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*The Secretariat's draft report was prepared for the Committee by Paul O'Brien and Yosuke Jin, with statistical assistance from Josette Rabesona, Valéry Dugain and Hermes Morgavi under the supervision of Patrick Lenain.*

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## Basic statistics of Norway, 2012

(Numbers in parentheses refer to the OECD average)[a]

| LAND, PEOPLE AND ELECTORAL CYCLE | | | | | |
|---|---|---|---|---|---|
| Population (million) | 5.0 | | Population density per km² | 15.5 | (34.3) |
| Under 15 (%) | 18.4 | (18.1) | Life expectancy (years, 2011) | 81.4 | (80.0) |
| Over 65 (%) | 15.5 | (15.3) | Men | 79.1 | (77.3) |
| Foreign-born (%, 2011) | 12.4 | | Women | 83.6 | (82.8) |
| Latest 5-year average growth (%) | 1.3 | (0.5) | Last general election | September 2013 | |
| **ECONOMY** | | | | | |
| Gross domestic product (GDP) | | | Value added shares (%) | | |
| In current prices (billion USD) | 500.4 | | Primary sector | 1.2 | (2.5) |
| In current prices (billion NOK) | 2 909 | | Industry including construction | 42.5 | (27.4) |
| Latest 5-year average real growth (%) | 0.6 | (0.6) | Services | 56.3 | (70.0) |
| Per capita, PPP (thousand USD) | 65.7 | (37.2) | | | |
| **GENERAL GOVERNMENT** Per cent of GDP | | | | | |
| Expenditure | 43.3 | (42.6) | Gross financial debt | 34.4 | (102.4) |
| Revenue | 57.2 | (36.2) | Net financial debt | -167.6 | (64.1) |
| **EXTERNAL ACCOUNTS** | | | | | |
| Exchange rate (NOK per USD) | 5.8 | | Main exports (% of total merchandise exports) | | |
| PPP exchange rate (USA = 1) | 8.8 | | Mineral fuels, lubricants and related materials | 69.8 | |
| In per cent of GDP | | | Machinery and transport equipment | 7.9 | |
| Exports of goods and services | 40.9 | (53.8) | Manufactured goods | 6.8 | |
| Imports of goods and services | 27.5 | (50.4) | Main imports (% of total merchandise imports) | | |
| Current account balance | 14.2 | (-0.5) | Machinery and transport equipment | 38.2 | |
| Net international investment position (2010) | 94.2 | | Manufactured goods | 15.2 | |
| | | | Miscellaneous manufactured articles | 14.8 | |
| **LABOUR MARKET, SKILLS AND INNOVATION** | | | | | |
| Employment rate (%) for 15-64 year-olds | 75.8 | (65.0) | Unemployment rates (%) | | |
| Men | 77.7 | (73.1) | Total (age 15 and over) | 3.1 | (7.9) |
| Women | 73.8 | (57.0) | Youth (age 15-24) | 8.5 | (16.2) |
| Average hours worked per year | 1 420 | (1 766) | Long-term unemployed (1 year and over) | 0.3 | (2.7) |
| Gross domestic expenditure on R&D (% of GDP, 2011) | 1.7 | (2.4) | Tertiary educational attainment 25-64 year-olds (%, 2011) | 38.1 | (31.5) |
| **ENVIRONMENT** | | | | | |
| Total primary energy supply per capita (toe) | 5.9 | (4.2) | $CO_2$ emissions from fuel combustion per capita (tonnes, 2011) | 7.7 | (10.0) |
| Renewables (%) | 46.9 | (8.5) | Water abstractions per capita (1 000 $m^3$, 2007) | 0.6 | |
| Fine particulate matter concentration (urban, PM10, µg/$m^3$, 2010) | 16.1 | (20.1) | Municipal waste per capita (tonnes, 2011) | 0.5 | (0.5) |
| **SOCIETY** | | | | | |
| Income inequality (Gini coefficient, 2010) | 0.249 | (0.304) | Education outcomes (PISA score, 2012) | | |
| Relative poverty rate (%, 2010) | 7.5 | (10.9) | Reading | 504 | (496) |
| Public and private spending (% of GDP) | | | Mathematics | 489 | (494) |
| Health care | 9.2 | (9.5) | Science | 495 | (501) |
| Pensions (2009) | 7.4 | (8.7) | Share of women in parliament (%, September 2013) | 39.6 | (25.8) |
| | | | Net official development assistance (% of GNI) | 0.9 | (0.4) |

Better life index: *www.oecdbetterlifeindex.org*

*a)* Where the OECD aggregate is not provided in the source database, a simple OECD average of latest available data is calculated where data exists for at least 29 member countries.

*Source:* Calculations based on data extracted from the databases of the following organisations: OECD, International Energy Agency, World Bank, International Monetary Fund and Inter-Parliamentary Union.

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# Executive summary

- *Main findings*
- *Key recommendations*

## Main findings

Norway's new government has taken over responsibility for a prosperous, well-managed economy, where people are generally happy – indicators of both material and non-material welfare are at high levels. Intelligent use of wealth from petroleum resources and active use of monetary policy within the flexible inflation-targeting framework have insulated Norway from the worst of the financial crisis-induced recession and supported the recovery. There are challenges in a number of areas, which are taken up in this Survey.

**Monetary policy and financial stability.** Flexible inflation targeting has worked well in the face of the financial turmoil of the past decade. The authorities have been rightly concerned about rising house prices and the vulnerability of highly-geared households. Policy interest rates have been somewhat higher than would have otherwise been warranted because of this. Signs of a cooling housing market may be due to guidance on loan-to-value ratios and perhaps also to anticipation of tighter capital requirement for banks. Norway has adopted a counter-cyclical buffer, to strengthen the banking system in case of severe shocks, before others. Its operation will involve some learning by doing and, while not being concerned with fine tuning, should also give the central bank a little more room for manoeuvre in its use of policy rates.

**Fiscal policy.** The new government continues to follow the cross-party consensus on keeping the structural non-petroleum budget deficit to 4% of the value of the Government Pension Fund Global (GPFG) over the business cycle; a structural non-petroleum deficit of around 3% of the GPFG is budgeted for 2014. The real return on the assets of the GPFG has often been less than 4%. Despite the benefit of petroleum revenues, overall taxation levels are quite high. A reduction in Norway's relatively high taxation, beyond the steps taken in the 2014 budget, with concomitantly lower public spending growth, could increase economic dynamism. With greater attention to prioritisation and spending efficiency, there will still be room for increasing public expenditure in some areas. Full transparency in public finances is important for maintaining consensus and effective planning.

**Promoting entrepreneurship.** Current prosperity has tended to disguise a slowing of underlying productivity growth. To sustain growth in living standards as petroleum production declines, a thriving culture of entrepreneurship is necessary to spot and exploit opportunities, and to raise risk-capital and other resources. Public support for innovation should be based on good framework conditions in regulatory and competition policy, with direct support being carefully managed.

**Education, skills and the labour market.** Education and labour market policy have important parts to play in setting the incentives for people to develop necessary skills and to participate fully in economic activity, while maintaining the co-operation and solidarity characteristic of Norway. The combination of the flat wage structure, highly subsidised tertiary education and large numbers of people taking early retirement through disability may not be appropriate for encouraging the development and effective use of those skills.

## Key recommendations

### *Monetary policy and financial stability*

- The monetary policy stance of the central bank is appropriate. Interest rate policy needs to continue to pay attention to financial stability risks, until the developing macro-prudential tools have shown their effectiveness.
- Monitor whether the macro-prudential tightening has the intended effect on financial stability. If necessary, revise the system of indicators and decision-making processes in line with evolving experience.
- The financial vulnerabilities resulting from high household indebtedness at floating interest rates should continue to be addressed, notably by further action on prudential policy, e.g. on loan-to-value ratios and stress-testing of borrowers' debt servicing capacity.

### *Fiscal policy*

- Aim for a gradual fall in the level of taxation, accommodating this within the fiscal guidelines by reducing the growth of public spending below that of national income.
- Improve the efficiency of public spending through more consistent assessment of value for money. Any new public body for transport investment should focus primarily on cost-efficiency in project choice, construction and maintenance.
- Within the goal of lower taxation, reduce distortions created by the tax system, notably features advantaging owner-occupied housing.
- Consider a longer term policy of keeping the non-petroleum deficit well below the 4% guideline, in view of the stronger than expected increase in the Government Pension Fund Global (GPFG), uncertainties in the future rate of return on the GPFG, pressure of demand in the economy, and fiscal challenges due to ageing.

### *Promoting entrepreneurship*

- Continue to base innovation support on a competitive-bid based approach rather than automatic support. Continue to focus policy for clusters pragmatically on improving framework conditions and information flows rather than promoting clusters *per se*.
- In addition to focus on STEM (Science, Technology, Engineering and Mathematics) skills for innovation, ensure that entrepreneurial skills such as risk assessment, people management, project planning and finance are also given a place in the national skills strategy.

### *Education, skills and the labour market*

- Continue to improve the level of training of teachers. Investigate the impact of the performance assessment and reward approach used in Oslo on educational outcomes there compared with those in the rest of the country.
- Focus more on cost-effectiveness in tertiary education, with better incentives for both students and institutions. To improve equity and strengthen the link between demand for skills and their supply, consider measures such as more guidance on course selection, better information for students on career prospects, differentiated tuition fees or differentiating (existing) grants, and penalties for excessive duration of studies.
- Lower the replacement rate for long-term sickness absence and shift some of the costs onto employers. To avoid encouraging early withdrawal from the labour market, align the rules for early retirement in the public sector with those in the private sector.

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# Assessment and recommendations

- *Macroeconomic prospects*
- *New tools to complement monetary policy*
- *Evolving fiscal policy*
- *Sources of growth*
- *Innovation and entrepreneurship*
- *Human capital, education and the labour market*

Norway's economy has continued to prosper with continued growth in average incomes, low inequality, low unemployment and low inflation. Petroleum wealth has contributed to high incomes and supported the non-petroleum (mainland) economy; around 8% of mainland production is estimated to be directed towards supplying the offshore sector. At the same time, the prudent policy of saving almost all of net profits from petroleum as public sector assets has mitigated the impact of terms of trade fluctuations while building up a substantial stock of financial assets held in the Government Pension Fund Global. The value of this fund was about 200% of mainland GDP, some USD 800 billion, by the end of 2013.

Norway's early and continued recovery from the impact of the financial crisis is certainly partly due to the favourable position afforded by accumulated petroleum revenues. Therefore Norway faces few of the dilemmas that characterise macroeconomic policy in many OECD countries at the moment. Few acute difficulties appear in other policy areas, although previous *Economic Surveys* have highlighted relative problems, such as low cost-efficiency in education, poor work incentives in the sickness-disability system, some weaknesses in public expenditure management, and distortionary elements in the taxation of capital. Nevertheless, the new government coalition, which took over in October 2013, has signalled certain key economic issues it wishes to address (Box 1).

### Box 1. **The new government's policy priorities**

The new government has announced its commitment to implement growth-enhancing policies, such as raising infrastructure investments and strengthening its efforts to lift productivity growth. It has also committed itself to reduce the overall tax level with an aim to encourage investment and saving and to increase labour supply.

In amendments to the 2014 budget the following challenges were noted that the government wishes to address:

- Slowing productivity growth.
- Real labour costs which are high and rising faster than productivity.
- High house prices and hence high household debt.

The government intends to keep within the budgetary guidelines on the use of petroleum revenue and the Government Pension Fund Global.

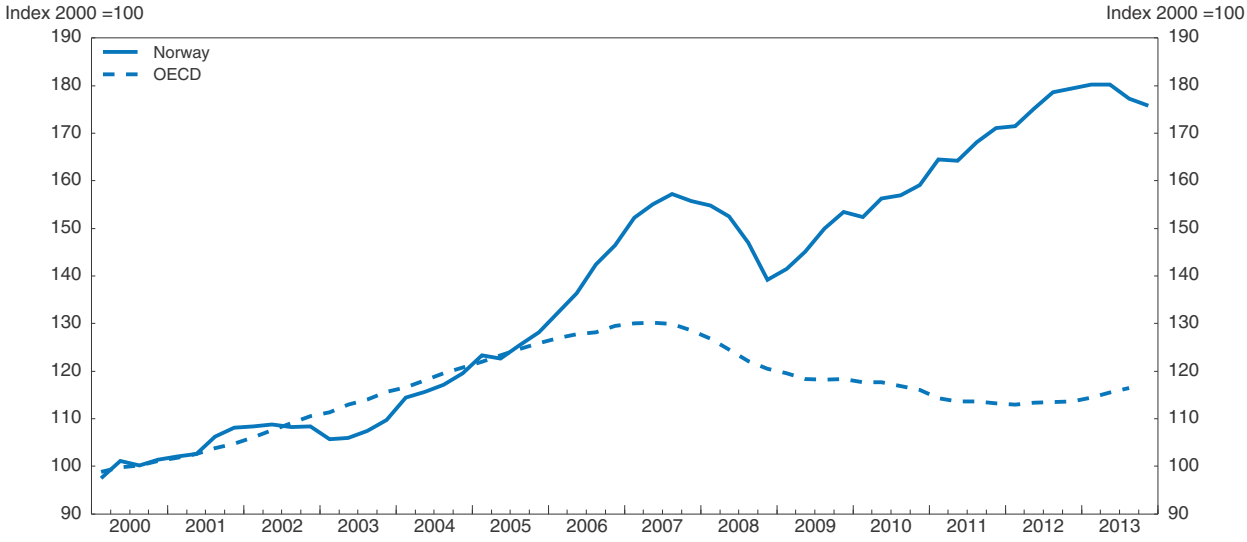
The government intends to rechannel spending of petroleum revenues towards measures that stimulate growth and production. This included a stronger prioritization of infrastructure investments as well as investments in health education and research in the amended 2014 budget.

It set up a productivity commission to advice on how to strengthen productivity growth.

It is expected to aim for greater use of private sector provision of public services, e.g. in health and education.

Consumer price inflation has been low, well below the central bank's 2½ per cent target, for several years. This has justified low interest rates: the Norges Bank main policy rate has been in the range of 1.5% to 2.25% since 2010. Expectations (by the central bank but also by other forecasters, including the OECD) of accelerating inflation have generally been confounded. However, house prices have climbed well above pre-crisis levels, though they have fallen somewhat since mid-2013 (Figure 1). Also, wage costs have steadily risen well above those in most other countries, leading to low profitability in some industries exposed to foreign trade and where productivity has not kept pace.

Figure 1. **Real house prices**[1]



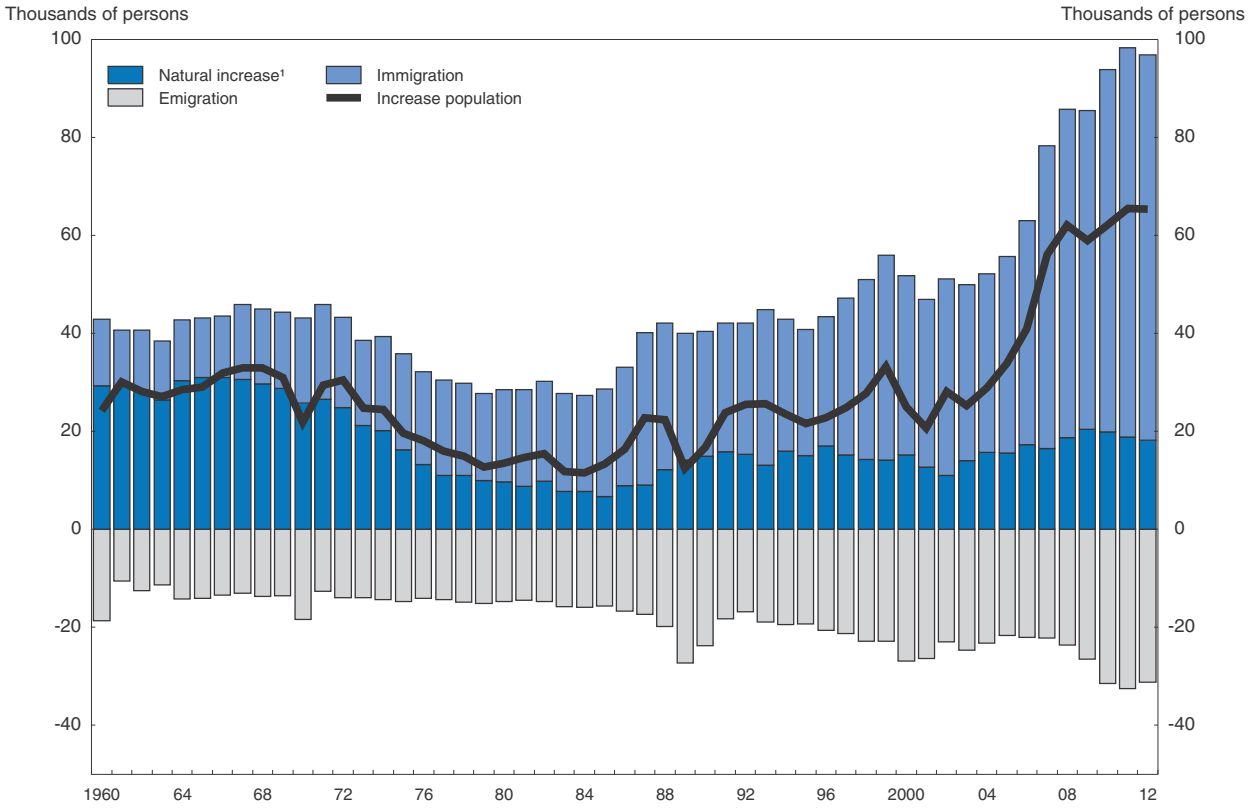

1. Adjusted by private consumption deflator.
*Source: Datastream* and *OECD Economic Outlook Database*.

StatLink http://dx.doi.org/10.1787/888932998348

High levels of demand and employment have played a role in attracting strong immigration flows. These now involve quite large numbers of people coming from central European countries, especially Poland. Since 2006, net immigration has been around twice the level of natural population increase (Figure 2). The share of the foreign born in the population has risen from relatively low levels to around the OECD average, similar to that in Germany, the United Kingdom and the United States.

