlying inflation than CPI-ATE, though these may be not so easy to communicate, or anchor to, as they are statistical constructs. The Bank has also noted in recent communications that CPI-ATE has tended over time to under-predict headline inflation by about 0.3 percentage point. In its Inflation Reports and the press releases following the interest rate meetings, the Bank now states its view on current core inflation in terms of an interval. Moreover, the Bank has underlined that the attainment of the inflation target over time should be measured by CPI. In its recent Inflation Reports the Bank has introduced a forecast of CPI with a separate fan chart around it in addition to the forecast of CPI-ATE. In mid-2004 the Bank reformulated its fixed two year horizon, stating that it will aim at meeting the inflation target within a reasonable time horizon, normally 1-3 years. The relevant horizon will depend on disturbances to which the economy is exposed. The Bank should strive to develop and communicate appropriate measures for underlying inflation.¹⁴

Figure 2.5. **Various measures of underlying inflation**
12-month rise



Source: Norges Bank.

However, problems persist. Even though for the time being, policy enjoys high credibility as the overall economic outcome is very satisfactory – low inflation with high growth – the ultimate goal of inflation targeting is to firmly anchor inflation expectations. The Bank has put stress on designing an interest rate path that “looks good” (Qvigstad, 2006), based on the following expanded list of criteria: anchoring inflation expectations; getting the balance between inflation and output right; robustness with respect to alternative assumptions; interest rate smoothing; financial stability; and cross-checks with simple monetary policy rules. The grounding of interest rate projections in an empirically valid model for monetary policy analysis, leading to best possible inflation forecasts contingent upon this future interest rate path, seems critical in order to assure such a result (Box 2.2). If benign supply side shocks persist and inflation expectations are well anchored at the target Norges Bank should perhaps allow itself longer than 3 years to reach its inflation target, while raising interest rates now in order to stabilise the economy.

Financial stability (asset price) concerns

An unfolding policy uncertainty relates to adverse trends in money and credit aggregates, due notably to fast rising household indebtedness. Norges Bank places emphasis on demographic and other structural factors in the explanation of excess housing demand and rising prices. However, like in other countries, the extended period of low long-term interest rates could well have reinforced these trends. Increasing indebtedness among groups of households increases the risk of future adjustment costs, especially in the case of sharper than foreseen monetary policy tightening in the next year or two. History shows that the larger threat to financial stability nevertheless derives from

Box 2.2. Inflation forecasting by the central bank

The credibility of the inflation targeting regime rests fundamentally on the ability to make reasonably accurate inflation and corresponding interest rate forecasts given real time information and understanding of the policy transmission mechanism. This becomes all the more important with the lags in transmission of monetary policy, which the Norges Bank has itself identified (quoting Milton Friedman) as “long and variable”. The quality of forecasts of the common explanatory variables for inflation, *viz.* wages, exchange rates, foreign prices, and the output gap, are essential inputs into this process, so that unforeseen movements in any of these should be traceable to genuine exogenous shocks, not endogenous forecast failures. These will require data-consistent estimates or calibrations of the parameters and lags involved in the endogenous determination of these variables, *inter alia* via domestic interest rates, and of their relationship to the dynamic core inflation process.

Since the output gap – like underlying inflation – is itself unobservable, getting an accurate reading on the extent of economic pressures, and hence future inflation, is a main challenge and source of uncertainty, and indeed the starting point of the whole forecasting exercise (see Kloster, 2006). Norges Bank has perfected its information gathering tools with the help of a strong regional network providing information ahead of the formal data issued by Statistics Norway, which gives a good idea of resource tightness in the economy. Hence, the quality of data going into the decision process seems adequate, though the thrice-yearly frequency of the inflation report at some point lags the availability of quarterly data national account releases, as discussed in Dørum and Holden (2006). The short term estimates of the output gap and underlying inflation, and important exogenous variables, then feed into the Bank’s “core model” of the macro economy with parameters calibrated in accordance with economic theory and available empirical evidence (see Husebø *et al.*, 2004). This model produces interdependent forecasts of the key macroeconomic variables (output gap, inflation, interest rate, exchange rate) in an interactive process with a surrounding system of smaller models, as well as an element of judgement (see Koster and Solberg-Johansen, 2006). Using a variety of models is seen as a way to reduce inherent modelling uncertainty.

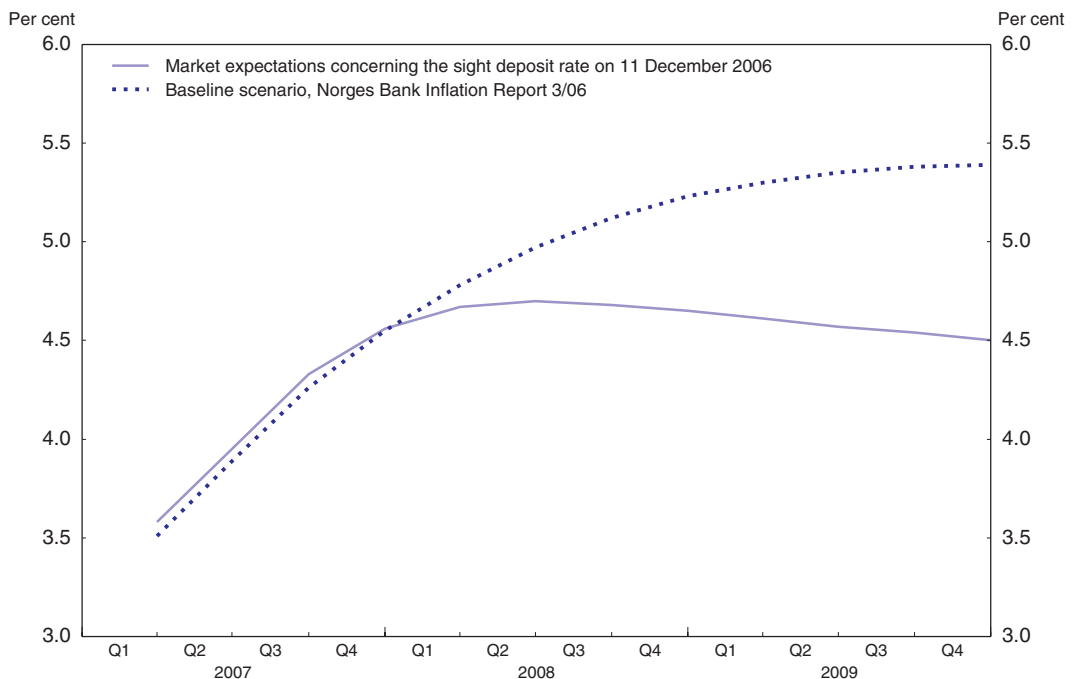
Norges Bank’s forecast of CPI-ATE inflation has been characterised by significant errors, sometimes even in the first forecast quarter, since 2002. It has attributed the negative surprises to unforeseen shocks in import prices, the exchange rate and increased competition in domestic markets. For the forecasts made in 2002 and 2003, CPI-ATE outcomes ended up frequently outside the 90% confidence interval, which constitutes a forecast failure. As this should be a rare, not recurrent event, the confidence intervals shown around the central forecasts appear to exaggerate the precision of the forecasts (confidence intervals shown by the Swedish Riksbank are for example much wider). The Bank apparently got a better handle on the inflation process, allowing it to markedly reduce its inflation forecast errors especially after the first quarter of 2005, by taking into account the rising share of low-cost imports in total imports due to domestic demand shifts toward such goods (see Åserud, 2005). Still, Dørum and Holden (2006) consider that true uncertainty is likely to be greater than indicated by the fan charts.

firms’ profitability, which is now robust. But looking forward there are risks. Firm profits are sensitive not only to household demand but also, in a very open economy, to fluctuations in the exchange rate.

Pursuing financial stability in the context of flexible inflation targeting is not straightforward, particularly with a supply shock that moves inflation and output in different directions. In general, it is not possible for the central bank to also target financial stability so long as it has only one degree of freedom (*viz.*, interest rate level or, alternatively, the speed at which inflation target is approached). It could try to vary the policy horizon beyond that needed to stabilise inflation and output only, although this depends on the choice of financial indicator – if it is the firm bankruptcy ratio, a longer horizon would be needed to allow a more gradual adjustment of the exchange rate to which this indicator is particularly sensitive; but if household debt, a shorter horizon may be preferable because the faster the rise in the interest rate the less likely an unsustainable pile up of mortgage debt. Either way, though, variability of the main targets might increase.¹⁵

By publishing its future interest path, starting with *Inflation Report 3/2005*, the Bank is better positioned to convey the message that the low interest rate level will not prevail, besides improving the predictability of policy and its ability to influence inflation expectations more generally.¹⁶ Rational agents would cut back their borrowing if they saw the rising costs of these loans in the future. However, this seemed to have had little impact as debt growth has continued unabated and market interest rate forecasts remain below those of the central bank (Figure 2.6). Hence, it seems the best that the Bank can do now is to keep a close eye on financial vulnerability indicators and factor them adequately into its inflation feedback mechanism and output forecasts. Indeed, this is what it indicates it is doing.

Figure 2.6. **Future interest rate path: Norges Bank vs. market**¹



1. Derived from estimated forward rates. A credit risk premium and a technical difference of 0.20 percentage point were deducted in calculating the sight deposit rate.

Source: Norges Bank.

In the current situation of emerging housing market imbalances and low inflation, Norges Bank may be doubly sensitive to the exchange rate consequences of its tightening

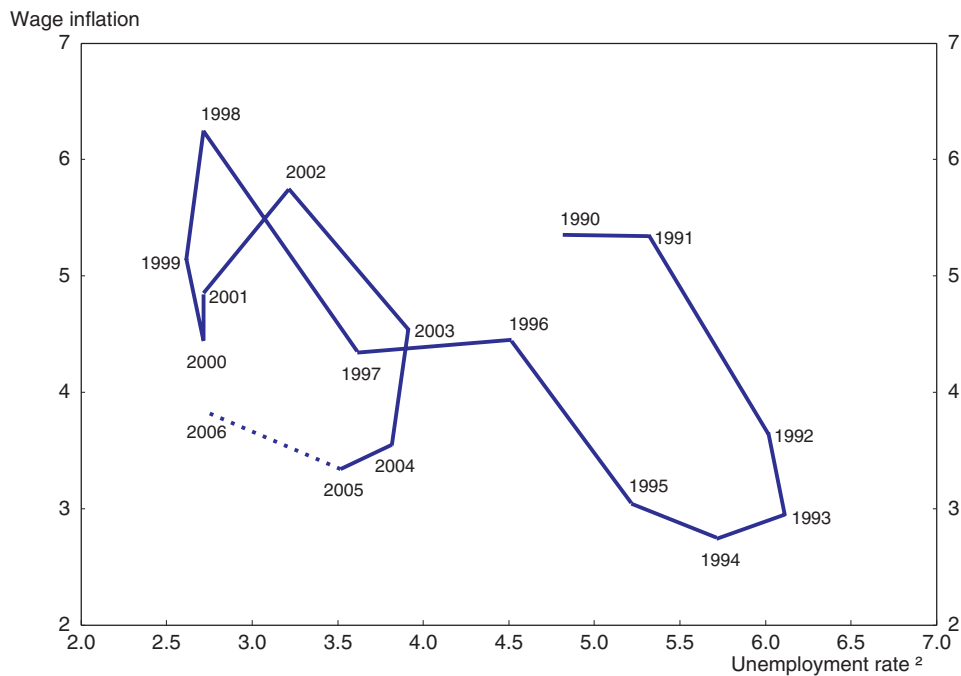
actions: not only could it push inflation down even lower by driving the exchange rate up, it could also thereby exacerbate financial fragility concerns. The Bank is adamant about not targeting asset prices – whether house prices, exchange rates or equity valuations – and rightly so, but it obviously places high weight on (and is constrained by) the exchange rate as an intermediate variable whether it is finally concerned about inflation, output, or financial stability. The exchange rate transmission channel is, after all, the quickest and perhaps strongest of the three (the other two being demand impacts of interest rates and price impacts of the output gap).¹⁷

Uncertainty about the “Phillips curve”

Perhaps the most critical uncertainty lies in the relationship between labour market tightness and wage developments. A key part of the inflation process resides in wage behaviour. A possible downward shift of the NAIRU linked to greater labour market competition implies a smaller hypothetical “sacrifice ratio”, that is, by how much inflation rises in response to a given reduction in unemployment (Bean, 2006 sees this as “flattening” of the Phillips curve).¹⁸ A lower NAIRU will increase the resource utilisation of the economy and reduce the structural unemployment. It also implies that inflation will be curbed at lower unemployment rates than before. Norges Bank has under uncertainty about the NAIRU to decide whether it is safer (or conversely more costly) to err on the side of too much or of too little restriction.¹⁹

The latest Norges Bank Watch report (Dørum and Holden, 2006) advises erring on the side of low inflation, which actually should be seen as a chance to lower unemployment more than would otherwise be possible rather than as a threat to policy credibility. This in turn implies the need to step up the present pace of policy tightening. If it turned out that the Bank was tightening too fast after all, say if the economy slowed more than expected, it could easily correct the mistake by easing back down, having more room to do so; but if it made the opposite mistake of tightening too slowly, thereby provoking an uncontrolled overheating, it could be much harder to get the inflation down again. However, the Bank's overall concern must be to anchor inflation expectations on target.²⁰

It is also possible that the Phillips curve has not changed after all, and that wages will respond to the 3¼ per cent (and falling) unemployment rate much as in the past (Figure 2.7). If that were the case, a forward looking policy would probably have implied a faster tightening, geared to attaining the neutral rate of interest by end 2007 at the latest. Since Norges Bank did not do this, then it may have believed that the Phillips curve has indeed shifted, at least temporarily, not least because memories of severe monetary tightening in 2002 and of the worldwide “jobless recovery” are still strong, and unions – who fundamentally care about employment – have internalised the Bank's policy response to wage immoderation.²¹ However, this inclination may be changing. In its 1st of November 2006 monetary policy strategy meeting, Norges Bank announced that, because of signs of increasing resource tightness and incipient wage pressures, it was raising its projected policy interest rate path by about ½ percentage points on average, implying that the neutral rate of interest would now be reached in 2008, instead of 2009, and that inflation was now expected to increase at a somewhat later point in time. It seems that publishing an explicit interest rate projection has ensured greater policy consistency and stimulates the Bank to explain changes in its strategy satisfactorily.²² Indeed, the greater monetary policy transparency has been working very well.

Figure 2.7. Phillips curve¹

1. Data for 2006 are estimations.
2. Registered unemployed persons as a percentage of labour force.

Source: Ministry of Finance, National Budget 2007.

Box 2.3. Key recommendations for monetary policy

Because of the comfort of the current economic situation and the risks of negative developments, monetary policy must be resolutely forward looking.

- Given that low inflation and high oil prices are driven by the global supply shock, which is of unknown duration but highly beneficial to the economy, and the need to improve the credibility of conditional inflation forecast, allow more time to reach the 2½ per cent inflation target. The Bank should strive to develop and communicate appropriate measures for underlying inflation.
- The recent decision to speed up the pace of tightening was appropriate since it mitigates the risk of overheating in the light of long policy lags to inflation. However stand ready to pick up the tightening pace further if domestic capacity constraints persist.
- Do not attempt to target house prices, equity prices or the exchange rate. The Bank should take impacts of house prices only to the extent that they affect the outlook for inflation and the real economy.
- Review inflation forecasting methods to improve accuracy of near term forecasts and thus avoid having to change the interest rate path too often; correct the impression of high certainty in the inflation fan charts; consider publishing the details of the inflation forecasting model as a further step in policy transparency; pursue research on obtaining data consistent parameters and lags underlying the Bank's quantitative model.

Notes

1. A growing body of literature shows that reduced risk levels make asset prices more vulnerable to changes in risk perceptions. Hence, volatility can be higher because risk margins are so thin.
2. The latest IMF World Economic Outlook, November 2006, is predicting a sharp drop of non-oil commodity prices by the end of the decade.
3. Household and enterprise debt grew at 15 and 18% respectively annual rates in the first 9 months of 2006.
4. See OECD (2005).
5. This could reflect that the external positive supply shock has been common to all OECD countries, with China putting further downward pressure on OECD wide interest rates through its policy of holding US Treasuries instead of letting its currency appreciate. Norway is of course following a similar strategy regarding its oil receipts, albeit holding a more diversified portfolio of foreign assets than is China.
6. Norges Bank estimates this effect at around 0.2 percentage point currently.
7. Even though the overall debt-to-asset ratio is satisfactory, those individual households that are most heavily indebted, typically young first-time owners and lower income groups are not the same as those who own the assets. See Riiser and Vatne (2006).
8. Empirical estimates indicate that for each 1 percentage point increase in the projected medium-term policy interest rate path, house prices and housing wealth could fall by over 3% by 2009 (Berge *et al.*, 2006).
9. In a low inflation environment, a fall in house prices is more likely to be needed in order to realign relative prices. This could have especially damaging impacts on output growth, as housing wealth effects have been estimated to be strong in Norway, on the order of those estimated for the United States.
10. The OECD estimates the NAIRU at 4.14%.
11. See *e.g.*, Jafarov (2005) which finds a notable estimated impact of domestic unit labour costs and output gap, as well as imported prices (representing foreign labour costs and output gap), on domestic core inflation. Akram and Nymoen (2006) estimate models of the inflation process which depends on imported inflation and domestic wages, themselves a function of the unemployment rate in Phillips curve type relationship. Nymoen (2005) presents a reduced form type relationship relating core inflation directly to the unemployment rate, foreign inflation, domestic and foreign interest rates and exchange rates.
12. See also S. Checcetti, "Core inflation is an unreliable guide", *Financial Times*, 12 September 2006.
13. This is line with recommendations in the previous Survey.
14. The Bank of England and the ECB have recently tended to focus more on headline than on core inflation. On the other hand, the US Federal Reserve continues to consider core inflation as the best indicator of underlying inflation.
15. See Akram *et al.* (2006).
16. See Woodford (2006) for a discussion of publishing central bank interest rate projection.
17. The previous Survey of Norway suggested that the Bank be clearer about not targeting exchange rates as an end in themselves, which would be antithetical to inflation targeting, and the Bank has been careful in its communications to stress this point. At the same time, the last two Norges Bank Watch reports seem to have chided the Bank for not taking stability of the exchange rate more seriously as an end in itself, as is specified in the central bank's mandate written by the Ministry of Finance.
18. Indeed, the labour unions believe that the numbers of Polish and Baltic workers are much higher than estimated and that the threat of outsourcing is larger than commonly appreciated (*source*: LO discussions with OECD mission in October 2006).
19. Interestingly, a few years ago central banks such as the Federal Reserve were worried about the excessive risks of deflation. Thus, interest rates may have then been kept low longer than otherwise in order to "take out an insurance policy" against the perceived costlier risk. The present situation would seem to be the opposite.
20. In any event, the transmission lags from interest rates to inflation are normally longer than those to output.

21. Besides, there is no downward trend in unemployment; statistically trend unemployment remains around 4%, the threshold below which wage pressures have typically emerged in Norway.
22. See Berge (2006).

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Chapter 3

Putting public finances on a sustainable path

Prudent management of national resource abundance has been the hallmark of Norwegian public governance and a cornerstone of Norway's economic success. Norway has rationally decided to exploit finite natural resources in the long term interests of all its citizens and descendants. The more oil money that can be saved now, or else used to improve the foundations for growth, the more easily can fiscal solvency and high growth be secured as the population ages and the pension system matures. Notwithstanding the illusion of a relaxed long run budget constraint, enhanced by the oil price windfall, expansive spending programmes must be resisted and budget room used for pension pre-funding. This will involve a determined scrutiny of expenditure programmes and high transparency of tax and subsidy policies. In particular, the growing use of oil money to subsidise widespread non-employment by various public schemes needs to be critically examined. Pension and welfare system reform is needed to encourage individual responsibility and longer working lives in the light of a massive rise in projected age-related public spending, the highest in the OECD.

The oil price revenue windfall presents both opportunities and significant challenges for fiscal policy. On the basis of oil at \$60 per barrel, the value of the Government Pension Fund – Global (GPF-Global, previously the Government Petroleum Fund) at its peak (around 2020) would be almost double that expected when the oil rule was first created, greatly increasing the injection of oil money into the economy and the fiscal expansion during the transition to the steady state non-oil deficit (see Figure 1.13). This could bid up inflation and deliver a too strong real exchange rate appreciation. The oil boom also paradoxically clouds the picture for longer run fiscal sustainability. By inducing complacency about the long run state of the public finances, it could worsen the gap by reducing incentives to reform and make social compromises.

Fiscal policy in 2006 and 2007: likely pro-cyclical while respecting the rule

Even though the main purpose of the fiscal rule is to smooth the absorption of oil revenues and stabilise the real exchange rate through time, it plays a supplemental output stabilising role in two critical ways. *First*, it stabilises the fiscal impulse over and above longer term smoothing by allowing deviations from the 4% rule to counteract large cyclical variations in economic activity or sharp swings in the value of the fund (“considerable emphasis must be put on stabilising the economy”). *Second*, the rule is expressly defined in terms of the structural non-oil balance, allowing full play of the automatic fiscal stabilisers in contrast to inherently pro-cyclical rules on the actual deficit. This eases the burden for monetary policy.

The recent evolution of the budget shows these principles to be intact but coming under strain. The actual non-oil deficit has been falling since 2003 as the economy strengthened, displaying the operation of the automatic stabilisers. The structural non-oil deficit, conversely, has been rising, although not as much as the expected real return on the GPF-Global.¹ The overshoot from the 4% fiscal rule has thus been reduced (Table 3.1). The estimated structural

Table 3.1. **The non-oil structural balance**
National budget 2007, NOK billion

	2004	2005	2006	2007
Non-oil fiscal budget deficit	79.2	64.7	59.5	57.0
- Transfers from Norges Bank ¹	4.9	5.1	5.2	5.6
- Net interests ¹	3.9	2.2	2.0	-4.6
- Extraordinary items	6.5	0.4	1.6	0
- Cyclical corrections	17.6	5.1	-12.3	-15.1
= Structural non-oil budget deficit	52.2	52.4	62.9	71.0
<i>Memorandum items:</i>				
Structural non-oil budget deficit as % of mainland trend GDP	3.9	3.8	4.3	4.6
Change from previous year in percentage points	0.5	-0.2	0.5	0.3
Mainland output gap as % of mainland trend GDP	0.8	1.4	2.0	2.0
Structural non-oil budget deficit as % of GPF-Global	6.5	5.5	4.7	4.0
Overshoot	2.5	1.5	0.7	0.0

1. Deviation from trend.

Source: Ministry of Finance and OECD Economic Outlook 80 database.

Table 3.2. **The 2006 Budget: final vs. initial**
NOK billion

	Initial budget proposal ¹	Final Budget Revision ²	Change
Revenues excl. petroleum activities	585.6	607.9	22.3
- Expenditures excl. petroleum activities	656.4	664.9	8.8
= Non-oil budget surplus	-70.8	-57.1	13.4
+ Net revenues from petroleum activities	327.9	357.9	30.0
+ Dividends on the Pension Fund – Global	59.3	49.0	-10.3
= Consolidated surplus	316.4	349.8	33.1
<i>Memorandum item:</i>			
Structural non-oil budget surplus	-65.9	-62.5	3.4

1. November 2005.

2. December 2006.

Source: Ministry of Finance.

non-oil deficit for 2006 is somewhat lower than initially budgeted (Table 3.2), while the government gets back onto the 4% path in its budget for 2007. These developments send encouraging signals for fiscal credibility. Nonetheless, the rule should have ideally been undershot in both 2006 and 2007, as the rising structural deficit to GDP ratio was pro-cyclical in those booming years. There has also been a re-orientation toward higher spending and tax levels, as: i) in the 2006 Budget structural tax revenues have been revised up, and part of this windfall gain has been channelled into higher spending rather than used to reduce the deficit (Table 3.2); and ii) the 2007 Budget reverses the rest of the (modest) 2005 tax cut, bringing the tax level back to the 2004 level (below). It may be questioned whether the extraordinary run up in world commodities prices is not exaggerating the receipts being used as a base for increased spending-revenues generated by terms of trade profits could one day falter but spending increases are hard to reverse (Box 3.1)

Box 3.1. Adjusting the fiscal stance for terms of trade effects

It is possible that the “true” structural non-oil deficit is larger – hence the fiscal stance weaker – than it appears because of extraordinary fiscal receipts arising from cyclical terms of trade gains which have been mistakenly attributed to the fiscal effort. Such windfall receipts have been very large for OECD commodity rich countries like Australia and Canada, but cyclical adjustment methods strip out the impact of the domestic output gap only. Excluding also windfall terms of trade effects would imply a weaker underlying balance, hence a potential fiscal problem once the commodity cycle inverts. It is commonly thought that Norway is not concerned by this problem, as oil sector revenues are indeed excluded from the balance before any adjustment is made. However, this may not be sufficient. Chapter 1 shows that the mainland export structure is substantially based on commodities apart from oil.

Turner (2006) performs an adjustment of the fiscal stance for terms of trade effects in the case of Australia. This requires estimating a terms of trade gap in addition to the standard output gap (summing up to the “real income gap” for a commodity intensive country), then historically estimating the sensitivity of fiscal receipts to both gaps. For Australia, the terms of trade semi-elasticity of the company tax is especially high – double that of the output elasticity – as most terms of trade gains are channelled to the economy via profits. For 2005, a year of large cyclical commodity price increases, the temporary component of the Australian fiscal balance including such terms of trade effects was about 1½ per cent of GDP, whereas according to the standard OECD output gap methodology it was close to zero.

It will be important to undershoot the deficits permitted by the fiscal rule significantly over the remainder of the medium term horizon (2008-2011). A too rapid injection of oil money may end up creating inefficient public spending and inflation. This is already the concern in 2007, when large construction projects are being planned at a time when resource tightness in construction is acute. This could serve to bid up wages. On top of such efficiency arguments, there are equity ones. In particular, the first five years' deficit overshoots should be fully compensated in order to preserve the fund's capital for future generations as intended and to help pay for the pensions of the current one. The ability to do this under present high growth and high oil price conditions coincides ideally with the responsibility to avoid inflationary waste.

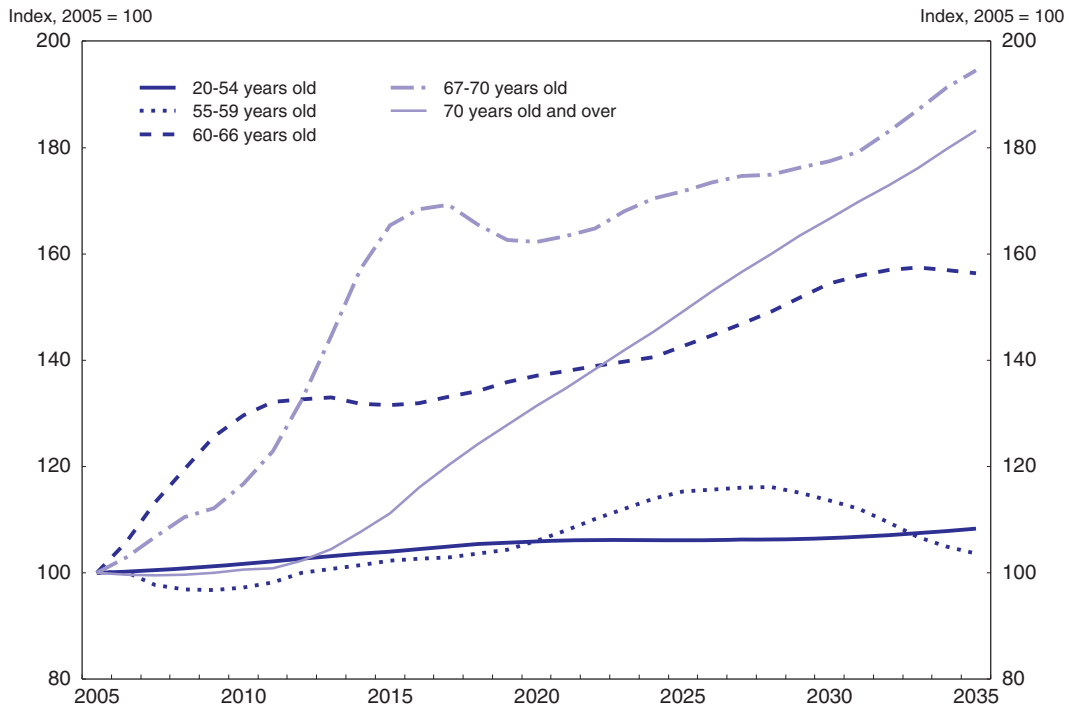
Ageing, oil fund income and the fiscal gap

Over the coming decades, declining petroleum revenues, slower growth in the tax-paying labour force, and rising ageing-related expenditures will undermine sustainability of the public finances. If nothing is done to increase the flow of government revenues available for pension and health care costs, via reforms, either the oil fund will have to be spent or (equivalently) debt will have to be issued, implying a need for even higher tax increases or spending cuts later on.