Low unemployment is one reason why immigration has been strong, as Norwegian employers face labour supply constraints. Foreign born people account for about 12% of the total population. However, average hours worked in Norway are 20% below the OECD average. Low average working hours result partly from lower typical hours and fewer people working very long hours, and partly from the widespread use of part-time working arrangements; this is partly related to high female participation and generous maternity leave. These phenomena may potentially restrict overall national income but they are mostly the result of free choice and contribute to Norway's high ranking on "work-life balance" among indicators of well-being. Norway also ranks very highly on a number of other well-being indicators, including self-assessed "life satisfaction" and is well up the ranking even where it performs least well (Box 2).

Figure 2. **Sources of population growth since 1960**




1. Births minus deaths.
*Source:* Statistics Norway.

StatLink http://dx.doi.org/10.1787/888932998367

Box 2. **Well being, Norway's best and worst scores**

Norway scores very highly on many of the 11 main components of the OECD's Better Life Index, whether on the more objective indicators or the subjective ones. Best scores are:

**Life satisfaction**, where people surveyed on average assess their overall life satisfaction as 7.7 on a scale of 0 to 10, higher than in any other country than Switzerland, just slightly above Iceland, Sweden and Denmark.

**Jobs and earnings**, where Norway's high employment rate, low unemployment, job security and good earnings rank it second overall, after Switzerland.

**Household income**, where high wages and high participation rates are more than sufficient to offset the relatively low working hours, generating adjusted household income exceeded only in the United States and Luxemburg.

**Work-life balance**, where the relatively large amount of time available for leisure and personal care, and the low numbers of people working long hours, give Norway a higher score than any country other than Denmark and the Netherlands, just ahead of Belgium, Spain and Sweden.

Even Norway's lowest rankings are quite good in international comparison:

On **Education**, Norway's 15 year olds perform just above the average but just below the median country. Recently, data collected under the OECD's Programme for International Assessment of Adult Competences (PIAAC), show that Norway's adults score in the top 4 to 6 countries of 24 surveyed, in reading numeracy

Box 2. **Well being, Norway's best and worst scores** *(cont.)*

and "problem solving in technology-rich environments". But on literacy, young adults in Norway perform less well than this compared with young adults elsewhere.

On **Safety** Norway has a low murder rate, higher only than Iceland and Japan, but is around the median for the assault rate. For assault, the rate of assaults on males is nearly twice that on females, a disparity larger than in all but 7 of the 36 countries surveyed.

On **Health** Norway ranks "only" 13th with life expectancy ranked 10th and self-reported health 15th.

Table 1. **Well being, Norway's best and worst scores**

| | Life satisfaction | Jobs and earnings | Household Income | Work-life balance | Health | Safety | Education |
|---|---|---|---|---|---|---|---|
| Norway rank (among 36 countries) | 2 | 2 | 3 | 3 | 13 | 16 | 17 |
| Scores: | | | | | | | |
| Maximum | 10 | 8.9 | 38 001 | 9.8 | 9.4 | 10 | 9.5 |
| Norway | 9.7 | 8.6 | 31 458 | 9.1 | 8.1 | 9.1 | 7.2 |
| Average | 6.2 | 6.2 | 23 047 | 7.3 | 6.9 | 8.3 | 6.3 |
| Minimum | 0 | 2.3 | 11 039 | 0 | 0.6 | 0 | 0.7 |

*Source:* OECD, *How's Life? 2013, Measuring Well-being.*

StatLink http://dx.doi.org/10.1787/888932998234

## Macroeconomic prospects

The mainland economy is projected to expand robustly over the next two years, with an upturn in non-petroleum exports as the global economy gradually improves. Sustained wage and employment growth will support private consumption (Table 2). Investment in the petroleum industry has risen very strongly in recent years, but is expected to slow markedly, while housing investment will also lose momentum. Nevertheless, total investment will remain the strongest component of demand. The structural non-petroleum budget deficit is projected to remain well within the limits that require it to average no more than 4% of the value of the Government Pension Fund Global (see below Box 3). Nevertheless, growth in the value of the GPFG implies continued fiscal stimulus, as the structural non-petroleum deficit is projected to be over 5% of mainland GDP. The housing market is cooling, as shown by the fall in house prices since mid-2013. The tightening of mortgage lending conditions in 2011-12 may have influenced this.

While the short-term outlook is reasonably good, there are many risks, some domestic and some international, both on the upside and the downside. The high level of household debt means that aggregate demand is particularly sensitive to changes in interest rates, and conversely that other shocks to demand that affect household incomes could have a significant impact on the quality of banks' assets. Externally, Norway remains vulnerable to terms of trade shocks via petroleum prices. Over the past decade these have been largely favourable, leading to strong budget revenues and upward pressure on the exchange rate. In the future, strong growth in world demand, especially in the leading emerging market economies, may generate further price increases, while supply shocks such as the development of shale gas and other unconventional fossil fuels could lead to price falls, as could success in moving towards the zero carbon emission economy needed if global warming is to be substantially mitigated. The growth of the GPFG renders the budgetary

position less sensitive to petroleum prices but increases exposure to world financial market fluctuations, whether positive, as in 2013, or severely negative, as in 2008.

Facing these risks, Norway has a well-developed set of policy tools. Monetary policy has room to act on both deflationary and inflationary risks, while the floating exchange rate gives automatic compensation for some external shocks. On the fiscal side the automatic fiscal stabilisers are quite powerful, and the government has the ability to make quite rapid discretionary fiscal policy changes to supplement these tools if necessary, as in 2009.

Table 2. **Macroeconomic indicators and projections**

Annual percentage change, volume (2011 prices)

| | 2011 Current prices (billion NOK) | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| **GDP** | **2 751** | **2.9** | **0.6** | **2.1** | **2.5** |
| **Mainland GDP** | **2 075** | **3.4** | **2.0** | **2.5** | **2.9** |
| Private consumption | **1 130** | 3.0 | 2.1 | 2.4 | 3.3 |
| Government consumption | **592** | 1.8 | 1.6 | 3.2 | 2.7 |
| Gross fixed capital formation | **539** | 8.3 | 8.7 | 3.3 | 3.6 |
| Housing | **121** | 7.3 | 6.4 | 2.0 | 1.2 |
| Business | **332** | 10.8 | 9.4 | 4.0 | 3.5 |
| Government | **86** | -0.4 | 9.5 | 1.8 | 7.3 |
| Final domestic demand | **2 262** | 3.9 | 3.6 | 2.8 | 3.2 |
| Stockbuilding[1] | | -0.1 | 0.0 | 0.0 | 0.0 |
| Total domestic demand | **2 376** | 3.6 | 3.4 | 2.6 | 3.1 |
| Exports of goods and services | **1 154** | 1.1 | -3.9 | 1.5 | 1.8 |
| *of which* crude oil and natural gas[2] | **568** | 0.7 | .. | .. | .. |
| Imports of goods and services | **779** | 2.3 | 2.5 | 2.6 | 3.5 |
| Net exports[1] | | -0.2 | -2.3 | -0.2 | -0.3 |
| **Other indicators** (growth rates, unless specified) | | | | | |
| Potential GDP | .. | 2.3 | 2.6 | 2.8 | 2.9 |
| Output gap[3] | .. | -0.3 | -0.9 | -1.2 | -1.2 |
| Employment | .. | 2.0 | 0.7 | 1.1 | 1.3 |
| Unemployment rate | .. | 3.1 | 3.5 | 3.6 | 3.6 |
| GDP deflator | .. | 2.8 | 2.6 | 2.8 | 2.6 |
| Consumer price index | .. | 0.7 | 2.1 | 2.1 | 2.1 |
| Core consumer prices | .. | 1.6 | 1.5 | 1.9 | 2.0 |
| Household saving ratio, net[4] | .. | 8.1 | 8.7 | 9.1 | 9.1 |
| Current account balance[5] | .. | 14.5 | 10.8 | 10.8 | 10.9 |
| General government financial balance[5] | .. | 13.9 | 11.1 | 10.7 | 10.2 |
| Government Pension Fund Global[6, 8] | .. | 173.8 | 209.9 | .. | .. |
| General government net debt[5] | .. | -167.5 | -185.9 | -188.2 | -189.7 |
| Non-oil balance[6, 8] | .. | -4.6 | -5.0 | -5.7 | .. |
| Structural non-oil balance[7, 8] | .. | -4.7 | -5.2 | -5.7 | .. |
| Structural non-oil balance (% GPFG)[7, 8] | .. | -3.1 | -3.2 | -2.9 | .. |
| Three-month money market rate, average | .. | 2.2 | 1.8 | 1.8 | 1.9 |
| Ten-year government bond yield, average | .. | 2.1 | 2.6 | 2.9 | 3.1 |
| **Memorandum items** | | | | | |
| Non-mainland GDP (petroleum and shiping) | **676** | 1.3 | -3.5 | 0.6 | 0.9 |

*Note:* These projections are a partial update of *OECD Economic Outlook No. 94* from November 2013. Full forecasts will be published in *Economic Outlook No. 95* in May 2014.

1. Contribution to changes in real GDP.
2. Statistics Norway.
3. As a percentage of potential GDP.
4. As a percentage of household disposable income.
5. As a percentage of GDP.
6. As a percentage of mainland GDP.
7. As a percentage of trend mainland GDP
8. Ministry of Finance calculations and projections.

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## New tools to complement monetary policy

The flexible inflation targeting approach to monetary policy presents the authorities with a challenge, as domestic interest rates can have an uncertain effect on the exchange rate, depending on external factors – notably petroleum prices and interest rates in other countries. Norges Bank has maintained its policy interest rate at low levels since the onset of the financial crisis, currently at 1.5% since March 2012. Consumer price inflation had been well below the central bank's 2.5% guideline for several years, which justifies the low interest rates. On the other hand, such low interest rates have encouraged the real-estate boom. House prices had increased at a faster pace than disposable income for several years, which has been associated with strong credit growth. Household indebtedness is twice disposable income on average and almost exclusively at floating interest rates.

The primary objective of monetary policy is low and stable inflation. Norges Bank's inflation targeting approach takes account of financial stability concerns alongside traditional objectives; this was made more explicit in 2012. The central bank considers that low interest rates kept for an extended period may lead to financial imbalances (Norges Bank, 2012a; Olsen, 2013a, 2013b). As a result, the policy interest rate has been higher than what inflation and the output gap alone would have implied (Figure 3). There is some risk in gearing monetary policy to financial stability, since it could interfere with the primary inflation objective (Gelain et al., 2012). Although this has not been a major problem in Norway to date, in general, more policy instruments are required to achieve different objectives at the same time (Olsen, 2013a, 2013b).

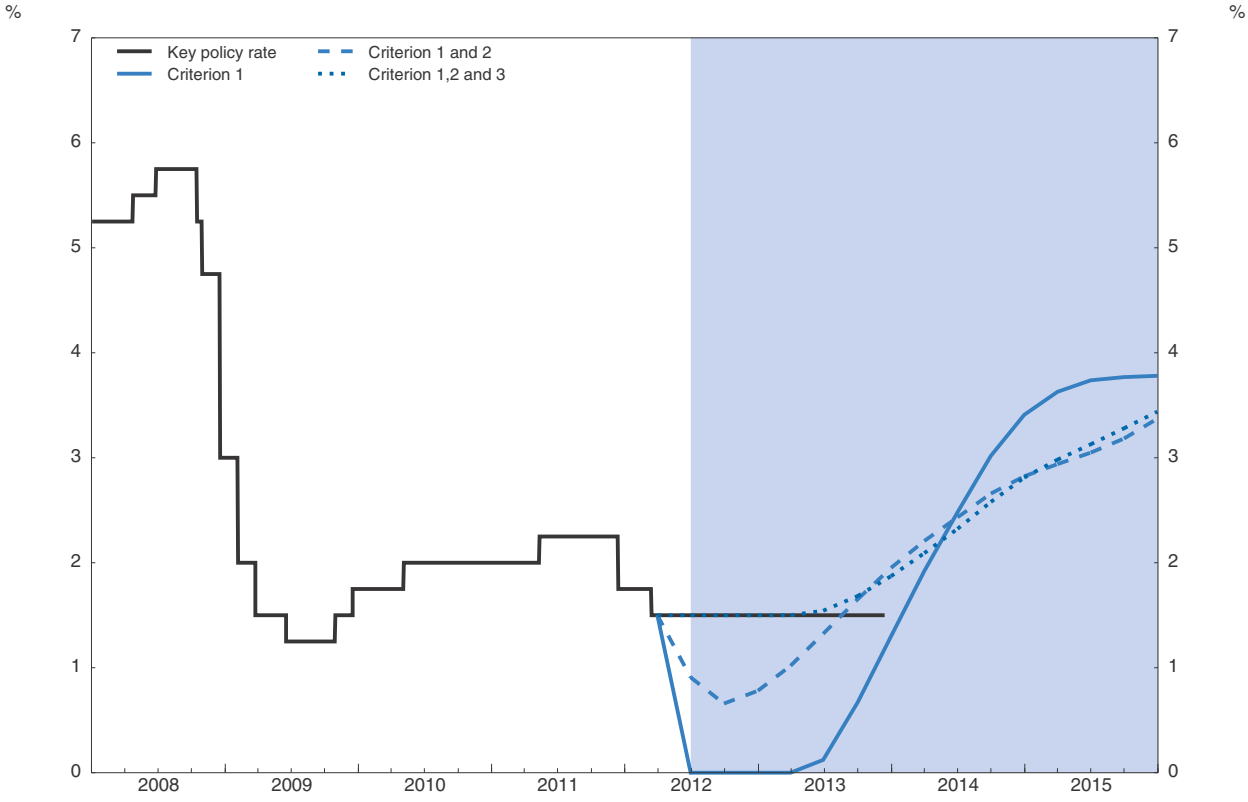
One such tool is a counter-cyclical buffer in the bank capital requirements regulations, as required by Basel III and the EU Capital Requirements Directive IV (CRD IV). In December 2013, Norway became the second country (after Switzerland) to introduce a buffer, at a level of 1% of risk-weighted assets and with effect from July 2015. If the capital ratio falls below the required total level, the authorities will be able to impose constraints on banks' behaviour, notably restricting dividend payments and employee remuneration. In a strong downturn the authorities could remove the counter-cyclical buffer requirement or reduce its level, to mitigate pro-cyclical effects of tighter credit conditions.

The Finance Ministry makes decisions on the level of the counter-cyclical buffer every quarter, based on advice given by Norges Bank; this advice is published, once the decision has been made. The central bank's advice is informed by an analysis of four indicators: the ratio of credit to GDP, the ratio of house prices to household disposable income, commercial property prices and the wholesaling funding ratios of Norwegian credit institutions; both the levels and deviations from estimated trends of these indicators are taken into account. This is a somewhat more developed approach than an initial proposal from the Bank for International Settlements to use just the credit-to-GDP ratio. The indicators can be quite sensitive to the estimation method used for the trend, however (as Figure 4 shows for one of the indicators). The recent increase in mortgage lending rates and spreads to funding costs may reflect banks anticipating these higher capital requirements, in addition to the effect of increases in the normal capital requirements under CRD IV and action on mortgage loan-to-value ratios.

This allocation of decision-making responsibility seems to suit the existing Norwegian institutional arrangements regarding financial stability. Other countries may choose different arrangements, for example giving more responsibility to the central bank or other

Figure 3. **Appropriate interest rate path according to different criteria**

As predicted in March 2012




Criterion 1: set the interest rate with a view to stabilising inflation at target or bringing it back to target after a deviation has occurred.
Criterion 2: set the interest rate path to provide a reasonable balance between the path for inflation and the path for overall capacity utilisation in the economy.
Criterion 3: set the interest rate so that monetary policy mitigates the risk of a build-up of financial imbalances, and so that acceptable developments in inflation and output are also likely for a range of different economic outcomes.
*Source:* Norges Bank.

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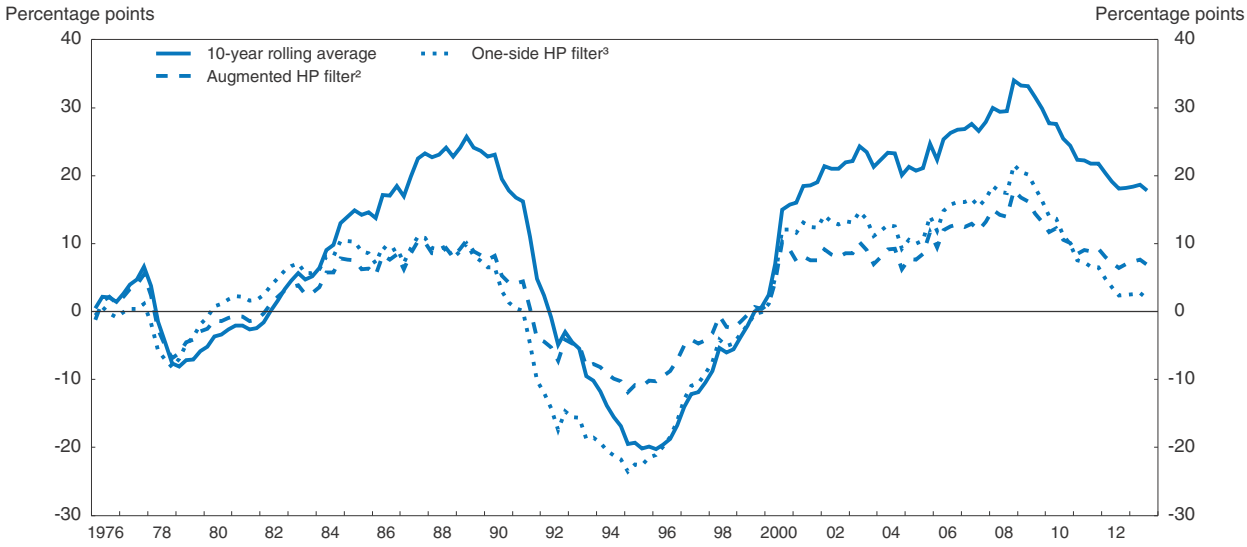
independent institution. This setup, and the indicators used, are new in all countries and may be subject to modification in the light of experience.