Ageing pressures on public spending

As elsewhere in the OECD, at the root of the long run fiscal funding problem lies a rising old-age population relative to the working-age population (Figure 3.1). The ratio of citizens past official retirement age to those of working age will decline slightly until

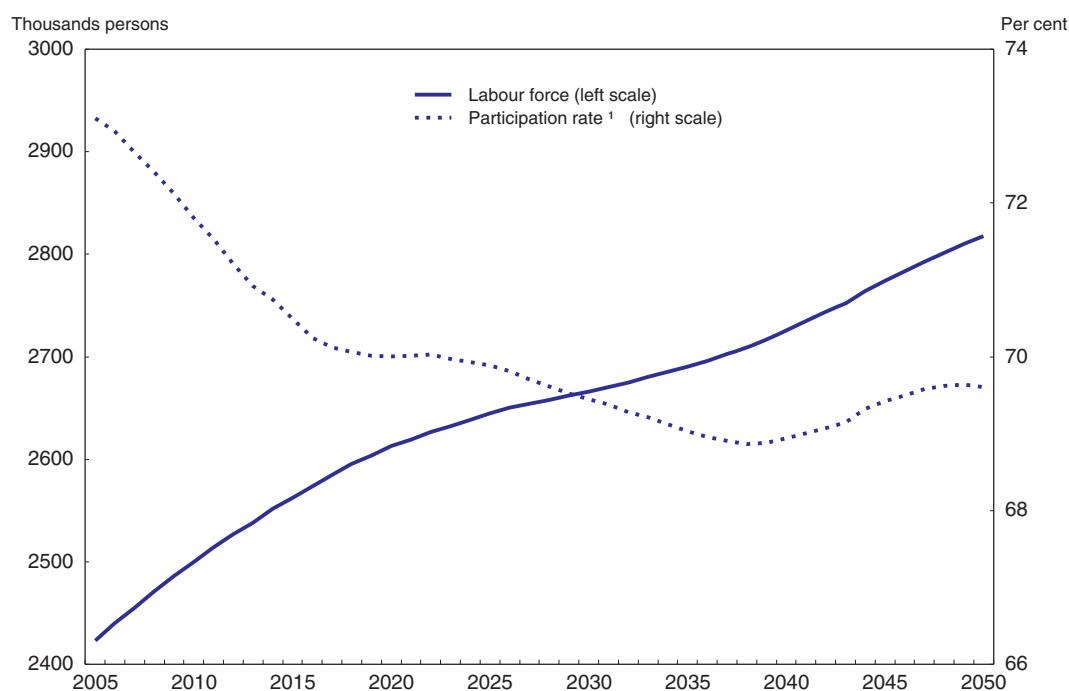
Figure 3.1. **Demographic development**



Source: Statistics Norway.

about 2012 and then rise rapidly over subsequent decades because of longer lives and fertility below the reproduction level. A particularly rapid increase in the age group 60-66 years from 2005 reflects the high number of births in the early years after the Second World War. A still relatively high fertility rate (1.8) makes the demographic challenge somewhat less critical in Norway than in many other European countries, and, together with some immigration, allows for a slight continuing rise in the working-age population through time. But a projected secular decline in the participation rate due to demographic changes (assuming current age-specific participation rates) would set a limit to the rise in the workforce (Figure 3.2). With age-specific participation rates currently among the highest in the OECD area, the potential for increased participation rates is also likely to be more limited than in other OECD countries.

Figure 3.2. **Workforce development**

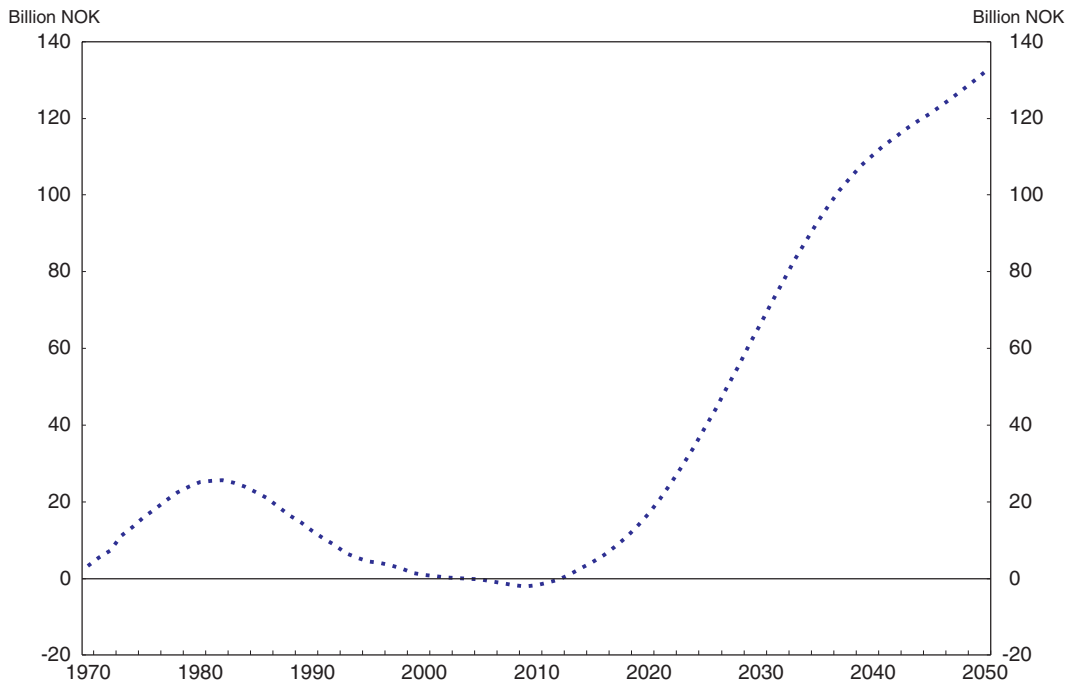


1. Working age definition corresponds to 16-74 years old.

Source: Norwegian Ministry of Labour and Social Inclusion.

Such trends cannot but have a marked impact on the public finances. On a net basis (after subtracting tax payments), demographic developments *per se* have strengthened public finances in real terms since 1980, reflecting temporarily favourable demographics due to the sparse number of births during the interwar years. They will continue to reduce public expenditures slightly until about 2010 (Figure 3.3). Public expenditure will then rise in real terms as the number of retirees begins to accelerate. The relatively late maturation of the Norwegian pension system (created only in the 1960s) implies that the total increase in public expenditures would be even stronger. Starting around 2025, retirements of large cohorts of women who joined the workforce in the 1970s as public jobs expanded will also pull expenditure upwards. As a share of mainland GDP, old age pension expenditure before

Figure 3.3. **Net impact of ageing on public finances**
Expenditures less taxation of cash benefits compared with 2004, 2004 prices



Source: Ministry of Finance.

reform rises from around 6% today to almost 15% in 2050. The implied 9% of GDP increase is far above the 3½ per cent average for the OECD countries reported in the latest OECD projection exercise (Casey *et al.*, 2003).

The rise in old age pension spending, large as it is, does not capture the full extent of ageing costs. Health costs will rise with a shifting demography, insofar as older people on average use up more health care resources. In addition to the age-related increase, health expenditures for a given age-structure could well rise with the income effect, reflecting the effect of technology and relative price movements in the supply of health services. Recent OECD estimates suggest a 3-7% of mainland GDP rise in public health and long term care costs by 2050 in Norway, which is above the OECD average notwithstanding the more moderate demographics (Table 3.3). Keeping to the lower end of this range would require reforms to eliminate the historical tendency for health expenditures to grow faster than income.

A further age-related cost is attached to the large group of premature labour market leavers, centred on the age of 59½, via early retirement programmes or disability schemes. This group has been rising very rapidly (Chapter 4) and related support programmes absorb a substantial share of public spending (Table 3.4). If the same trends were to continue, it would add again to age-related costs. The projections below implicitly assume that the age-specific proclivity to enter such programmes remains fixed (as assumed in Figure 3.2 above). On this assumption, the associated costs will keep rising purely because of cohort effects, and baby boomers have already started moving into their 60s, the high-risk group for early retirement and disability, as of 2005. This may, however, be optimistic as the

Table 3.3. **Public health and long-term care spending**
In % of GDP

Health care			Long-term care			Total				
2005	2050		2005	2050		2005	2050			
	Cost-pressure	Cost-containment		Cost-pressure	Cost-containment		Cost-pressure	Cost-containment	of which Demographic effect	
Australia	5.6	9.7	7.9	0.9	2.9	2.0	6.5	12.6	9.9	8.7
Austria	3.8	7.6	5.7	1.3	3.3	2.5	5.1	10.9	8.2	6.9
Belgium	5.7	9.0	7.2	1.5	3.4	2.6	7.2	12.4	9.8	8.2
Canada	6.2	10.2	8.4	1.2	3.2	2.4	7.3	13.5	10.8	9.3
Czech Republic	7.0	11.2	9.4	0.4	2.0	1.3	7.4	13.2	10.7	10.0
Denmark	5.3	8.8	7.0	2.6	4.1	3.3	7.9	12.9	10.3	8.9
Finland	3.4	7.0	5.2	2.9	5.2	4.2	6.2	12.2	9.3	8.1
France	7.0	10.6	8.7	1.1	2.8	2.0	8.1	13.4	10.8	9.6
Germany	7.8	11.4	9.6	1.0	2.9	2.2	8.8	14.3	11.8	10.1
Greece	4.9	8.7	6.9	0.2	2.8	2.0	5.0	11.6	8.9	6.5
Hungary	6.7	10.3	8.5	0.3	2.4	1.0	7.0	12.6	9.5	8.6
Iceland	6.8	10.7	8.9	2.9	4.4	3.4	9.6	15.2	12.3	11.0
Ireland	5.9	10.0	8.2	0.7	4.6	3.2	6.7	14.5	11.3	8.5
Italy	6.0	9.7	7.9	0.6	3.5	2.8	6.6	13.2	10.7	8.5
Japan	6.0	10.3	8.5	0.9	3.1	2.4	6.9	13.4	10.9	9.4
Korea	3.0	7.8	6.0	0.3	4.1	3.1	3.3	11.9	9.1	8.7
Luxembourg	6.1	9.9	8.0	0.7	3.8	2.6	6.8	13.7	10.6	8.2
Mexico	3.0	7.5	5.7	0.1	4.2	3.0	3.1	11.7	8.7	6.3
Netherlands	5.1	8.9	7.0	1.7	3.7	2.9	6.8	12.5	9.9	8.1
New Zealand	6.0	10.1	8.3	0.5	2.4	1.7	6.4	12.6	10.0	8.9
Norway¹	9.8	14.4	12.0	3.5	5.8	4.8	13.3	20.3	16.7	14.6
Poland	4.4	8.5	6.7	0.5	3.7	1.8	4.9	12.2	8.5	7.9
Portugal	6.7	10.9	9.1	0.2	2.2	1.3	6.9	13.1	10.4	9.0
Slovak Republic	5.1	9.7	7.9	0.3	2.6	1.5	5.4	12.3	9.4	9.1
Spain	5.5	9.6	7.8	0.2	2.6	1.9	5.6	12.1	9.6	7.4
Sweden	5.3	8.5	6.7	3.3	4.3	3.4	8.6	12.9	10.1	8.9
Switzerland	6.2	9.6	7.8	1.2	2.6	1.9	7.4	12.3	9.7	8.1
Turkey	5.9	9.9	8.1	0.1	1.8	0.8	6.0	11.7	8.9	8.5
United Kingdom	6.1	9.7	7.9	1.1	3.0	2.1	7.2	12.7	10.0	8.6
United States	6.3	9.7	7.9	0.9	2.7	1.8	7.2	12.4	9.7	8.3
Average	5.7	9.6	7.7	1.1	3.3	2.4	6.7	12.8	10.1	8.6

1. Norway expressed as a percentage of Mainland GDP.

Source: Adapted from OECD (2006), "Projecting OECD health and long term care expenditures: What are the main drivers?" OECD Economics Department Working Paper No. 477.

absence of any reforms in these schemes to date suggests that the trend to rising disability inflows at all age groups, including younger ones, could keep on going. Based mainly on the cohort effects, the estimates in Casey *et al.* (2003) imply a 2% of mainland GDP increase in early retirement costs, again the highest in the OECD. The implied rise in total age-related costs by 2050, including old-age pension, health/long term care and early exit schemes (the latter on optimistic assumptions) could thus reach 14-18% of mainland GDP.

The financing gap

The long run general government financing gap as calculated by the Norwegian government, measures government non-oil revenue plus the expected 4% return on the GPF-Global less the sum of pension expenditure and non-pension expenditure, given the

Table 3.4. **Selected budgetary income support schemes**

2007 NOK billion

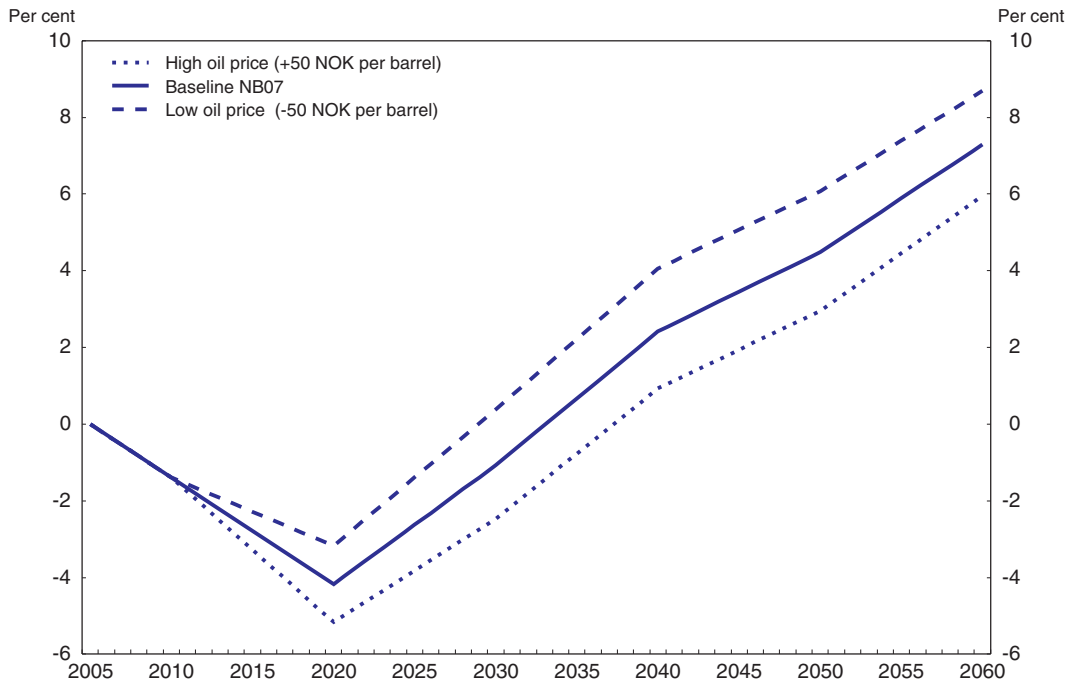
	2001	2002	2003	2004	2005	2006
NIS schemes:						
Sick leave	30.4	31.6	33.6	30.0	26.5	28.4
Rehabilitation	15.0	17.0	19.9	21.1	20.9	20.2
Disability	40.9	42.0	43.8	45.6	47.2	48.7
Old age pension	85.4	85.9	86.9	88.3	90.0	91.7
Family allowances and cash benefits	16.9	16.4	16.4	16.8	16.3	16.3
Medicinal and technical remedies (rehab)	12.4	13.7	14.2	14.9	14.8	14.7
Other:						
AFP subsidies	0.5	0.6	0.6	0.7	0.8	0.8
Public occupational pensions	11.3	12.0	12.5	13.3	14.0	14.6
Total	212.6	219.2	227.9	230.7	230.4	235.4
As % of mainland GDP	15.7%	16.0%	16.4%	16.0%	15.4%	15.2%

Source: Ministry of Finance and OECD Economic Outlook 80 database.

present tax system, pension system and standards for public services.² This shows a need for fiscal tightening of 4½ per cent of GDP by 2050 and 7¼ per cent by 2060. Oil will not solve the whole problem, therefore, and even if the oil price were to stay high (the long run price assumed in the baseline is \$35 per barrel), each extra \$10 in price would reduce the required fiscal effort by only about 1½ per cent of GDP (Figure 3.4). This gap should also be seen as a bare minimum: factoring in a further expansion of health due to the income effect would add another 2-6% to the required fiscal effort associated with ageing,³ and

Figure 3.4. **Income from petroleum will not suffice**

General government funding gap as a percentage of mainland GDP

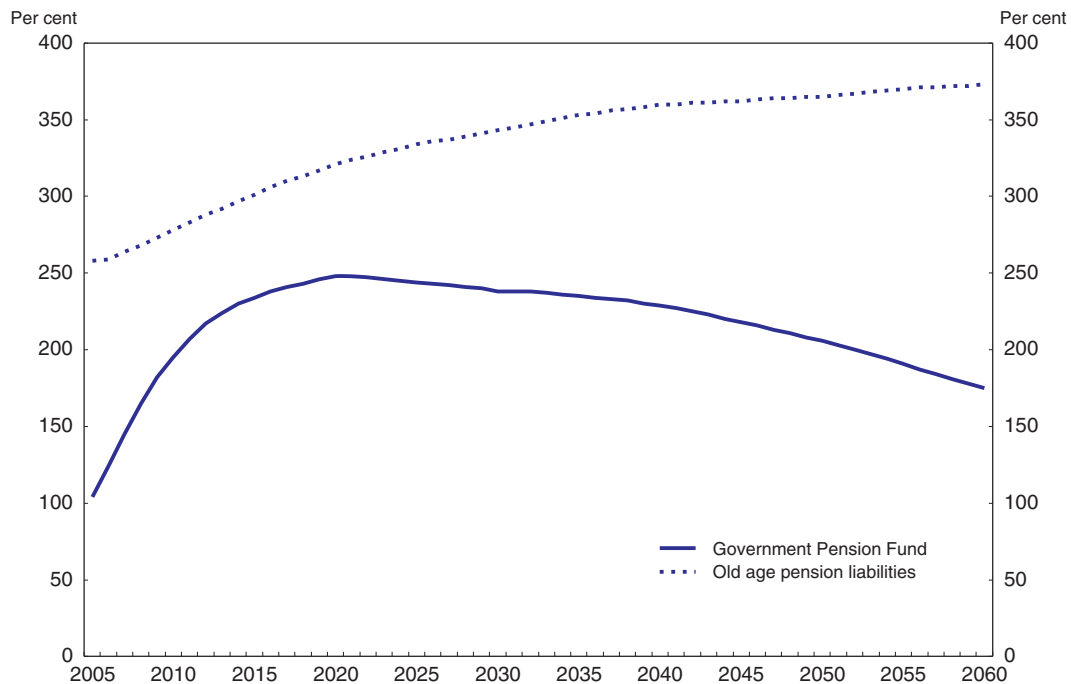


Source: Ministry of Finance.

further considering risks of continuing rises in structural inflows into early pensioner schemes dwarfs the significance of oil money even more. The oil wealth and the oil price rise offer only partial relief from the necessity for reforms.

Another way of seeing the problem is to compare the stock of liabilities at each moment in time with the value of the GPF. Presently, this difference is significant at around 150% of mainland GDP as the GPF is not that large as far as pension funds go,⁴ while Norway lags other countries in pension system reform. By 2020 or so, this gap shrinks notably because of a continuing rise in the fund's value, but by 2050, it will have again grown to 200% of mainland GDP on current projections. Even further out, the pension bill will still be rising and the GPF as per cent of GDP will be falling – as oil revenue inflows into the fund will have fallen below the level necessary to keep the value of the Fund constant as a share of GDP – meaning that the stock gap will only keep rising (Figure 3.5).⁵ Once again, it needs to be emphasised that rising health and early pensioner costs are not yet fully factored into this picture. Sufficient tightening of the fiscal rule could stabilise the value of the fund in terms of GDP or allow a more gradual descent. This would alleviate the funding problem, in addition to reducing the costs of transition to the post-oil economy (Akram, 2005), though requiring very far sighted sacrifices which may not be realistic politically.

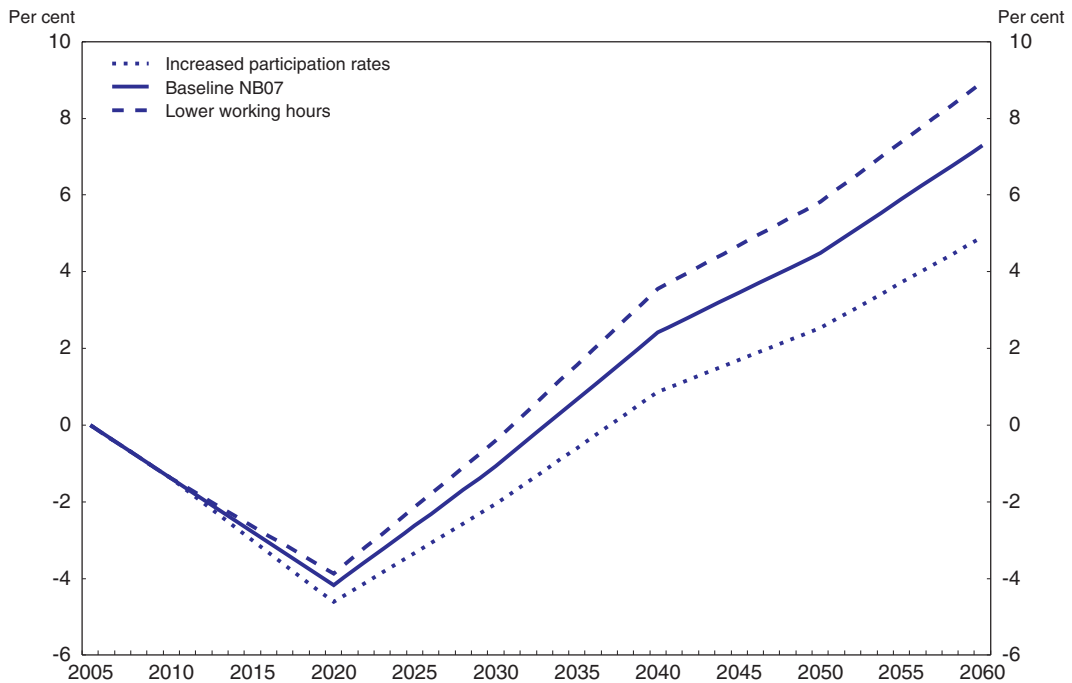
Figure 3.5. **Old age pension liabilities in the public social security scheme and the Government Pension Fund**
Per cent of mainland GDP



Source: Ministry of Finance.

Assumptions about labour supply are powerful drivers of the projected financing gap. This is because growth of labour supply will increase the tax base. Figure 3.6 shows that policies to extend the effective retirement age sufficiently to raise labour supply by 4%

Figure 3.6. **The importance of high labour supply**
General government funding gap as a percentage of mainland GDP



Source: Ministry of Finance.

could reduce the 2050 gap to just 2½ per cent of mainland GDP. Conversely, if working hours decline by less than 0.1% a year – corresponding to only around one-tenth of the observed average yearly decline since 1970 – then the gap would rise to almost 6% by 2050. Thus, higher participation rates via longer working lives or a higher share of full-time employment holds the key to a significantly reduced fiscal gap. Pension reform, as well as reforms targeted at disability and sick leave is the main vehicle for achieving such a rise in labour supply.

Pension reform

Evidence throughout the OECD shows substantial substitution between different early exit routes from the labour market to specific early retirement schemes or disability benefits. Once an exception, Norway, with the introduction of the “AFP” scheme in 1988 and the rising tide of disability pensioners has joined and even surpassed OECD countries in this negative trend. As noted, if these were to continue they could considerably add to the rise in pension costs attributable to demographic effects alone.

There is an apparent political will to tackle these long-term issues under the wider pension reform process. Following the political agreement in Parliament in May 2005, various steps have recently been proposed to reform the pension system (Box 3.2). The suggested steps skew the pension earnings profile somewhat more toward lower income groups than in the original proposals, yet maintain the following four important principles: pension benefits after retirement will be indexed to an average of wages and prices, with accrual of pension rights during the working life still indexed to wages alone; pensions will

Box 3.2. The pension reform process

In May 2005, Parliament reached an agreement on “principles of a reform” in three areas: the introduction of a life expectancy adjustment ratio, benefits based on lifelong earnings, and pension benefits indexed on an average of prices and wages after retirement. The Parliament agreement also provided guidelines concerning other critical measures introduced in the December 2004 White Paper. This included in particular, the design of a new National Insurance System (NIS) pension scheme based upon the principle of actuarial fairness from 62, inspired from the Swedish and Italian notional accounts approach. Parliament also requested a redesigned reform featuring more redistribution. The reform will be effective as of 2010.

A new White Paper on pension reform was presented to Parliament in October 2006. It retained the proposal concerning the introduction of a flexible retirement age in the Social security system from 62 years based on actuarial principles. At the same time the government proposed somewhat higher pension credits to people with low to medium earnings than in the former White paper. Finally the government stated its intention to negotiate changes in the present AFP scheme with the social partners, in order to transform it into a supplementary benefit, based on actuarial principles, to the Social security old age pension. In order to make this more politically feasible, the government signalled its intention to increase its contribution to AFP in line with demographics. The reform is estimated to reduce old age pension expenditure in the Social security system by some 3% of GDP in 2050.

In January 2006, mandatory occupational pensions, supplementing the National Insurance pension, were extended to all firms. This should lead to a rise in the average replacement rate and coverage, an important adjunct to any future public pension reform. The reform has been largely a success, though some regulatory issues still need to be resolved. In particular, current pension fund regulations require a minimum share allocated to domestic risk-free long term bonds, which however are scarce in Norway due to the lack of government debt (it was mostly paid off by early oil income).

Remaining issues include *inter alia* adjustments, and possibly extensive reform, of the Social security disability pension in order to make it compatible with the new old age pension system, and similar reform of the occupational pension system in the public sector. A special commission is looking at a comprehensive and coordinated reform of the disabled pension schemes, with a report likely to be issued in March 2007.

be automatically adjusted to take into account longer life expectancy; the introduction of flexible retirement from age 62, based on actuarial adjustment of the yearly benefit; and the supplementary (income based) pension shall be more actuarially fair with benefits now calibrated to the entire working life. These elements will all allow for higher pension benefits for each additional year at work. However, until there is accompanying reform of AFP and public occupational pensions, little increase in labour supply can be expected from the old age pension reform in isolation.

Improving the coherence and efficiency of the various pension schemes is critical even with high oil revenues, given the gap shown in Figure 3.5. Norway should turn towards a modernised, notional defined contribution pension scheme on an actuarially fair basis, giving direct and transparent linkage between contributions and benefits. The AFP scheme today contradicts the main goal of any reform, which aims at increasing the effective age of retirement. The government’s stated intention to maintain the per capita AFP subsidy

appears to go against past OECD recommendations to scrap, or severely streamline, it. However, if the social partners can come up with a creative way to channel this subsidy into a form of income support that does not distort the work-leisure choice and thus undermine the main pension reform (which could be difficult), then it could be justified from a political economy point of view. It is perhaps regrettable that the government did not explicitly condition its offer on the prior reaching of such a reform. Moreover, rising spending on AFP subsidies in line with demographic ageing should be taken into account in calculations of the future financing gap. Finally, tax distortions and financial incentives to shift to disability pensions, rather than to take up a basic retirement scheme, should be removed along with tightened access. These issues are taken up in Chapter 4.

Fiscal accountability

The so far favourable demographics, combined with immaturity of the pension system, obscure the large non-pension, non-oil deficit that will need to be addressed as part of the fiscal effort. Norway has by just about any measure – whether state participation in the economy, public sector employment share, or public spending to (mainland) GDP ratio – one of the largest governments of the OECD.⁶ The responsibility to avoid waste of scarce oil resources or taxpayers' money is correspondingly great. The high level of spending reflects society's choice to have an all-encompassing welfare state and a dispersed settlement pattern throughout the far-flung country. Such programmes are very expensive and, in the absence of strong controls and good policy design, carry a substantial risk of spending inefficiency. As reported in previous *Surveys*, progress has been made since the mid-1990s to control spending inefficiencies, and taxes were lowered to constrain spending further and improve framework conditions for growth. However, recent developments raise some budgetary and tax issues that are discussed below.

Budget policies for enhanced spending control

Several budgetary practices, used in many or most OECD countries, have been suggested by Joumard and Suyker (2002) and IMF (2005) to improve spending control and make fiscal policy more sustainable in Norway:

- complementing the deficit rule by an explicit spending rule to stop spending creep;⁷
- introducing an explicit medium term framework to better inform the policy debate about through-time ageing and welfare costs, deviations from the fiscal rule and other tensions;⁸
- introducing accrual accounting to provide better information on costs, especially for investment;
- properly evaluating the costs and identifying the beneficiaries of tax expenditures; and
- providing comprehensive estimates of the costs of regional policy.