Relatively favourable conditions on home mortgage loans may persist, however. With CRD IV having entered into force in July 2013, the required common equity tier 1 ratio is currently at 9% and will be gradually increased to 12% (10% for banks not deemed to be systemically important) as of 2016 (the countercyclical buffer is additional to this). In general, a higher capital requirement is expected to increase lending rates and to constrain activity. Its effect seems to be somewhat weaker in Norway (BCBS, 2010; Akram, 2012), perhaps because of low risk-weights on home mortgage loans by large banks using the internal rating based (IRB) approach. In practice, transitional provisions (the "Basle I floor") keep mortgage risk weights well above the 10% to 13% range that IRB models can produce. In October 2013, the Ministry of Finance took action which will increase IRB-calculated risk-weights on mortgage loans to 20% on average for the IRB banks.

A different type of challenge may emerge in the future if inflation picks up and interest rates rise. Currently, around 7% of households spend more than 20% of income on interest

Figure 4. **Credit indicator of financial imbalances**

Total credit[1] mainland Norway as a percentage of mainland GDP, deviations from estimated trends




1. Sum of non-financial corporations in Mainland Norway (total economy pre-1995) and households.
2. One-sided Hodrick-Prescott filter augmented with a simple projection. Lambda = 400 000.
3. One-sided Hodrick-Prescott filter. Lambda = 400 000.

*Source:* Norges Bank, *Monetary Policy Report 04/13*.

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payments. According to *Finanstilsynet*, the financial supervisory authority, an increase of the mortgage lending rate to around 6½ per cent (in 2012 Norges Bank's assessment was that the normal level of the key policy rate to be around 4% for the next few years [Norges Bank, 2012b]), this share would rise to 20% of the total (Finanstilsynet, 2013). This could be a drag on household demand and on growth. The unwinding of household debt, which tends to occur once property prices peak, may also restrain growth. Statistics Norway's models indicate that a larger shock, a rise in the policy rate of 5 percentage points, would reduce GDP by around 5% – assuming no negative feedback loop via troubled banks.

The Norwegian banking system is closely interconnected with other Nordic countries. Through the EEA, some EU policies apply, such as any future directive on recovery and resolution, but the Single Resolution Mechanism currently under discussion would not, for example. The interconnectedness underlines the continuing importance of close co-operation among Nordic bank policies.

### Summary of recommendations on monetary policy and financial stability

- The monetary policy stance of the central bank is appropriate. Interest rate policy needs to continue to pay attention to financial stability risks, until the developing macro-prudential tools have shown their effectiveness.
- Monitor whether the macro-prudential tightening has the intended effect on financial stability. If necessary, revise the system of indicators and decision-making processes in line with evolving experience.
- The financial vulnerabilities resulting from high household indebtedness at floating interest rates should continue to be addressed, notably by further action on prudential policy, e.g. on loan-to-value ratios and stress-testing of borrowers' debt servicing capacity.

## Evolving fiscal policy

Norway's fiscal position is enviable. Revenues from petroleum production have averaged around 17% of mainland GDP (about 14% of total GDP) over the period 2001-13. They are quite variable: over the same period the average absolute change from one year to the next has been over 3% of mainland GDP and the standard deviation of the actual change over 4%. Such high and variable revenues can pose a challenge to budgetary policy and macroeconomic management, the "resource curse", which Norway has dealt with rather successfully through the operation of the Government Pension Fund Global (GPFG) and associated fiscal guidelines (Box 3).

This strategy has insulated the budget, and to a considerable extent the economy as a whole, from these revenue fluctuations while allowing the underlying impact on fiscal policy to build up gradually over the years. The impact of this policy can be seen in its effect on national saving. Since the late 1990s, the national saving rate (measured with respect to total GDP, not only mainland) has risen by around 10 percentage points, almost entirely as a result of increased government saving (Figure 6).

### Box 3. **The Norwegian macroeconomic policy framework**

Fiscal policy works within a set of guidelines on the use of revenue from oil and gas production. The guidelines have two parts, a rule on the use of annual petroleum revenues and a rule on the use of the accumulated stock of revenue:

- All government revenues from oil and gas production, whether through taxation or ownership, less investment costs, are paid into a fund, initially called the Government Petroleum Fund but now known as the Government Pension Fund Global (GPFG). The GPFG invests exclusively in assets outside Norway. By the end of 2013, accumulated assets in the GFPG were valued at around NOK 5 000 billion (about USD 800 billion), more than 200% of mainland GDP. Investment guidelines are that 60% of the fund should be held in equities, 35-40% in fixed-income securities and up to 5% in real estate.
- The so-called 4% rule stipulates that the structural mainland budget deficit (i.e. the central government deficit excluding petroleum revenues and adjusted for the cyclical position of the economy excluding petroleum and shipping) should, over time, be equivalent to 4% of the value of the GPFG at the end of the year prior to the budget year.

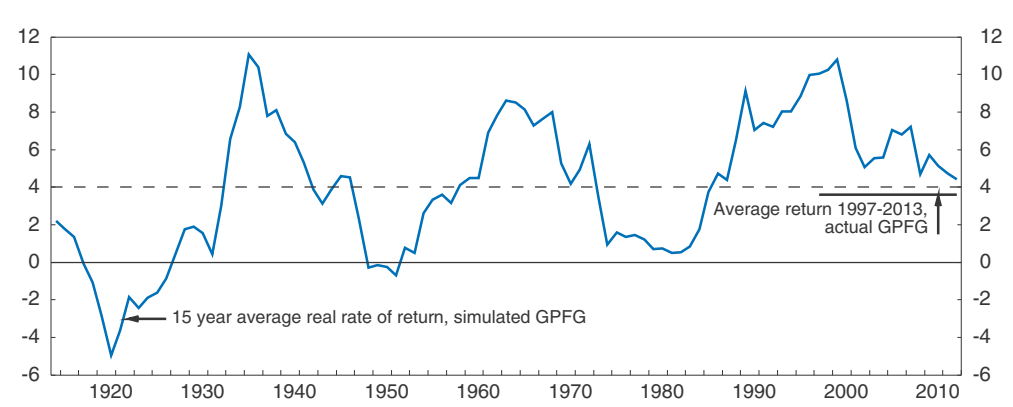
The figure of 4% was chosen because it was estimated that this was the long run real rate of return the fund could expect. The average return since 1997 up to late 2013 has been about 3¾ per cent. A simulation of the fund's value over the previous century shows that 15 year rolling average returns would have varied between zero and 10%, with an average of 4.8% (Ministry of Finance [2012]; Figure 5).

A non-petroleum structural deficit equal to 4% of the GPFP is not a target for any particular year, the government is free to deviate from it in various circumstances, notably when discretionary fiscal action seems necessary, or when the value of the GPFG changes erratically or very rapidly. Although one of the aims of the GPFG is to preserve petroleum wealth for future generations, the guidelines do not explicitly require that cumulated deviations of the structural deficit from the 4% value should be zero. Use of the phrase "the 4% rule" or "4% guideline" in the text of this report encompasses both the 4% rule as outlined above and the underlying rule allocating all current petroleum revenue to the GPFG.

Box 3. **The Norwegian macroeconomic policy framework** *(cont.)*

Figure 5. **Simulated real return on the Government Pension Fund Global (GPFG)**

Actual return on the GPFG[1] and returns on a GPFG-like portfolio[2]




1. Average actual return on the GPFG for the period 1997-2013, including an estimate for 2013. The average return from 1997 to 2012 was 3.2%.
2. Average annual real returns during rolling 15-year periods on a GPFG-like portfolio from 1900 to 2012. The GPFG-like portfolio comprises of 60% of equities and 40% of long-term government bonds. The country distribution is largely identical to the distribution in the GPFG's benchmarks for equities and fixed income. The Ministry of Finance calculated such returns on the basis of Dimson-Marsh-Staunton Global Returns Data.

*Source:* The Ministry of Finance.

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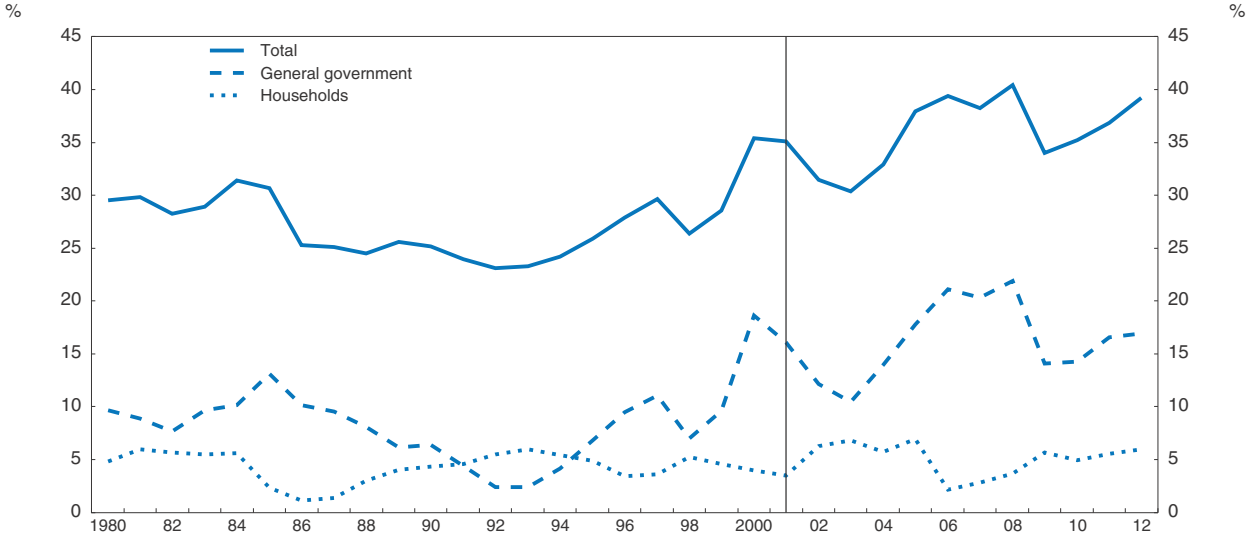
By 2014, 4% of the GPFG will be equivalent to around 8% of mainland GDP. On current budgetary plans, policy will be significantly tighter than this, with a structural non-petroleum deficit more like 5¾ per cent of mainland GDP.

In the fiscal rule, the figure of 4% was chosen as a plausible value for the long run real rate of return that could be expected from the GPFG. In that way, the real value of the wealth represented by non-renewable resources of oil and gas in the ground would be converted into financial wealth. The actual real rate of return has varied considerably, and therefore future returns are highly uncertain. To ensure preservation of the wealth-conserving properties of the fiscal rule, it might therefore be prudent to reduce the assumed real rate of return below the current 4%, but there are dangers in opening up the issue of the assumed rate of return, unless there is a consistent divergence over a long period. Nevertheless, given the rapid recent rise in the size of the fund, the current policy of keeping the deficit well within the limit implied by the 4% rule is appropriate because it represents a cautious approach to both issues – preserving the value of the fund and avoiding excessive growth in aggregate demand.

As a percentage of mainland GDP, total general government non-petroleum revenue in Norway is, along with that of Denmark, now the highest in the OECD (Figure 7). Even excluding GPFG revenues (equivalent to over 5% of mainland GDP), which are not a burden on the mainland economy, the share is still the 7th highest in the OECD. Under the previous government's policy of maintaining the average level of taxation unchanged, rising GPFG revenue has been used to fund increasing levels of public expenditure. This keeps the

Figure 6. **Saving rates by sector**

As a percentage of total GDP




*Source:* OECD, *Annual National Accounts Database.*

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burden of taxation at relatively high levels, likely to induce distortions and inefficiencies in private sector behaviour. Levels of taxation could be reduced over time, especially if public spending efficiency were improved. Stronger impact evaluations and cost-benefit analyses could help raise efficiency. The new government is considering establishing an independent efficiency unit for the public sector with a remit to audit cost-benefit analyses, to secure good quality and consistent practice. The previous *Economic Survey* (OECD, 2012) suggested creating a more powerful cross-ministry agency for monitoring such impact evaluations and cost benefit analyses, in a chapter on public expenditure management.

Previous *Economic Surveys* have also suggested that there is room for more private provision of public services, even in areas such as health and education where services are provided free of charge. Competition on the basis of cost, with safeguards for maintaining service quality, can produce efficiency gains. Many services are provided at local or county level, and the KOSTRA system for monitoring spending can form the basis for cost comparisons in a lot of areas. The new government has indeed announced that it intends to pursue the idea of increased private sector participation. The free provision of tertiary education, along with grants for student living costs, has led to a growth in the number of local colleges, who aspire to university status. The low apparent rate of return to tertiary education in Norway may suggest that cost and quality control here are very important, although the relatively low premium to earnings associated with additional education may well reflect egalitarian labour market conventions rather than a human capital effect.

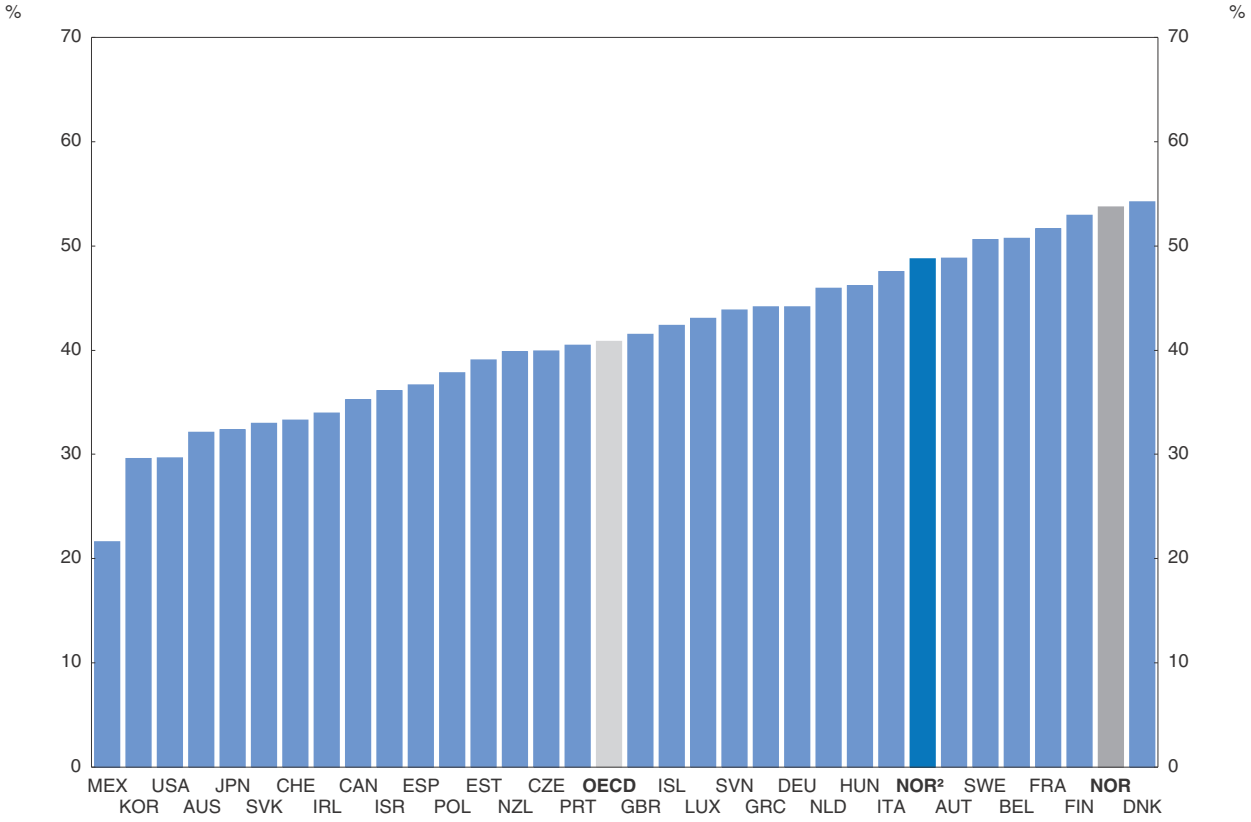
In one important and sometimes controversial area, road planning and construction, the government has also announced that it may set up a new public body to manage national road building programmes and perhaps expand the role of public-private partnerships (PPP), though not many details are available. It is important to bear in mind that the efficiency gains from PPP lie in project planning and cost management, not in

financing. An appropriate balance between risk and reward is also important – if the private side of the partnership bears no risk, it should not be remunerated as if it does. Where public money or contingent liabilities are involved, projects should be exposed to public scrutiny – audits, cost-benefit analysis and so on – just like any other public spending programme. The new body could potentially be classified as part of the private sector, depending on the share of income from "market" sources (which can include publicly enforced toll revenue). But through its borrowing and likely implicit government guarantees, there may be contingent liabilities for the government; if they are not included in national accounts definitions of general government budgets, these should be explicitly recorded in annexes to the public accounts.

The new government has also made a start on tax reduction, reducing income tax by one percentage point, reducing the wealth tax (from 1.1% to 1.0%) and abolishing inheritance taxation in the revised 2014 budget. This starts to address another problem raised in the chapter on capital taxation in the previous *Economic Survey*, where it was

Figure 7. **General government total[1] revenue**

As a percentage of GDP




*Note:* Data for Norway refer to mainland. The OECD area is the simple average of the countries for which data are available (using Norway figures excluding GPFG).

1. Excluding interest income.
2. Excluding revenue from the Government Pension Fund Global.

*Source: OECD Economic Outlook 94 Database.*

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shown that income from some forms of saving faces effective tax rates of over 100% when income tax, wealth tax and inflation are taken into account.