The suggestion for a spending rule seems even more pertinent at current oil prices. The former government had a self-imposed constraint that public expenditure should grow less fast than GDP in real terms, which was fulfilled during its mandate. Yet this fails to avoid spending creep insofar as the public consumption deflator largely reflects labour costs while most social transfers are indexed to wages, and wages have tended to rise far more strongly than the general price level (Chapter 1). Furthermore, the new government has apparently distanced itself from this kind of spending limit, even though the commitment to keep the taxes unchanged at the 2004 level combined with the 4% rule

implicitly sets a spending limit. The Soria Moria declaration (the pre-election platform of the current governing coalition parties), the 2006 Revised Budget and the 2007 Budget state that: future budget room shall be used to allow more spending for social objectives (“communal benefits take priority over tax reductions”); a large expansion in public employment is planned; and, to these ends the previous government’s tax cuts in 2005 are being reversed. While there are surely many pockets of unfilled needs, there are also surely many ways in which spending could be channelled from present inefficient uses to these priorities, thus preventing the need for higher tax distortions. It also seems strange to be raising taxes when the oil price has climbed so high, as it may already be difficult to spend the rising oil income judiciously, and tax cuts may be in order in view of the need to boost potential growth.

Medium-term budget forecasts and a project on accrual accounting were introduced by the previous administration, with interesting results.⁹ The new Budget plans to widen the experimental treatment concerning accrual accounting so as to have more evidence, with a preliminary evaluation to be presented in 2009. As already mentioned, the Budget plans large increases in infrastructure spending – for items such as schools, day care centres, medical facilities, and urban roads – to fulfil an important mandate to its electorate. The adoption of budget best practices as outlined above, notably the adoption of accrual accounting, would pave the way for more easily accessible cost information. The existing requirements for cost-benefit analysis, and the system for assessing major investment projects (above NOK 500 million), constitute a good framework, but the results of the cost-benefit analyses should be given more weight in deciding on costly infrastructure projects.

The OECD has also recommended outcome-based management, the use of more price signals, and contestability of private service provision. The Norwegians have applied outcome-based budgeting in health, R&D, university funding and employment services areas. As noted in last year’s *Survey*, qualitative results in the health care sector have improved markedly, but costs are rising much faster than expected partly because of a lack of price signals to constrain demand. Care should be taken when adopting this type of performance funding as there can be dangers with perverse incentives and issues about the quality of service delivered and the performance information itself. There also remains an array of barriers to private entry in supply of health care services. Given the OECD projections on future health spending trends reported above, which could nearly double the projected fiscal gap due to old age pension spending alone, it seems important to put all the recommendations into practice. The same goes for education: Norway ranks as number four in absolute spending levels per pupil in primary and secondary school and ranks sixth in spending levels in tertiary education, yet the scholastic achievement scores are the lowest among the Nordic countries and somewhat below the average of the OECD. Moreover, low opportunity costs for university students imply inefficiently long studies and misallocations of human capital (Chapter 5). The fact that the one-third of the population which benefits from higher education must be subsidised by the generally poorer two-thirds who do not suggests an equity argument for university fees (Clark *et al.*, 2006). Labour market services have been reformed, but there is some question about the reform’s impact on spending efficiency (Chapter 4). Finally the privatisation programme which was installed in the previous government now risks going backwards.¹⁰

Such considerations lead to the question of whether the fiscal rule may not now be too “generous”. Is a 10% of GDP “steady state” spending of the oil money – i.e., 4% of a 250% of

GDP oil fund value projected at its peak around 2020 at the present \$60 oil price (Chapter 1) – really sustainable? It may be high time to consider a conditional fiscal rule capped by the 4% limit, in light of higher oil prices and global asset price risks than when the rule was first devised. This would help stabilise fiscal spending through time, reduce inflation and exchange rate pressures, allow a buffer for volatility, help to pre-fund pension liabilities, and preserve more capital for the use of future generations.^{11, 12}

Tax reform

The new government raised the tax level back up to that of 2004, and made a commitment to keep it there while retaining the flexibility to make further changes to the system in ways that are consistent with its social policy orientation (Box 3.3). Thus, it has

Box 3.3. New directions in tax policy

The 2007 Budget establishes the following objectives for the new government's tax policy:

1. *The level of direct and indirect taxes will be raised back to 2004 levels, which are to be maintained while increased budget manoeuvre is to be used to support higher spending. Increased wealth and income taxes targeted on higher incomes, abolition of tax exemptions on pension savings plans, higher VAT on food and a new CO₂ tax more than offset a variety of tax alleviations to agriculture, union fees, poor pensioners paying the wealth tax, and other changes.*
2. *The distributional profile of the tax system will be strengthened. Even though income is more evenly distributed in Norway than just about anywhere else in the OECD, the new government is strongly committed to improving it even more. It achieves a more progressive tax structure by lowering the threshold for the highest tax rate and raising that for the lowest one, while increasing allowances and exemptions for lower incomes. It also raises the wealth tax, revaluing properties for real estate tax purposes, and raises the VAT on foodstuffs from 13 to 14%, judging that the regressive impacts of this move are not significant. It also proposes that tax-favoured pension savings schemes (tending to benefit high income individuals) be curtailed: the wealth tax exemption on annuities and the right to deduct premium payments on individual schemes are abolished, some of these having already being announced in the 2006 Revised Budget.*
3. *Environmentally friendly consumption shall be encouraged. This is achieved by introducing a tax on NO_x emissions. Furthermore, a CO₂ emissions element is introduced in the motor vehicles tax. Also a CO₂ tax on household gas heating is established.*
4. *"Excessive" government fees shall be reduced. Evidently some fees being charged at the local level exceed costs, against the guidelines for use of fees. The government is going to address this, for instance in the area of driving and vehicle tests. The downward adjustment of fees is to continue in future budgets.*
5. *Regionally differentiated employer social security contributions will be reinstated. EFTA surveillance has allowed a reinstatement after having prohibited it for the past 2 years on the basis of EU competition policy decisions. Employer contributions in the farthest northern regions are zero, and substantially alleviated in other remote regions. The government claims that this is an efficient instrument to counter depopulation problems in peripheral areas and that it increases transparency of regional policy.*

Box 3.4. Policy recommendations for a sustainable fiscal policy

Pension reform

- Implement the October 2006 White Paper proposals for NIS old age pension reform, where the key elements are: partial price indexation of benefits; benefits calculated on the basis of the entire working life; an adjustment for life expectancy and introduction of flexible retirement from age 62, based on an actuarial adjustment of the yearly benefit.
- Reform AFP and public occupational schemes soon thereafter and making replacement rates in both subject to actuarially fair adjustments from age 62; further reform disability pensions as outlined in Chapter 4 for consistent treatment of all premature exit routes.
- Fulfil the promise to retain AFP subsidies only in exchange for a reform of the uses of these funds by the social partners in a way that is fully consistent with an actuarially fair pension system overall.
- Consider modest annuities to top up reformed AFP early retirement pensions, limited to certain groups, and offer higher wages for highly qualified public sector workers to compensate for reduction in generosity of their occupational pension scheme, making the new pension fully portable.
- Assess regulatory issues in private pension funding, in particular minimum requirements on domestic long term risk free bonds.

Budget and expenditure policy

- Undershoot the fiscal rule in 2007 if tax overshoots emerge again by mid-year and then over the medium-term (2008-2011) sufficiently to compensate for overshoots during 2002-2006.
- Consider making the fiscal rule a binding upper 4% limit rather than a central target, barring a negative shock; supplement the deficit rule by an explicit spending rule expressed in terms of nominal ratios to GDP.
- Expand the multi-year general government projections, showing the medium-term impact of fiscal policy decisions, so as to improve budgetary planning.
- Expand the use of accrual accounting and increase transparency concerning tax expenditures and costs of regional policies in order to inform budget debate.
- In deciding on public investment projects put more weight on the results of cost-benefit analyses of infrastructure projects.
- Remove entry barriers to private service provision in competition with public services, to promote contestability and efficiency of the latter.

Tax reform

- Consider reinstating the tax cut programme as oil fund income rises, to boost potential growth in view of longer run challenges.
- Review the impact of higher progressivity on incentives to work, study hard and innovate; and of new tax credits to agriculture on the already high level of agricultural protection.
- Reconsider curtailment of tax relief on contributions to private pension plans in light of political economy considerations.
- Preserve justified fees on government services as a way of constraining demand and expand them to health, education and other areas relying on output based management, while addressing poverty in a more targeted way by direct income transfers; the same holds for tax subsidies to agriculture.
- Consider expanding the use of property taxes at the local level in exchange for cuts in central government grants to improve accountability in spending, in line with previous OECD recommendations.
- Insofar as more regional financial autonomy results in too much difference across the country in terms of tax capacity, consider well-targeted equalising transfers.

undertaken a large variety of social relief measures, including more credits to agriculture. The structure of taxes has been made more progressive by adjusting exemption and threshold levels, without raising marginal tax rates. This subjects more people to the high marginal rates and thus should be analysed for incentive effects. It is also questionable whether the agricultural sector, already among the most heavily subsidised of the OECD, needs yet more assistance. Tax relief for contributions to private pension plans have been curtailed. This measure seems consistent with OECD views that such credits may not stimulate savings overall,¹³ yet there is public pressure to reverse this decision in order to facilitate reaching an agreement on the pension reform. The government has raised the base for the property tax by allowing municipalities to tax properties also outside of densely populated areas. Municipalities are likely to make use of this increased flexibility to raise taxes, though this could also somewhat reduce their excessive dependence on discretionary central grants.¹⁴

Notwithstanding its decision to reverse the 2005 cuts in the overall level of tax, the government has pursued the tax reform launched by the previous government. The reform aimed at closing the various tax loopholes that had developed as unintended behavioural responses to the early 1990s major tax reforms. Under the most recent reform, the top marginal tax rate on labour income was decreased to 48% (54% when employer's social security contribution is included), and a dividend tax raised the top marginal tax rate on capital income by 20 points, to 48%, in 2006. Thus, the former large difference between marginal labour and capital income tax rates is largely closed, also eliminating opportunities for tax arbitrage, and tax collections could improve as a result. However, the government still reserves the right to review the distributional and administrative implications of the reform.

Notes

1. The small decline in the non-oil structural deficit as a percentage of Mainland GDP in 2005 and sharper rise in 2006 is explained by lower than expected deficit for 2005 due to a positive (structural) tax surprise.
2. See OECD (2005), Table 1 and IMF (2005), Appendix 1.
3. This range is calculated by subtracting the fixed demographic component from the calculated rise in total public health and long-term care spending under the cost pressure and alternative cost containment scenarios in Table 3.3.
4. In 2005 the Netherlands', Icelandic and Swiss funds (counting public and private together) were respectively 125, 123, 117% of GDP (see OECD *Pension Markets in Focus*, October 2006, Issue 3, Chart 2), compared with somewhat under 100% of mainland GDP for the GPF- Global, plus some 9% for private funds as inferred from the foregoing OECD report. However, a press release by Norges Bank on 21 November 2006 states that following the largest ever quarterly increase for the GPF in the third quarter of 2006, to some 113% of mainland GDP, "the Fund is now the largest pension fund in Europe". Adding in private funds, Norway's pension funds would now appear to be indeed among the top in the OECD.
5. Equivalently, this implies that even if the entire GPF were devoted to creating a funded pension system, it would cover only around one third of present pension liabilities. See Grønvik (2006).
6. The tax ratio however is not among the highest thanks to oil receipts.
7. In Norway, this process includes the practices of irreversible spending increases in downturns, tax bonuses in upturns ploughed into higher spending, or local government spending overshoots rubberstamped by Parliament in mid-year.
8. Norway is in fact a world leader in presenting generational accounts.
9. See OECD (2005) for a discussion of these experiments.

10. The government has signalled that it will maintain present shares in Telenor, Norsk Hydro, Statoil and DnBNOR and keep Statkraft and Statskog as fully state-owned enterprises.
11. Akram (2005) suggests that a 1% spending rule would fully preserve the capital of the fund for future generations in terms of GDP. This is because some of the actual return earned should be reinvested to keep up with economic growth.
12. The political economy of such a “tying of hands” should be carefully evaluated, however, and a more informal approach might suffice. The principal factor which has changed is the rapid climb in the popularity of a party whose main platform is to spend much more of the oil money, which could put pressure on the traditional parties which have ruled government until now.
13. See Yoo and de Serres (2004).
14. See Joumard and Suyker (2002), who argue for more local tax autonomy in order to improve the incentives for local spending accountability and control.

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Chapter 4

Reforms to boost labour supply

In many respects, the Norwegian labour market is in fine form: unemployment is low; participation rates, notably of old-aged workers and women, are above OECD averages; and the labour force is rising. Yet, the labour market faces challenges. Private sector employment has grown modestly over the past 15 years, hours worked per employee are the lowest among OECD countries and the expected retirement age is 7½ years less than the formal age of retirement. Above all, Norway faces one of the highest shares of persons on disability and sickness absence benefits among OECD countries. Tightening eligibility criteria and reducing the generosity of sickness absence and temporary disability schemes seems necessary. For instance, reducing the number of days lost due to sickness absence to the EU average level would boost hours worked in Norway by 3%.

After an unusually long “jobless recovery”, continued high GDP growth has finally led to strong employment gains since mid-2005. The labour market has recently been tightening fast, with unemployment falling close to its historical lows. Although wage growth has so far remained moderate, Norway faces the challenge of increasing its labour supply, an utmost pre-condition for continued non-inflationary expansion. The first part of this chapter examines the performance of the Norwegian labour market against the backdrop of its evolution during the last two decades. It notably reviews its present strengths and weaknesses, focusing on aggregate employment, wages and the matching process. The second part focuses on the challenge of increasing labour utilisation, an essential pre-condition for the sustainable financing of the welfare system. Three critical challenges arise:

- reducing sickness absences;
- improving the inclusion of disabled workers in the workplace;
- reforming early-retirement schemes.

An enviable job market?

Labour market participation is high in Norway. Close to 75% of the working-age population was employed in 2005, compared to an average level of about 65% in the OECD (Table 4.1). Contrary to most European countries, where employment rates among the old-age workers started to decline in the 1980s, Norway has been sharing with Iceland one of

Table 4.1. Labour market performance

	1985-1995			1995-2005			1985			2005		
	Norway	EU15	OECD	Norway	EU15	OECD	Norway	EU15	OECD	Norway	EU15	OECD
Employment rate ¹	74.0	60.3	52.5	76.5	62.9	54.9	75.0	58.5	63.4	75.2	65.2	65.5
of which: Men	79.9	72.7	76.5	80.3	72.1	75.6	84.3	73.0	76.3	78.3	72.9	75.0
Women	67.9	48.1	52.5	72.5	53.7	54.9	65.6	44.2	50.8	72.0	57.5	56.1
Unemployment rate ¹	4.4	10.0	7.3	4.1	9.1	6.9	2.6	10.7	8.0	4.7	8.4	6.8
of which: Men	4.5	8.6	6.8	4.2	8.1	6.5	2.1	9.6	7.5	4.9	7.7	6.5
Women ¹	4.2	12.0	8.0	3.9	10.4	7.4	3.2	12.5	8.7	4.4	9.2	7.1
Long term ²	28.7	67.8	48.3	23.2	64.4	47.5	17.5	71.8	48.8	25.3	60.4	46.9
Young ³	10.3	19.4	14.2	11.0	17.3	13.1	6.5	22.3	16.4	12.0	16.6	13.3
Participation rate	77.4	66.9	69.5	79.7	69.2	69.9	77.1	65.5	68.8	78.9	71.1	70.2
of which: Men	83.7	79.5	82.0	83.8	78.4	80.8	86.1	80.7	82.5	82.3	78.9	80.3
Women	70.9	54.3	57.2	75.5	60.0	59.2	67.8	50.5	55.6	75.4	63.3	60.3
Older persons ⁴	64.2	40.4	49.3	68.0	42.8	51.2	66.2	41.3	49.2	68.8	50.6	54.5
of which: Men	74.3	55.7	64.2	74.2	53.7	68.0	79.9	59.3	66.2	74.6	57.2	68.8
Women	26.3	26.3	35.2	31.9	31.9	39.5	25.4	25.4	34.1	38.3	38.3	43.9
Hours worked ⁵	1440.5	1543.0	1448.2	1378.9	1665.8	1669.5	1473.0	1413.2	1292.0	1360.0	1634.0	1541.2

1. Refers to the population aged 15-64.

2. Share of unemployment for 6 months and over.

3. Refers to the population aged 15 to 24.

4. Refers to the population aged 55 to 64.

5. Refers to annual average per working age person, unweighted average for EU15 and OECD.

Source: OECD (2006), *OECD Employment Outlook*.

the highest and most resilient participation rates among older workers. Female workers also participate actively in the labour market, far more so than in other OECD countries barring Iceland.

However, over the past 5 years, participation rates have slid. Even though some cyclical forces may be at play, there is evidence that Norway faces a structural erosion. This trend is particularly salient among men aged between 55 and 64, whose participation has fallen from 80% in 1985 to 75% in 2005. In a context of ageing and risks to the sustainability of the welfare system (Chapter 3 and OECD, 2005a), this is a key challenge. For instance, older workers leave the labour market through disability pensions to a larger extent than elsewhere. In addition, youth unemployment rates, although still below international levels, doubled during the past two decades whereas the OECD and EU averages registered significant declines (Table 4.1). This must however be seen in connection with a low level of effective long-term youth unemployment as almost 60% of unemployed persons between 16-24 years were part-time students in 2005. During the past two decades the “registered” unemployment rate for young persons, which excludes such people, has in fact been cut by half.¹

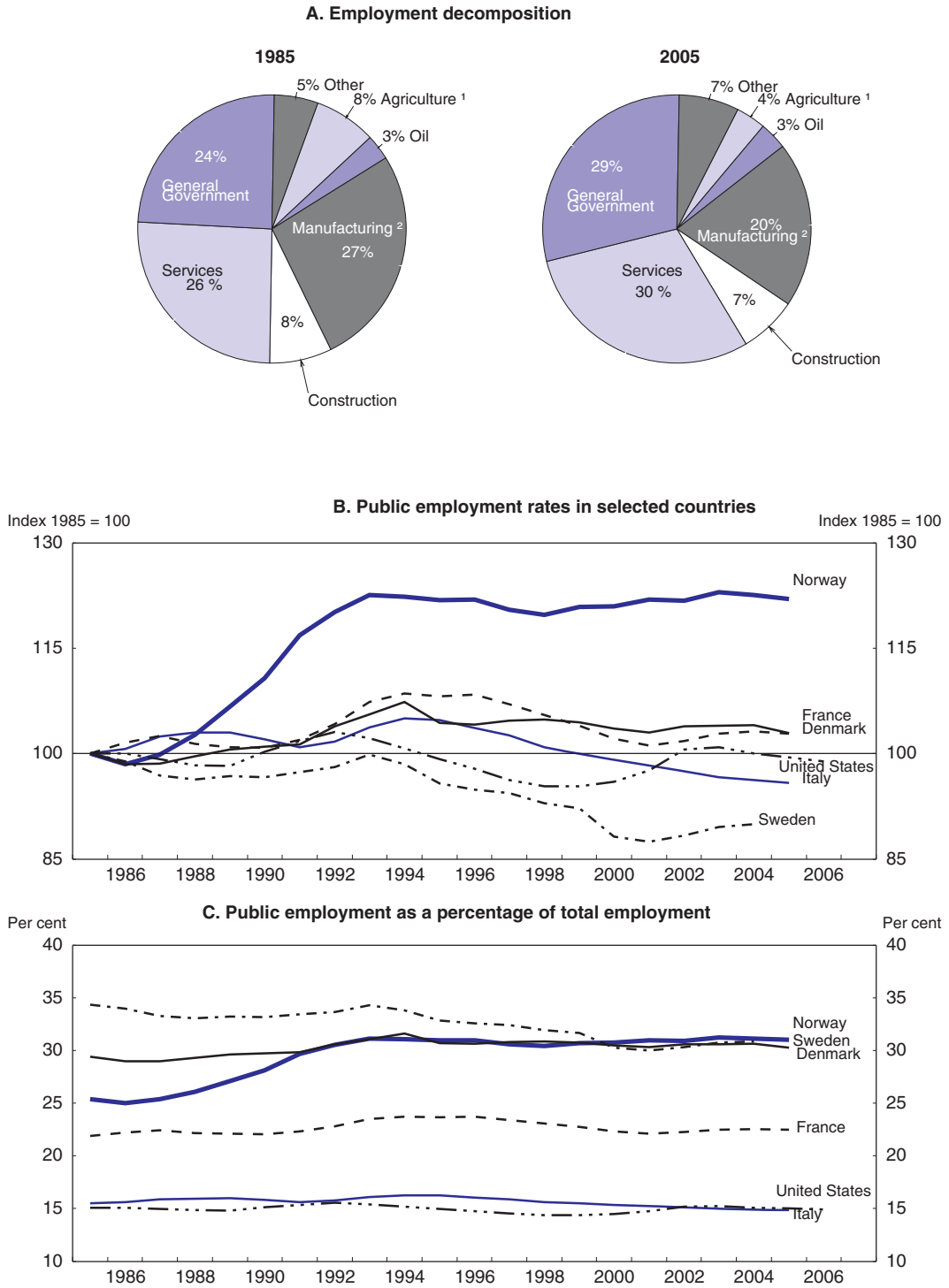
A large public sector

Since the early 1980s, the sectoral structure of employment has dramatically changed (Figure 4.1). Agriculture today employs less than 4% of workers. With only 15% employed in the manufacturing sector, Norway is fairly de-industrialised, but no more so than countries with comparable levels of development such as the United States, the United Kingdom or France (Chapter 1). Services account for the growing part of employment, with much of it concentrated in public services. Since the 1970s, the share of general government employment has risen by about 10 percentage points, reaching by far the highest share of OECD countries (Figure 4.1, Panel A). Using a broader definition, the share of full-time employment in non-market activities has increased over the same period from 22% to 31%. As the majority of women work in welfare services, the high rate of public services may thus be part of the explanation of high female employment rates.

During the 1990s, about 50% of job creation was concentrated in the sectors of education, health and social services (Table 4.2).² This may have been a response to the sharp recession starting in 1988 (Figure 4.1, Panel B), partially explaining the apparent resilience of Norwegian employment and unemployment rates.³ Contrary to other Nordic countries such as Denmark or Sweden, the trend followed by public sector jobs has not been reversed in Norway. With the exception of 2006 where public sector jobs explain less than 20% of the total employment growth, the job recovery seems to be to a large extent driven by the development of public services, while employment in private services has grown slowly. This contrasts strongly with the rapid rise in private sector jobs in, for example, Denmark during the same period. This is particularly striking in retail, hotel, transport and financial services, which have been strong job providers in other OECD countries over the same period. On the other hand, productivity growth was strong in most of these sectors, mainly due to structural reforms, in the early nineties (Chapter 1).

These developments raise two specific issues. First, has this strong preference for providing services through the public arm been detrimental to growth in private-sector jobs? Cross-country estimates do suggest that there has been on average a crowding-out effect of private employment by public employment in OECD countries (Bassanini and Duval, 2006). For instance, the creation of one public job destroyed about 1.5 private jobs over the 1960-2000 period in the OECD (Algan *et al.*, 2002). This effect is highly significant in

Figure 4.1. **Employment indicators**



1. Agriculture including fishing and mining.
 2. Utilities are included in manufacturing.

Source: Statistics Norway, Annual National Accounts, OECD Analytical database.

Table 4.2. **Job creation in Norway: mostly in public sector¹**

	Annualised growth (%)			Contribution to growth (%) ²		
	1980-1990	1990-2005	1980-2005	1980-1990	1990-2005	1980-2005
Agriculture, fishing and mining	-2.4	-3.0	-2.9	-2.1	-2.4	-4.6
Agriculture, hunting and forestry	-2.8	-3.2	-3.2	-1.9	-2.0	-4.1
Fishing and fish farming	0.1	-2.3	-1.4	0.0	-0.3	-0.3
Mining and quarrying	-3.1	-2.2	-2.7	-0.1	-0.1	-0.2
Oil	1.6	1.0	1.3	0.6	0.6	1.2
Oil and gas extraction incl. services	6.1	2.8	4.3	0.5	0.6	1.2
Transport via pipelines	0.0	3.2	..	0.0	0.0	0.0
Ocean transport	0.0	-0.1	0.0	0.0	0.0	0.0
Manufacturing	-2.1	-0.7	-1.3	-4.2	-1.6	-5.9
Utilities	0.4	-0.4	-0.1	0.4	-0.6	-0.2
Electricity and gas supply	1.3	-2.5	-1.0	0.1	-0.4	-0.2
Water supply	-2.0	4.0	1.6	0.0	0.0	0.0
Other transport industries	-0.1	0.4	0.2	-0.1	0.4	0.3
Post and telecommunications	1.1	-1.8	-0.7	0.3	-0.6	-0.4
Construction	-0.1	0.3	0.1	-0.1	0.3	0.2
Services	1.5	1.5	1.6	4.0	7.1	11.5
Wholesale and retail trade, repair of motor vehicles	0.1	0.6	0.4	0.1	1.3	1.5
Hotels and restaurants	3.2	1.0	2.0	0.8	0.4	1.2
Financial intermediation	2.6	-1.6	0.1	0.8	-0.7	0.1
Dwellings (households)	2.0	0.6	1.2	0.0	0.0	0.0
Business services	4.4	4.6	4.7	2.3	6.1	8.7
Public administration and social services	2.1	1.2	1.6	7.1	7.2	14.7
Public administration and defense	1.4	-0.7	0.2	1.3	-0.9	0.3
Education	2.0	1.1	1.5	1.5	1.3	2.9
Health and social work	2.7	2.4	2.6	3.5	6.0	9.8
Other social and personal services	2.2	1.0	1.6	0.9	0.7	1.6
Total	0.5	0.6	0.6	5.7	10.6	16.8
Employees	0.7	0.9	0.8	7.3	13.0	21.1
Self-employed	-1.2	-1.6	-1.5	-1.7	-2.4	-4.2
Total Private sector³	0.0	0.4	0.2	-0.3	5.1	5.1
General government⁴	2.2	1.2	1.6	5.9	5.5	11.7
Central government ⁴	1.0	3.2	2.4	0.9	5.2	6.3
Local government ⁴	2.7	0.1	1.2	5.0	0.3	5.3

1. Statistics Norway released revised NA-figures on December 5, 2006. The numbers in the table are not based on the upward revisions.

2. Calculated as $X(T) - X(0)/Total(0)$. For example, between 1990 and 2005, total employment grew on average by 0.6% a year, and grew by a total amount of 10.6%.

3. Proxy calculated as the difference between total employment and general government employment.

4. From 2002 on, specialist health services are transferred from local to central government.

Source: Statistics Norway, *Annual National Accounts*, OECD calculations.

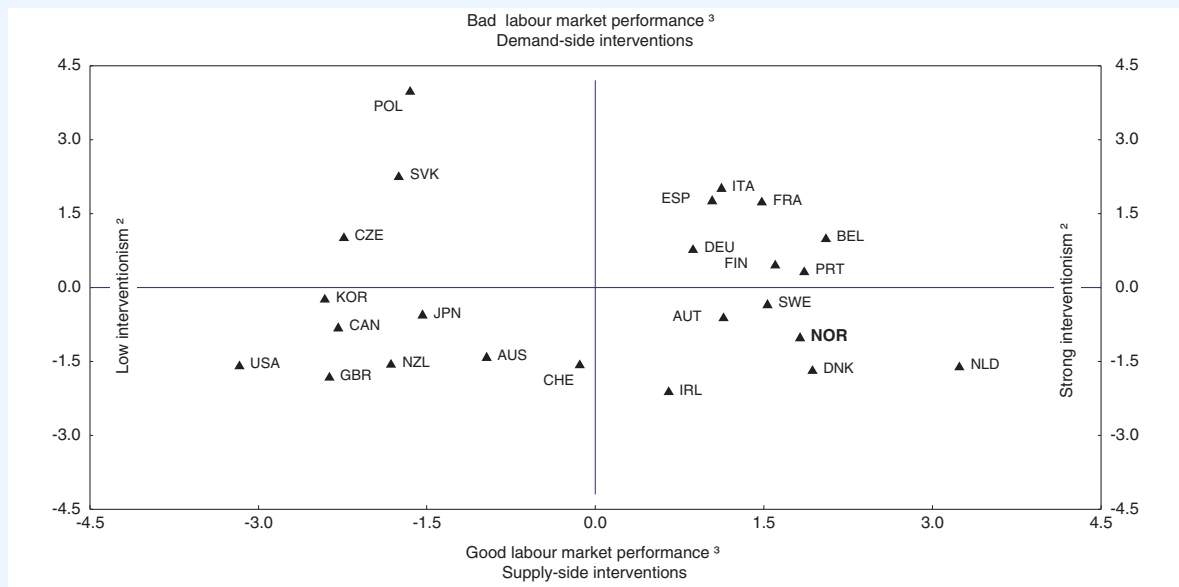
countries where public production is highly substitutable with private activities and where the public sector provides high rents. Even though in Norway the general government provides services that are mostly complementary to the private sector's supply, the crowding-out effect might also be substantial with an elasticity of at least unity. Other Nordic countries were confronted with large budget deficits in the 1990s and needed to downsize their welfare state. This led to a severe reorganisation of the public sector (Figure 4.1, Panel B), which Norway was never challenged to do. There is some evidence that, in Norway, the public sector's cost efficiency may be lagging Joumard and Suyker (2002). This seems to be especially the case in primary and secondary education (OECD, 2006c) or in general hospitals Bibbee and Padrini (2006).

Box 4.1. How Nordic is the Norwegian labour market?

A growing literature has recently tried to link labour market performance with institutions. For instance, Bassanini and Duval (2006) find that favourable employment outcomes can be associated with different degrees of policy interventionism. Whatever the metrics, the Norwegian labour and social institutions share many features with some countries such as, above all, Denmark and Sweden, but also the Netherlands, Austria, Ireland, and to a lesser extent, Finland.

Figure 4.2 reports the results of a principal component analysis carried out in OECD (2006a). Starting from a set of labour market, fiscal and product market indicators, the analysis leads to interesting results. Two axes summarize more than 70% of inertia and can easily be interpreted. The horizontal axis summarises the degree of policy intervention, whereas the vertical axis reports on labour and policy performances. Norway appears to be at the heart of a group of countries qualified by Sapir (2005) as “Nordics”, mixing strong interventionism (strong activation policies, high redistribution, and high union coverage) with strong labour markets outcomes. Following Sapir’s definition, this model differs from the alternative successful Anglo-Saxon model (with low interventionism but high performance) and contrasts with the weakly performing group of Mediterranean and Continental European countries. So, based on a purely statistical analysis, Norway might be considered as the most representative “Nordic” group, sharing the most common characteristics with each of its members.

Figure 4.2. Similarities and differences in policies, institutions and labour market performance across OECD countries¹



1. Principal component analysis includes the following variables for 24 OECD countries: active labour market programmes (ALMP, expenditure per unemployed persons as a percentage of GDP per capita), union co-ordination (COOR), union coverage (COV), employment protection legislation (ELP), product market regulation (PMR), tax wedge (TW) and unemployment benefits (UB, average gross replacement rate over a five-year period).
2. The horizontal axis represents the first principal component, accounting for 39.3% of total variance. As all policy variables (with the exception of the PMR) are positively correlated with this axis, the first principal component can be interpreted as an aggregate indicator of the degree of interventionism of labour market policies.
3. The vertical axis represents the second principal component, accounting for 34.1% of total variance. As the correlation coefficient between the unemployment rate and the second principal component is strongly positive (and it is strongly negative in the case of the employment rate), this suggests that the second principal component provides an indicator of labour market performance.

Source: OECD (2006), *OECD Employment Outlook*.

Nordic labour market institutions

The Norwegian labour market combines relatively high intervention, good institutions and policies and high performance. It may be considered to be representative of the so-called “Nordic model” (Box 4.1). In such a framework, the Norwegian labour market has been resilient, with a remarkably low and stable NAIRU, of around 4% over the past decade, according to OECD estimates. EPL strictness, strong to medium according to OECD benchmarks, has remained relatively stable over the past years, with average strictness for permanent contracts and above-average regulation on temporary contracts (Table 4.3). This framework appears to reveal a strong aversion to any form of a dual labour market, according to Norwegian observers.

Table 4.3. **Employment protection legislation in OECD countries**

	Regular procedural inconveniences	Notice and severance pay for no-fault individual dismissals	Difficulty of dismissal	Fixed-term contracts	Temporary work agency employment	Collective dismissals	Employment protection legislation-regular	Employment protection legislation temporary	Summary indicator ¹
Australia	1.5	1.0	2.0	1.3	0.5	2.9	1.5	0.9	1.5
Austria	2.5	0.9	3.8	1.8	1.3	3.3	2.4	1.5	2.2
Belgium	1.0	2.4	1.8	1.5	3.8	4.1	1.7	2.6	2.5
Canada	1.0	1.0	2.0	0.0	0.5	2.9	1.3	0.3	1.1
Czech Rep.	3.5	2.7	3.8	0.5	0.5	2.1	3.3	0.5	1.9
Denmark	1.0	1.9	1.5	2.3	0.5	3.9	1.5	1.4	1.8
Finland	2.8	1.0	2.8	3.3	0.5	2.6	2.2	1.9	2.1
France	2.5	1.9	3.0	4.0	3.3	2.1	2.5	3.6	2.9
Germany	3.5	1.3	3.3	1.8	1.8	3.8	2.7	1.8	2.5
Greece	2.0	2.2	3.0	4.5	2.0	3.3	2.4	3.3	2.9
Hungary	1.5	1.8	2.5	1.8	0.5	2.9	1.9	1.1	1.7
Ireland	2.0	0.8	2.0	0.8	0.5	2.4	1.6	0.6	1.3
Italy	1.5	0.6	3.3	2.5	1.8	4.9	1.8	2.1	2.4
Japan	2.0	1.8	3.5	0.5	2.0	1.5	2.4	1.3	1.8
Korea	3.3	0.9	3.0	0.8	2.6	1.9	2.4	1.7	2.0
Luxembourg	2.5	2.0	3.3	5.3	4.3	5.0	2.6	4.8	3.9
Mexico	1.0	2.1	3.7	2.5	5.5	3.8	2.3	4.0	3.2
Netherlands	4.0	1.9	3.3	0.8	1.6	3.0	3.1	1.2	2.3
New Zealand	2.0	0.4	2.7	1.5	1.0	0.4	1.7	1.3	1.3
Norway	2.0	1.0	3.8	3.3	2.5	2.9	2.3	2.9	2.6
Poland	3.0	1.4	2.3	0.0	2.5	4.1	2.2	1.3	2.1
Portugal	3.5	5.0	4.0	1.8	3.8	3.6	4.2	2.8	3.5
Slovak Rep.	5.0	2.7	2.8	0.3	0.5	2.5	3.5	0.4	2.0
Spain	2.0	2.6	3.3	3.0	4.0	3.1	2.6	3.5	3.1
Sweden	3.0	1.6	4.0	1.8	1.5	4.5	2.9	1.6	2.6
Switzerland	0.5	1.5	1.5	1.3	1.0	3.9	1.2	1.1	1.6
Turkey	2.0	3.4	2.3	4.3	5.5	2.4	2.6	4.9	3.5
United Kingdom	1.0	1.1	1.3	0.3	0.5	2.9	1.1	0.4	1.1
United States	0.0	0.0	0.5	0.0	0.5	2.9	0.2	0.3	0.7
<i>Min.</i>	0.0	0.0	0.5	0.0	0.5	0.4	0.2	0.3	0.7
<i>Max.</i>	5.0	5.0	4.0	5.3	5.5	5.0	4.2	4.9	3.9
<i>OECD average</i>	2.2	1.7	2.8	1.8	2.0	3.1	2.2	1.9	2.2
<i>EU15 average</i>	2.3	1.8	2.9	2.4	2.1	3.5	2.4	2.2	2.5

1. The summary EPL indicator is a weighted average of regular employment protection legislation (EPLR) temporary employment protection legislation (EPLT) and the strictness of collective dismissals, with respective weights of 5/12, 5/12 and 2/12.

Source: OECD (2004), Ministry of Labour and Social Inclusion.

The generally good labour market outcome may be due to a pragmatic approach when applying legislation, and to a high level of coordination. Norway has the highest level of bargaining centralisation and co-ordination of OECD countries (OECD, 2004). For instance, the latest wage round has been based on the so-called “front-runner model”, with the exposed sector negotiating first and gearing its wage claims to competitor wages. This has led to a relative moderation in aggregate wage growth. Some other specific factors may have cooled wage claims such as: rising immigration of workers from new EU member states, notably (Polish) contractors in the hot sector of construction;⁴ and the introduction of a mandatory occupational scheme as of 2006 (paid for by the employers). However, the high degree of centralised wage bargaining and the high level of coordination result in wage compression, which may to some extent reduce incentives to undertake certain demanding studies such as engineering and science. Eventually, this might distort the allocation of labour and account for rising skill shortages. On the other hand, the wage bargaining system, together with “no tuition fees” policies in tertiary education, serves the social goal of promoting equality in Norway.⁵

Boosting labour supply is the key challenge

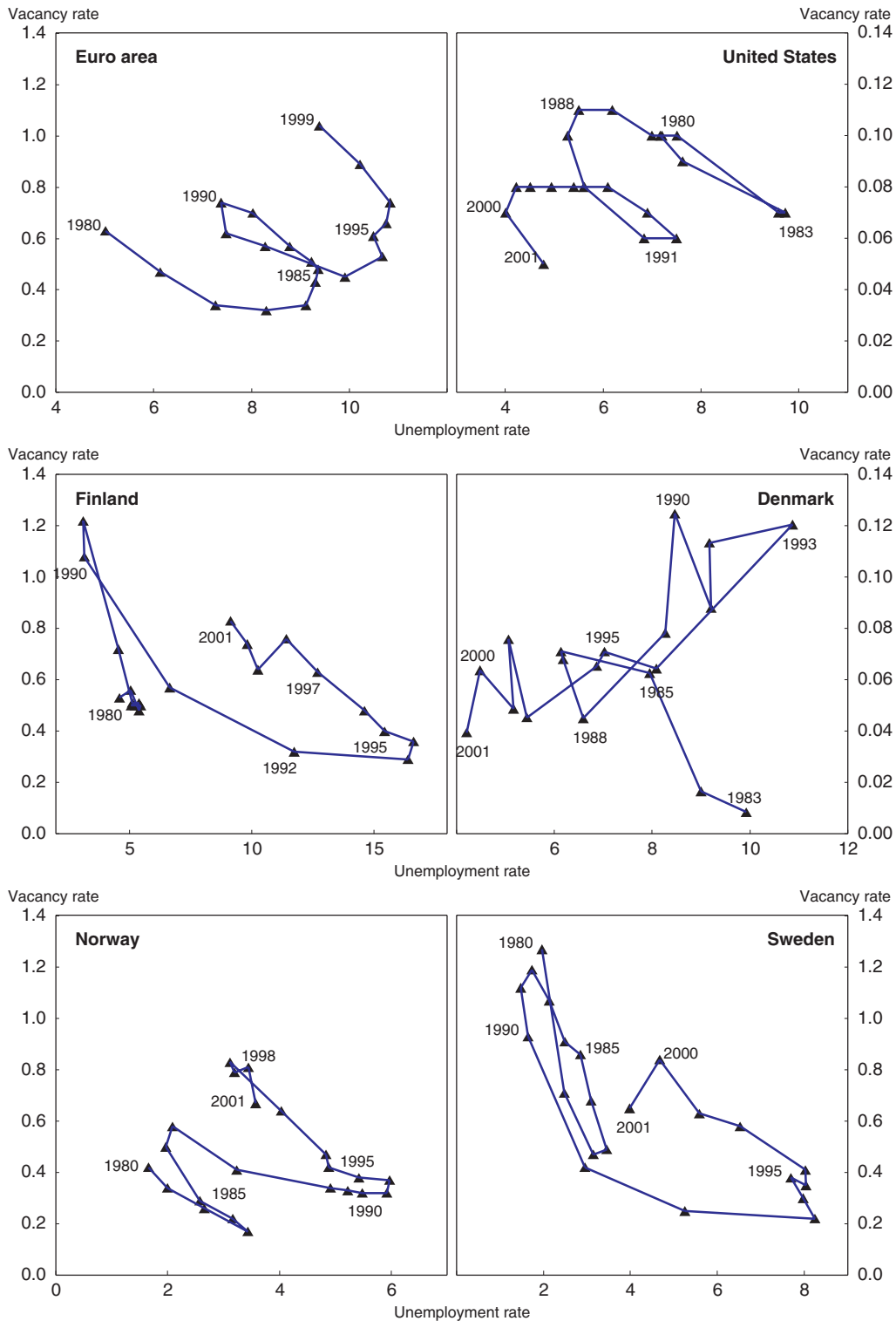
A rising mismatch between supply and demand

Over the past two decades, a rising mismatch between labour supply and demand has become common in some OECD countries. Figure 4.3 shows Beveridge curves for Nordic countries, the European Union and the United States. As in many other European countries, Norway has faced an increasing rate of unfilled job vacancies, albeit in a context of very low unemployment. This outward shift of the curve indicates rising inefficiency of labour market matching from 1980 until the beginning of the 1990’s. Since then there have only been small changes. Common to Finland and Sweden, this phenomenon stands in stark contrast to the apparently remarkable improvement registered in the United States. Significant skill shortages in Norway, partly cyclical, have recently emerged in sectors such as construction, manufacturing, engineering, business and oil services and health care, but there seems also to be a sign of a structural mismatch between the supply and demand of skills. In 2005, higher education admissions declined by 2%, but new students in engineering and science declined by more than 13%. In the health sector, a structural expected shortfall in specialists is amplified by a large number of departures from these occupations, especially into disability.

Immigration into Norway has increased significantly in recent years (Figure 4.4), mainly as a response to structural labour shortages in specific sectors such as hotels and restaurants, construction and to a lesser extent, medical services and engineering. Rising immigration and openness to cross-border labour flows inside the European Economic Area has strongly benefited Norway. The country adopted relatively liberal immigration rules, allowing people from the new EU member states to enter the country before obtaining work. Over the past four years, Norway has received almost 50% of all the migration from new EU member states to the Nordic countries, mainly because of higher wages and the availability of jobs. Immigration has been important in agriculture and construction, with a strong influx of Polish contractors and workers who have weighed on local firms’ bargaining power. Besides, this new wave of immigration might have lowered the NAIRU by reducing labour mismatch. This could also help to explain why domestic prices and wage inflation have remained subdued up to now.

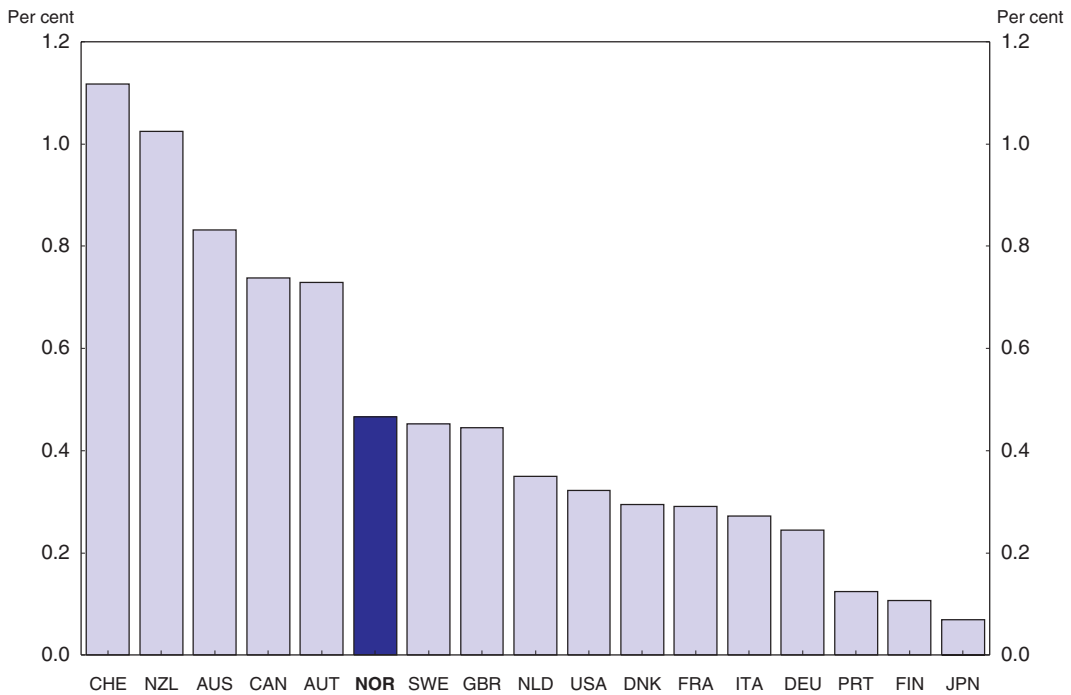
Figure 4.3. **Limited evidence for an improvement in the matching process**

Beveridge curves for the euro area and selected OECD countries, 1980-2001



Source: OECD (2003), OECD Employment Outlook.

Figure 4.4. **Inflows of foreign nationals**
As a percentage of total population, in 2004, harmonised data



Source: OECD (2006), *International Migration Outlook*.

However, immigration may not have been sufficient in the face of rising bottlenecks in specific industries where language barriers are not negligible, such as health care, or in sectors demanding high skills such as engineering and project management. Besides, a growing resistance from the trade unions, notably in the construction sector, has recently emerged. This has led local authorities and the government to argue that they will pursue active policies to control wage and working conditions for immigrant workers from the new EU member states (so called Action Plan against Social Dumping). The authorities should therefore not turn towards a more protectionist stance, as this could be detrimental to growth and productivity in the medium run, and inflationary in the short term.

The duration of working time is short

Norway shares with the Netherlands the lowest average number of hours worked among OECD countries. Over recent years, the duration of working time has exerted a drag, lowering potential growth by roughly $\frac{1}{2}$ percentage point per year. In a context of rising demand for social expenditure and services, enhancing working hours offers a large margin of manoeuvre to boost labour supply and finance welfare without distortions (Chapter 3 and below). The present low duration of working time is mainly explained by below-average weekly working hours, and a record high number of days lost due to non-holiday reasons, notably sickness absences (Table 4.4). Days lost due to sickness absences in Norway are more than twice the OECD average (Figure 4.5).

Various explanations have been proposed to account for the wide variations in hours worked between OECD countries (Annex 4.A1). Rising living standards have been

Table 4.4. The anatomy of a typical working year
Decomposition of average annual hours worked by full-time equivalent workers (dependent employees, 2002)

	Annual hours of work	Average weekly hours on all jobs	Annual weeks worked	Holidays and vacation weeks	Full-week absences due to non holiday reasons ¹	Part-week absences due to non holiday reasons	Absences due to sickness and maternity leave ²	Absences due to non holiday reasons
	(a) = (b) * (f)	(b)	(f) = 52 - [(g) + (h) + (i) + (j)]	(g)	(h)	(i)	(j)	(h) + (i) + (j)
	Hours		Weeks not worked					
Austria	1 497	38.4	39.0	7.2	2.9	0.4	2.6	5.9
Belgium	1 451	36.3	40.0	7.1	2.4	0.5	2.1	5.0
Czech Rep.	1 692	41.3	41.0	6.2	2.3	0.3	2.2	4.8
Denmark	1 410	36.3	38.9	7.4	2.8	1.1	1.8	5.7
Spain	1 639	38.8	42.2	7.0	1.3	0.4	1.2	2.9
Finland	1 491	38.8	38.5	7.0	2.8	1.6	2.1	6.5
France	1 467	36.2	40.5	7.0	2.2	0.5	1.9	4.6
Germany	1 480	36.5	40.6	7.8	1.9	0.3	1.4	3.6
Greece	1 816	40.7	44.6	6.7	0.2	0.2	0.2	0.6
Hungary	1 798	40.9	43.9	6.3	0.9	0.1	0.8	1.8
Iceland	1 714	43.2	39.6	6.1	2.8	1.6	1.9	6.3
Ireland	1 585	36.3	43.7	5.7	1.4	0.2	1.0	2.6
Italy	1 533	37.4	41.0	7.9	1.8	0.3	1.0	3.1
Luxembourg	1 582	37.9	41.7	7.5	1.4	0.2	1.2	2.8
Netherlands	1 223	31.8	38.4	7.5	2.9	1	2.2	6.1
Norway	1 339	37.3	36.0	6.5	4.8	1.1	3.6	9.5
Poland	1 817	41.8	43.4	6.2	1.2	0.3	0.9	2.4
Portugal	1 688	40.4	41.8	7.3	1.5	0.2	1.2	2.9
Slovak Rep.	1 761	41.8	42.2	6.9	1.4	0.1	1.4	2.9
Sweden	1 349	38.1	35.4	6.8	4.2	1.8	3.8	9.8
Switzerland	1 586	37.5	42.3	6	1.7	0.9	1.1	3.7
United Kingdom	1 546	38.2	40.5	6.5	1.8	1.6	1.6	5.0
Total average	1 566.5	38.5	40.7	6.8	2.1	0.7	1.7	4.5
EU15 average	1 517.1	37.5	40.5	7.1	2.1	0.7	1.7	4.5

1. In the case of Norway, column h mainly provides estimates of lost weeks due to sickness, which are not measured by the Labour Force Survey.

2. These weeks are already included in columns (h) and (i), but are included a second time in order to correct for an assumed 50% under-reporting in the Labour Force Survey.

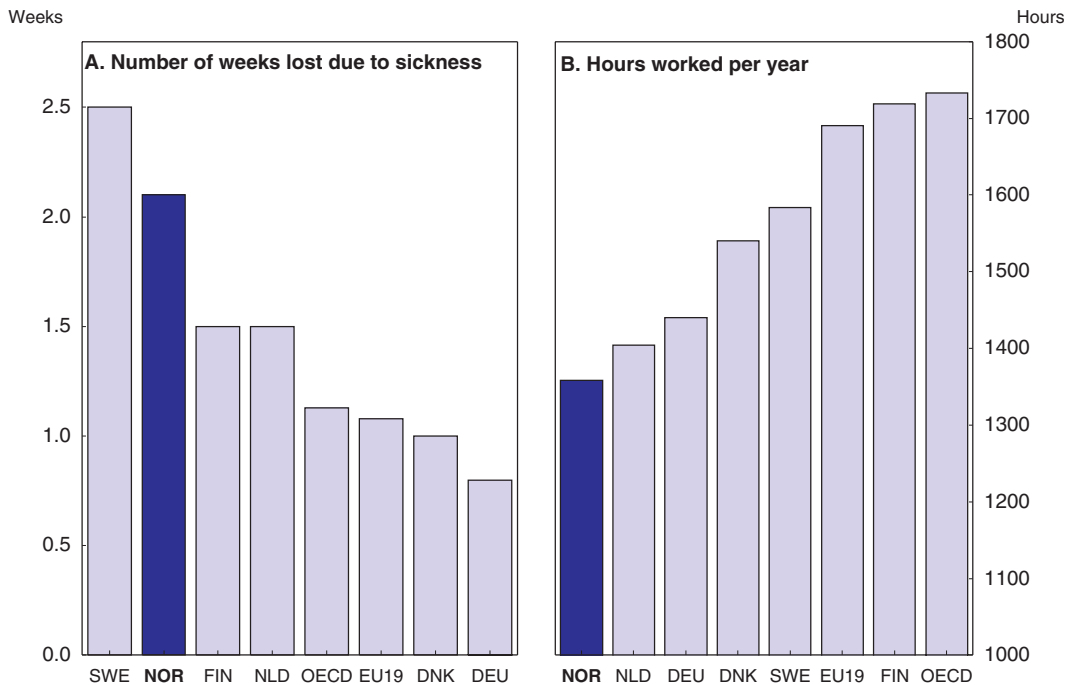
Source: OECD (2004), *OECD Employment Outlook*.

historically accompanied by shorter working time. In the case of Norway, which benefits from one of the highest GDP per capita in the world, this may be the main reason for a collective choice in favour of leisure rather than more consumption. The impact of high marginal taxation cannot, however, be neglected. Even if Norway has recently carried out an ambitious reform, the average marginal tax rate on labour income remains relatively high, slightly above 49%. High average marginal taxation rates might have played a role, although there is no clear-cut evidence linking changes or levels in hours worked and changes or levels in average marginal taxation (Annex 4.A1). However, the interaction between high marginal tax rates, benefits, unions and other labour market institutions is likely to be an important explanatory factor.

A 30-hour workweek pilot project has been recently launched in some Norwegian firms. Pushing the legislation further in this direction would dramatically reduce potential growth and increase labour shortages. Because the country will face new ageing-related challenges, there is, on the contrary, a need for rising hours and efficiency (Chapter 3).

Figure 4.5. **Hours worked and working weeks lost due to sick leaves**

2004



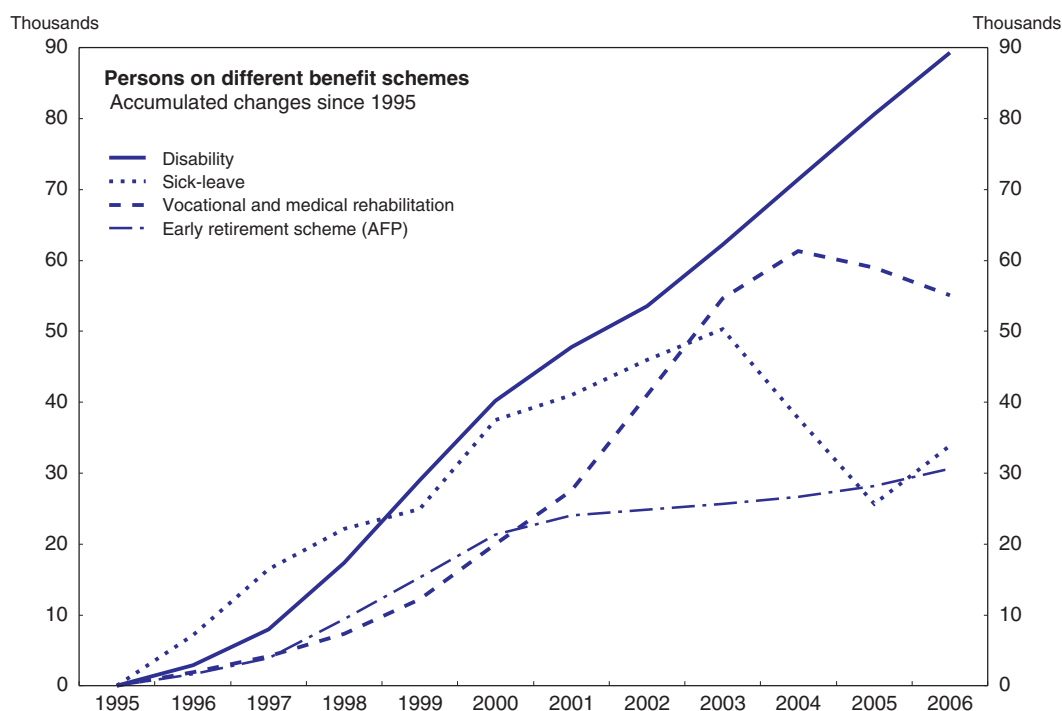
Source: OECD, Going for Growth database.

Boosting work incentives through further reduction in marginal income taxation might boost labour supply somewhat and could help to solve a part of the ageing issue (Fredriksen and Stølen, 2005). If it is politically difficult to reduce the number of vacation days, a severe reduction in sickness absence days and “unjustified” absences offer a considerable margin of manoeuvre to reach this objective. For instance, a return to the EU average number of lost weeks strictly due to sick absence would contribute to a rise in annual hours worked of 3%. A larger reform, such as bringing absences for non-holidays reasons to the EU average, would boost working hours by 14%, which is a significant part of the long term financing gap related to welfare programmes (Chapter 3).

Strengthening work incentives to safeguard the Norwegian welfare system

High employment rates in Norway are coupled with extremely high rates of sickness absence and disability benefit reciprocity. Only Sweden has sickness absences comparable to those in Norway, and only Poland faces such high rates of disability benefits. In Norway, inflows have kept rising in various schemes (Figure 4.6), despite increasing rejection rates of applications⁶ and despite the Inclusive Workplace Agreement (see below). Problems are concentrated at all age groups but in particular among those over age 55 and, ominously, among those below 30 who are more and more numerous to apply for a permanent disability status (Table 4.5).

Public spending on sickness absence and disability benefits amounted to 4.1% of GDP in Norway in 2004. This is more than twice the OECD average. Whereas the unemployment rate has been stable, the share of disability recipients in the working-age population nearly

Figure 4.6. **The number of disability pensioners keeps rising**

Source: Ministry of Finance, Ministry of Labour and Social Inclusion.

Table 4.5. **Sickness benefits are the main pathway to disability benefits in Norway**

Distribution of people on new benefits aged 20-66, 2003-04¹

Status in 2004	Status in 2003 ²					
	Unemployment benefit	Sickness benefit	Medical rehabilitation benefit	Vocational rehabilitation	Disability pension	All benefits
Unemployment benefit	..	75.1	6.8	8.2	9.9	100.0
Sickness benefit	39.4	..	5.4	12.1	43.1	100.0
Medical rehabilitation benefit	1.8	74.0	..	17.4	6.7	100.0
Vocational rehabilitation	3.4	41.1	37.9	..	17.6	100.0
Disability pension	2.3	41.9	33.7	22.1	..	100.0
Early retirement benefit	21.0	67.0	1.3	0.0	10.7	100.0
Old age pension	4.2	5.6	0.9	0.0	89.3	100.0

1. The table should be read in the following way. Of all new disability benefit recipients in 2004 who were on another kind of benefit in 2003, 41.9% came from sickness benefits and 33.7% and 22.1% from medical and vocational rehabilitation, respectively; the remaining 2.3% transferred from unemployment benefits.

2. Status in 2003 refers to persons on a social security benefit at 1 January 2003. Status in 2004 refers to those persons who had a benefit at 1 January 2003 and who also had a benefit at 1 January 2004.