The Norwegian tax system is relatively free of distortions, apart the area of capital taxation (OECD, 2012; Denk, 2012). The system has fewer special rates and exemptions than many other tax systems, though it is always worth checking to see that these address a real need rather than a sectional interest. For example, the comparatively high standard rate of value added tax, 25%, could be reduced if other lower rates, such as on food and some transport, or exemptions were abolished. The mandate of the recently appointed tax commission, which is due to report in late 2014, is mainly the important issue of the vulnerability of the corporate tax system to international tax shifting; the 2014 budget took some steps to limit interest deductibility in this context. The new government has suggested setting up a green tax commission, which could for example examine the issue of inefficient multiple rates in the carbon tax, as well as the possibilities for increasing or refining environmental taxation. It has already acted in one area, by increasing the carbon tax on some previously low-tax sectors. Other taxation issues such as housing and wealth taxation, as identified in previous OECD *Economic Surveys*, could be considered subsequently.

**Summary of recommendations on fiscal policy**

- Aim for a gradual fall in the level of taxation, accommodating this within the fiscal guidelines by reducing the growth of public spending below that of national income.
- Improve the efficiency of public spending through more consistent assessment of value for money. Any new public body for transport investment should focus primarily on cost-efficiency in project choice, construction and maintenance.
- Within the goal of lower taxation, reduce distortions created by the tax system, notably features advantaging owner-occupied housing.
- Consider a longer term policy of keeping the non-petroleum deficit well below the 4% guideline, in view of the stronger than expected increase in the Government Pension Fund Global (GPFG), uncertainties in the future rate of return on the GPFG, pressure of demand in the economy, and fiscal challenges due to ageing.

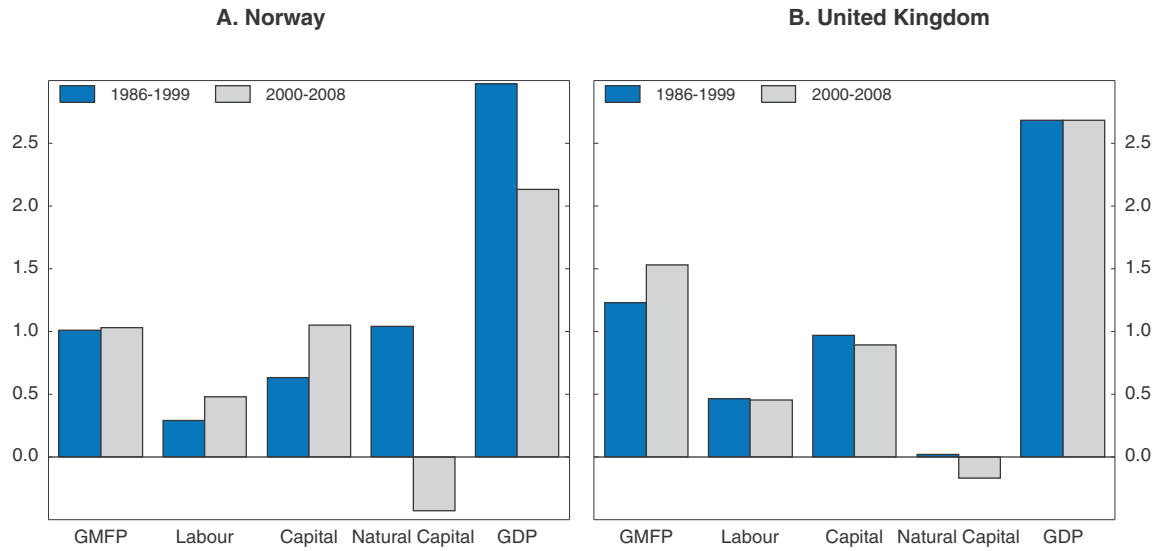
## Sources of growth

The exploitation of natural resources has been one of the most important factors in understanding developments in the Norwegian economy over the past three decades. "Growth accounting" exercises traditionally calculate how growth in national income is composed of growth in labour and capital resources employed and underlying productivity growth, often referred to as total or multi-factor productivity growth. Recent OECD work provides an interesting perspective on this by treating use of natural resources as an additional factor of production, alongside capital and labour, as sources of GDP growth in such a growth accounting exercise (Brandt et al., 2013).

From the mid-1980s to 2000 the growth contribution of natural capital was relatively large in Norway and turned negative thereafter, as oil reserves started to diminish (Figure 8). Although the growth contribution of other factors of production increased a little, GDP growth declined almost in tandem with the growth contribution of natural

Figure 8. **Contribution to GDP growth**

Contributions to period average growth




*Note:* GMFP: Generalised multi-factor productivity.
*Source:* Brandt et al. (2013).

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capital, as estimated growth in generalised multi-factor productivity (GMFP) was almost unchanged.

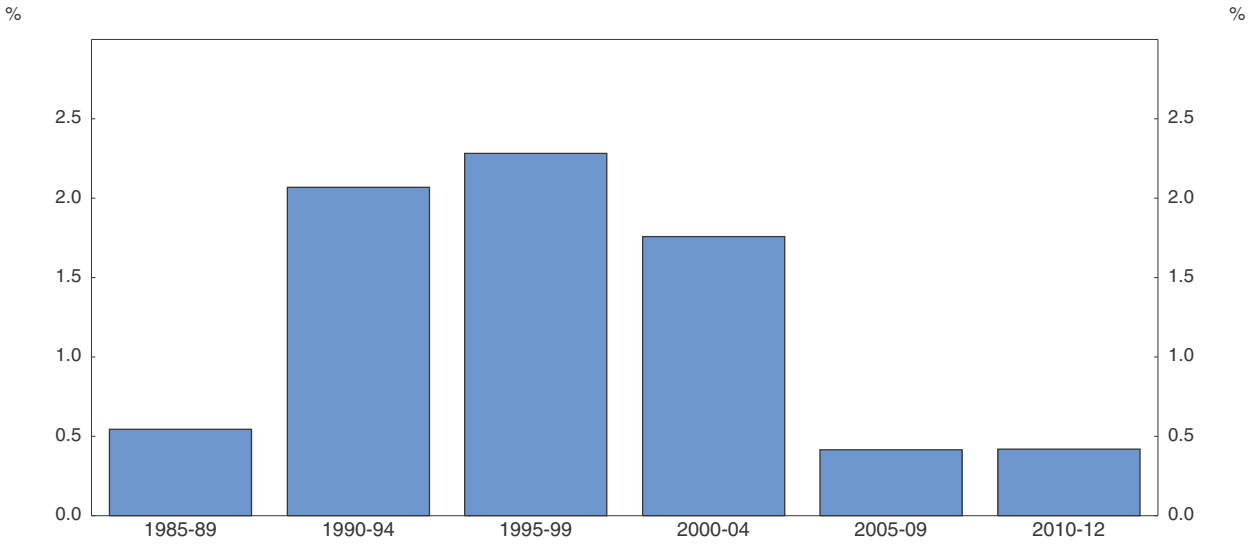
This decline in GDP growth can, in fact, be entirely attributed to declining oil and gas production. GDP growth in mainland Norway, which excludes the offshore gas and oil sectors, even increased a bit across these two periods. Still, one interpretation of the picture shown in Figure 8 would be that during times of resource abundance Norway did not invest sufficiently in other forms of wealth, such as human or physical capital, to maintain its ability to generate similar increases in income when resource use is declining. Promoting innovation and entrepreneurship could help to attain higher productivity growth to make up for the vanishing growth contribution of gas and oil. The United Kingdom seems to have been able to maintain GDP growth across the two periods; however, the drop in the contribution of natural capital was much smaller.

The decline in overall GDP growth in the decade after the 1990s due to reduced growth in petroleum production was partly offset by some increase in labour and capital input, while underlying multi-factor productivity growth assessed in Brandt et al. (2013) was little changed. Developments since the period 2000-08 analysed suggest a somewhat more pessimistic picture. Underlying productivity growth in the mainland economy (which should be much less affected, if at all, by the decline in extraction of petroleum, most of which is exported) declined after the 1990s. Its decline appeared to continue through the recession and picked up only a little in the subsequent recovery (Figure 9).

There is thus a risk that, beyond the cyclical recovery, future growth rates will be lower than those to which Norway has been accustomed, even in the mainland economy. The earlier period, in addition to being one in which the use of non-renewable resources was accelerating, was also one in which structural reform policy was more active than in the last decade; significant reforms occurred in taxation and retail regulation in the 1990s, for

Figure 9. **Slowing underlying productivity growth**

Total factor productivity, average annual change, mainland




*Source: OECD Economic Outlook 94 Database.*

StatLink http://dx.doi.org/10.1787/888932998500

example. Resources in the GPFG will continue to grow (though at a diminishing rate) but this would not make up for a shortfall in underlying productivity growth. Productivity growth depends on innovation, which can arise from adopting better technologies or new products from abroad, from research and development (R&D) activity in Norway to develop home-grown improvements, as well as in less obvious ways such as organisational innovation, including just better use of new technologies in existing activities.

The government has set up a commission on productivity to investigate these issues. Previous OECD *Economic Surveys* have emphasised the importance of policies to maintain competition and an open economy. While in many areas, regulatory indicators show that Norway performs well, they also suggest that there are barriers to competition in some service industries. There is also evidence of significant potential to raise productivity in public services such as education and hospitals. State-owned companies play a large role in the economy, potentially a source of inefficiency, although arms-length governance arrangements for such companies prevail in Norway. In addition, innovation-specific support policies need to adapt to the changing technological environment.

## Innovation and entrepreneurship

Norway has a set of innovation policies in place which have been partly based on technology- and industry-neutral subsidies to R&D or innovation investment, with projects requiring approval from the Research Council of Norway (RCN). The main programme, *Skattefunn*, operates through a tax credit scheme (though it is essentially a grant since if the tax credit exceeds the tax liability, the difference is paid as a grant), and is potentially open-ended as there is no fixed budgetary limit once the RCN approves the scheme. However, for each company there is a ceiling on R&D spending that is eligible for the tax credit (this ceiling was substantially increased in the 2014 budget, after several years without change).

Smaller programmes for R&D grants operate on the basis of competition for a fixed budget of grants, based on a ranking by the RCN of the various potential projects.

Some other support programmes are more closely tied to specific industries. Agriculture is a declining industry in relative terms and its contribution to GDP is now exceeded by fish farming, an industry that grew up largely spontaneously. Support to agriculture is delivered through very high implicit subsidies from price support and import restrictions (such as a 277% tariff imposed on certain cheese at the beginning of 2013). Agriculture also benefits from a special programme by Innovation Norway, an agency of the Ministry of Industry. On the other hand, newer industries also receive special attention, especially if related to renewable energy and energy saving, for which separate funding, not overseen by Innovation Norway, has been set up. The system of support for R&D is moving away from technological and industry neutrality to a more targeted approach.

In addition to targeting R&D activity in various ways, policy has also been concerned about human capital. The proportion of students studying STEM (Science, Technology, Engineering and Mathematics) subjects is relatively low in Norway: just over 1% of Norwegian employees aged 25-34 have such a degree, compared with an OECD average of about 2%. The authorities have looked for ways to encourage young people to take up such courses and to make them more relevant by encouraging university-industry links. But starting salaries for graduates in STEM disciplines are not much above average – the issue may be as much the demand for STEM skills by employers as the supply of those skills. From this point of view an essential set of people are entrepreneurs.

Definitions of entrepreneur often seem indistinguishable from that of innovator, as they are likely to have many attributes in common (Table 3). There are perhaps two key functions of entrepreneurs that innovators do not necessarily need. One is the organisational role, bringing together different kinds of people as well as material and financial resources, and making them work effectively together. The other is taking financial risk. Innovators may undertake either of these activities, entrepreneurs certainly do.

Entrepreneurs do not necessarily have to innovate, in the commonly used sense of the word, to be useful. Setting up a new company, or expanding an existing one, to provide similar goods and services to those that already exist and using similar production techniques is not innovation. But if it increases competition in existing markets or serves new domestic or export markets, it can contribute to increasing national income. The contribution of entrepreneurs to innovation, increasing the underlying productivity growth

Table 3. **Innovator or entrepreneur?**

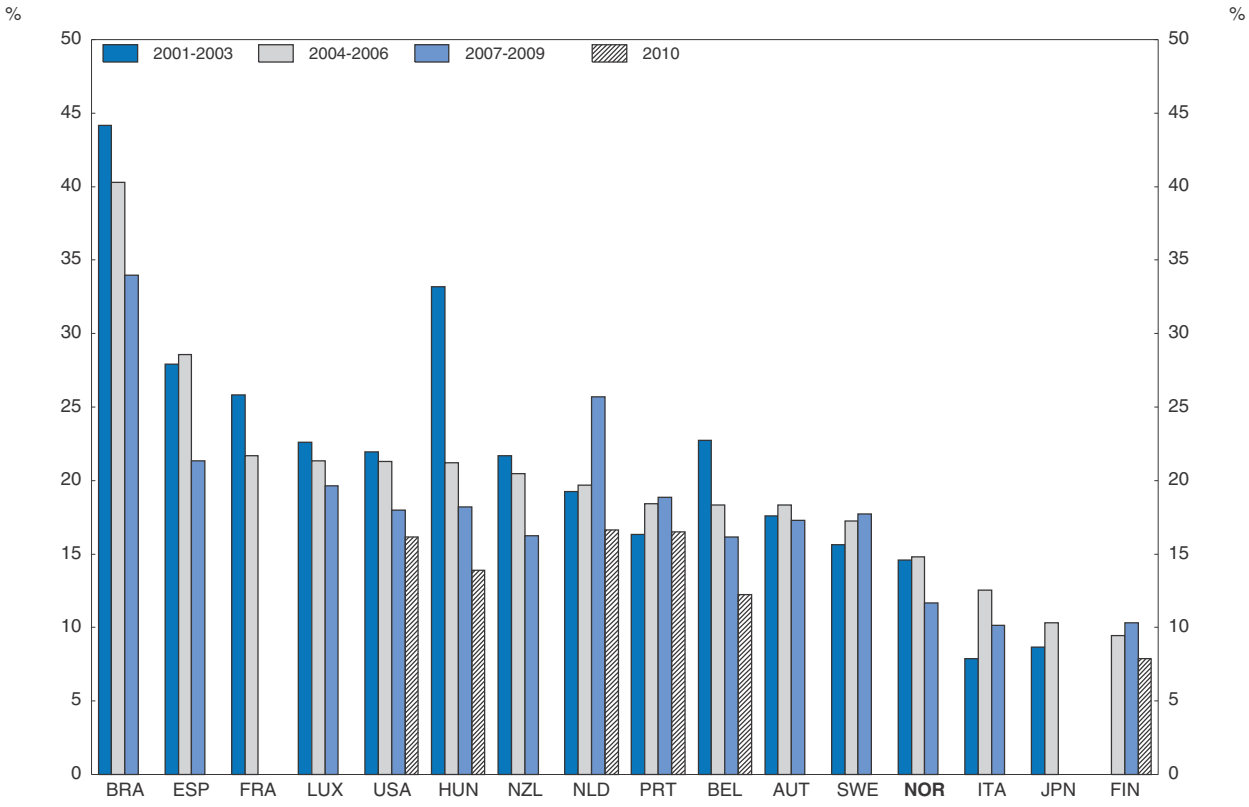
| | | Innovators | Entrepreneurs |
|---|---|---|---|
| Innovate | | Yes | Maybe |
| Invest | | Maybe | Yes |
| Employ | | Maybe | Yes |
| Manage | | No | Yes |
| Deal with public administration | | Maybe | Yes |
| R&D | sponsor | No | Maybe |
| | conduct | Likely | No |
| Risk own cash | | Maybe | Yes |
| Risk other | | Yes (time, status…) | Maybe |
| Key skills, (relative to typical salaried employee) | | Technical | Managerial, financial, vision |
| Contribution | | New products, techniques | More, better, or lower-cost, production |

discussed earlier, may come in many ways, for example through directly spotting innovative projects that need someone to organise and finance them, or by employing the kind of people likely to spot new opportunities in existing businesses. Such people may or may not be STEM graduates.

A widespread measure of the degree of entrepreneurship is the rate of new firm creation, where Norway seems to lag (Figure 10). Another international comparison, based on surveys of individuals, suggests that Norwegians generally see that there are plenty of opportunities for entrepreneurship in Norway, but by comparison with other countries only a relatively small proportion of Norwegians feel they are equipped with the skills that entrepreneurs need (GEM, 2011).

In some countries, regulatory barriers to entry might explain low start-up rates, but OECD indicators of product market regulation show Norway in a favourable position. Nevertheless, barriers to entry in some services appear relatively high, and some aspects of employment protection, such as a high degree of restriction on the use of temporary

Figure 10. **Norway has a lower start-up rate than many countries**




*Note:* The graph reports country averages in start-up rates (defined as the fraction of start-ups among all firms) across the indicated three-year periods. Start-up firms are those firms which are from 0 to 2 years old. The period covered is 2001-11 for Austria, Belgium, Finland, Hungary, the Netherlands, Norway, and the United States; 2001-10 for Brazil, Spain, Italy, Luxembourg and Sweden; 2001-09 for Japan and New Zealand; 2001-07 for France; and 2006-11 for Portugal. Sectors considered are: manufacturing, construction, and non-financial business services. Businesses never growing above one employee and those living only for one year are excluded. Owing to methodological differences, figures may deviate from officially published national statistics. For Japan data are at the establishment level, for other countries at the firm level.

*Source:* Preliminary results from the DynEmp project (Criscuolo et al., 2014).

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contracts, may make start-ups more difficult as well as potentially increasing adjustment costs in established firms. Along with the comparatively high weight of public sector enterprises in the economy, this suggests that framework conditions for entrepreneurship may be a part of the explanation for low start-up rates. In addition, competition policy has a feature that potentially permits competition-restricting mergers more easily than in many other countries. This is the "total welfare" principle, which allows benefits to the merging companies to be taken into account rather than just consumer welfare. As in New Zealand, which uses a similar principle, this may nevertheless be justified in order to allow economies of scale to be effectively exploited in small and geographically remote markets.

Some related evidence is ambiguous. For example start-ups in Norway appear to be somewhat larger in terms of initial employment than in other countries (the same is true for neighbouring Sweden) and their survival rate somewhat higher. Is this a sign that barriers to entry keep out a large share of small potential start-ups, or that Norwegian entrepreneurs put together better developed business plans that allow them to start with more employees and to survive better? Although average survival rates are good, fewer start-ups in Norway experience the very rapid growth that characterises the most successful businesses. Looking for evidence to clarify this kind of issue could be one of the tasks of the new productivity commission.