Source: National Insurance Administrations for Norway (NIA), OECD (2006b).

doubled from 6% to 11% between 1980 and 2005.⁷ Despite a very good economic and labour market situation, the employment rate of disabled people in Norway is just under 45%, compared to 83% for the non-disabled population (OECD, 2006b).⁸ This is a poor outcome, as no other OECD country spends anywhere near as much as Norway in terms of vocational rehabilitation and training to avoid inflow into long-term benefit schemes.

The authorities have recently decided to address this issue and looked forward to improving labour supply-implemented measures (see below). After a long discussion, a government-appointed commission should issue a report in Spring 2007, with reform proposals on the disability pension system. An OECD team has recently delivered a comprehensive report to the government (OECD, 2006b).⁹ This section summarises the OECD's main findings and recommendations, as laid down in more detail in (OECD, 2006b). In short, three main priorities arise in Norway:

- controlling incapacity-related public spending (in particular sick-leave benefits);
- reducing the inflow from sickness to disability benefits; and
- raising the outflow from disability into work.

Sick leaves: no trend reversal?

Long-term sickness absences in Norway are the first step towards disability and explain a relatively poor performance in man-hours worked (Table 4.4 and Figure 4.5). A tripartite agreement, called the "Inclusive Workplace Agreement (IW)", was signed for the period 2001-2005 by the government and social partners. It included three major objectives: to reduce sick leaves by at least 20% from their level in the second quarter of 2001; to secure employment for a larger number of persons with disabilities; and to increase the age of retirement. A change in sick pay regulation in July 2004 introduced restrictive measures that may have temporarily reduced absence rates (OECD, 2005a). A functional assessment by a General Practitioner (GP) has been made compulsory after eight weeks of sickness absence and stricter sanctions on practitioners who do not comply with the new rule of sickness certification have been introduced, albeit seldom put into practice. Besides, employers face a new obligation to prepare a follow-up plan for long-term sick leave recipients, in relation with employment services. Despite some encouraging results, the IW agreement has failed to reach its objective. By the end of 2005, man days lost due to sickness had fallen by only 12% from the 2001 level. Since then, inflows have re-accelerated and are now almost returned to the 2001 level, suggesting that such trend reversals are difficult to maintain without tighter administration and deterrent incentives (Figure 4.6).

In December 2005, the agreement was prolonged to the end of 2009. In addition, the government recently asserted the goal of saving NOK 2.5 billion on sick leave benefit payments. In line with OECD recommendations, the government proposed that absence periods should be co-financed by employers and the social security. The employers' share would be raised to 20% for up to six months and then set back to 10% for the rest of the benefit period (up to 12 months).¹⁰ This new co-financing scheme would have been a step in the right direction by enhancing employer and employee responsibility. Yet, this proposal met fierce opposition and was rejected by the social partners. Employers objected to the financial cost of such a measure, and the labour unions feared employers would screen applicants and discriminate against the less healthy. A commission, headed by the Prime Minister, has recently suggested new financial and accelerated activation measures that aim to deliver saving equivalent to those projected in the original proposal.¹¹ Not only have the tripartite agreements' attempts to reform the sickness and disability benefit schemes been unsuccessful, but analysing this event, the current negotiation framework may have hindered any necessary change, as previously warned by the OECD (OECD, 2005d). In such circumstances, the government should not accept a veto against public intervention and experimentation. Introducing a gradual co-financing system would be a useful reform, as larger employer funding has helped reduce absences rates in the UK and the Netherlands.

Beyond the IW agreement, eligibility criteria for long-term sickness absence benefits need to be reformed. Since 2004, GPs have to assess the functional capacity of workers on sick leave, but controls are hardly existent. Frequent controls of GP assessments and of patients by National Insurance doctors, as practiced in other OECD countries together with use of sanctions, would strengthen the system (Prinz, 2006; OECD, 2006b and OECD, 2005a). These controls might be critical, especially during the first two months of sick leave, before people jump into the assessment process towards disability (Table 4.6).

Table 4.6. **The assessment process from sickness to disability in Norway**

NORWAY	
<i>Time scale</i>	
1 week	Up to three days of self-declared absence (up to 8 days in IW-firms)
2 weeks	First medical certificate for 1-2 weeks; as of day 16, NIA pays sickness benefit
6 weeks	Follow-up plan by the employer and the employee with support from Workplace Centres; control by the Labour Inspection Authority, penalties possible
9 months	Dismissal possible after 6-12 months
12 months	End of sickness benefit payment and application for medical rehabilitation benefit (disability benefit possible but unlikely at this stage)
1.5 years	Local NIS assessment as to whether medical rehabilitation needs to continue (8-9 months medical rehab on average)
2 years	End of medical rehabilitation, start of vocational rehabilitation (if needed) with a rehabilitation allowance
3 years	Typical time for transfer into disability benefit (but much earlier transfer possible if no prospect for improvement)
3 years plus	Vocational rehabilitation can often stretch over several years (three years maximum since recently, two years on average)

Source: OECD (2006b), *Sickness, Disability and Work: Breaking the Barriers. Norway, Poland and Switzerland*, National Insurance Administrations for Norway (NIA), update November 2006.

Addressing the growing inflow into disability: a priority

Norway has done much to insure that disabled workers have an equal opportunity to access continued education and training, and to be evenly represented in all sectors of the economy, including the public sector. The Norwegian sickness and disability benefit system appears to contain many useful provisions: there is an option for gradual re-entry from sickness into work, a very fine grid of partial disability benefits, and a possibility of keeping a disability benefit upon moving into work (OECD, 2006b). Yet, high inflows into benefits, low outflows from those benefits and low employment rates do not suggest that the rehabilitation scheme is working effectively (Table 4.7).

Table 4.7. **Outcomes from vocational rehabilitation in Norway, 2004**

Percentage of those who completed a period of vocational rehabilitation, 2004¹

Age	Completed rehabilitations (%)	Of which:						Total
		Full-time work (> 30 h/week)	Part-time work (< 30 h/week)	Unemployed	Long-term sick leave or rehabilitation	Disability benefits or retirement pension	Other outcomes	
20-29	34.9	34.0	9.8	8.4	21.9	7.0	18.8	100.0
30-39	38.0	37.2	11.0	5.2	26.4	9.0	11.3	100.0
40-49	48.2	27.7	14.6	4.5	27.8	16.1	9.4	100.0
50+	67.1	16.1	12.2	3.8	24.7	33.7	9.4	100.0
Total	44.9	28.6	12.2	5.2	25.6	16.8	11.6	100.0

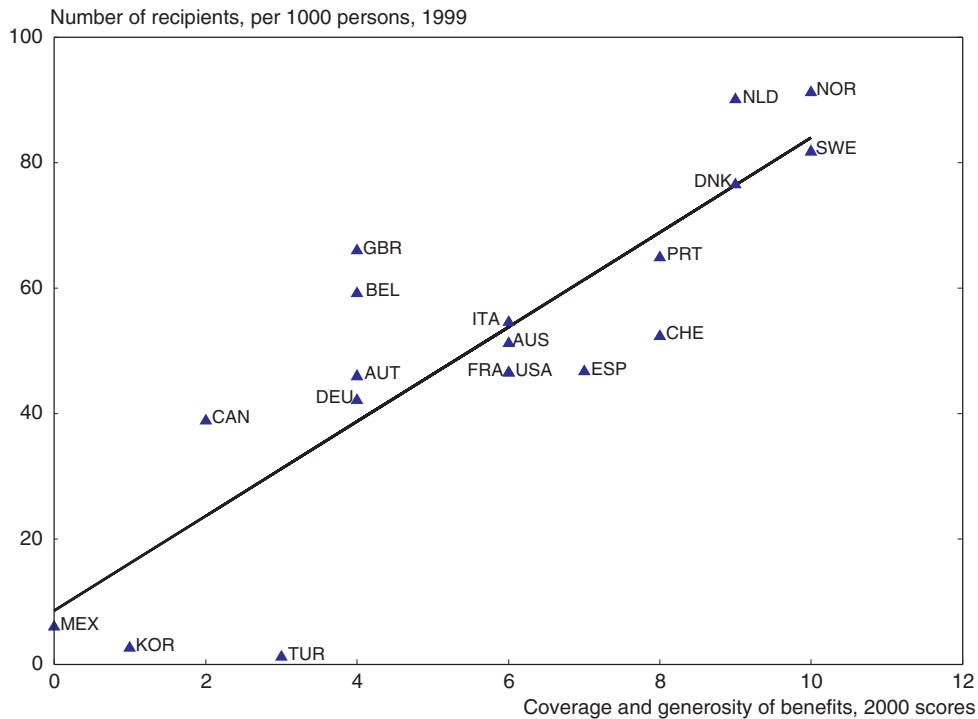
1. A rehabilitation programme is seen as completed if the person does not return within 13 weeks.

Source: Administrative data from the Public Employment Service (AETAT).

Financial incentives do matter

The evidence from cross-country research is that benefit levels and coverage are the most important explanatory factors in disability inflow (OECD, 2003). Thus Norway, Sweden, Denmark and Netherlands combine a high number of recipients with relatively high coverage and generosity of disability pensions compared to other OECD countries (Figure 4.7). What are the incentives to move from work into benefits in Norway? First, for most Norwegians, sickness benefits offer a 100% replacement rate up to 6 basic amounts (G),¹² which is close to the average production worker earnings (APW). As for disability benefits,¹³ net replacement rates for workers are also relatively high in Norway, even for childless singles,¹⁴ above 60% at APW. Besides, the occupational second pillar defined benefits, which cover 50% of Norwegian employees, boost net replacement rates to around 80% (OECD, 2006b). Furthermore, looking at average effective tax rates (AETR) for beneficiaries, incentives to move back into work are extremely low for those on a temporary or permanent disability benefit.¹⁵

Figure 4.7. **Coverage and generosity of disability pensions are high in Norway**



Source: OECD (2003), *Transforming Disability into Ability*.

Over the past decade, sickness and disability policies in Norway have tended to shorten benefit duration and increase monitoring, while leaving replacement rates unchanged. If eligibility criteria and follow-up appear to be critical, there is maybe some scope to reduce the generosity of temporary disability pensions and sick leave replacement rates. Long-term sickness could thus be reduced to, say, 75% of the previous wage, which would be more in line with other OECD countries, to increase individuals' incentives to return to work.

More should be done to raise the proportion of people on disability benefits who move to employment. Current barriers include the awarding of permanent and full benefits to most applicants, the limited possibility of combining a full benefit with labour earnings, and the limited incentives for partial benefit recipients to increase their working hours (OECD, 2006b). The favourable tax treatment of permanent disability benefits in comparison to taxation of labour income should also be removed, and in-work benefit payments for disabled persons taking up work or increasing their working hours should be considered.

Eligibility criteria and assessment procedures need some tightening

In the context of the IW-framework, attempts to reduce sickness absences are driven more through motivation than sanctions. Offering proper training for doctors to fulfil their role in disability assessment is important but not sufficient. Certifying sickness is not controlled in Norway. This creates risks of lenient assessment and conflicts of interest for GPs. In most OECD countries, contrary to Norway, social insurance experts frequently check GP's sickness assessment, control patients at home and are able to deliver sanctions in case of non-fulfilment of duties. Better control by insurance doctors of both patients and GPs, as carried out in most OECD countries, is needed in Norway. GPs should be regularly controlled and eventually sanctioned by temporarily losing the right to certify long-term sickness. Abuse by patients should also be sanctioned by delivering fines and reducing their eligibility to full replacement rates in long-term sick leaves.

Currently, more than 80% of all disability assessments are prepared solely by GPs, suggesting that assessment of long-term disability still relies excessively on GPs' judgement. However, the assessment function is becoming ever more difficult as applications for permanent disability increase for non-specific, mental and stress-related illness motives.¹⁶ Besides, the low share of partial awards despite the seemingly strict entry criteria for a full benefit suggests that medical assessments are too lenient. Disability gatekeeping and assessment should thus be transferred to the National Insurance Scheme (NIS) and its specialised social insurance doctors, with increased involvement of vocational experts in the assessment process.

Improving active labour market policies' enforcement

Successful labour market reforms over the past decade have been geared towards increasing the effectiveness of activation programmes (OECD, 2006c). Norway has also developed very strong rehabilitation training programmes. Individual action plans were introduced, along with new counselling, training and other active measures to bring each jobseeker quickly back into work. However, as shown in Table 4.7, outcomes are surprisingly disappointing in some areas. *First*, there seems to be a need of evaluation to gauge the net employment outcomes of specific schemes and assess the practices of the administrations involved (see below). *Second*, the process of vocational rehabilitation seems particularly long (Table 4.6): despite introduction of a temporary benefit status in 2004, recipients are still out of the labour market for four years on average, giving people the feeling that they are on a waiting post and reducing their employability. *Third*, because medical rehabilitation is financed by National Insurance Services (NIS), delivered by municipal health services and vocational training is provided by the Public Employment Services (PES), the efficiency of such a complex organisation may be questioned.

As in many OECD countries, Norway has aimed at tying ALMPs more closely to the implementation of work availability requirements for the receipt of unemployment benefits. The 2006 “NAV reform” in Norway brought some tentative responses. By merging welfare offices, labour offices and the social insurance services this reform seeks to improve the collaboration between agencies administering different benefits and placement services. In addition to the merger, performance objectives for public employment services, outsourcing on an experimental basis of follow-up and placement, as well as implementing performance-related bonuses for private providers have been tried out. There are however no plans for such policies on a permanent basis. The Norwegian authorities should be praised for this ambitious re organisation, but some issues remain (Box 4.2). For instance, should the NAV reform go further, leading to a full integration of PES with the municipal services dedicated to medical rehabilitation, vocational and job placement? A White Paper has recently been issued to accompany this reform: temporary, vocational and medical rehabilitation should be merged in one scheme, and the link between benefits and programmes should be broken to deliver more tailor-made services to recipients, with an overall focus on getting people into labour force more quickly.

Empirical research has recently provided a detailed evaluation of Norwegian activation (ALMP) programmes on unemployment duration (Røed and Raaum, 2006). Once completed, programme participation improves employment prospects, but there is often an opportunity cost in the form of a lock-in effect during participation. It is thus argued that the direct on-programme and post-programme effects do not justify the high administrative costs related to programmes. For instance the cost of producing one month of labour market training amounts to the average income of a low-skilled wage earner. It is also proven that programme efficiency varies over the business cycle.¹⁷ This leads to a specific recommendation to rescale and improve activation policies in Norway. Programmes should be targeted at persons with poor individual employment prospects and long unemployment spells to boost active integration. In particular large effects are found specifically for immigrants from developing countries (Røed and Raaum, 2006).

Box 4.2. **A new public employment and welfare service : the one-door policy**

Up to 2005, Norway had three different levels of welfare agencies: a National Employment Directorate, a National Social Security (“trygd”) Directorate and a social assistance service (at the municipal level). This suboptimal organisation was a major source of debate in the 1990s. In 2005, the parliament decided to coordinate and partially merge those divisions in a new Public Employment and Welfare service, creating a structure of sixteen thousands employees to provide Labour Market Programmes (LMP). Labour market policies are administered by local public employment offices and can be divided into four main groups (Røed and Raaum, 2006):

- vocational training, typically in classrooms, providing skills to meet the needs for skilled-labour among local employers;
- temporary public employment (mainly in local community);
- temporary wage subsidy paid to private employers;
- job placement programmes in the public and private sector aiming at providing basic job qualification.

This so-called “NAV” reform should first help to clarify the situations of persons outside the labour market, especially those in the “grey zone” that might be considered too sick to work, but too healthy to claim disability benefits. For instance, medical rehabilitation was under the responsibility of the municipal health services, whereas vocational rehabilitation was managed by the former Employment Services. From now on, claimants for unemployment, social security benefits, social assistance and active labour market programs will address the same services, located in the same building.

The main objective of this “one-door policy” is to develop and improve tailor-made services for the individual and improve labour market participation. Merging agencies with different cultures and histories will however require a smooth transition between 2006 and 2010. Because this reengineering of the public employment services requires a transition from passive claims processing to the implementation of more active and individualised approach, the NAV reform is not expected to increase labour market participation until 2010. Specific issues remain:

- Will the different services really collaborate? Is this a genuine merger or a juxtaposition of services with different administrative authorities? Is there an effective will to give priority towards activation policies?
- Little is known about how the existing regulations and provisions available in the system are being implemented by local actors. Important investments will be surely needed for training caseworkers of the new merged institution. Up to now, there are some worries that this new organisation is driven by a culture of delivering benefits rather than activating workers (13 000 employees out of 16 000 come from the “payer” body, with little expertise in activation policies). There is thus a need for intensive retraining and proper monitoring of the performance of local offices delivering the services, in order to assess results and identify worst performers. Evaluation remains a key issue.
- Medical and vocational rehabilitation, which are the responsibility of different bodies, should go hand-in-hand according to recent proposals. This requires a strong co-ordination and common objectives, with the priority being to restore the person’s work ability.

Conclusion

To conclude, Norway has enjoyed an enviable position. Labour market performance is high, with strong participation and employment rates at all ages. Yet, some institutional failures are putting in danger the long-term sustainability of the welfare state. With an ever-growing public sector, there are risks of sub-optimal sectoral allocation of jobs, especially in an ageing society which could lead to more crowding out between public and private jobs. Risks are also high that the global performance of the labour market might erode because of too generous assistance and early retirement schemes. Norway needs an ambitious rescaling of its disability and sickness assessment process. Activation policies must be streamlined, while controls and sanctions must be enforced. Financial incentives to work should also be enhanced, reducing tax-induced distortion and phasing-out actuarially non-neutral schemes. Enforcing such reforms would in the medium-run significantly boost hours worked, while consolidating the Norwegian welfare state.

Box 4.3. Summary of recommendations

Reduce sickness absence and inflows to disability benefits

- Consider a gradual lowering of sickness benefits after, say, the first three months. Long-term sickness absence replacement rates should be reduced to levels more comparable with OECD countries, say 75% of former pay up to 6 basic amounts (G).
- Introduce frequent checks of GPs' sickness assessments and controls of patients by social insurance doctors, a common practice in OECD countries. When there is evidence of abuse, enforce sanctions and temporarily suppress GPs' certification rights. Abuse by patients should also be sanctioned by delivering fines and reducing their eligibility to full replacement rates in long-term sick leaves.
- Transfer the assessment of disability benefit eligibility to NIS doctors and vocational experts to reduce GPs' conflict of interest.
- Introduce measures enhancing employer-employee's responsibility, such as co-financing of sickness benefits, as recently proposed by the government and successfully experimented in the UK and the Netherlands.
- Existing disability entitlements should be regularly reviewed, for instance once every two years and functional capacity revised.

Streamline ALMP organisation to raise outflows into the labour market

- Streamline vocational programmes and consider a stronger integration process in the Public Employment Services merger. In particular, medical and vocational rehabilitation programmes should be better coordinated.
- Introduce rehabilitation and vocational training schemes after a sickness period of three to six months to speed up the return of long-term sickness benefit recipients back to work.
- Target and tighten labour market programmes on persons with poor individual employment prospects, in particular immigrants, to enhance outcomes.
- Extend the possibility of combining a partial benefit with labour earnings and improve financial incentives for partial benefit recipients to increase their working hours, with combined stricter controls to avoid special arrangements and abuse of part-time subsidised work.

Notes

1. From 1985 to 2005 unemployment increased by 13 000 persons among persons aged 16 to 24 years. Unemployed persons in the same age group registered at the employment offices decreased from 6.5% of the labour force in 1985 to 4.9% in 2005.
2. The rise is mainly explained by job creation in local governments. In Northern regions, more than 40% of employees work in the public sector. This reflects the presence of Norwegian armed forces as well as the impact of regional forces.
3. Here lies part of the explanation of the stability of Norwegian employment rates, whereas the Swedish and Finnish never returned to their levels of the 1980s.
4. The construction sector often ignited wage pressures in economic upswings in Norway.
5. Most universities and educational institutions are financed by the state.
6. Which are however slowly approaching OECD averages according to OECD (2006b).
7. Interestingly, adding this supplementary share of disabled to an extended measure of unemployment would lead to a structural rate of unemployment close to European averages (roughly 8 to 9%).
8. This is slightly below the OECD average.
9. A preliminary version of this report was also presented to a commission aimed at reforming disability schemes in accordance with a global pension reform, which should deliver its main recommendations in Spring 2007 (Prinz, 2006).
10. As an offsetting measure, the employer-only financed period would be reduced by two days to 14 days. Besides, the newly introduced mandatory occupational pension schemes for smaller companies (total wages less than NOK 2.5 million) could be administrated by NAV.
11. Hospital waiting lists should be reduced to accelerate operations of temporarily disabled. GPs, employers and employees should be activated earlier, establishing a follow-up plan no later than 6 weeks (reduced from 8 weeks). It is specified by the law that employers and employees should have dialogue meetings no later than 12 weeks after medical certification. The penalties for employers that do not follow the rule are doubled. New financial measures to accelerate health and rehabilitation services have been put forward. They should bring the long-term sick back to work faster.
12. The basic amount, named G, was around NOK 61 000 on average for 2006.
13. Note that any disability pension is calculated as if the recipients would have worked and contributed for a pension until 67, with a 40 year average contribution period. See Bellone and Bibbee (2006) for a detailed presentation of the Norwegian social schemes.
14. At 100% of APW, they reach 72% for a temporary and 62% for a permanent disabled; at 150% of APW, they reach 57% and 59%, respectively.
15. For instance, there is some incentive for an average earner to work, but only up to a level of 70% of APW with a 60-70% average tax rate. This is a level of tax only reached again at more than 150% of APW earnings, which this person is highly unlikely to ever achieve.
16. This amounts today to close to 25% of diagnosed disability inflows.
17. Employment effects are more favourable in good times than in bad times. Second, the fraction of individuals with poor prospects rises in recoveries and booms.

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ANNEX 4.A1

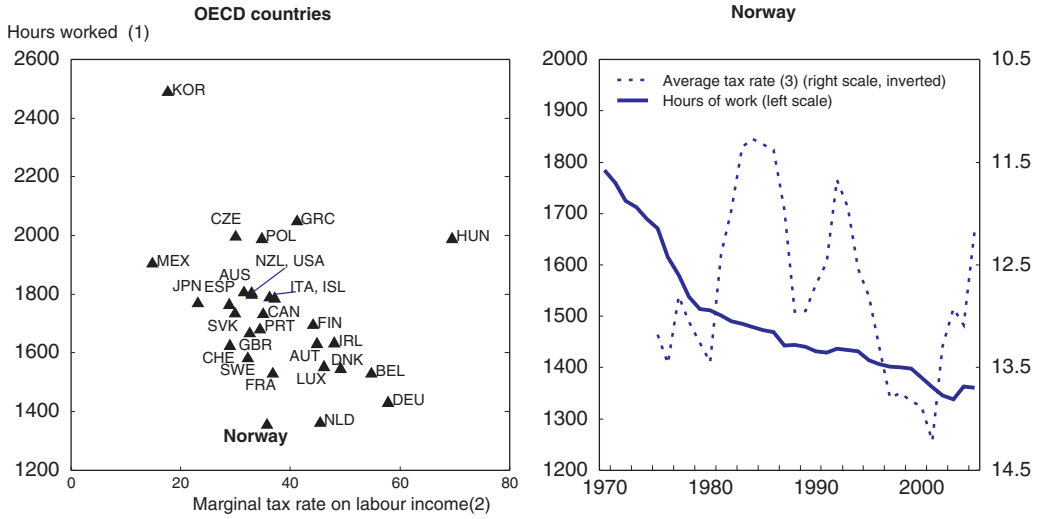
Why do Norwegians work so little?

An expanding literature has recently tried to understand why variations in hours worked are so wide among OECD countries. On the one hand, some argue that the cross-country differences in labour input can be essentially explained by tax-induced distortions (Prescott, 2004). On the other hand, a growing literature focusing on collective choices and income effects provide an alternative explanation (Alesina *et al.*, 2005). This annex examines which of these factors are the most likely to explain Norway's short working time.

In the case of the Nordic countries, recent research based upon a general equilibrium modelling shows that policy might account for the difference in average annual hours worked between Sweden and the United States (Olovson, 2004). The main distortion would have come from taxes in general, and labour taxes in particular, due to the fact that labour taxes really influence the choice between working in the market and in home production. Interestingly, the model is consistent with the falling trend in hours worked since 1960 and with the large reduction observed from 1960 until around 1980.¹ However, those simulations overestimate hours worked between 1960 and 1975. In the case of Denmark or Sweden, high marginal taxation rates would have accounted significantly for reduction of hours worked (OECD, 2005c and OECD, 2005b). With panel data estimates and controlling for endogeneity and other factors such as GDP per hours worked or proxies for part-time work, elasticity of taxes to average hours worked comes close to -0.6 (OECD, 2005a). In a similar vein, Nickell (2003) finds through a cross-country study that tax rates *per se* can explain only around a quarter of the variation in labour input. Following these results, a reduction of the marginal tax rate on labour income in Norway to levels observed in the United States (a reduction to the OECD median) could, everything else being equal, boost hours worked by 8% (3%).

More recently, new research has concluded that the tax channel may be fragile; the effects of taxes on labour inputs are found to be small in micro-econometric studies (Alesina *et al.*, 2005). Furthermore, when labour taxes are found to have a significant impact, they explain only a little of the overall picture (Faggio and Nickell, 2006). Figure 4.A1.1 shows the relationship between hours and taxation. Interestingly, Norway, France and Netherlands seem out of the pack with lower hours worked for a given level of tax rate. Figure 4.A1.2 shows that there is no clear-cut correlation between the average rate of taxation and average annual hours worked. Besides, it seems difficult to establish any temporal causality between the two series in Norway. Looking at different empirical estimates on various horizons and on a cross-country approach, it so happens that there is

Figure 4.A1.1. **Low hours worked because of high taxes**

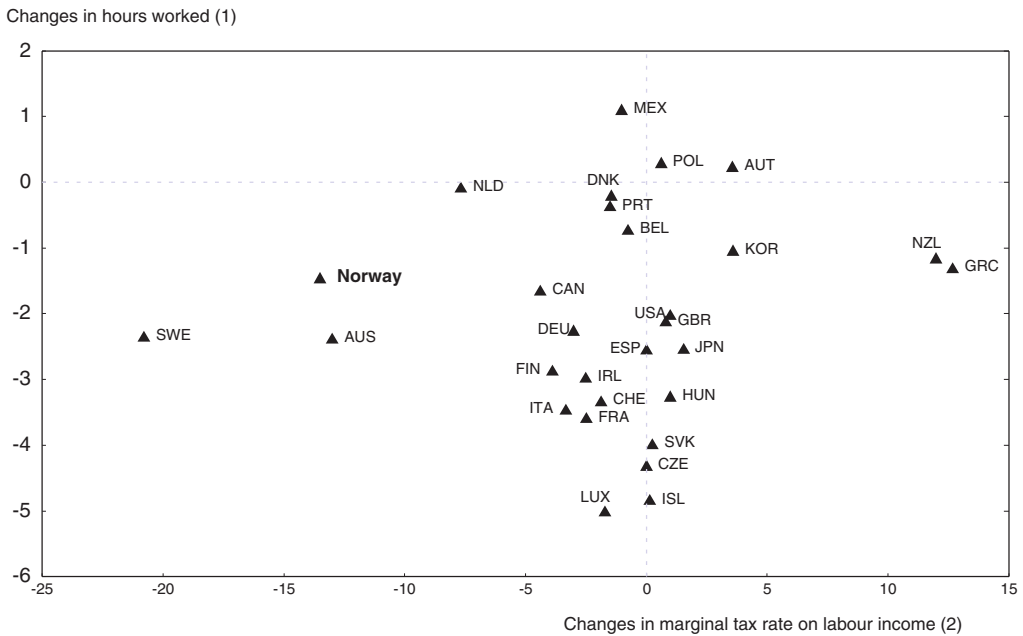


1. In 2004 except 2003 for Austria, Hungary, and Korea.
2. Marginal income tax rate plus employee contributions, single person with no children earning the average wage, in 2005.
3. Average implicit tax rate on households, direct taxes paid by households over real disposable income plus other revenues.

Source: OECD, *Taxing Wages 2004/2005*, and OECD Analytical database, *Labour Force Statistics*.

Figure 4.A1.2. **Low hours worked and falling taxes: cross-country changes in hours worked and taxation**

Changes in per cent between 2000 and 2005



1. In 2004 except 2003 for Austria, Hungary, and Korea.
2. Marginal income tax rate plus employee contributions, single person with no children earning the average wage, in 2005.

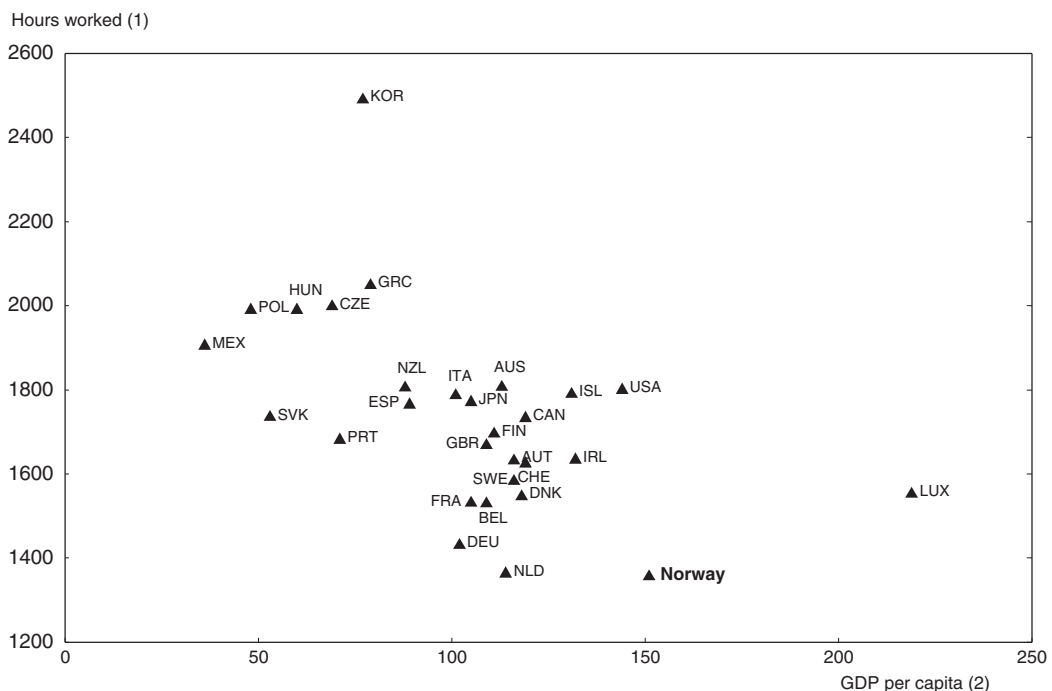
Source: OECD, *Taxing Wages 2004/2005*, OECD Analytical database and *Labour Force Statistics*.

no clear-cut evidence linking changes or levels in hours worked and changes or levels in average taxation (Figure 4.A1.2). For instance, Norway has recently benefited from a strong decrease of average marginal tax rates, with a coincident fall in annual hours worked.²

The short duration of working time in Norway reflects two specific institutional and social causes: a large number of weeks of vacations and a high number of days lost due to sickness and maternity. Part-time work (especially female) is around average in Norway and thus cannot be considered a main driver as in the case of the Netherlands.³ Unlike many continental European countries (*e.g.*, France, Belgium or Germany), Norwegian governments never caught on to the idea that some people, particularly old-age workers should be encouraged into early-retirement to make room for the younger generation (albeit this may have changed with a strong support for AFP). Whereas the work sharing and unemployment argument is clearly a serious explanation in the case of France (Kramarz *et al.*, 2006), it is not convincing in the case of Norway. By contrast, low weekly hours worked may be the manifestation of “a social multiplier” effect expressing positive externalities due to collective preferences for leisure (Alesina *et al.*, 2005). It is argued for instance that strong unions, generous welfare benefits and social democratic governments imply both high taxes and direct collective pressure towards less work.

High GDP per capita, allowing a comfortable choice between consumption and leisure – the income effect – seems to be one of the most robust explanations for low average annual hours worked and a large number of vacation days in Norway. Strong incentives to jump into sick absences as a substitute to vacation or working time arrangements because of high replacement rates and low sanctions may complete the picture. Figure 4.A1.3

Figure 4.A1.3. **Low hours worked because of high GDP per capita**

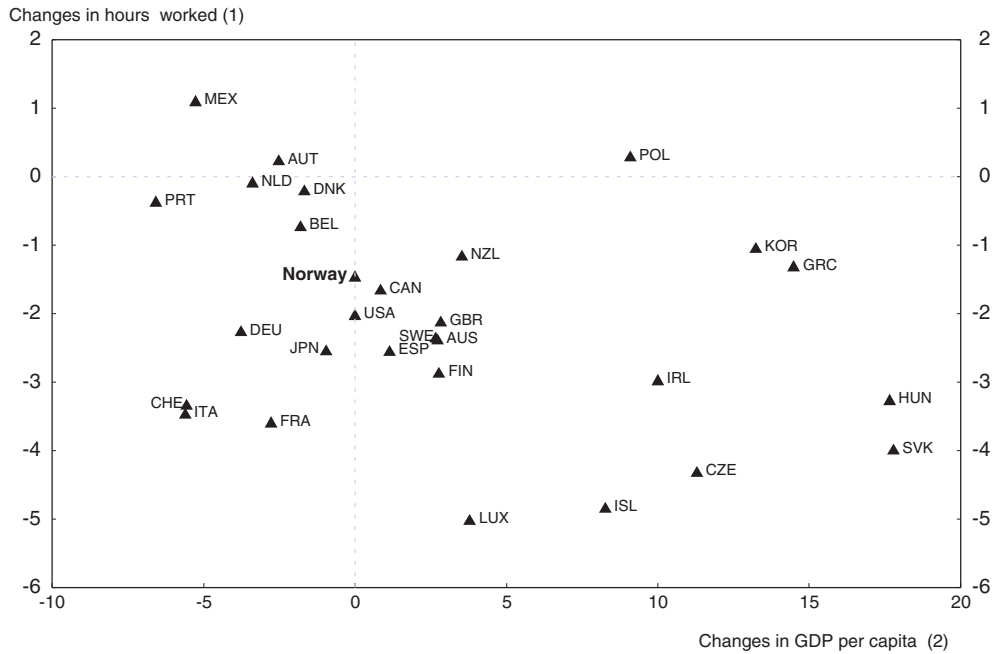


1. In 2004 except 2003 for Austria, Hungary, and Korea.

2. In 2005, constant prices and PPP 2000, OECD = 100.

Source: OECD, *Main Economic Indicators* and OECD Analytical database.

Figure 4.A1.4. **Cross-country changes in hours worked and GDP per capita**
Changes in per cent between 2000 and 2005



1. In 2004 except 2003 for Austria, Hungary, and Korea.
2. In 2005, constant prices and PPP 2000, OECD = 100.

Source: OECD, *Main Economic Indicators* and OECD Analytical database.

shows for instance a robust cross-country correlation in levels between GDP *per capita* and annual average hours worked. Looking at relative changes, though, this relationship does not seem to be so clear-cut (Figure 4.A1.4). Of course, other specific microeconomic and social factors such as a strong desire for a balanced life and good working conditions should not be neglected. Specific Nordic values and social norms may certainly be at stake, but remain difficult to measure.

Notes

1. This is a stylised fact common to all Nordics.
2. Excluding the recent stabilisation in sickness absences, which is more likely to be related to a new tightening rule than to a revised arbitrage between labour and leisure.
3. Norway's and the Netherlands' average weekly hours of work are highly comparable. Yet, the share of part-time in the Netherlands is twice as big as in Norway. For instance, 30% of female employees were working less than 20 hours a week in Norway in 2002, whereas they were close to 60% in the Netherlands (OECD, 2004).

Chapter 5

Encouraging innovation

R&D intensity and other standard innovation measures are low in Norway. This presents something of a puzzle. On the one hand, productivity growth has been high, and on the other, Norway has developed a solid institutional framework for innovation support. The main problem seems to lie on the side of firms, who have done very well by adapting existing technologies to boost their productive efficiency, apparently seeing little need to produce innovations of their own on account of high risks and costs. Indeed, industrial structure is characterised by relatively large shares of small firms and low tech industries. The same patterns are reflected in education output, with a dwindling supply of math, science and technology (MST) degrees. However, future growth potential will depend increasingly on innovative activity, especially as the oil sector, the source of many knowledge spillovers up until now, will henceforth decline while population ageing limits future growth of labour input. Furthermore, a minimum critical mass of technical competency is needed in order to be able to recognise and adapt evolving new technologies to confront global competition. All this suggests that a greater policy focus on improving the framework conditions for competition and risk-taking is needed, involving stronger competition policy, reduced public ownership in market-based production, and financial market development. This would stimulate a greater perceived need for innovation by firms and a corresponding demand for MST skills. The government could contribute to this process by encouraging the supply of qualified MST teachers and counteracting market failures in the supply of venture capital and equity financing more generally. Various regulatory and fiscal barriers to the growth of firms would also need to be removed by establishing a level playing field.

Most of the increase in material living standards since the industrial revolution has been the result of innovation: new or improved goods and services, and new ways of producing and delivering them. OECD work shows a strong link between private-sector innovative activity as conventionally measured, and GDP growth (Bassanini *et al.*, 2000; Ahn, 2002). Innovative activity is costly; it has uncertain outcomes, and if successful, can be copied cheaply if it enjoys no legal protection. But if the protection is too restrictive (or if innovations are kept secret), society will lose some of the benefits. Hence there is a case for policies that both provide a framework for innovation by private business and that accord an appropriate level of protection to its fruits while encouraging their diffusion (Nadiri, 1993; Cameron, 1998). The case for public intervention is widely recognised, and all OECD countries have a mix of policies in place aimed at supporting innovation.

This chapter first describes the institutions and policies that impact on innovative activity, either deliberately or as a side effect. It then assesses the state and evolution of such activity, and to what extent specific policies here are cost-effective. Policy conclusions and recommendations are then drawn.

The institutional framework

Policy institutions are well funded and have clear mandates

Following reorganisation and rationalisation in the previous and current decade, there are now three major public policy institutions in Norway that help fund or encourage innovation activity in Norway: The Research Council of Norway (RCN); Innovation Norway (Innovasjon Norge); and SIVA (Industrial Development Corporation of Norway). The intention of the reforms is that each institution should have clear and distinct mandates, and that they should cooperate with each other to provide a better service to the private sector.

The Ministry of Education and Research has administrative responsibility for the **RCN**, formed from the 1993 merger of 5 councils. Of its 2006 budget of NOK 5.2 billion (about € 650 million, or ¼ per cent of GDP), 20% was provided by the Ministry of Trade and Industry for industrial R&D projects, and 24% by the Ministry of Education and Research. The Ministry of Education and Research also allocates nearly € 200 million as return on the “research fund”, making the Ministry RCN’s largest contributor.¹ The remainder came from contributions of other ministries. The RCN advises the government on research policy; is an important source of finance for publicly-funded fundamental and applied research; is a meeting-place for researchers in the public and private sectors; cooperates in international research; and distributes as grants nearly 30% of public funds for R&D, after evaluation of projects.

Among the instruments for supporting industrial R&D and innovation, the general and project-based innovation arena (Brukerstyrt innovasjonsarena, BIA) and related schemes are central. Further, the RCN helps finance three types of innovation-oriented institutes. The newly-created “Centres for Research-based Innovation” (SFI) aim at

encouraging private-sector R&D efforts via closer relationships between major research groups and R&D-intensive enterprises. Explicit links to foreign researchers and institutes are needed to qualify for an RCN grant (no grants have yet been made). Twenty-one “Norwegian Centres of Excellence” (SFF) have been named (more are expected). These are already-existing research groups, chiefly in universities, and the aim is to underwrite high-quality long-term fundamental research. Together with SIVA and Innovation Norway (see below), the RCN contributes to the financing of “Norwegian Centres of Expertise” (NCEs) which support existing regional industry clusters’ efforts to improve competencies. Looking forward, the intention is that the RCN should focus on financing long-term programmes (of approximately € 125 million each over a 5-10 year lifespan) in the areas of petroleum resource management, clean energy, nanotechnology, aquaculture, climate change, ICT and genomic research.

Innovation Norway results from the January 2004 merger of the Norwegian Tourist Board, the Norwegian Trade Council, the Norwegian Industrial and Regional Development Fund (SND) and the Government Consultative Office for Inventors (SVO). Funded primarily by the Ministry of Trade and Industry and the Ministry of Local Government and Regional Development, its provision of industrial support is comparable to that of the RCN. Its mandate is to achieve national and regional goals in accordance with the government’s innovation policy. It encourages private-sector innovation, especially in start-up firms, for which it provides seed capital in cooperation with the private sector. However, most such start-ups have remained small in size (like most Norwegian firms). It also promotes industrial research and development contracts (IFU) whereby (at least) two parties, usually a customer and (normally) an SME supplier, commit to developing an innovative product, service or process new to their market. Up to 35% of development costs can be financed by a grant from Innovation Norway. Collaboration between Norwegian SMEs and foreign enterprises is especially favoured.

SIVA, with a turnover of around € 30 million, is a co-owner of around 60 science and research parks and other innovation centres. It advises on, and helps finance, the creation of networks between regional, national and international R&D units. It also helps to create industry incubators as well as encouraging the establishment of new firms within them. Such firms may receive start-up grants from Innovation Norway.

An indirect policy initiative to encourage R&D is the reformed funding mechanism for universities and other institutions of higher learning. As of 2002, 40% of their funding depended on results, including publications in peer-reviewed academic journals. Similarly, funding for regional hospital trusts has become competitive, with 40% core funding for research and 60% depending on results. Basic research projects are financed by the Ministry of Research and Education, under guidance from the RCN. In real terms, university spending on R&D rose by 8% between 2003 and 2005. The 2006 budget for universities allowed for a redistribution between universities of 10% of the funding envelope based on 4 indicators: the volume of scientific publications; the number of PhD candidates; the amount of funding for research granted by the RCN; and the amount of funding granted by the EU framework programmes. This additional financial incentive approach will be evaluated in a few years’ time.

Finally, there are a large number of research institutes in Norway of different sizes, typically working under contract for business and the public sector. They are responsible for about one quarter of all Norwegian R&D, but their relative importance has gradually

shrunk since the 1980s. The RCN is charged with reviewing the system of grants to these institutes and developing new guidelines for public funding. Raising the level of support for environmental and technical research was an early result of this review process.

The policy framework

Encouraging innovation is a policy priority

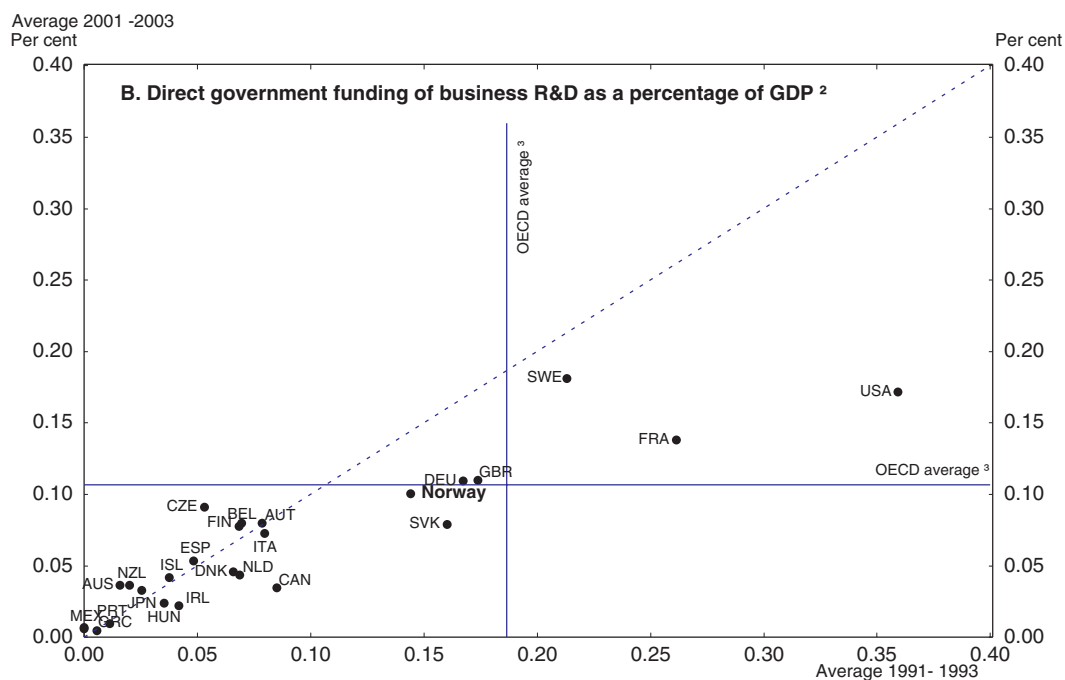
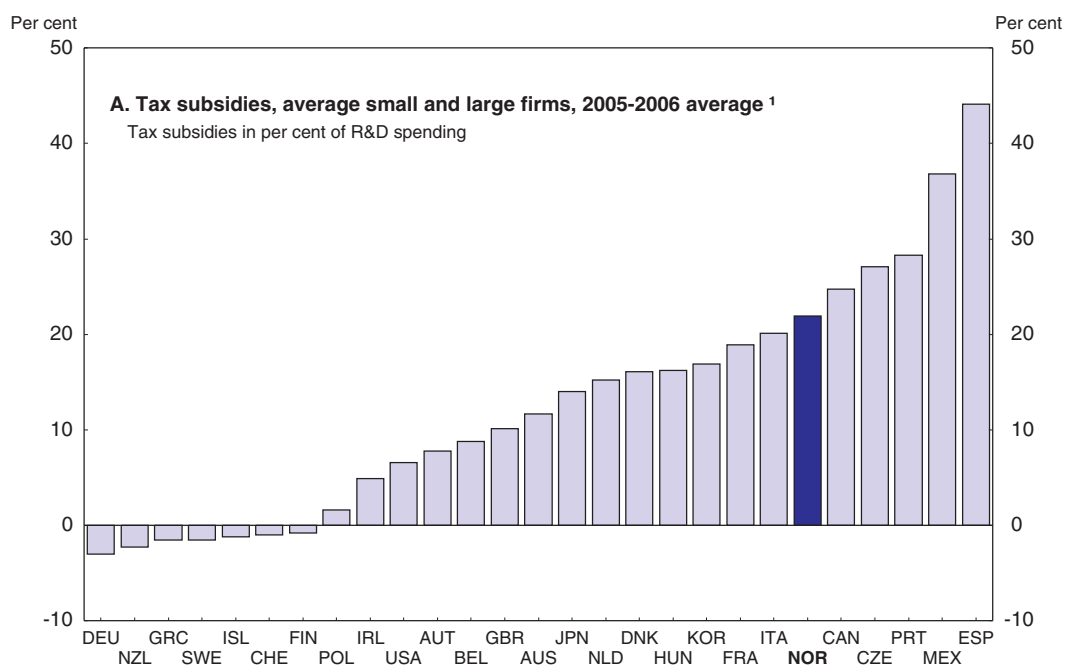
Successive governments have stressed the importance of innovation for maintaining and increasing living standards in the future, especially once petroleum exports start to dwindle. The reorganisation and stepped-up financing of the three main innovation policy institutions is one demonstration of this concern. The current government target is to raise total R&D spending to 3% of GDP by 2010, with public financing of R&D at 1% (the 2004 figures were 1.6% and 0.74% respectively, rising to 2.1% and 1% respectively if expressed as a percentage of mainland GDP).

As in most OECD countries, private sector R&D receives favourable tax treatment and grants. The generosity of tax subsidies, as measured by the OECD's "B-index" calculations, averaged about 22% in 2006, well above the OECD average and exceeded only by Canada, Czech Republic, Portugal, Mexico and Spain (Figure 5.1). Direct government funding of private R&D was 0.11% of GDP, close to the OECD average, but well above the median.

The tax credit scheme "Skattefunn" was introduced in 2002. Approval of projects according to R&D content is given by the RCN. When it was introduced, some grant-based incentives were scaled back. The Skattefunn provides a 20% deduction of R&D costs up to NOK 4 million (about € 530 000) per firm and per year for internal projects and an additional NOK 4 million for R&D purchases from universities and institutes. Large companies enjoy an 18% deduction (because of EU/EEA state aid rules), but the ceilings are the same. The qualifying projects must generate new knowledge in a broad sense that favours the development of new products, services or processes. There are no regional or sectoral constraints. Enterprises that have no, or insufficient, taxable income are paid the equivalent as a grant (as much as 76% of total tax expenditures was distributed in this way in 2004). The Skattefunn is thus neutral as between qualifying projects, regions, sectors and the tax position of qualifying firms, but lowers the marginal cost of R&D in small enterprises or low R&D spenders more than in larger ones. It has proved highly popular in the business sector since its inception. The 2004 tax expenditure of the Skattefunn was NOK 1.4 billion, about 0.1% of GDP.

The broadly neutral construction of the Skattefunn is a point in its favour, especially in Norway where there is a long tradition of including regional, social and sectoral goals in industrial policy. Of course, lower taxes on firms have to be compensated by higher taxes elsewhere. It is also possible that firms now claim tax credits against spending that they would not previously have classified as R&D. There is also the question of additionality, to what extent the tax credit generates genuine additional R&D that would not have taken place in its absence. The effectiveness of the Skattefunn in stimulating additional private R&D is currently under evaluation. It is relevant, although by no means conclusive, that the tax expenditure over the 2002-2004 period amounted to NOK 3.4 billion, equivalent to more than € 400 million, while recorded business R&D spending, which is erratic, did not rise.² Preliminary data shows that nominal spending on private R&D recovered somewhat in 2005, but remained slightly below 2003 levels. Finally, there is the possibility that even if the tax credit stimulates genuine additional R&D, the tax expenditures could have been

Figure 5.1. Fiscal support for private R&D investment



1. Measures the generosity of tax incentives to invest in R&D, on the basis of the pre-tax income necessary to cover the initial cost of one dollar R&D spending and pay corporate taxes on one dollar of profit (B-index). A value of zero on the chart would mean that the tax concession for R&D spending is just sufficient to offset the impact of the corporate tax rate. Note that the B-index measures only the level of tax subsidy for qualifying firms and projects. Not all private R&D projects qualify in all countries, for example if, as in Norway, there is a comparatively low spending ceiling on the projects that can attract the tax relief.
2. The large fall observed in some countries between 1991-1993 and 2001-2003 reflects a cutback in defence spending. In the case of Norway, it also reflects the scaling-back of R&D grants following the introduction of the Skattefunn.
3. Unweighted average.

Source: OECD (2006), OECD Science, Technology and Industry Outlook.

better used in other areas. As regards this last point, Russo (2004) finds in a whole-economy analysis that the gains from successful R&D-linked tax incentives are significantly greater than those from an equivalent reduction in personal or corporate tax reductions. The result reflects the potentially high social returns to private R&D spending.

Education and training policies are important for creating a suitable framework for successful innovation. Total spending on education is 6.3% of GDP, higher than in most OECD countries. Primary and secondary education is provided free of charge and most spending on tertiary education is also publicly funded. Average years spent in formal education for both men and women are among the highest in the OECD, and have been high for several decades. About 40% of the population aged 25-34 had at least tertiary education in 2002, a higher proportion than in any other European country, and behind only Korea, Japan and Canada. Nearly a third of the 25-64 year-old population have tertiary education, a figure comparable to that in other Nordic countries, and exceeded only by the United States and Japan (Table 5.1). As in most OECD countries, the proportion of the relevant population pursuing higher education to the bachelor degree level has risen in recent decades, whereas the percentage of students pursuing scientific and technical courses has fallen, and the numbers are low by international comparison (Figure 5.2). The numbers of those successfully graduating at the masters or doctorate level have risen relatively rapidly, and there is a higher proportion of graduates in the scientific and technical fields at this level than at the lower levels. There has also been a rapid rise in the number and proportions of students following business studies at the bachelor and masters levels.

The cost-effectiveness of the Norwegian educational system at present for training future scientists and engineers is questionable. Although Norway spends more than the

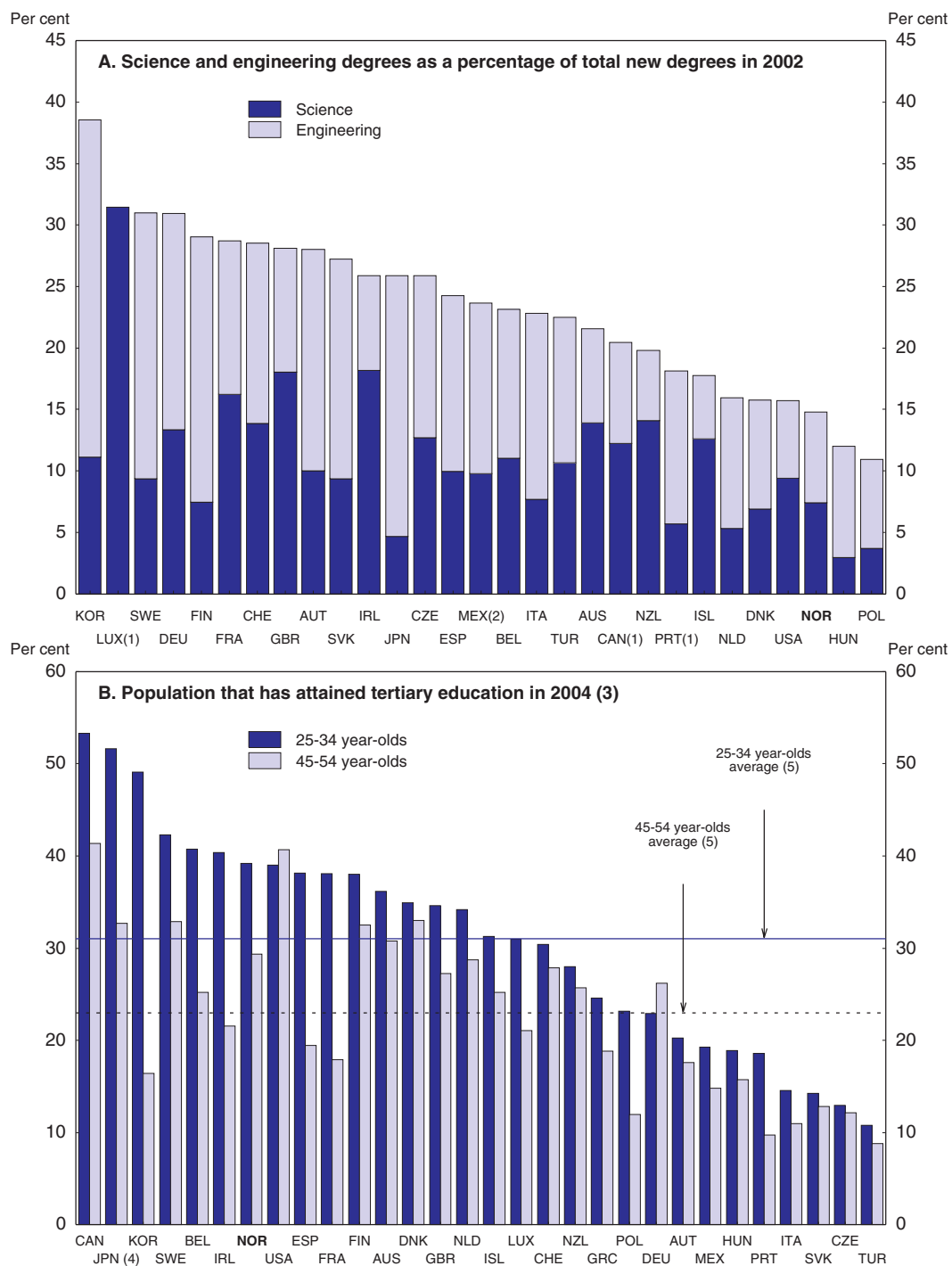
Table 5.1. **Indicators of education**

	Years of formal education, 2003					Proportion of age group with tertiary education		
	Total	Males		Females		25-64	25-34	55-64
		25-34	55-64	25-34	55-64			
Czech Republic	12.4	12.6	12.4	12.6	11.8	12	12	10
Denmark	13.6	13.7	13.5	14.0	13.0	32	35	26
Finland	12.1	12.9	10.5	13.6	10.4	33	40	24
France	11.5	12.8	10.3	13.0	9.5	23	37	14
Germany	13.4	13.5	13.6	13.4	12.4	24	22	22
Greece	10.5	11.8	9.0	12.5	7.9	18	24	11
Iceland ¹	13.3	13.7	13.3	13.5	11.8	26	29	17
Ireland	12.9	13.9	11.1	14.3	11.2	26	37	15
Italy ¹	10.0	11.2	8.4	11.6	7.4	10	12	7
Japan	12.4	13.3	11.2	13.2	10.5	37	52	19
Korea	11.9	13.6	10.1	13.5	7.9	29	47	10
Netherlands ¹	12.9	13.4	12.6	13.6	11.4	24	28	19
Norway	13.8	14.3	13.2	14.7	13.0	31	40	22
Poland	11.6	12.0	10.8	12.7	10.4	14	20	11
Portugal	8.2	9.0	7.2	10.0	6.9	11	16	6
Slovak Republic	12.4	12.8	12.2	13.0	11.4	12	13	9
Spain	10.5	11.9	8.6	12.5	7.7	25	38	11
Sweden	12.5	13.1	11.2	13.4	11.6	33	40	26
United Kingdom	12.7	13.1	12.4	13.0	12.1	28	33	21
United States	13.8	13.7	13.8	14.0	13.5	38	39	35

1. 2002.

Source: OECD (2006), *Education at a Glance*.

Figure 5.2. Tertiary education



1. Data refers to 2000.
2. Excludes tertiary-A second degree programmes.
3. Tertiary education is defined as tertiary type A and advanced research programmes and tertiary type B education.
4. Data refer to 2003.
5. Unweighted average.