The new government has taken some measures to increase incentives to innovation, notably raising the ceiling on *Skattefunn* R&D support. It has also announced that it wishes to reduce the burden of bureaucracy. If the latter included reducing unnecessary barriers to entrepreneurship, it could have an even more important impact on innovation and growth than increasing direct subsidies.

In Norway over 30% of employment is in the public sector. The development of new "products" is perhaps less important there than in the private sector, but encouraging an entrepreneurial approach might help to maintain a system that adapts to technological change and looks for more efficient ways of fulfilling the public service objectives. One way is to make more use of contestability in the provision of public services by private providers. Even within the irreducible public sector, a willingness among employees to take some risks in looking for efficiency-enhancing measures could be a force for gains in cost-effectiveness.

**Summary of recommendations on entrepreneurship**

- Continue to base innovation support on a competitive-bid based approach rather than automatic support. Continue to focus policy for clusters pragmatically on improving framework conditions and information flows, rather than promoting clusters *per se*.
- In addition to focus on STEM (Science, Technology, Engineering and Mathematics) skills for innovation, ensure that entrepreneurial skills such as risk assessment, people management, project planning and finance are also given a place in the national skills strategy.
- Encourage universities to further develop Technology Transfer Offices (TTOs), including collaboration between universities.
- Consider further reductions in the wealth tax to increase incentives for entrepreneurs.

## Human capital, education and the labour market

Innovation and productivity growth may be held back partly because employers underrate the importance of recruiting people with the right kind of skills. By international comparison, the incentive to undertake tertiary education, as measured by the earnings premium and better employment prospects, is relatively low in Norway. This could be an indication of a problem on the demand side, as could the traditionally relatively flat earnings distribution.

### *Education*

The education system itself faces some challenges, as described in the chapter on education in the 2008 *Economic Survey* (OECD, 2008; and Boarini, 2009). First, while the general level achieved by Norwegian secondary school students, as measured at age 15 by the OECD PISA study, is around average, these average results are achieved at well above average costs. Some of the higher costs are due to the costs of providing education in small schools in remote areas, and so might be thought of as a cost of regional policy rather than education policy itself. But other factors, such as insufficient focus on performance at all levels – student, teacher and school – and the level of qualification of teachers, are also likely to play a role.

This problem of the relative cost-inefficiency of the primary and secondary education system has been recognised for some time, and some measures have been taken. To improve teacher quality, entry standards for teacher training were introduced together with a reform of teacher training in 2010. The new teacher training programme will produce more specialised teachers, covering fewer subjects; supplementary education and training for teachers and school principals has also been introduced. Use of existing information on student performance has been somewhat expanded, but has not been extended to full publication of school average results; the new government has said that it will consider taking this step. Publication of results preferably in "value added" form (i.e. comparing the improvement in students' performance during the year, not simply the level attained) was recommended in OECD (2008) and can be a useful tool for encouraging improvement and analysing teaching methods. It could also be a source of frustration in a system without parental choice of school, and potentially lead to too much emphasis on testing, so should be undertaken with some care. In the Oslo education district, teachers and school principals are to some extent rewarded on the basis of performance, unlike in the rest of the country. It is surprising that no study of whether this appears to be effective in raising standards has been undertaken.

A second key challenge in education is the rate of dropout at the upper secondary level, mostly in the vocation-oriented courses. Completion rates are well below the OECD average and the average age at completion significantly higher. One of the reasons that the dropout rate may be higher in Norway is because of the tight labour market. Given that the earnings premium to continuing education may not be high, immediate paid employment can be much more attractive, and many skills can be acquired on the job. Nevertheless, assessing dropout behaviour to understand why it occurs, and how education could be modified to improve employment prospects for current dropouts, could be beneficial.

Subsidies to Norway's tertiary education system are particularly generous. Tuition is largely free and relatively generous maintenance grants are available. As a result, the costs faced by university students are among the lowest in the OECD and public spending on

tertiary education one of the highest relative to GDP. These forms of support are independent of the cost of the course being followed and the likely value of different courses to society. OECD calculations of the returns to education show that the estimated rate of return to education, which depends importantly on the difference between observed average earnings for graduates compared with non-graduates, is lower in Norway than in most countries. In Norway the private rate of return is 6.7% compared with the OECD average of 11.2%; the public return for Norway is 5.7%, compared with an OECD average of 13.0%.

These figures may suggest that public subsidies are excessive, especially if most of the benefits of tertiary education accrue to the graduates themselves rather than to the population as a whole, so that subsidies can be regressive. In this case, a system of charging tuition fees, related to the cost of the course, could improve efficiency, for example through shorter duration of studies and students with more demanding expectations for value for money. Since support for tertiary education requires financing through the tax system, reducing the subsidy could also increase equity. To overcome financing difficulties, a system of student loans with income-contingent repayment, perhaps supplemented by means-tested grants for poorer families, can accompany tuition fees. However, it can be argued that the flat wage structure in Norway compresses the observed earnings premium – some of the benefit of higher productivity of graduates accrues to non-graduates' earnings. If this effect is more important in Norway than elsewhere, the comparison of rates of return may be biased.

There are other ways to improve efficiency in tertiary education. Better use could be made of available data on career and income prospects associated with different subjects to take, and different institutions in which to study, to help students choose what courses to follow. Like in some other countries, study programmes, especially at the graduate level, could face a sunset clause and be renewed only when there are proven benefits to society, including in terms of job placement and earnings. The actual budget cost per student should also be made more explicitly visible, to encourage value for money.

### *Adult skills*

Despite evidence that the education system is inefficient and attainment levels at age 15 are only average, overall productivity in Norway is high. Perhaps the tertiary education system and work experience are sufficiently effective to compensate for possible gaps in the compulsory education system. It may also be that some aspects of the school education system which do not generate good scores in tests at age 15, for example the lack of competitive pressure and the emphasis on a co-operative approach, are a good foundation for later acquisition of skills.

Recently published data from the Programme for International Assessment of Adult Competences (PIAAC) may corroborate some worries about the education system, but also give grounds for optimism. Norwegian adults on average perform relatively better on PIAAC overall (where they are above average) than in PISA. They rank sixth for both literacy and numeracy, and fourth for problem solving out of the 23 countries in the PIAAC sample, whereas in PISA Norway ranks 8th for literacy (above average) and 12th on numeracy (below average) in the same sample of countries. Norway is unusual among PIAAC countries in that young people, aged 16-24, perform worse on literacy tests than all other age groups except the 55-65 group. It is rare for older age groups to out-perform the young, which might suggest some problems in the education system. On the other hand, when it

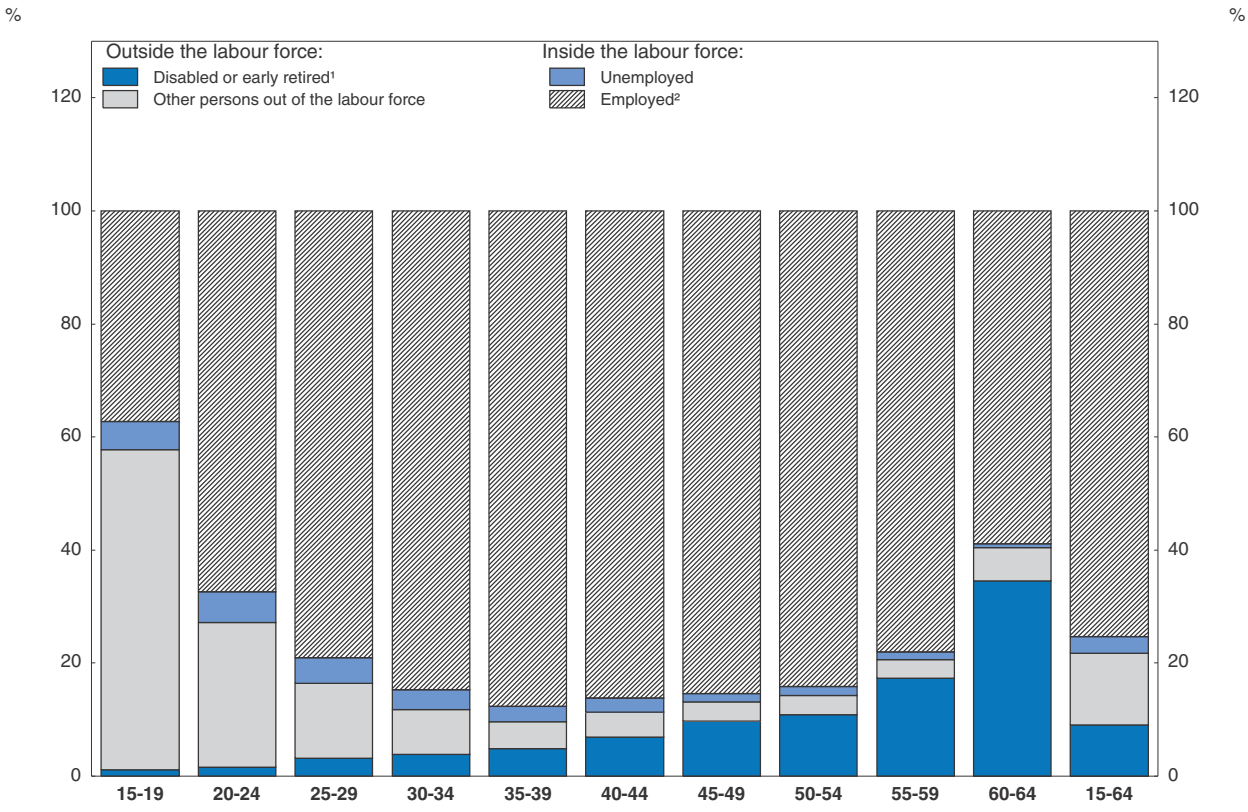
comes to problem solving, the young in Norway exceed the performance of older people by a greater margin than in most countries. The overall good performance and especially that of the young, in "problem solving in technology-rich environments" is interesting alongside Norway's very rapid adoption of ICT in all walks of life but especially in public and private services, of which it may be both cause and effect.

Norway is currently developing a "skills strategy", discussing what is lacking and what is needed with all the social partners and in cross-ministry discussions. The strategy may need to pay more attention to skills for entrepreneurship. Education and training planning has to try to anticipate the skills which will be needed in the future, but skilled entrepreneurs will be responsible for translating those needs into demand for labour and supply of jobs.

### *The labour market*

On most measures the labour market continues to perform very well. Low unemployment generates strong wage growth, but not so strong as to threaten inflation,

Figure 11. **Population structure, 2010**




*Note:* This chart is based on a mixture of administrative data and survey data which may not be strictly comparable. "Employed and in education", "Not employed and in education", "Disabled or early retired" use self-reported data on main activity; according to Statistics Norway and Ministry of Finance, no factual data on the labour market status of persons in education and persons receiving disability or early retirement benefits are available. For more categories and details see OECD (2012) Figure 9, page 24.

1. This is an estimate based on the Labour Force Survey of the number of persons who are outside the labour force and self-report "Disability or early retirement" as their main activity. It is assumed that no person inside the labour force is disabled or early retired.
2. Including those in education.

*Source:* Statistics Norway.

StatLink http://dx.doi.org/10.1787/888932998538

and annual negotiations between unions and employers try to set wage growth at levels with which the relatively less competitive sectors of the economy can cope. At the same time, the tight labour market and the high wages attract strong labour immigration. In the private sector, long working lives contribute to Norway having one of the highest average ages of effective retirement in the OECD. The pension system still encourages early withdrawal from the labour market for public sector employees, however, because the reform of the early retirement system agreed by the social partners for the private sector has not been agreed by the public sector.

As has been pointed out in previous *Economic Surveys*, although Norway benefits from high participation and low open unemployment overall, the sickness and disability system gives excessive incentives for some people to withdraw from the labour market. To a great extent this is in effect a disguised early retirement system – Norway has one of the highest rates of both sickness and disability in the OECD (OECD, 2010), but no other indicators suggest an unhealthy population – allowing a significant proportion of people to exit the labour market well before normal retirement age (Figure 11). Governments have attempted to reduce take-up of disability benefits largely by trying to improve gate-keeping, but this appears to have only transitory effects. Recent measures to expand the possibility to use partial disability benefits in parallel with employment are a sensible step but are unlikely to address the more fundamental problem of use of disability to, in effect, retire. As previous *Economic Surveys* have pointed out, if tighter gate-keeping cannot be made effective, it may be necessary to lower the level of disability benefits to reduce "demand" for this programme.

**Summary of recommendations on education and labour market policy**

- Continue to improve the level of training of teachers. Investigate the impact of the performance assessment and reward approach used in Oslo on educational outcomes there compared with those in the rest of the country.
- Focus more on cost-effectiveness in tertiary education, with better incentives for both students and institutions. To improve equity and strengthen the link between demand for skills and their supply, consider measures such as more guidance on course selection, better information for students on career prospects, differentiated tuition fees or differentiating (existing) grants, and penalties for excessive duration of studies.
- Lower the replacement rate for long-term sickness absence and shift some of the costs onto employers. To avoid encouraging early withdrawal from the labour market, align the rules for early retirement in the public sector with those in the private sector.
- Further widen the use of standardised student tests – in value added form – for assessing school and teacher performance. Consider the costs and benefits of publication of these tests at the school level.
- Provide clear guidelines on disability assessment to general practitioners and monitor compliance. Make more extensive use of partial disability benefit awards.

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ANNEX

# Follow-up to previous OECD policy recommendations

*This annex reviews recent action taken on recommendations from previous Surveys. Recommendations that are new in this Survey are listed in the relevant chapter. An indication of the first year in which recommendations appeared is given in parentheses (except that we have not tracked back before 2005).*

This annex presents, under each theme:

- Recommendations from earlier surveys
  - ***Action taken since the previous survey (2012)***

## Social protection

- Minimise work disincentives in the unemployment insurance system (since 2005).
  - ***The maximum unemployment benefit period for temporary laid-off workers, which had been increased as an anti-crisis measure, was reduced to 30 weeks within any 18-month period. As from 2014 it will return to its statutory level of 26 weeks.***
- Reduce sick leave (since 2005).
  - ***No recent action. Since July 2011, measures to provide for earlier and closer monitoring of sick leave have been in place, with provision for sanctions against the employee, employer and doctor for failure to follow up. The government takes part in the Inclusive Working Life Agreement with between social partners, without proposing further changes since then. The agreement aims at 20% reduction in sick leave, measured as a percentage of scheduled man-days compared with 2001 and introduced new or extended administrative procedures; compulsory meetings or plans for activation.***
- Tighten disability schemes (since 2005).
  - ***No recent action on access. In 2013, a new trial with using the work assessment allowance as a wage supplement, to make it easier to combine disability benefits and work, was launched.***

## Labour markets

- Increase flexibility in wage setting (since 2005).
  - ***No recent action.***
- Modernise employment protection legislation (since 2005).
  - ***No action.***
- Enhance efficiency of job placement services and ALMP (since 2005).
  - ***The July 2006 merger of the Public Employment Services and the National Insurance Services was completed in early 2011. This resulted in the creation of NAV. The reform will be under evaluation until 2014.***

## Education

- Reduce the number of schools; improve accountability by publishing value-added assessment of school performance on standardised national tests of pupils (since 2010).
  - ***No recent action.***
- Introduce stricter selection and graduation criteria for initial teacher training; encourage formal training for developing competencies of practising teachers (since 2010).
  - ***No recent action on selection or gradual criteria in teacher training. The system of support of teachers' continuous professional development will be further strengthened in 2014.***
- Develop more structured career paths with recognition for demonstrated competencies.

- ***No action.***

- Include school performance as a determinant of school principals' rewards; consider school level merit-based salary awards to teachers (since 2010).
  - ***No action. Oslo education authorities have operated along these lines for several years.***
- Make the allocation of public funds to higher education institutions more transparent (since 2012).
  - ***No action.***
- Introduce tuition fees and income contingent repayment loan scheme in higher education (since 2012)
  - ***No action.***

## Health care

- Structure activity-based (including Diagnosis Related Groups, DRG) financing to avoid excessive incentives for low-priority activities. Make greater use of co-payments by patients (since 2005).
  - ***In the National Budget 2014, the government proposes to increase the percentage reimbursed under activity-based financing from 40% to 50% of calculated DRG costs.***
  - ***No action on the use of co-payments by patients.***

## Financial markets

- Reduce vulnerabilities to the banking sector (e.g. introduce a limit on loan-to-value ratios) (since 2012).
  - ***New capital and buffer requirements for credit institutions and investment firms – based on the Basel III standards and the CRR/CRD IV framework came into force on 1 July 2013. The requirements will be gradually increased over a three-year period, and fully phased-in by 1 July 2016.***
  - ***A counter-cyclical capital buffer was introduced in December 2013, to be effective from July 2015.***
  - ***As from October 2013, banks using internal rating based (IRB) risk models must use a minimum level of 20% (raised from 10%) for the loss given default estimate for most residential mortgage loans. In effect this raises the average risk-weight on residential mortgage loans to about 20% for IRB banks.***

## Quality of public finance

- Tackle ageing issues (since 2007).
  - ***No recent action. The early retirement scheme in the public sector continues to strongly encourage workers to retire at age 62.***
- Investigate the impact of the combination of wealth and capital income taxes and align the taxation of different asset classes (since 2012).
  - ***In 2014, the rate of wealth tax is reduced from 1.1% to 1.0%. The tax-assessed values of second homes and business property are increased from 50% to 60% of their market values; the rate for first homes remains 25%. The threshold triggering wealth tax is increased from NOK 870 000 to NOK 1 000 000.***
  - ***The inheritance tax is abolished from 2014.***

- ***The tax rate on ordinary income (which includes capital income) is reduced from 28% to 27%.***

- Reduce the implicit tax subsidy to owner-occupied housing: tax the imputed income or remove progressively mortgage interest deductibility (since 2010).
  - ***No action.***
- To raise the efficiency of public spending, evaluation tools such as regulatory impact analysis and cost-benefit analysis should be used more systematically (since 2012).
  - ***No significant action. The Ministry of Government administration, reform and church affairs has initiated a project to draft a new instruction for official studies and reports. The objective is to increase the quality and frequency of regulatory impact analysis.***
  - ***Cost-benefit guidelines will be modified in 2014 on the basis of a 2012 committee report.***
- Develop a multi-annual approach to budgetary planning (since 2012).
  - ***The new government has announced that it will appoint a commission to give advice on multi-annual budgeting.***

## Environmental policies

- Limit $CO_2$ emissions, and reduce the divergence of rates in the $CO_2$ tax (since 2010).
  - ***From 2013 the $CO_2$ tax on petroleum activities was increased from 210 NOK per ton to 410 NOK. Petroleum activities are also included in the EU ETS. In the 2013 budget, the government introduced a specific $CO_2$ tax on mineral oil for the fishing fleet operating in coastal waters with the tax rate set at 49 NOK per ton in 2013. It is proposed that the tax rate increases further to 98 NOK per ton from January 2014.***
  - ***From 2014 it is proposed that the general $CO_2$ tax rate on mineral oil and gas and the tax on HFC and PFC be increased by about 100 NOK to about 330 NOK per ton of $CO_2$ equivalents. Auto diesel subject to road usage tax is exempted from the tax increase, whilst the specific tax rates for domestic aviation increase by about 50 NOK per ton of $CO_2$.***
  - ***With the changes to the $CO_2$ tax, as well as the inclusion of the aviation sector and the processing industry into the EU ETS, it is estimated that more than 80% of Norwegian GHG emissions are subject to a price on carbon. But the rates remain very divergent across different emission sources. It is mainly agriculture and treatment of waste that does not face carbon prices.***
- Account systematically for environmental aspects in cost-benefit calculations (e.g. by using an explicit shadow price for GHG emissions) (since 2010).
  - ***A government appointed expert committee presented a report in October 2012 on cost-benefit analyses, including recommendations regarding shadow pricing of GHG emissions. The guidelines for cost-benefit analyses are being revised.***

## Agriculture and fishery

- Enhance competition in the agriculture market (since 2006).
  - ***No action.***
- Reduce tariffs and increase import quotas in the agriculture market (since 2008).