Source: OECD (2005), OECD Science, Technology and Industry Scoreboard and OECD (2006), Education at a Glance.

average OECD country on education (relative to GDP), scores are low by international comparison. The 2000 OECD PISA results for overall mathematical ability as reported in *Learning for Tomorrow's World* placed Norwegian 15-year olds only at the average of the sample countries³ and the 2003 results placed them significantly below the average. Similarly, the 1995 and 2003 TIMMs⁴ results for 4th and 8th grade students in maths and science not only placed Norway well below the average for the country sample, but also showed a considerable weakening between the two years (Table 5.2). Although Norway scores higher than the United States or Italy in the PISA study, most of the other more advanced OECD countries have better performances. On the other hand, according to OECD/StatCan research as reported in *Learning a Living* (OECD, 2005), Norwegian adults have comparatively high levels (and low inequalities) of literacy, numeracy and problem-solving skills – but only 6 countries were in the sample. One interpretation is that the educational system was more successful in the past than it is now at training students in the relevant disciplines. The generally low directly-relevant academic qualifications of current Norwegian teachers of mathematics and “hard” natural sciences (*e.g.*, physics) support this interpretation. Another interpretation is that high-ability students today are less likely than in the past to opt for the more difficult scientific and technological courses. It is scant comfort that the same trends are even more marked in Sweden and some other countries.

Nevertheless, Norway ranks consistently favourably in terms of numbers of private-sector researchers. About 0.7% of all employees were so employed in 2001, the year before

Table 5.2. **Educational attainment**

	(I)	(II)		(III)		(IV)		(V)	
		High benchmark				Intermediate benchmark			
		1995	2003	1995	2003	1995	2003	1995	2003
Czech Republic	84	..	..	..	..	..	..	..	..
Denmark	85	..	..	..	..	..	..	..	..
Finland	93	..	..	..	..	..	..	..	..
France	83	..	..	..	..	..	..	..	..
Germany	76	..	..	..	..	..	..	..	..
Greece	62	..	..	..	..	..	..	..	..
Iceland	85	..	..	..	..	..	..	..	..
Ireland	83	..	..	..	..	..	..	..	..
Italy ^{1, 2}	69	26	23	59	59	59	59	59	59
Japan	86	54	53	85	86	85	86	85	86
Korea	91	50	57	81	88	81	88	81	88
Netherlands ¹	88	48	43	82	85	82	85	82	85
Norway	80	32	21	72	63	72	63	72	63
Poland	78	..	..	..	..	..	..	..	..
Portugal	70	..	..	..	..	..	..	..	..
Slovak Republic	81	42	34	77	72	77	72	77	72
Spain	76	..	20	..	58	..	58	..	58
Sweden	83	52	38	83	75	83	75	83	75
United Kingdom ³	..	30	32	61	70	61	70	61	70
United States	74	38	41	68	75	68	75	68	75

Column I: percentage of 15-year old students achieving levels 2-5 on a math's scale.

Columns II-V: percentage of 4th and 8th grade students reaching TIMMs benchmarks of science achievements.

1. 2003 refers to 2002.

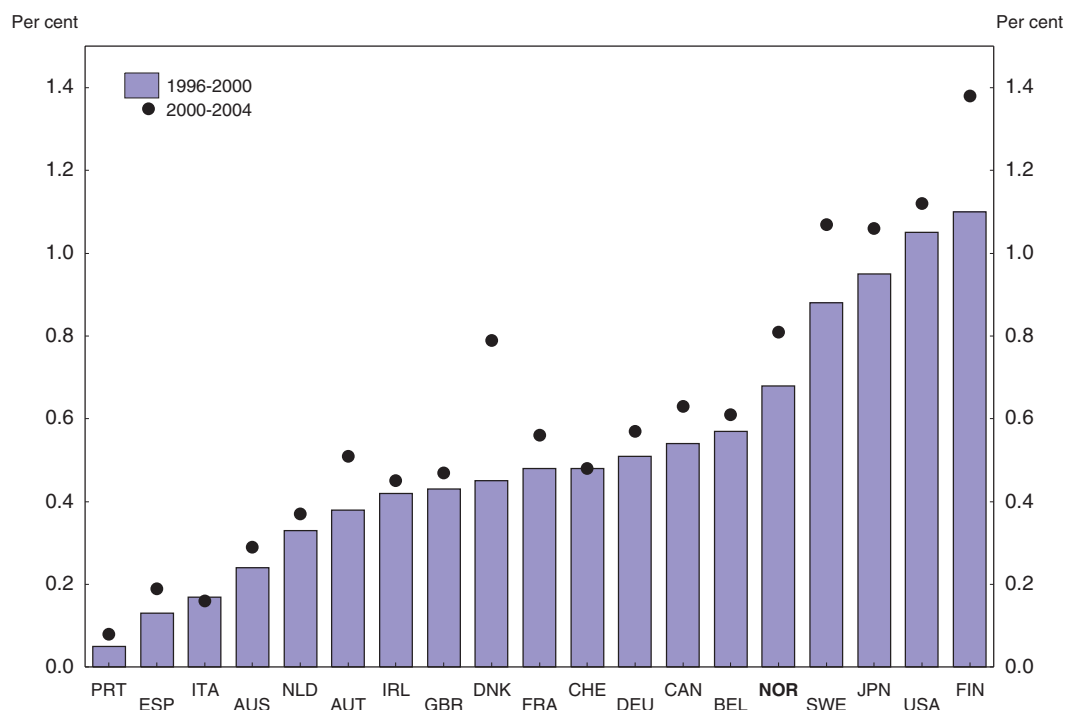
2. 1995 refers to 1999.

3. Scotland.

Source: OECD (2003), *Learning for Tomorrow's World, Trends in International Mathematics and Science Study*.

the Skattefunn was introduced, a figure exceeded only by Finland, Sweden, Japan and the United States, and there has been a steady rise from an already above-average level in the past 25 years (Figure 5.3). There is thus no shortage of appropriately skilled persons to carry out R&D. Indeed, innovating firms report no major problems in this area (see below).

Figure 5.3. **Business sector researchers**
Per cent of total industrial employment, average per annum



Source: OECD, Main Science and Technology Indicators database.

Current and recent policy initiatives aim to strengthen the numbers and quality of people in the relevant disciplines, on the assumption that the social benefits (via increased intensity of research) outweigh the costs. As noted above, the “Norwegian Centres of Excellence” will secure stable funding for research groups deemed to be of high quality. Mathematics, science and technology research will have priority. The number of PhD university fellowship posts, and post-doc positions, are programmed to rise further. Increased financial support will be given to Norwegian researchers seeking research experience abroad. Graduate schools that objectively demonstrate high scientific quality can compete for admission to the national graduate school category, with enhanced financing. Extra financing will be available to train future secondary school teachers in maths, science and technology (MST).⁵ Lower down the age-scale, the intention is to increase funding and credits for the teaching of MST at the primary and secondary school level. The reform effort (“Culture for learning” and “Kunnskapsløftet”) aims to devote more teaching time to MST, to promote gender equality, and raise the proportion of upper secondary students following MST courses.

Innovation can also be fostered by strengthening incentives for academic researchers to exploit their findings commercially. The route pioneered in the United States by the 1980 Bayh-Dole Act allows academics, as well as their institutions to patent or license their work and earn royalties. Experience shows that most commercialisations of academic research

findings have earned moderate returns for their creators, rather than the millions of dollars that a few, well-publicised, discoveries have made for individuals and their institutions. To assist academics who are unfamiliar with the sometimes time-consuming procedures involved, technology-transfer offices staffed by 10-15 persons have been set up in Norwegian universities as from 2003 (the FORNY umbrella programme, with a 2006 budget of € 15 million facilitates this, and other ways of commercialising the results of public research). Their mission is to facilitate commercialisation of research, and to give advice on starting up new companies. The results in practice of this initiative are being evaluated. A side-effect is that they can discourage (or delay) academics from bringing their findings into the public arena at an early stage via publications and conferences, thus reducing the potential social benefits of scientific discoveries.

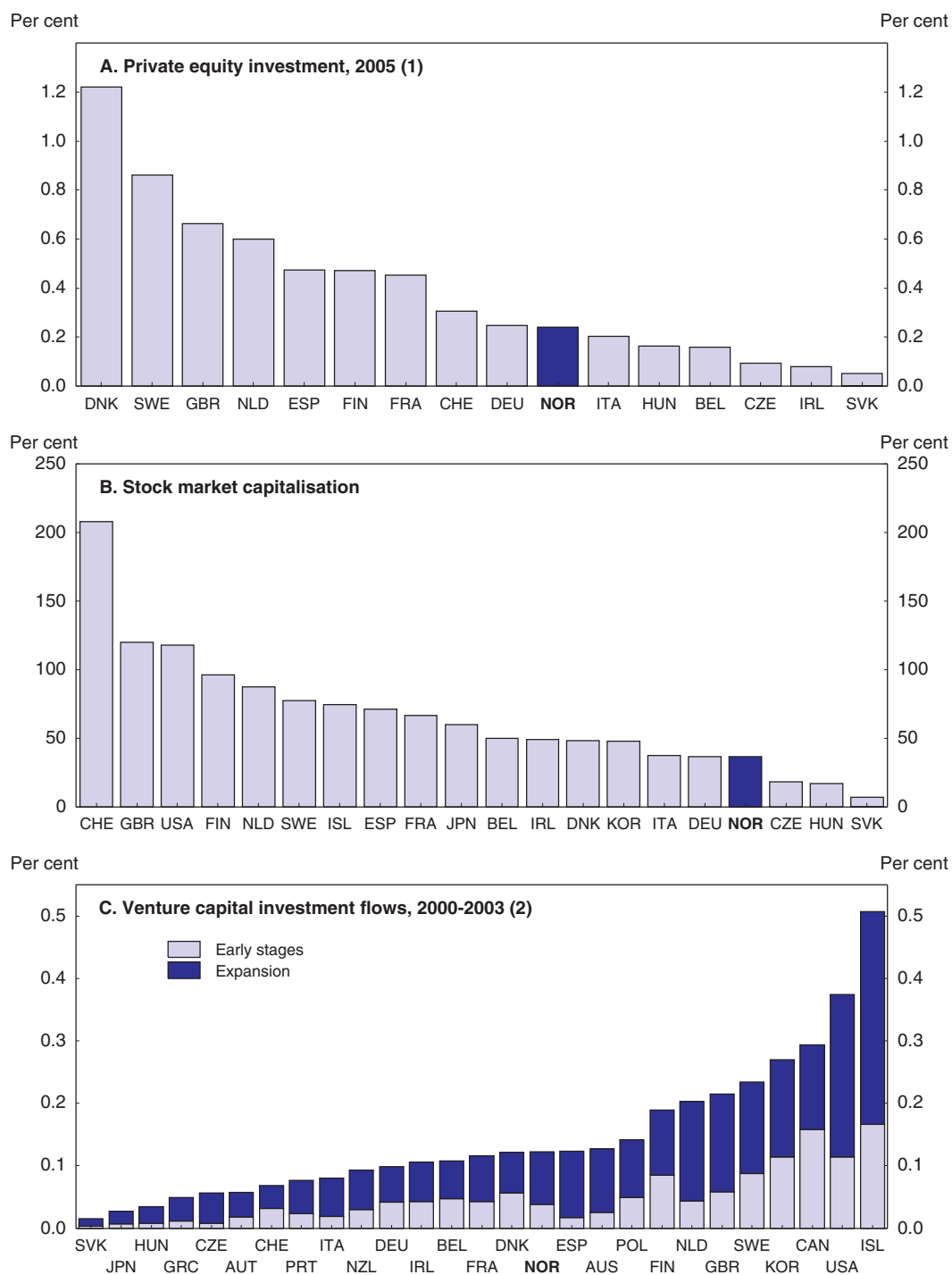
Exploiting the synergies between academic and business sector research efforts by facilitating partnerships between them can bring benefits to both sides. Steps in this direction are underway. Business-oriented college programmes are now encouraged to collaborate with SMEs. The potential benefits for the firms involved can be large, although typically, only a few such firms are attracted by this form of collaboration. Their effectiveness could be enhanced by making it easier for researchers to pass to and from between the private and public sectors.

Financial market policies and institutions are important drivers of innovation. Research is costly and risky. It is tempting to believe that only large established firms with some monopoly power derived from earlier successful innovations can afford to invest heavily in R&D. But most empirical studies show that once industry characteristics are allowed for, there is no relationship between R&D spending and industry concentration ratios (Ahn, 2001). Ultimately successful innovations can be made by start-up firms that lack experience, profits or even a market, and by firms that are too small to finance large-scale research with their own in-house resources. Deep and liquid equity markets complemented by an active venture capital system that can supply advice and management skills as well as finance are needed.

Reflecting *inter alia* the (partial or total) public ownership of many large enterprises, Norway's equity market is relatively underdeveloped, with private equity investment equivalent to around 15% of GDP compared with a European average of 25% and as much as 87% in Sweden. Corporate investors account for 65% of the total, private investors for only 4%. The venture capital market is larger than in many OECD countries, though well below the leading countries. According to data from the Norwegian Private Equity and Venture Capital Association (NVCA), whose members managed about € 3¼ billion at end 2005,⁶ local institutions and the State together provide over half of the funds for the venture capital market and private investors about one third. Pension funds and insurance companies are hardly allowed to invest in venture capital funds. A striking feature of the Norwegian venture capital system is that most investment is in expansion and buyouts of surviving firms. Provision of seed capital for start-ups is quite small (Figure 5.4).

A further policy response to this market gap in funding for new firms has been to set up private/public seed capital funds to stimulate investors via state incentives (and also to encourage commercial development of university research projects). Under the "Nationwide seed capital scheme" administered by the Ministry of Trade and Industry and Innovation Norway, the State stands ready to lend (at NIBOR + 2%) nearly € 100 million to four investment funds located in university cities. Private investors must contribute an equal

Figure 5.4. **Venture capital**
As a percentage of GDP



1. The asset class of VC or PE (or Buyout) funds dedicated to invest from funds raised by 3rd parties into growth or restructuring cases.
2. 2000-2002 for Iceland; 1998-2001 for Australia, Japan, Korea and New Zealand.

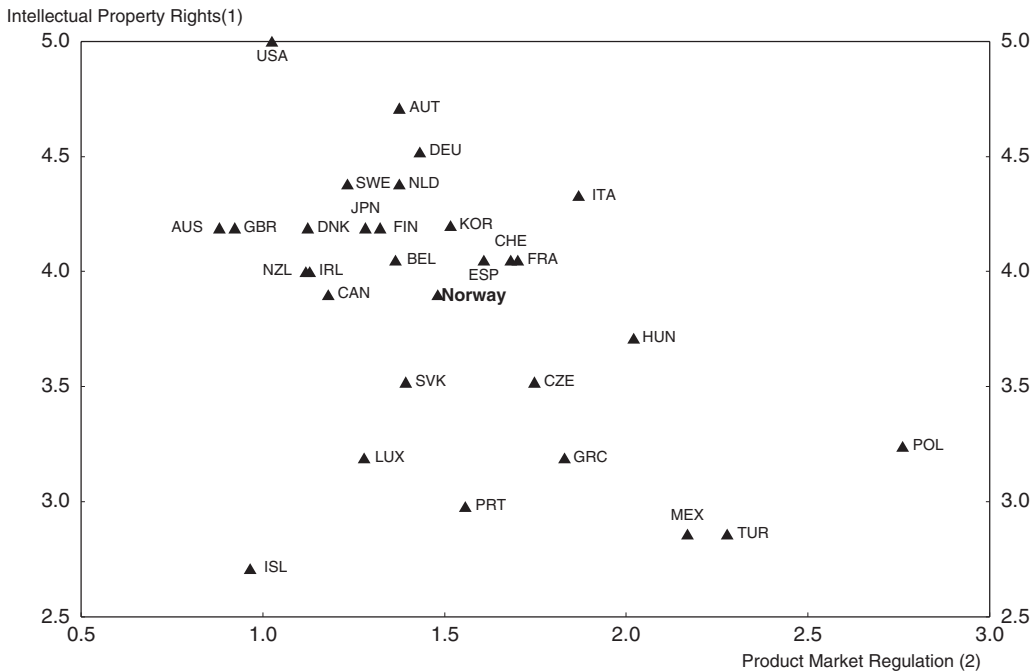
Source: European Venture capital associations, World Bank Financial Development and Structure Database and OECD venture capital database.

amount. There are no geographical restrictions on where investments can be made. The scheme is not yet operational, reflecting investor resistance to restrictions on follow-on investments. The same Ministry, and Innovation Norway, are also involved in a similar but smaller scheme intended to encourage start-ups in assisted areas. It is not yet operational either. Generally, Innovation Norway is the policy tool for this type of financing.

The government owns a fund-of-funds investment company, **Argentum** to which the Storting has allocated some € 330 million over the years. Its purpose is to facilitate access to international venture capital and encourage the development of the Norwegian equity market more generally. All investments made by Argentum must have majority private ownership: state participation is hands-off, but it is possible that participants feel they have some sort of implicit guarantee.

Innovation activity is also affected by the combination of **competition policy** and its implementation, and the **protection of intellectual property rights (IPR)**. The impact of competition between firms by itself is potentially ambiguous: monopoly profits derived from earlier innovations and protected by IPR can finance continuing research, but fierce competition between incumbents, plus credible threat of entry, can also spur firms to innovate their way out of danger (Aghion and Howitt, 2005). Conversely, innovation is discouraged by a regulatory environment that does not always stimulate competition and which is combined with weak protection of IPRs. Norway scores about in the middle of the range for OECD countries on both criteria (Figure 5.5), although the countries that have more restrictive regulatory environments than Norway are mostly the less advanced countries. While barriers to entrepreneurship are among the lowest for OECD countries, extensive state control brings Norway to an only average position for overall regulation of product markets.

Figure 5.5. **Regulation and intellectual property rights**



1. Index scale of 0-5 from least to most restrictive.

2. Index scale of 0-6 from least to most restrictive.

Source: OECD (2006), *Going for Growth*.

In summary, Norway has strong government support for public and private innovation, both political and financial, institutions that foster it, a collection of specific and background policies that make private R&D attractive, and sizeable numbers of qualified people to carry it out. What are the results?

Innovation activity

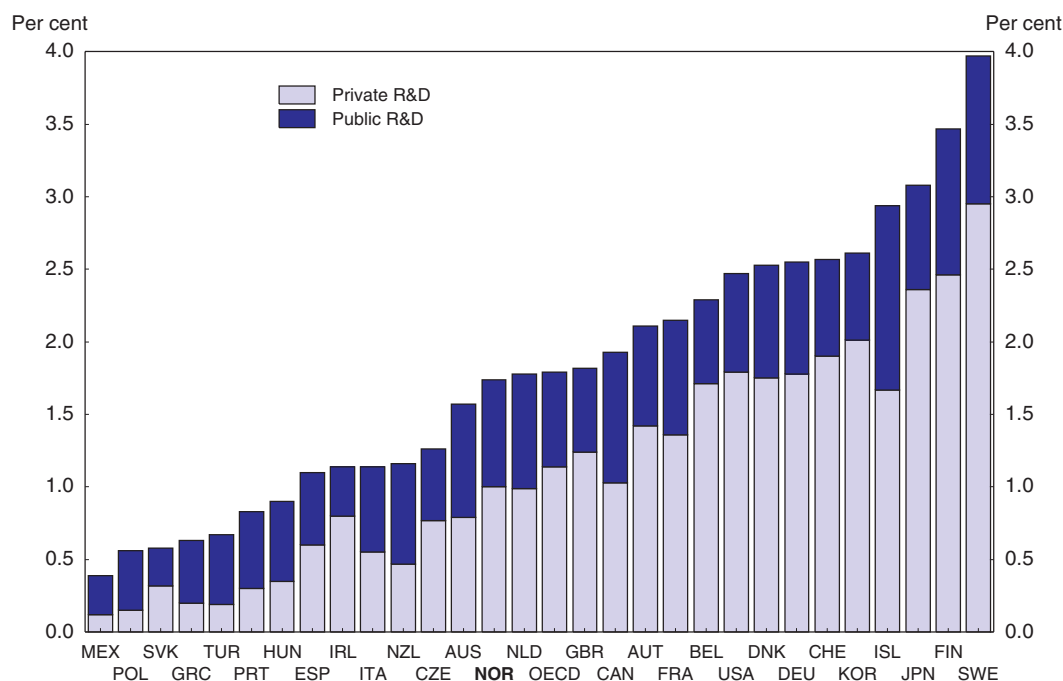
Activity is lacklustre and so are the results

Most indicators of innovation activity imply that Norway performs poorly relative to other advanced OECD countries and to its Nordic neighbours. Spending on research and development (R&D) overall and especially in the private sector is low; patenting activity is low; given its *per capita* income, Norway has an only average score on the European Innovation Scoreboard (EIS, 2005)⁷ and is improving only very slowly; the ratio of innovation drivers to outputs is low; the most recent Community Innovation Survey results imply that much innovation by firms is reactive rather than proactive (and that most firms do not innovate); and recent OECD research ranks Norway below the average of 20 countries examined in a factor analysis of innovation indicators. It is in part because of all this that Norwegian governments have made raising the measured level of innovation a policy priority, and the Storting has allocated substantial resources for fostering private-sector innovation.

In 2004 (the latest year for which comparable data exist for most OECD countries), total spending on R&D, the standard indicator of innovation inputs, was 1.6% of GDP in Norway. This is significantly lower than the 2.3% average of the 20 OECD countries for which data are available, and it was the 12th out of those countries⁸ (Figure 5.6). Most of the countries

Figure 5.6. **Expenditure on R&D in the public and business sectors**

As a percentage of GDP, 2003¹



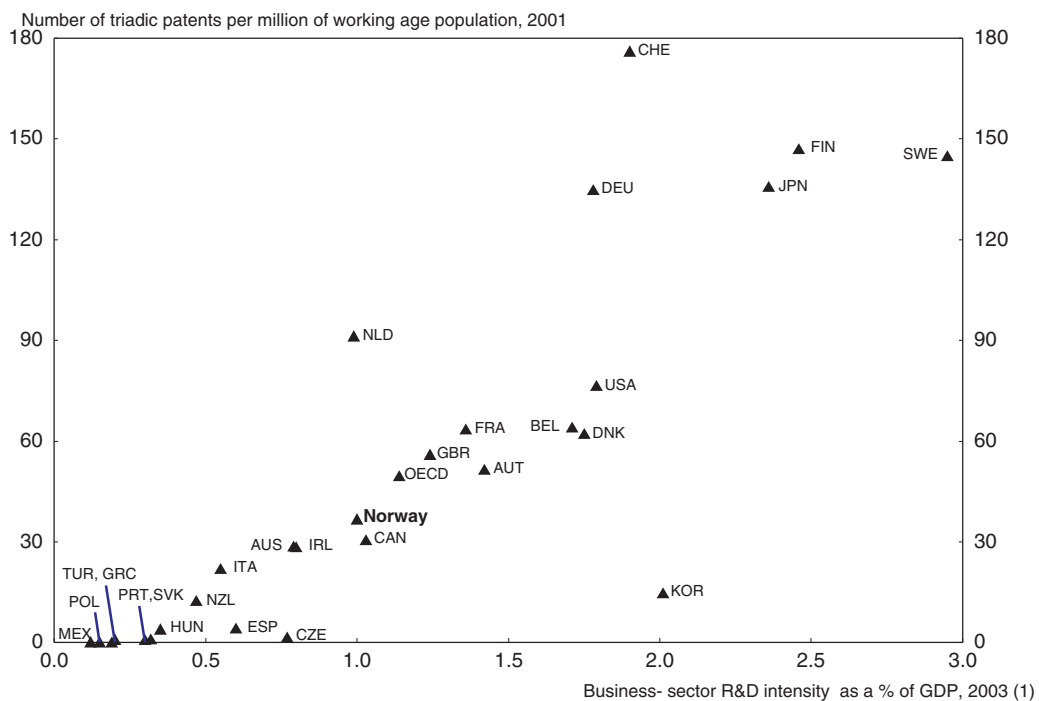
1. 2002 for Australia, Austria, Portugal, Switzerland and Turkey; 2001 for Greece and Mexico.

Source: OECD, Main Science and Technology Indicators database.

that have lower R&D spending than Norway also have far lower *per capita* incomes. The Norwegian ratio has been lower than that of the EU15 for over 20 years and there is no sign of convergence. Private R&D spending is a comparatively low 0.9% of GDP, slightly more than half the OECD average, and has if anything tended to fall in recent years. Hence low R&D spending in Norway reflects in particular low private spending.

One measure of innovation outputs is patenting. On this measure, Norway also scores low, and the recent trend is downward. Applications for patents in Norway by Norwegian-based firms have been falling since 1999, and those by foreign enterprises have been falling steeply for longer than that. Although this has been to some extent offset by rising international applications, the total is also falling. It is not useful to compare national applications as between countries because of major differences in patent laws, criteria, costs, etc. One way around this is to compare applications for so-called triadic patents, i.e., applications for the same patent to the patent offices in the US, Europe and Japan (these are presumably patents for important innovations that their applicants believe will attract world-wide business interest). Normalised with respect to population, Norway comes out ahead of some high per capita income countries (Australia, Canada, Ireland, Italy), but very far behind others, and especially behind its Nordic neighbours, Sweden and Finland (Figure 5.7). In this context, it should be noted that Norway has decided to join the European Patent Organisation as soon as feasible. This will make it easier and cheaper for Norwegian entrepreneurs to both protect their innovations and bring them to the attention of a larger market.

Figure 5.7. **Patenting activity**

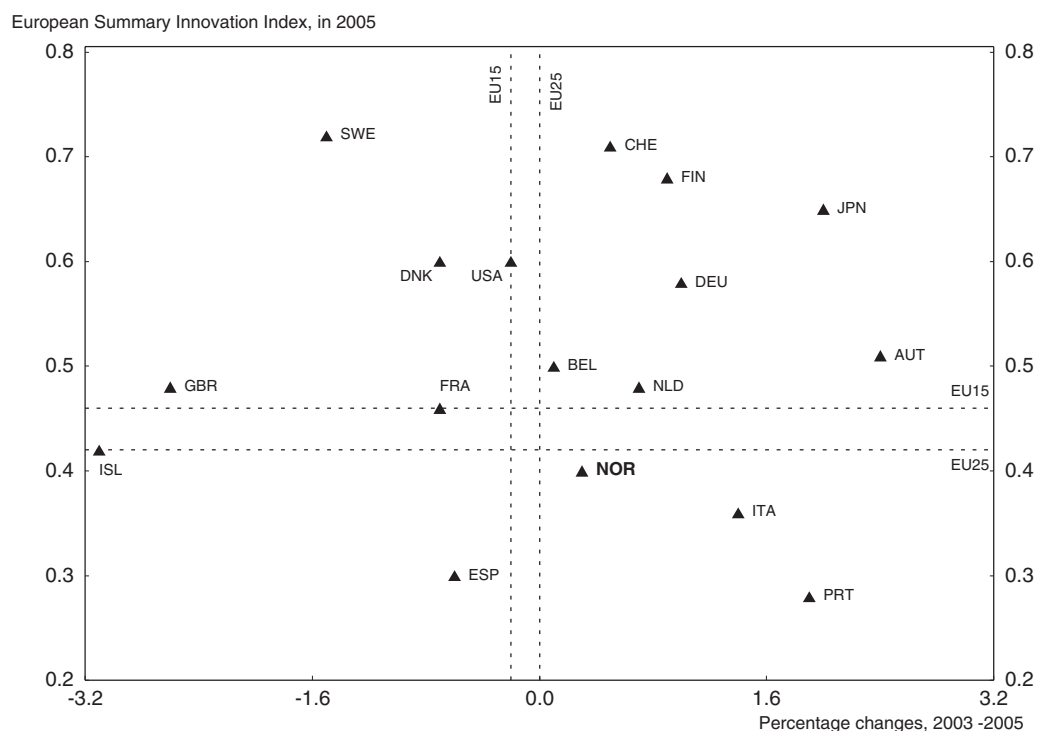


1. 2002 for Australia, Austria, Portugal, Switzerland and Turkey; 2001 for Greece and Mexico.

Source: OECD (2006), *Going for Growth*.

The “innovation scoreboard” published by TrendChart provides a summary index of technical innovations (SII). The 2005 SII places Norway well below the EU15 average and below the EU25 average (and far below leading countries such as Sweden, Finland, the US and Japan). As with R&D spending and patenting, almost all the countries that have lower scores than Norway also have much lower *per capita* incomes (Figure 5.8).⁹ The scoreboard divides indicators into inputs into innovation (human capital; R&D; public funding for private R&D; private funding of university research; measures of entrepreneurship; intensity of innovation activity) and the outputs of innovation (employment in, and exports of, high-tech industries; sales of new products; patenting; trademarking). The Norway ranking on human capital is good, but is offset by poor results for intellectual property and application in terms of the importance of innovative sectors. The results for outputs are nearly all poor.

Figure 5.8. **EIS scores**



Source: European Innovation Scoreboard 2005. Comparative Analysis of Innovation Performance.

One consequence of the disparate results for innovation drivers and results is that the measured ratio of innovation “outputs” to “inputs” is low. On the assumption that inputs result in outputs, Figure 5.8 shows that Norway’s innovation outputs are considerably lower than might be expected, given the level of inputs (which themselves are lower than most advanced countries in the sample). Again, most of the countries that have lower scores than Norway on outputs are relatively poor countries; many of them in central and Eastern Europe, whose attempts to improve innovation performance are comparatively recent.

A useful source of information about innovatory activity is the regular Community Innovation Surveys (CIS) conducted by the EU. They cover most European countries, and in fact the CIS is the main data source for the EIS. Firms in all the countries covered are invited to respond to detailed questionnaires concerning many aspects of innovation in practice. Response is obligatory for those Norwegian firms that are sampled, and hence a great deal of information can be obtained. For other countries, response is voluntary, and sometimes quite low, possibly leading to bias (for example, innovating firms may be readier than others to respond, and firms that have encountered difficulties when innovating might be readier than others to answer the relevant questions). Another difficulty in interpreting the results is that it is not possible to estimate how “important” an innovation might be. An innovatory process could be something as simple as computerising the payroll or as complex as developing a radically new way of analysing genetic information. Firms in some countries might be readier than in others to describe minor changes in production methods or products new to the local market as innovatory.

Detailed results from the CIS4¹⁰ for Norway indicate that:

- The 2004 results showed little significant change in innovating activity relative to that reported in the 2001 Survey.
- About 40% of all enterprises reported that they had made some kind of innovation in 2002-2004. About 10% reported making innovative products that were new to the market.
- The largest enterprises (> 500 employees) were more than twice as likely as the smallest (< 20 employees) to report any kind of innovative activity, but the more numerous smaller firms (< 100 employees) in total nevertheless accounted for most reported innovations.
- Innovation by an enterprise is as likely to be sparked off by information from outsiders (customers or suppliers) as within the firm itself.
- Only a minority of innovating firms reported factors that hampered such activity, chiefly economic (high costs, lack of funds). Difficulty in finding qualified personnel was not a major factor.
- Less than a fifth of all innovating firms (but about one fifth of innovating manufacturing firms) applied for patents to protect their innovations. Use of other formal methods (registered design, trademark and copyright protection) was twice as frequent. Strategic protection (secrecy, design complexity and, especially, lead-time advantage) was more important still.
- Large manufacturing enterprises were more likely than any other category to report all types of innovation (process, product, organisational, marketing).

These findings are confirmed also by recent OECD work (Carey *et al.*, 2006) that examines the EIS dataset using a factor analysis approach to determine which variables are most related to the phenomena under discussion. Ten indicators are strongly associated with *knowledge development*. Four different indicators are all relevant to *knowledge application*.¹¹ Together, these two factors explained 66% of the variance. Others contributed little individually. Norway ranked 10th out of 20 countries on knowledge development because comparatively good performance on measures of human capital and cooperation between SMEs on developing innovations was offset by poor performance in private R&D spending, patenting and share of high-tech industries. It ranked last with Denmark out of

17 countries on knowledge application, with poor results across the board (percentage of SMEs innovating in-house, SMEs' innovation spending relative to turnover, and sales of products new to the firm but not to the market).

The picture that emerges from the above is thus that Norway is a country which possesses most of the necessary specific and framework policies, institutions and human resources to have an innovation-intensive economy, like most other comparatively advanced OECD countries. Yet the indicators paint a picture of relatively low innovation activity and mediocre innovation outputs in the business sector. The link between innovation activity (e.g., as measured by the SII) and per capita GDP is by no means perfect, but given its level of innovation, Norway's per capita GDP "should be" about the same as Spain's.

The "Norwegian puzzle"

The Norwegian puzzle is that despite weak innovation inputs and even weaker outputs, Norwegian per capita incomes are very high by international comparison, even excluding oil earnings.¹² Furthermore, the level and growth rate of total factor productivity – TFP – has been respectable by international comparison. Innovation in processes and delivery systems is likely to have a positive impact on TFP growth because higher outputs can be achieved with fewer resources.¹³ The Norwegian puzzle is this combination of high and dynamic incomes but low measured innovatory activity.

This puzzle raises four questions. Is it real? If it is real, does it matter? If it is real and it matters, are policies addressing it adequately? Can and should more be done?

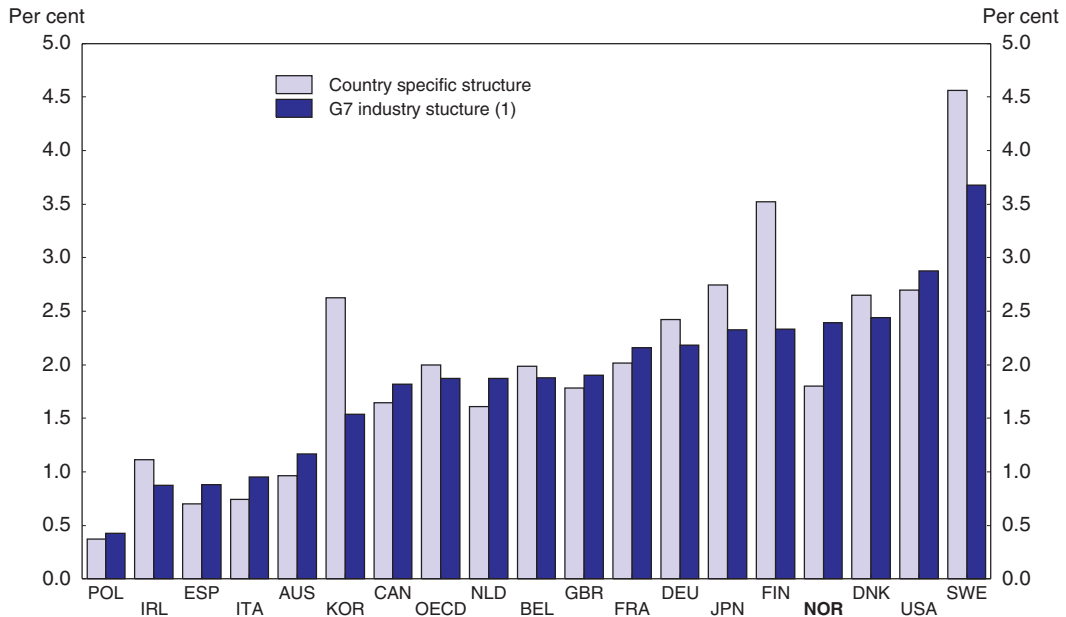
Is it real?

Possible explanations of the puzzle are that the Norwegian economy is underrepresented in innovation-intensive industries; that conventional measures of innovation activity understate the true amount in the case of Norway; that what matters for productivity is using innovations that may have been developed elsewhere, not developing them at home and/or that R&D matters most for high-tech industries, but good productivity growth is achievable in low-tech industries with minimal spending. These are all important and widespread sources of innovation.

Typically R&D-intensive industries such as IT manufacturing, pharmaceuticals, aerospace, and automobile production are indeed under-represented in Norway. If Norwegian industry had the same industrial structure as the average G7 country, its private-sector R&D spending relative to business-sector GDP would rise from a below-average 1.7% to an above-average 2.3% (Figure 5.9). Furthermore, the private sector is characterised by a comparatively large number of small firms, whereas large firms (as in other countries) typically spend relatively more on R&D and are more active in patenting.¹⁴ At first sight it thus appears that these features go most of the way to explaining the "Norwegian innovation puzzle". But there is a question of cause and effect. Are there many SMEs because their favourable status in some areas (as regards labour-market legislation, reporting obligations, grants and subsidies) discourages them from expanding? Is R&D spending low because there are few R&D-intensive industries, or are there few R&D-intensive industries because Norwegian entrepreneurs shun them? Part of the puzzle is that the Norwegian economy has all it takes to support large, vibrant and profitable R&D-intensive industries, but possesses relatively few.¹⁵

Figure 5.9. **R&D intensity in the business-sector adjusted for variations in industry structure**

Percentage of business sector value added, average over 1999-2002



1. All countries are assumed to have the same industry structure. Calculated on the basis of R&D intensity per industry with the weights of each industry corresponding to their share of total business-sector value added on average across G7 countries.

Source: OECD ANBERD and STAN databases.

Weakly supporting evidence that high R&D intensity (and patenting activity) may be desirable but not necessarily essential for fast growth comes from the contrasting experiences of Norway, Ireland, Sweden and Japan. The first two countries have each enjoyed brisk growth over long periods but spend comparatively little on private R&D, whereas the two others invest heavily in R&D but experienced a growth slowdown until recently. However, simple bivariate comparisons can be misleading. The results from more sophisticated multivariate analyses are more reliable. For example, the work of Bassanini *et al.* (2001) finds a statistically robust and positive link between private R&D spending and per capita GDP growth after taking other factors into account. The link between public R&D and growth is found to be weaker. There is evidence that spending on mostly defence-related R&D crowds out private R&D, whereas civilian-related public R&D appears to be complementary with private R&D.

It could be argued that the number of patent applications taken out seriously underestimates the flow of innovatory outputs in Norway, as Norwegian firms typically rely on other measures to protect their innovations. However, Norway is not exceptional in this respect. Responses to the EU's Community Innovation Surveys (CIS) show that less than 20% of innovating firms had applied for a patent in the previous two years, a figure similar to that in Norway. Reliance on secrecy, complexity and lead-time are considerably more important in practice in all countries. In addition, Norwegian applications for EU trademarks and registered designs are well below the EU average. And in any case, as shown earlier, virtually all the measures of innovation inputs and outputs show Norway to be underperforming.

What matters for profits and productivity is applying new knowledge effectively, not necessarily generating it in-house. Firms that are aware of new developments in their line of business elsewhere in the world, and are sufficiently motivated to take advantage of them, can do so via licensing agreements or other forms of co-operative behaviour. It is possible that this happens to a greater extent in Norway than elsewhere. The European Innovation Scoreboard (EIS) performance indicators show that life-long learning and co-operation between SMEs have well above average impacts on Norwegian innovation, with most other indicators well below average. But against this, Sweden, which scores even more highly than Norway on these two indicators, also scores much more highly on all the conventional measures of innovation activity. Furthermore, European innovation performance is inferior to that in Japan and the United States on the standard indicators. And in any case, highly trained and skilled personnel probably obtain more job satisfaction from applying their talents directly, rather than passing their time reading about success stories that are occurring elsewhere. Hence it is not evident that Norway's undeniable economic success results mainly from a high receptivity to technological ideas from elsewhere combined with superior ability to apply them. Furthermore, the results from the PISA and TIMSS studies referred to above imply that this superior ability, if it exists at all, is under threat.

Norway has few high-technology industries outside the petroleum sector (which, as an extractive industry, does not have an OECD technology level rating).¹⁶ The share of low-tech manufacturing production in total manufacturing output is around 80%, a considerably higher figure than almost any other OECD country (Høj and Wise, 2004). But low-tech does not entail low productivity: productivity in general in Norway is high. In part, this represents a reaction to the high levels of *per capita* GDP which have been boosted by rising oil exports.¹⁷ Labour is very expensive,¹⁸ and firms come under pressure to adjust their business operations accordingly. The striking feature of Norway is that the adjustment to high wage levels has been accomplished while maintaining high levels of employment, rather than crowding out low-skilled workers from the labour force, as in several other OECD countries. This has come about in part by exceptionally high growth in public employment (where measures of productivity levels have an element of arbitrariness) since the early 1990s (see Chapter 4). Indeed, Norway's employment rate is one of the highest in the OECD, including both among youths and older workers. Another striking feature of Norwegian employment structures is that the self-employment rate is the lowest of all OECD countries (Table 5.3). This suggests that Norwegians are happier working for a salary than running their own enterprise, with its attendant worries and risks. "But the sleepless nights of the entrepreneur are not unproductive" (Hébert and Link, 2006).

Employment in the service sector accounts for about 40% of total employment (in terms of hours worked), while the public sector employs about a third of all workers. Productivity in the public sector is not easy to measure. The relative size of the public enterprise sector is also the largest in the OECD which may have a chilling effect on competition (Høj and Wise, *op. cit.*).¹⁹

Value-added in the private service sector is now nearly half of Mainland GDP, comparable to that in the majority of richer OECD countries, and its contribution to overall growth has been high (that from manufacturing has been negligible and, except in the past few years, productivity growth in the manufacturing sector has been much lower than in comparable advanced countries). In particular, total factor productivity growth in the

Table 5.3. **Self employment trends**

	Self employment as a percentage of total employment		
	1990s	2000-2003	2004 or latest year available
Australia	15.8	14.1	14.0
Austria	13.7	13.1	12.8
Belgium	18.5	..	17.8
Canada	10.8	10.0	9.5
Denmark	10.1	8.9	8.7
Finland	15.3	13.1	12.8
France	11.2	8.9	8.8
Germany	10.6	11.2	11.8
Greece	46.0	41.3	40.3
Hungary	17.7	14.3	14.3
Iceland	18.2	16.3	14.1
Ireland	22.2	18.1	18.0
Italy	28.9	28.0	27.5
Japan	18.9	15.8	14.9
Korea	37.5	36.1	34.0
Netherlands	11.9	11.7	11.6
Norway	9.5	7.2	7.4
Portugal	28.0	26.5	25.9
Spain	24.6	19.3	18.1
Sweden	10.4	9.9	9.9
Switzerland	11.7	12.6	11.3
United Kingdom	14.2	12.3	13.6
United States	8.5	7.4	7.6
EU15	16.9	15.6	15.7

Source: OECD, Labour Force Statistics database.

wholesale and retail trade sectors has been very high. These sectors are relatively concentrated – four chains with large numbers of relatively small outlets now dominate food retailing (in addition Lidl has entered the market from September 2004) – and it is thus possible that horizontal and vertical integration since the 1990s have encouraged efficiency gains. By now, the scope for further such gains must be limited, and the lack of effective competition (see Høj and Wise, *op. cit.*) could militate against strong efforts to pursue them. A parallel problem may exist in the retail market for gasoline, which has long been dominated by 4-5 suppliers (one of which is state-owned). Pre-tax gasoline prices are typically the highest in the IEA countries (Høj and Wise, *op. cit.*).

The relevance of this to innovation is that although R&D intensity is low overall in Norway, it is high in the service sector compared with both manufacturing in Norway and the service sectors in many other countries. The average skill level of service-sector employees is also high. But even so, R&D spending in services has not significantly risen over the past 15 years, and the proportion of service-sector firms reporting innovations in the service sector has fallen from 34% of reporting firms in the 2000-2002 CIS survey to 28% in the 2002-2004 CIS survey.²⁰ In addition, the proportion of service firms reporting product innovations new to their markets was only 13%. Hence output innovations in the service sector appear to be low relative to the spending on their inputs.

The conclusion from the above is that the Norwegian puzzle is a real one. Despite a favourable policy climate for innovation, spending on it is low, except in the service sector, but even there, the resulting innovation activities are disappointing. Another part of the

puzzle is that R&D spending in the manufacturing sector is lower than can be explained by the particular industrial structure (which is itself something of a puzzle). The manufacturing sector has had to adapt to a rising real exchange rate, as was the case *e.g.*, for Germany before EMU. The typical way of achieving this is through better technology, process improvements, etc., which result in higher TFP levels. But according to Statistics Norway, the manufacturing sector has contributed virtually nothing to overall TFP growth during the last 20 years. So manufacturing, which competes on international and domestic markets, spends little on R&D and on average registers almost no technological progress (manufacture of electronic goods seems to be an exception). The sheltered service sector spends a great deal on R&D, the reported rate of innovation is low, but recorded TFP growth is high, albeit concentrated in a few sub-sectors (wholesale and retail trade, domestic transport and communication).

Does it matter?

Since Norwegians are rich and getting richer, and not only because of petroleum exports, it could be argued that lacklustre performance in innovation is not a major problem. Productivity is high, real growth rates have been respectable, overall TFP growth is better than in many countries with higher R&D spending, and industry has by and large managed to survive a changing world and a strong exchange rate. As long as governments abide by the fiscal rule, the petroleum/pension fund will help to sustain living standards for a very long time.

It will help sustain them but not increase them once the value of the fund's resources peaks relative to GDP. From then on, growth will require some combination of rising labour inputs relative to population (which cannot be sustained indefinitely, given an ageing population); steadily rising quality of labour inputs (difficult, if the PISA and TIMMs results are to be believed, but not impossible); rising capital/labour ratio (feasible, but with diminishing returns); and continued steady rise in TFP.

A continuing steady rise in TFP is essentially synonymous with innovation, which creates demand for new products and better ways of producing and distributing all products. Hence the rate of innovation in Norway needs to rise above recent and current lacklustre levels if expectations of continual rising prosperity are to be realised. The tradeable sector in particular will face ever increasing competition from low-wage fast-growing countries in Asia and Europe. This can only be achieved by much faster productivity growth in manufacturing than in the past (as now appears to be happening). In turn, this will entail moving closer to the technological frontier, and preferably being on that frontier in some sectors. Norway has long enjoyed a comparatively stable macroeconomic, social and political environment, and a well-educated labour force, factors that create a favourable background for private investment of all kinds, including in R&D. At the political level, there is clear awareness of the importance of innovation, there is long-standing political support for encouraging it, and the current ambitious policy objective is to raise private R&D spending by more than a percentage point of GDP over the next few years. Inducements exist in plenty, and the CIS surveys imply that few firms face real financial or skill shortages that could constrain innovatory activity. The policies directed specifically at subsidising innovation, *e.g.*, the Skattefunn and various grant schemes, are well designed (although the degree of additionality and hence their effectiveness has not yet been determined). The public institutions that exist to promote innovation have improved after the round of reforms and restructuring over the past

10-15 years. They have clear mandates and lines of authority and they are also adequately funded. The problem is with the results: policies and institutions seem to be “pushing on a string”. Norwegian firms, especially in the manufacturing sector, apparently feel that they can enjoy satisfactory profits without investing heavily in R&D.

Previous work by the OECD and others finds that the intensity of product market competition in Norway is in the middle range of OECD countries. Concentration of market power in a relatively small economy may be part of the explanation. On the other hand, administrative regulation is comparatively light. As noted earlier, public ownership of large enterprises is prevalent. Within the manufacturing sector, food processing is effectively protected from strong competition via barriers to agricultural imports (including processed foods). Despite the protection from foreign competition, price mark-ups in the food processing sector are low, as is the growth of productivity. This could imply that there are only low pressures to improve profitability, for example via innovation.

What is true for the most protected sectors is likely to be true to some extent for other sectors, and could help explain both why Norwegian firms spend comparatively little on R&D and also seem to obtain even less for their efforts than in other countries. It would help explain also why innovation efforts are often the result of demands from customers or suppliers rather than spontaneous efforts from within the firm, and why firms that innovate often join together with other firms in the same industry, *i.e.*, potential competitors, to finance innovatory projects.

Implications for policy

The relevance of any policy conclusions must depend on the accuracy and relevance of the analysis of the problem. The problem is simply stated: innovatory activity in Norway is low by almost every available measure, yet the future prosperity of the economy will depend increasingly heavily on innovation. But existing innovation-specific policies give strong financial incentives to private firms and there is no shortage of public institutions that can give information and advice. In addition: co-operation on research between academia and the business sector is now facilitated by long-term financing of qualified research and innovation centres under the FORNY programme; patenting of academic research findings is now officially encouraged, as is starting new firms by academics; the policy intention is to increase R&D spending to 3% of GDP (2% private, 1% public) by 2010, nearly double its current level; the educational level of Norwegians, including with tertiary education, is well above average among OECD countries for both men and women and at all ages; and firms do not cite lack of skills, technological knowledge, financial constraints as major barriers to innovation.

This suggests that existing innovation-specific policies and important framework conditions go as far as they need to stimulate innovation. Given the results, it could even be argued that the fiscal stimuli to innovation go too far – or that at least, there seems to be no case for making them even more generous unless and until evaluation exercises begin to show that they are having the desired, cost-effective, impact. Current studies based on firm-level databases of grant receivers, suggest that the schemes are well designed (Hervik *et al.*, 2006). In particular, the goal of raising spending on R&D to 3% of GDP by as soon as 2010 is questionable. It now appears to be difficult to achieve in the best of circumstances and could have perverse effects on firms’ behaviour. In the short term, it might also mainly drive up researchers’ earnings with little to show for it. It makes little

sense to target any particular numerical level of R&D spending in the short-run, although there are good reasons to try to increase it over the longer term. If and when Norwegian firms believe that the key to their profitable survival depends on more intensive innovation, spending on R&D will rise of its own accord.

It is clear that the future supply of qualified research personnel is beginning to dwindle. This could merely reflect market signals: if the supply of existing highly educated actual or potential research employees exceeds the demand for them by the public and private sectors, then there is little inducement for today's students to undergo years of challenging university training in maths, science and technology (MST). Norway is not the only country which is registering a fall-off in numbers of students opting for scientific and technological disciplines: the same phenomenon is seen in countries where R&D spending is high. It is thus possible that there is currently an overall excess supply of personnel engaged in innovative activities in Norway (and in other OECD countries).²¹ But it is important that future supply matches future demand which, if policy goals are to be met, will be greater than today's demand. The MST graduates of tomorrow are going to be responsible for a large proportion of long-term growth in living standards, and there will need to be a well-qualified body of teaching staff to train them. This implies in the first instance that such staff should be adequately rewarded. Greater differentiation between salaries of teachers and professors of MST and of other disciplines is desirable (and probably necessary), and this is officially recognised. Putting it into practice, though, could raise opposition from teachers of other disciplines in a traditionally egalitarian society.

The financial market in Norway is not as highly developed as it could be, reflecting both the comparatively small size of the economy, that of the typical firm, and also the high degree of public ownership. Provision of finance for new firms (venture capital) is growing, but from a small base. Regulations prevent or discourage *e.g.*, pension funds from investing in venture capital assets, and these should be reviewed. There is in particular a marked lack of seed capital. Attempts to compensate for this via the Innovation Norway initiative have not so far been very successful. In any case, there seems to be a lack of "seeds" as well as a lack of seed capital. Entrepreneurs are thin on the ground, perhaps because the risk of failure is as great as anywhere else, whereas the rewards of success are heavily taxed.

A possible reason for the unimpressive level of innovatory activity in the business sector (excepting, as always, the petroleum sector) is too-weak competition between firms. Virtually all recent empirical studies find that productivity growth and innovation activity are positively associated with the strength of competition, which other studies find to be below average in Norway. Previous OECD surveys have recommended actions to expose firms to a more stringent level of competition, for example via less public ownership in the market-based economy, and for competition policy to be implemented more often and more strictly. This will be politically difficult to achieve in current conditions of booming oil export earnings and strong overall growth in the economy. Indeed, the new government has announced its intention to maintain state ownership at about the present level and it has reversed some decisions of the Competition Authority in merger cases. The risk of "resource complacency" (Sachs and Warner, 1995) is a real one, and is growing. But the oil wealth will not contribute indefinitely to growth, and it would be unfortunate if by then, society is ill-adapted to face new challenges.

Box 5.1. Policy recommendations

- Most importantly, **competition policy and its implementation should be strengthened and product-market regulations relaxed, together with a continuing reduction of state ownership in market-based production.** Firms are arguably under insufficient competitive pressure to encourage them to look to innovation as an obvious way of staying in business profitably.
- **Introducing better incentives in the education system.** The worrying decline in numbers of students opting for mathematical, scientific and technological studies needs to be reversed. This will entail creating better incentives for qualified persons to teach such disciplines in both tertiary and (especially) secondary education institutions. In addition to current measures, salary differentials should be considered.
- **The financial system** is comparatively under-developed, in part because of restrictions on the class of assets that can be invested in by insurance companies and pension funds. These restrictions should be relaxed. The small amount of seed capital available for start-ups possibly reflects both these restrictions and a risk-averse climate. Public sector attempts (through Innovation Norway) to increase seed capital borrowing have not been very successful, allegedly because borrowing conditionality has been seen as too restrictive. If it is desired to go further down this road, conditionality should be lightened.
- **Public-private research links should be strengthened further.** Recent reforms to facilitate technology transfer by university researchers are welcome, but need to be monitored for effectiveness and efficiency. More needs to be done to encourage partnerships between academic and enterprise researchers. This could require a more pro-active outlook by academics, but also mechanisms to allow public-sector employees to be seconded to the private sector for periods without exposing them to financial risks, including erosion of pension rights.
- **Tax credits and grants** for private sector R&D seem to be sufficiently generous for SMEs. Raising the Skattefunn ceilings that reduce incentives mostly for larger firms could be considered, if the evaluation exercise shows that additionality is significant. The authorities should evaluate the effectiveness of current science, technology and innovation policies on an ongoing basis to make sure that current instruments are up to the challenges.
- **Long-term goals of R&D spending as a per cent of GDP.** Explore alternatives to the current and soon to expire numerical goals for R&D spending. Effective increases in R&D spending are conditioned by the speed with which they can be usefully absorbed by the business sector. In the longer term, appropriate reforms would likely result in a spontaneous demand-led rise in such spending.

Notes

1. The research fund is an account at the Norges Bank, to which the Storting allocated an additional € 1.7 billion in 2006, bringing the total capital to some € 6.2 billion.
2. It is well known from the literature that such tax schemes take off slowly (see Bloom *et al.*, 2002), and in addition there was a reduction in expenditure on grants for industry R&D as Skattefunn was introduced.
3. The sample includes all OECD countries plus 10 non-OECD countries at various stages of development. The PISA results place Norway significantly below 14 OECD countries, but ahead of the US, Italy, Greece, Portugal, Turkey and Mexico.

4. TIMSS is the “Trends in International Mathematics and Science Study” conducted by the International Association for the Evaluation of Educational Achievement (IEA).
5. Norwegian science studies present a mixed picture, with some strong groups but also weaker ones. However, the trend has been favourable over the past decade, with comparatively rapid developments in ICT, and growing numbers of publications and citations in reputable journals.
6. Members of the Swedish equivalent, the SVCA, manage nearly ten times more in an economy about double the size. It is estimated that this will rise to nearly EUR 4 billion by end-2006.
7. The European Innovation Scoreboard (EIS) is an initiative of the European Commission (DG5) and is available on the *TrendChart website at trendchart.cordis.lu/tc_innovation_scoreboard.cfm*.
8. It is lower than average even expressed as a percentage of mainland GDP.
9. The 2005 EIS results are not exceptional: Norway has registered comparatively low scores in the past on these EIS measures. EIS calculations based on current and past results imply that it would take Norway 20 years to catch up with the EU average – which is itself currently 50-80% below the leading countries such as Sweden, Finland, Japan and the US.
10. Detailed tables of CIS4 results for Norway, with information by sector and size, are available online at www.ssb.no/english/subjects/10/03/innov_en/.
11. Specifically, 10 indicators loaded strongly on to the first factor, which explained 45 per cent of the total variance: these 10 indicators all measure knowledge development. Four different indicators, measuring knowledge application loaded strongly on to the second factor, explaining a further 21 per cent of variance. Other indicator(s) contributed very little.
12. It is tempting to argue that Norway is rich mainly because of its oil wealth. But Mainland GDP is about 75% of total GDP at current very high petroleum prices, and this can be interpreted as a lower bound to the true “non-oil” GDP as at least some of the resources used in the offshore sector have alternative uses onshore. The country has managed to avoid the worst of the “Dutch disease”, whereby exports of high-price low-cost natural resources drive up the exchange rate and crowd out the traditional tradeable sector, leading to high structural unemployment. It may prove harder to avoid the “resource curse” (Sachs and Warner, 1995) whereby rents from natural resources induce complacency, excessive dependence on state largesse, and discourage investment in human capital (see Chapter 1).
13. Like Denmark, the Norwegian labour market is characterised by high flexibility, low levels of job protection, and generous unemployment benefits conditional on active job search. These labour-force characteristics could help explain the high TFP levels.
14. Nevertheless, because there are far more small enterprises than large ones, the total R&D spending of the smaller ones is broadly similar to that of the larger ones.
15. The petroleum sector is very probably an exception, even though its recorded spending on R&D is not high. But this could be partly mis-classification. Construction of the gigantic oil platforms operating in the deep and hostile waters of the North Sea is as much a “development” activity as it is pure investment.
16. The OECD technology ratings apply only to manufacturing industry and depend on the ratio of R&D spending to value-added.
17. The operations of the Government Pension Fund ensure that most petroleum export revenues do not feed directly into current incomes. But there is nevertheless an impact (see Chapter 1).
18. The annual UBS Prices and Earnings survey ranks Oslo, Copenhagen and Tokyo, as the three most expensive cities.
19. Nevertheless, it should be noted that tender is required for state and municipal procurement exceeding NOK 500 000 (approximately EUR 60 000), which is considerably below the EU/EEA requirement.
20. As noted earlier, cross-country comparisons of CIS results must be treated with caution, as response is obligatory in Norway, but not in Germany or Sweden. Arguably, non-innovating firms are less inclined to respond to the survey in those two countries.
21. Respondents to the CIS4 Survey did not cite difficulties in finding qualified research staff as an important deterrent to higher R&D spending.

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