- ***Backward action: The Norwegian government changed from specific duties to ad valorem duties for six tariff lines, comprising beef steaks and fillets, lamb carcasses and hard cheeses, effective from January 2013.***

- Reduce restrictions on transfers of fishing quotas (since 2010).
  - ***No action.***

## Support competition and reduce state aid

- Increase regulatory power of competition authorities (since 2005).
  - ***No action.***
- Reduce state aid, public subsidies and tax distortions (since 2005).
  - ***Budgetary support for industry has increased slightly. There has been a significant increase in actual payments to the renewable and clean energy sector.***
- Reduce state ownership in corporate Norway (since 2005).
  - ***In 2012, Statoil, a partly publically owned petroleum company, decided to sell its stake in the transport fuel retailer Statoil Fuel & Retail. Vinmonopolet, a publically owned alcoholic beverage retailer, is thus the only remaining publicly owned company in retail.***
  - ***Backward action: The Ministry of Trade and Industry proposed to Parliament that the Ministry be authorised to increase its shareholding in the fish farming and fish feed producer Cermaq ASA, and/or to sell its shares in the company. Following this the government increased its stake in Cermaq from 43.54% to 59.17%.***
- Improve state-owned activities governance (since 2005).
  - ***The Norwegian authorities have asked the OECD to clarify how the OECD Guidelines for Multinational Enterprises should be interpreted and the extent to which these are tailored to sovereign wealth funds like the GPFG.***
- Improve monitoring of cost-effectiveness of support for innovation and R&D (since 2008).
  - ***Evaluation reports have become standard practice. They tend to focus more on additionality of spending than the more difficult issue of its effectiveness.***

## Product market competition

- Promote competition in the postal services (since 2005).
  - ***No action.***
- Reduce barriers to entry in the retail sector (since 2005).
  - ***Backward action: The book agreement in April 2013 that regulates a fixed scheme for the sale of books would form the basis for the introduction of a book law. Such a law would lead to limited price competition among books, which results in high and fixed prices.***
  - ***In October 2013, the Ministry of the Environment has circulated a proposal for new state land use regulations for the localisation of retail malls and commercial activities. This will make it harder to establish malls outside city centres. The proposal implies that establishing trading businesses with a floor space exceeding 3 000 square meters shall not be allowed outside urban centres, unless the county governor agrees.***
- Enhance efficiency in transport services (since 2005).
  - ***No action.***

# Thematic chapters

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*Chapter 1*

# The financial system and real estate: Strengthening resilience

*In Norway house prices have risen to high levels, associated with very strong credit growth, in a context of low interest rates. Such a combination was in many countries a contributory factor to the 2008-09 crisis. The Norwegian authorities have been well aware of the problem. Below-target inflation and low interest rates abroad have kept policy interest rates low. "Macro-prudential" tools have been developed as additional policy instruments with a view to strengthen the banking system's resilience to possible shocks and dampen systemic risk. This chapter notes that although the authorities seem to have succeeded in containing over-heating pressures in the housing market, high levels of household indebtedness persist, a phenomenon which was an important factor in the last major Norwegian recession. The chapter also provides some longer run considerations on resource allocation in the housing market.*

In the long upswing known as the Great Moderation, expansionary monetary policy supported activity in much of the OECD without compromising general price inflation targets. But low interest rates also encouraged rising house prices (although not everywhere, notably not in Germany) and increasing household indebtedness and may also have contributed to excessively risky lending by financial institutions. The reaction of highly indebted households to macroeconomic shocks had contributed to the recession and subsequent banking collapse in Norway in the late 1980s. Having largely shrugged off the recent recession, Norwegian house prices and household indebtedness rose strongly after 2010 (Figure 1.1), in such exceptionally favourable conditions as low interest rates and high oil prices.

The authorities recognise that there can be risks in imbalances that might emanate from the housing market and household indebtedness, though there are other concerns too (Box 1.1). But the authorities have been short of policy instruments, hence the interest in developing "macro-prudential" tools. This chapter discusses the system for monitoring financial stability, macro-prudential tools, and specific housing-market measures that the Norwegian authorities have been developing. These policies should help to reduce financial imbalances associated with house prices and household indebtedness which could trigger or amplify an economic downturn, though it remains to be seen how they will work in practice. The chapter also considers structural policies which distort investment decisions and drive up house prices.

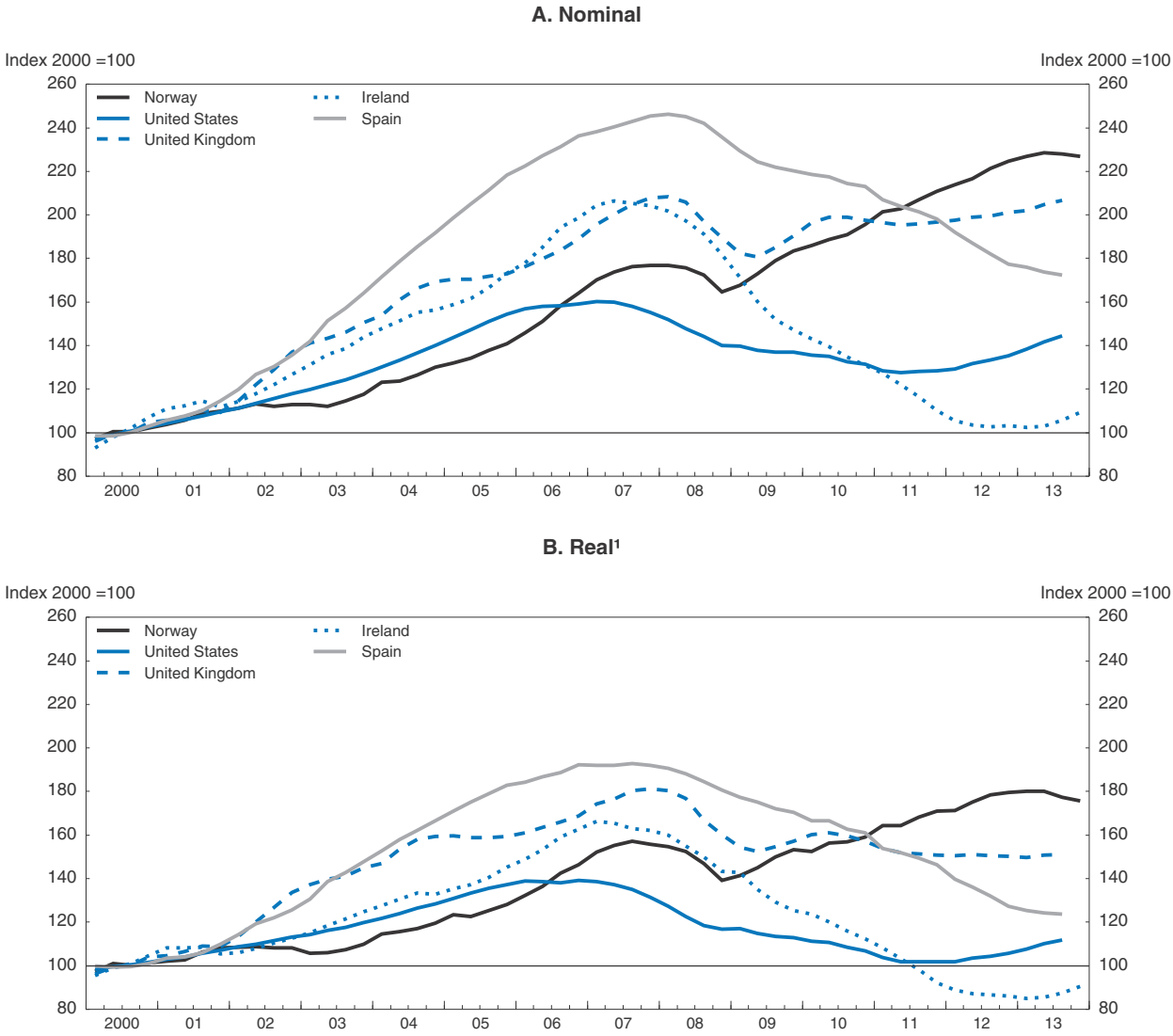
## Monetary and macroprudential policy for financial stability

### *Property prices and household debt have grown strongly*

The ratio of house prices to rents, one measure of "normality", is higher than it has ever been, whereas in most other countries the level is some way off the peak (Figure 1.4). House prices increased by around 85% in real terms between 2000 and mid-2013, a much larger increase than in aggregate household disposable income. The elasticity of house prices with respect to household income is usually estimated to be around unity over time and across countries (Andrews et al., 2011). Other forces than income "fundamentals", such as low interest rates and perhaps self-perpetuating expectations, have been at work.[1] The importance of expectations is suggested by the fact that a number of studies have found strong persistence in house price growth in Norway.[2] The role of house prices is particularly important in Norway since the homeownership rate is high at 76% while the private rental segment is small.

Credit growth to households has been strong and has exceeded mainland GDP growth for more than a decade (Figure 1.3) and aggregate household debt is now over 200% of disposable income (Figure 1.5). Nearly all lending to households in Norway is mortgage-related lending and is almost exclusively at floating interest rates. The current mortgage rate is around 4 or 5%, so a 1 percentage point increase would increase interest payments by nearly a quarter almost immediately. High debt-to-income ratios pose different threats

Figure 1.1. **House prices**




1. Adjusted by private consumption deflator.
*Source: Datastream* and *OECD Economic Outlook Database.*

StatLink http://dx.doi.org/10.1787/888932998557

for different income groups. For low-income groups, a high ratio implies potential risk for lenders because such households have limited room for reducing other expenditure to finance increased interest payments (Box 1.2); these are the loans where there may be some default risk. For high-income groups, that particular risk is smaller but the higher absolute level of interest payments means that the macroeconomic impact on levels of demand would be stronger.

### *Monetary policy has encouraged house price inflation*

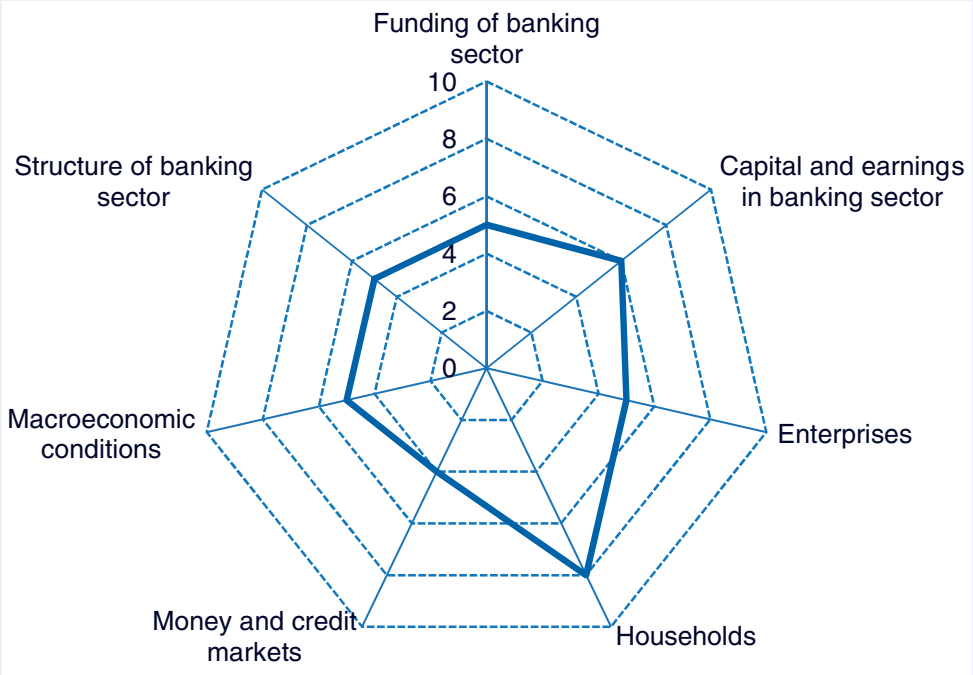
The flexible inflation targeting approach to monetary policy presents the authorities with a challenge, as domestic interest rates can have an uncertain effect on the exchange rate, depending on external factors – notably petroleum prices and interest rates in other

## Box 1.1. **Main aspects of financial stability**

Norges Bank has developed a tool to assess the resilience of the financial system, which considers internal vulnerabilities in the banking sector as well as external sources of risk (Dahl et al., 2011). As illustrated in the following cobweb-style diagram, the greatest vulnerability seems to stem from the high level of household debt.

Figure 1.2. **Vulnerabilities in the Norwegian banking sector**

November 2012




*Note:* A value of 0 denotes the lowest level of risk or vulnerability; a value of 10 denotes the highest level of risk or vulnerability.
*Source:* Norges Bank, *Financial Stability Report 02/12*.

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### The financial market and banks in Norway

The financial market in Norway is characterised by the importance of financial conglomerates and alliances. The share of the five largest banking groups in the market accounts for 64% of total assets in 2012. There are three subsidiaries of foreign banks and ten branches of foreign banks and their market shares in total assets are 12% and 13%, respectively.

Loans accounted for almost 75% of banks' assets, while deposits accounted for around 50% of liabilities, at the end of 2012. Money and capital markets have increased their importance as funding sources and account for 32% of liabilities. Net interest revenue provided almost 70% of total operating revenues in 2012 with its share having only slightly declined over the last decades. Banks' revenues from investment banking account for only a small share of overall revenues.

### Financing conditions

Norwegian banks have ample access to market funding and their funding structure is improving. The risk premium in three-month money market rates has come down towards the levels prevailing prior to the financial crisis and is currently about 0.25 percentage point. The maturity of banks' funding has increased since the 2008-09 crisis, which slightly improved the matching between funding and lending maturities. 65% of market funding has a maturity of over one year. A substantial share of their market funding consists of borrowing from abroad, almost 60% of total market funding at the end of 2012.

Box 1.1. **Main aspects of financial stability** *(cont.)*

**Capital and earnings in banking sector**

Norwegian banks' (consolidated group figures) pre-tax profit amounted to NOK 37 billion in 2012, for a return on equity of 11%. The results were associated with limited loan losses, 0.16% of total assets. Loan defaults were some 1.5% of all outstanding loans. The average Common Equity Tier (CET) 1 ratio among Norwegian banks was 11.1% at the end of 2012, which is above the current CET 1 requirement of 9%. The average CET ratio increased by 1.2 percentage points from the previous year and this was mainly achieved through retained earnings and stock issues rather than a reduction in assets.

**Exposure to enterprises**

Credit to non-financial enterprises declined in the wake of the 2008-09 crisis and credit growth has been primarily driven by the household sector since then. Debt in non-financial firms has stabilised as a share of GDP, albeit at a high level, for several years. Non-financial corporates are financially sound overall, as their ratio of equity to total assets ratio doubled in the 1990s and has been relatively stable at between 35% and 40% since the early 2000s. Debt-servicing capacity in non-financial corporates, as measured by earnings as a ratio to debt, is not particularly good by historical standards. However it has been recovering from the trough reached during the 2008-09 crisis. According to Finanstilsynet (the Financial Supervisory Authority of Norway), risk in the commercial property portfolio, which accounts for around 40% in total lending to the corporate sector, was reduced in 2012 through more stringent credit practices.

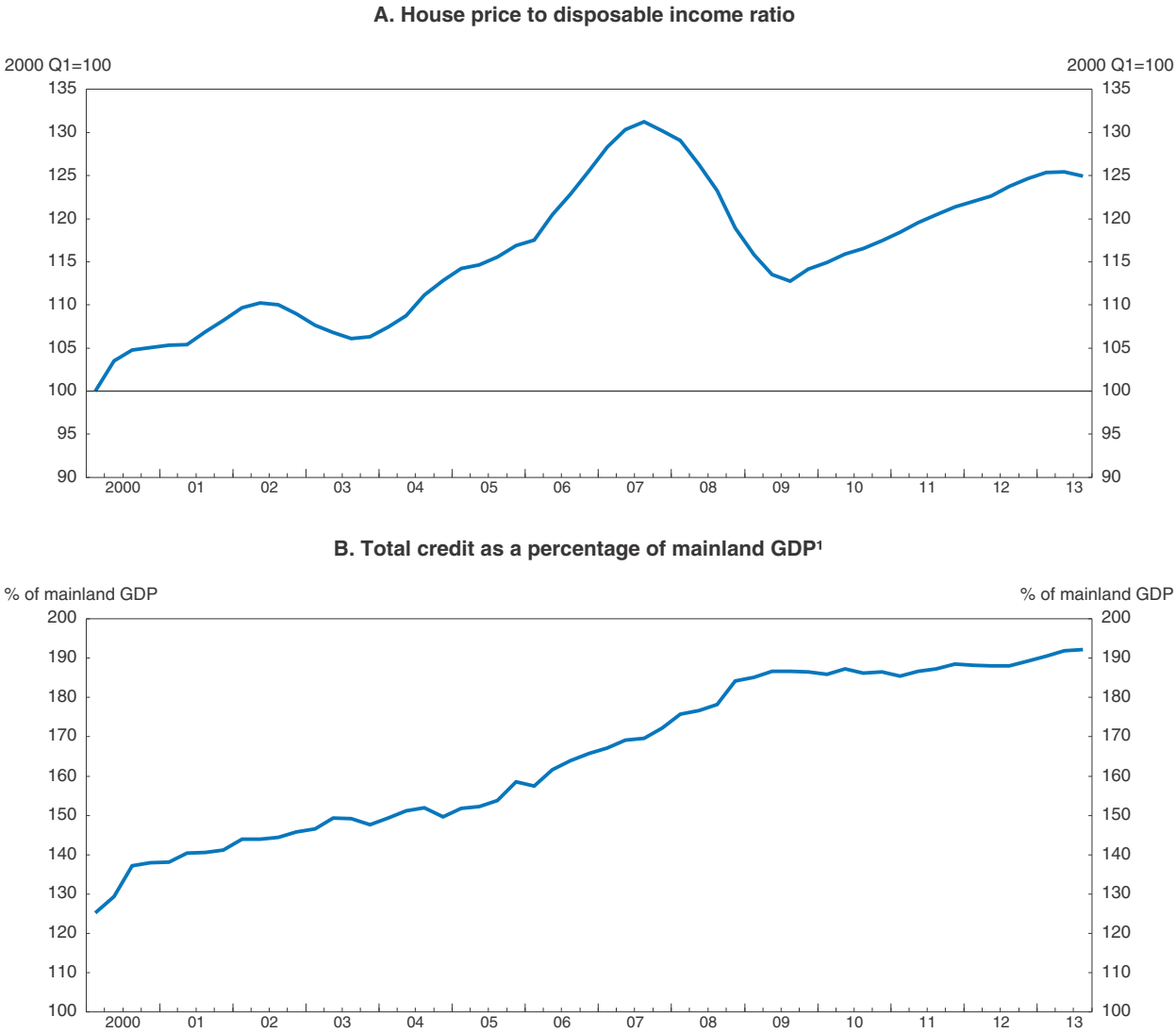
**Exposure to households**

Credit growth to households has been strong and has exceeded mainland GDP growth for more than a decade, so that despite the decline in credit to companies total credit has risen since the 2008-09 crisis (Figure 1.3). In aggregate, household debt has reached 200% of disposable income, which is high by historical and international standards. The debt-to-income ratios have increased in all income groups. The share of households where debt amounts to more than five times disposable income has increased rapidly from 4% in the mid-2000s to 11% in 2011 and such households are present in all income groups. In aggregate, net worth is positive due to housing wealth, while net financial wealth is negative (excluding life insurance and pension wealth).

countries. Norges Bank has maintained its policy interest rate at low levels since the onset of the financial crisis, currently at 1.5% since March 2012. This contrasts with the central bank's expectation that the normal level of the key policy rate would be around 4% for the next few years (Norges Bank, 2012a).

Such low interest rates, warranted by both below-target inflation and low interest rates abroad, would be expected to affect asset prices, including those of houses. The effect may be especially strong because output has not been significantly below potential for some time, and may be above it (Figure 1.8, see also Box 1.3). In general, there is a negative relationship between interest rates and house prices (e.g. ECB, 2003; IMF, 2005) which is found also for Norway (e.g. Jacobsen and Naug, 2005; Bjørnland and Jacobsen, 2009).[3] It is, however, usually difficult to estimate exactly the effects of interest rates on asset prices since causality can work in both directions (Andrews et al., 2011).

Figure 1.3. **House prices and credit growth**




1. The sum of households (domestic debt) and non-financial enterprises (domestic and external debt) in mainland Norway.
*Source:* Norges Bank, *Monetary Policy Report 04/13*.

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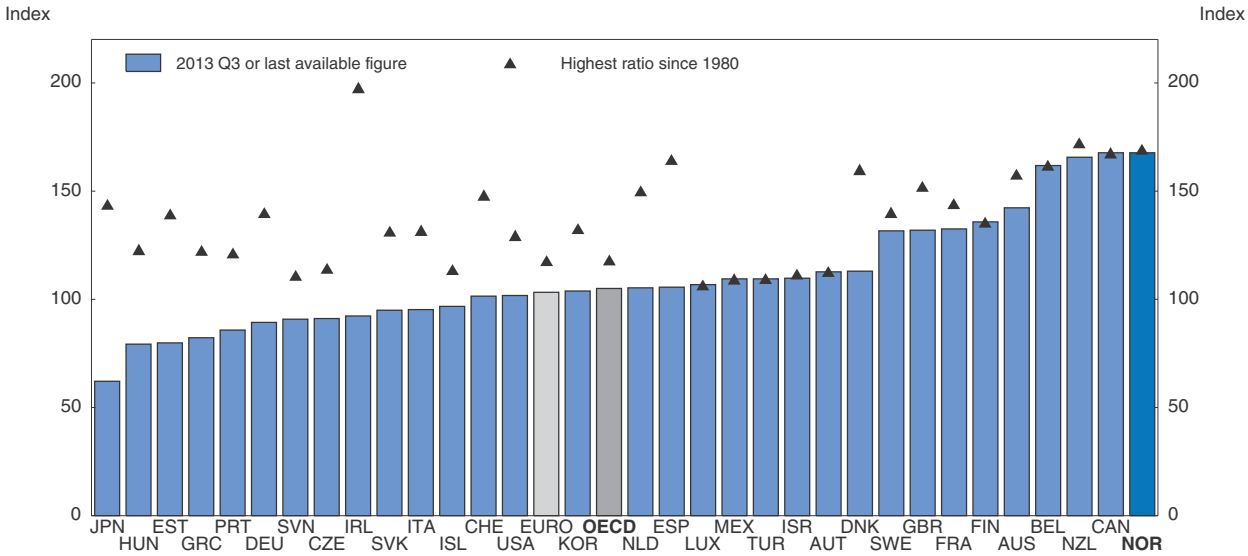
### *Extending the inflation targeting approach*

If asset prices are driven above sustainable levels when interest rates are kept low for an extended period, financial stability can be endangered. Woodford (2012) argues that it is possible to generalise an inflation targeting framework to take account of financial stability concerns alongside traditional stabilisation objectives. In practice, it is difficult to detect financial imbalances and thus the extent to which monetary policy should react to them. For instance, if monetary policy is geared excessively to stabilise property prices or credit growth, then it can disproportionately affect other objectives, such as inflation (Gelain et al., 2012). On the other hand, macroprudential instruments are intended to encourage financial institutions to respond to possible systemic risks building up at the macro level, notably high levels of credit growth, so as to have a more direct effect on financial stability

Figure 1.4. **House price to rent ratios across OECD countries**

Price to rent ratios compared with national historical averages, long term average = 100




*Source:* OECD calculation.

**How to read this figure:** in Norway the ratio of prices to rents was 70% above the average for 1980 to 2012 in 2013 Q3 and this was the highest figure recorded. In Ireland the 2013 Q3 figure was slightly below the long-term average, while the peak in that country was twice the long term average. The data in this chart cannot be used to compare absolute values of price to rent ratios across countries.

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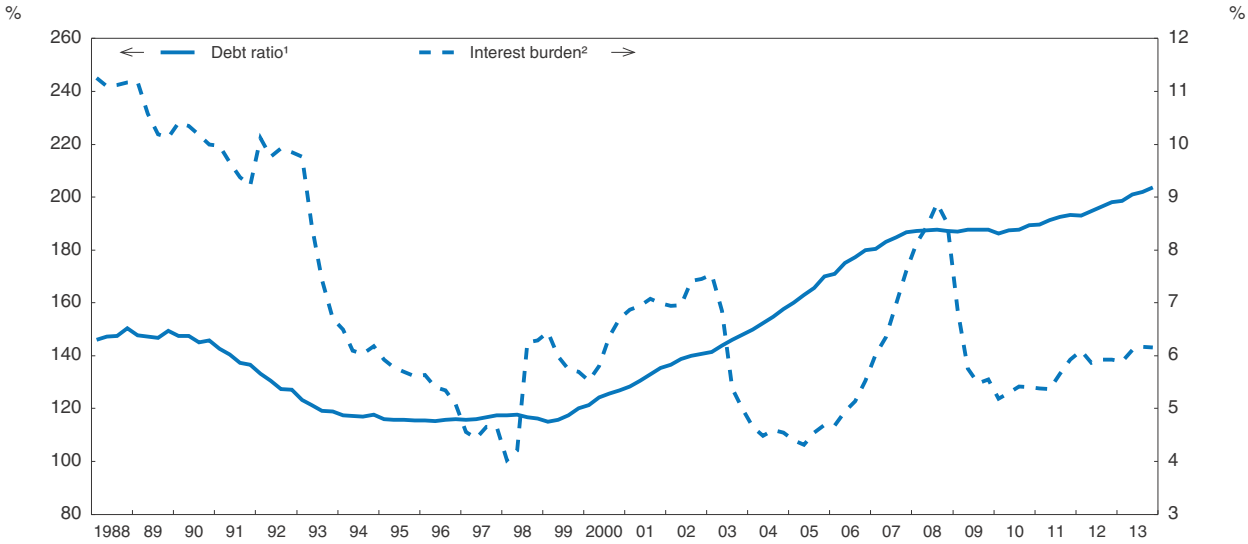
Figure 1.5. **Household liabilities**




1. Loan debt as a percentage of disposable income adjusted for estimated reinvested dividend income for 2000-05 and redemption/reduction of equity capital for 2006-12Q3.
2. Interest expenses after tax as a percentage of disposable income adjusted for estimated reinvested dividend income for 2000-05 and redemption/reduction of equity capital for 2006-12Q3 plus interest expenses.

*Source:* Norges Bank, *Monetary Policy Report 04/13*.

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### Box 1.2. **Household debt distribution**

In aggregate, household debt is now over 200% of disposable income and at around 130% of total income. In absolute terms this is largely due to increased debt in high-income households. At the same time, debt-to-income ratios have risen across all income groups. In aggregate, net worth is positive due to housing wealth while net financial wealth is negative. Housing and financial wealth accounts for 65% and 30% of the total, respectively.* In terms of wealth distribution, net worth is positive largely due to housing wealth across income groups, while net financial wealth is negative for most of income groups (Figure 1.6).

The debt burden is uneven across households of different structure. In general, younger households tend to be highly leveraged. Also family households tend to have a larger debt burden. Figure 1.7 shows that highly indebted households, defined as those with debt exceeding 200% of income, are often single person households aged between 30 to 44 and family households aged under 30 and between 30 and 44. Family households with young children also tend to have even larger debt-to-income ratios. In terms of financial leverage (i.e. debt relative to financial assets), it is the highest in the youngest age group. It decreases over age groups, regardless of household structure. In household aged more than 67, financial wealth it typically higher than debt.

What matters ultimately is households' debt-servicing capacity and solvency rather than the sheer size of debt. Lindquist (2012), identifying the historical consumption to income pattern for households of different age groups, calculated debt servicing capacity of households. She found that households aged 25-44 in particular will not be able to fulfil their debt payment without changing their historical consumption to income pattern, given an increase in the interest rate by 3 to 4 percentage points.

* In this household wealth dataset from Statistics Norway, all data come from tax return registers, except for private dwellings for which model-based estimated market values are used (Epland et al., 2012). Life insurance and pension wealth is not included, as it is not recorded in any tax registers. Such assets are not liquid before old-age and cannot therefore serve as buffers. In the national accounts, the share of insurance and pensions in total financial assets was 39% in 2011. This note applies to the data used in Figure 1.6.

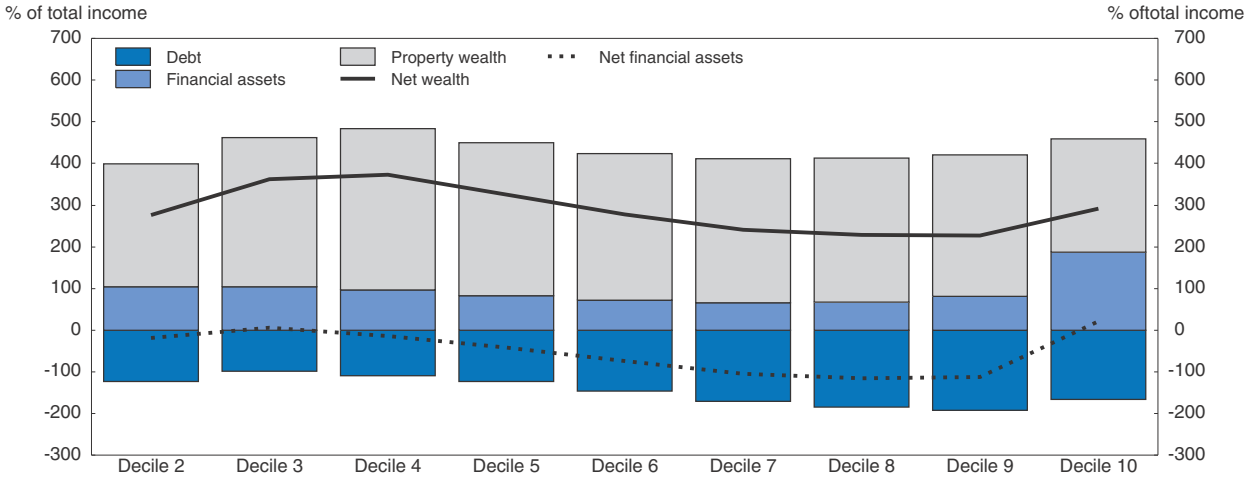
(Svensson, 2012). However, knowledge and experience of macroprudential regulation is incomplete and at an early stage (Smets, 2013).

Prior to the development of macroprudential tools, Norges Bank was taking financial stability into account to some extent in monetary policy decisions. In March 2012, it made explicit that it considers financial stability as an additional criterion for its conditional interest rate forecasts. Noting that an extended period of low interest rates can result in high debt levels, the central bank was concerned about the resulting vulnerability to macroeconomic shocks, which "may result in a fall in property prices, creating imbalances between borrowers' debts and the value of leveraged assets. By incorporating the interest rate level in the loss function, the Bank is seeking to counter the build-up of such imbalances." (Norges Bank, 2012b, p. 16).

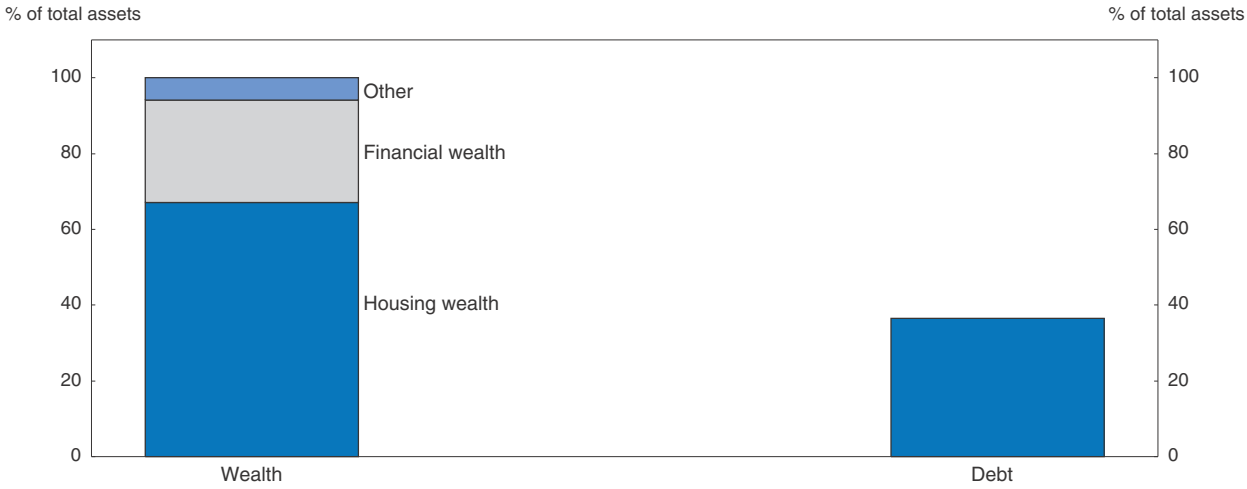
The effect of this approach is visible in the path the policy rate has taken since 2012. The policy rate has been higher than more traditional inflation and output gap considerations would have implied, and has been close to the central bank's prediction of what would be needed according to a broader set of policy objectives, including financial stability (Figure 1.10). A similar approach has been adopted in other countries recently. For example, a new Policy Targets Agreement was concluded in 2012 in New Zealand. This

Figure 1.6. **Household wealth and debt**

**A. Average wealth by income decile groups[1], 2012**




**B. Composition of household wealth and debt, 2011**




1. The first income decile group was excluded since this group is highly heterogeneous: in particular, pensioners who tend to have lower earnings but to have larger financial assets. This group also include students and immigrants who tend to have lower earnings.

See note to Box 1.2.

*Source:* Statistics Norway.

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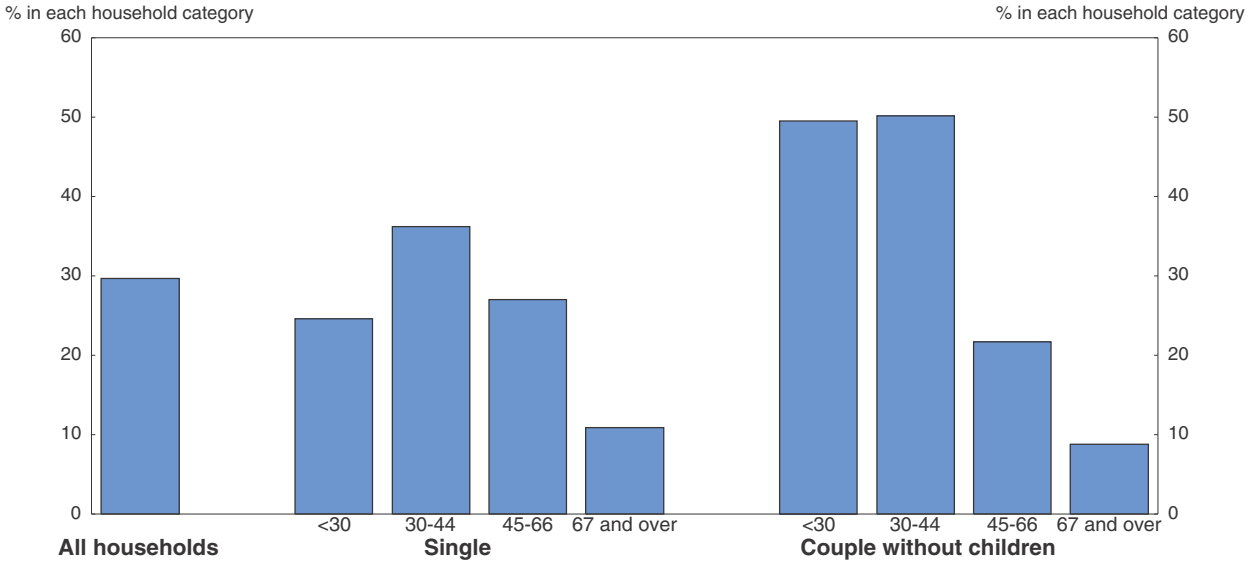
agreement gave greater prominence to the long-standing statutory obligation that monetary policy should "give regard to the efficiency and soundness of the financial system" and introduced a requirement that the central bank monitor asset prices (OECD, 2013a).

However, the primary objective of monetary policy is low – but not too low – and stable inflation. Additional instruments are needed to aim more effectively at several objectives at the same time (Olsen, 2013). Table 1.1 summarises the various tools that are now, or soon will be, in place to augment the range of instruments available, and they are further discussed in the following sections. One of the most interesting is the counter-cyclical capital buffer.

Figure 1.7. **Highly indebted households[1] by household structure, 2011**




*Note:* Households consisting of single persons living alone under the age of 18 are not included in the data. Couples included married couples, cohabiting couples and registered partners. Students are excluded.

1. Households with debt equivalent to 200% or more of income.

*Source:* Statistics Norway.

**How to read this figure:** 30% of all households have total debt more than twice their income, while for couples in the age group 30-44, without children, 50% of households are in this situation.

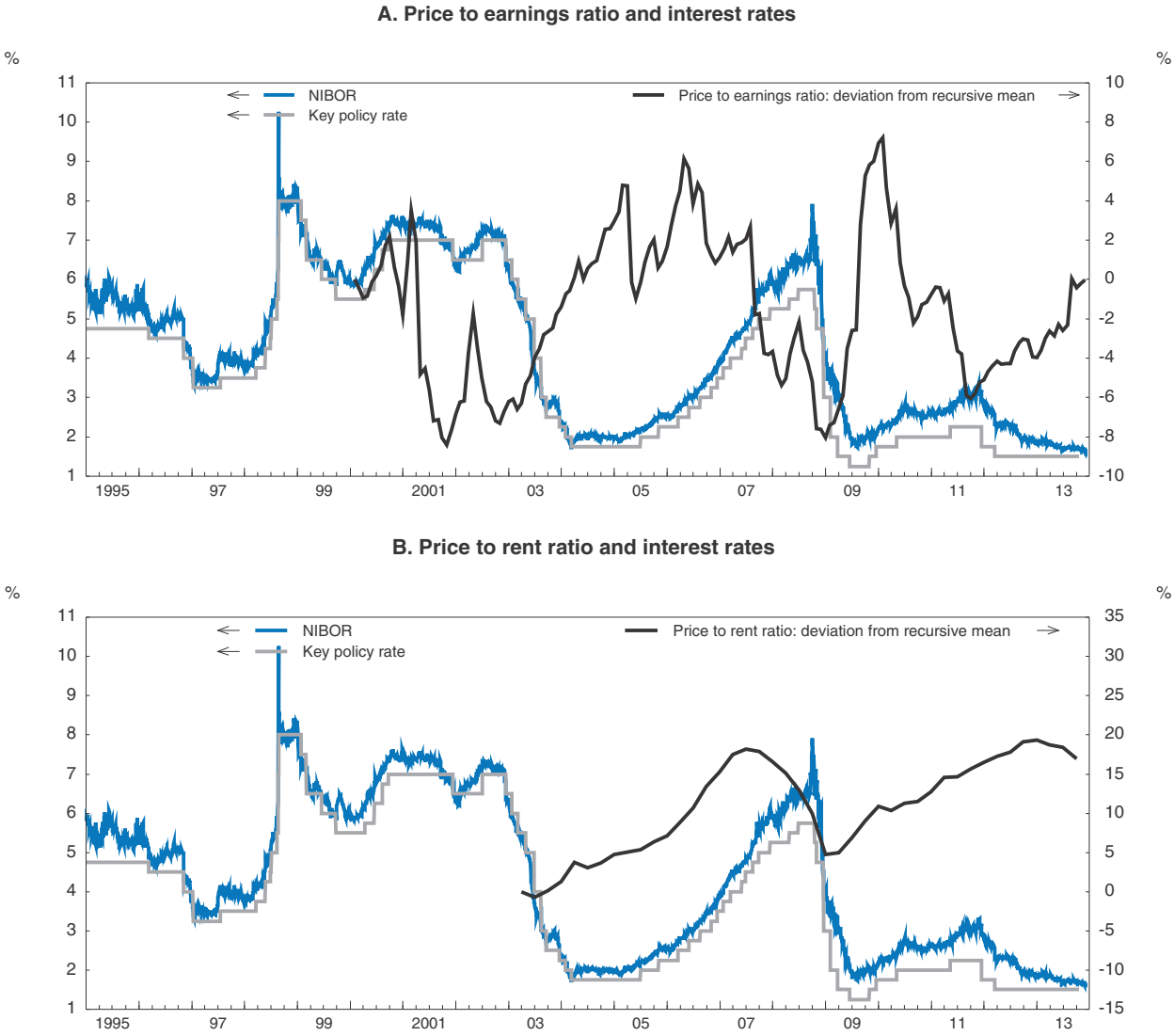
StatLink http://dx.doi.org/10.1787/888932998671

### *Macroprudential policy and indicators of financial stability*

The counter-cyclical buffer is one of the tools which aim at reducing the risk of build-up of imbalances and systemic risk. It is designed primarily to bolster banks' resilience in the event of a very sharp downturn and contain pro-cyclical fluctuations in the supply of credit. Macroprudential tools are often based on existing micro-prudential measures such as capital requirements, but their setting is conditioned on macro-financial developments or indicators of systemic risk, either in a rule-based or a discretionary fashion. But, as the central bank governor has pointed out "the counter-cyclical capital buffer is not a stabilisation policy instrument. The buffer is more likely to vary over longer credit cycles than follow the normal business cycle" (Olsen, 2013).

An increase in capital requirements is likely to raise effective borrowing costs and could affect economic growth. The most comprehensive study of the macroeconomic impacts of higher capital requirements for banks was conducted in 2010 by the Macroeconomic Assessment Group (MAG) established by the Financial Stability Board and the Basel Committee on Banking Supervision (BCBS, 2010a). This study covers 17 countries, though it does not include Norway. The estimated effects seem to be somewhat weaker in Norway (Table 1.2). Akram (2012) showed that lending rates increased by 0.14 point, credit reduced by 0.23 point, GDP reduced by 0.07 point following an one percentage point increase in the capital adequacy ratio over 8 quarters.[4] In Akram (2012), changes in capital requirements were primarily transmitted via lending rates, while no direct channel to the volume of credit to households was found.

Figure 1.8. **Interest rates and asset prices**[1]




1. The price to earnings ratio (PER) is a weighted average of the PERs of 50 constituents in the Oslo stock exchange compiled by Datastream. The house price to rent ratio is calculated by the OECD and uses the same definition as in Figure 1.4.

*Source:* Norges Bank, Datastream and OECD calculation.

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Basel III and the European Union Capital Requirements Directive (CRD) IV (which applies to Norway as a member of the EEA) require that national authorities establish a counter-cyclical capital buffer when necessary. The Basel Committee on Banking Supervision proposed to use the credit-to-GDP ratio as a guide in taking buffer decisions (BCBS, 2010b). It also proposed to set the counter-cyclical buffer when the ratio deviates from estimated trends by 2 percentage points or more. The buffer would vary from 0% (when the deviation is 2 percentage points or less) rising linearly to 2.5% (when the deviation is by 10 percentage points and more). CRD IV notes that national authorities should use other indicators and assessment where relevant. Norges Bank has been

## Box 1.3. **The house price-to-rent ratio**

House prices can be thought as a function of, among other things, the present value of expected rents, since this is the stream of income this asset generates.

To assess how much house prices deviate from fundamental values, it is useful to calculate "theoretical" price to rent ratios. The assumption is that there is some kind of arbitrage for a buyer between purchasing a house and renting one and that, in the equilibrium, rents should represent the market clearing price of services which housing provides at each instant.*

The theoretical price-rent ratio can be written as (for details see for example, Girouard et al., 2006):

$$R = P(i^a + \tau + f - \pi) \text{ or } P/R = 1/(i^a + \tau + f - \pi)$$

where $P$ represents house prices, $R$ rents, $i^a$ the after-tax mortgage interest rate, $\tau$ the property tax rate on owner-occupied houses, $f$ the recurring holding costs consisting of depreciation, maintenance and the risk premium on residential property and $\pi$ the expected capital gains on houses. This is the widely used standard definition of the real housing user cost of capital and represents the real price of housing services. ($f$ is set to be 0.04, and $\pi$ is proxied by the average of CPI inflation rates in the past five years, following previous OECD studies).

Figure 1.9. **Theoretical and actual price-to-rent ratios**

*Note:* Average 1990-2012.
*Source:* OECD calculations.

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Box 1.3. **The house price-to-rent ratio** *(cont.)*

The results of this calculation show a contrast between Norway and some other countries which experienced a property market boom before the 2008-09 crisis (namely the United States, Spain and Ireland). In the latter countries the actual price-to-rent ratio declined after the crisis and it is aligning with the theoretical value (it is even undershooting in Ireland). In Norway, the actual price-to-rent ratio has continued to increase after a slight halt due to the 2008-09 crisis.

In all the countries mentioned above, the mortgage interest rate has been low since the onset of the 2008-09 crisis. This has raised the theoretical prices and made actual price levels seem sustainable. In this sense, current price levels in many countries could be characterised as sustainable only with persistently low mortgage rates (André, 2010).

In the calculation illustrated in the figure, expected capital gains are assumed to be zero in real terms. The results are modified significantly if the actual house price inflation rates in the past years are used for the expected capital gain term, assuming that expectations on house prices are formed in an extrapolative way. Gelain and Lansing (2013) show that expectations of extrapolative nature can better explain many features in Norwegian data such as the positive correlation between the current price-to-rent ratios and future realised returns compared with rational expectation models.

* There exist some caveats: Rented housing and owner occupied must be supplying the same service, which is not necessarily always the case; the rental market must exist across equivalent properties – non taxation of imputed rent may interfere with this.

working on developing a set of indicators and Norway is among the first to have implemented such a monitoring system in practice.

Norges Bank uses the following four indicators and publishes them regularly in its quarterly Monetary Policy Report with Financial Stability Assessment (Figure 1.11):

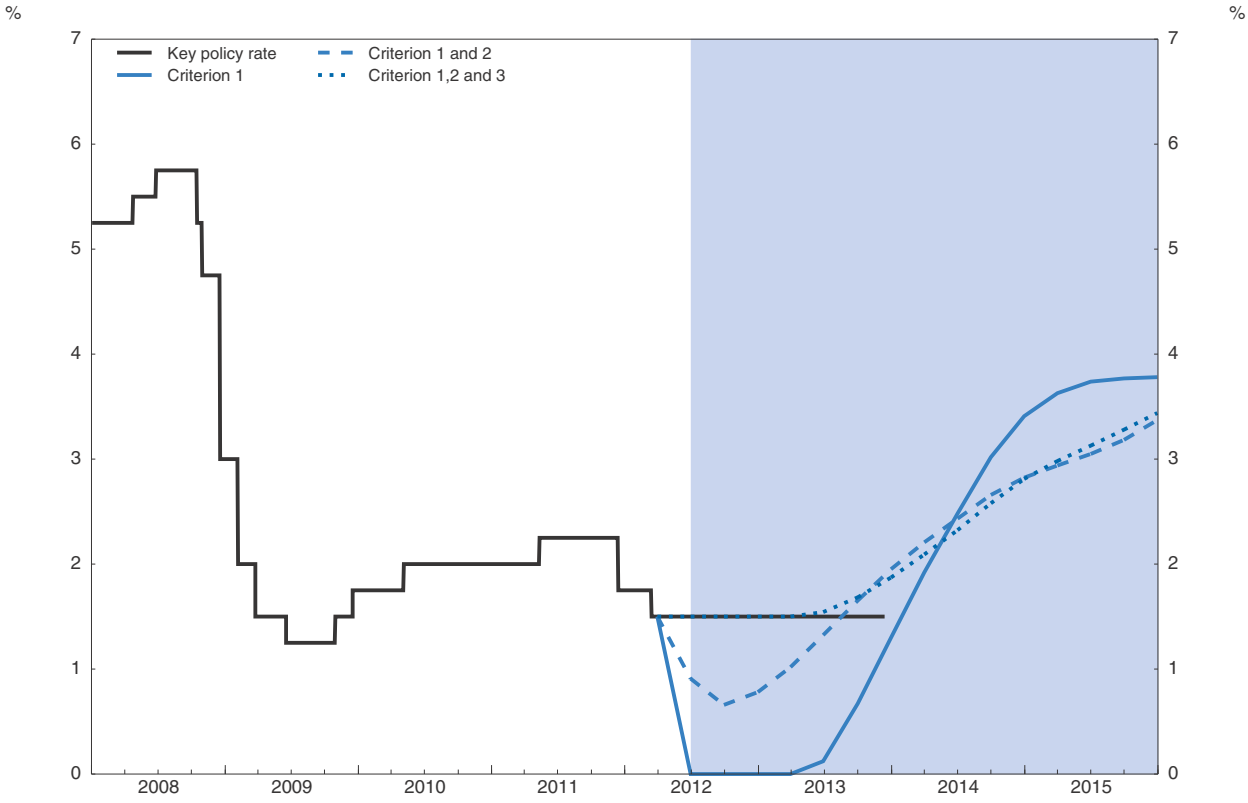
- The ratio of total credit (households and enterprises in mainland Norway) to mainland GDP.
- The wholesale funding ratios of Norwegian credit institutions.
- The ratio of house prices to household disposable income.
- Commercial property prices.

These indicators were selected on the grounds that they have risen ahead of periods of financial instability (Norges Bank, 2013). They are computed in terms of deviations from estimated trends, which are either a recursively calculated average, 10-year rolling average or a trend with the Hodrick and Prescott filter (augmented with a simple projection). In one area the data could be improved. The measure of commercial property prices used is not observed prices but a series imputed from observed rents. While rents matter for on-going debt-servicing ability, prices are crucial in case solvency is an issue. If imputed prices diverge from actual market prices (as they certainly do in the housing market, see Box 1.3) it could be important to monitor the difference to the extent that data availability makes it possible. Norges Bank has noted that there will not be a mechanical relationship between developments in the indicators and advice on the buffer, but will build on Norges Bank's professional judgement and take into account other requirements applying to banks (Norges Bank, 2013).

Credit growth and property prices have been identified as sending early signals of possible subsequent financial distress (Borio and Lowe, 2002). For Norway, Anh (2011) evaluated several financial indicators to see if these had signalled subsequent financial

Figure 1.10. **Appropriate interest rate path according to different criteria**

As predicted in March 2012




Criterion 1: set the interest rate with a view to stabilising inflation at target or bringing it back to target after a deviation has occurred.
Criterion 2: set the interest rate path to provide a reasonable balance between the path for inflation and the path for overall capacity utilisation in the economy.
Criterion 3: set the interest rate so that monetary policy mitigates the risk of a build-up of financial imbalances, and so that acceptable developments in inflation and output are also likely under alternative assumptions about the functioning of the economy.
*Source:* Norges Bank.

**How to read this figure:** if the sole objective of monetary policy were to maintain inflation at target, a Taylor rule would have implied a very low policy rate (line "criterion 1"). Taking the output gap into account in addition would have implied a higher path (line "criteria 1 and 2"). Norges Bank estimated that taking financial stability into account as well would have warranted a stable interest rate (line "criteria 1, 2 and 3") and this is very close to the path that has in fact been followed.

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distress, namely the crisis in the early 1990s and the 2008-09 crisis. This study found that the credit-to-GDP ratio seemed to best predict the occurrence of a financial crisis during the subsequent 2 to 3 years when it exceeds estimated trends by around 10% (if the threshold value is too high the indicator would not predict a financial crisis and if it is too low the indicator would wrongly predict a financial crisis).

### *Counter-cyclical measures will be installed*

With Norges Bank' advice, the Ministry of Finance decided to set up a counter-cyclical buffer of 1% (of risk-weighted assets) in December 2013, and this will be effective as of 30 June 2015. It may increase further if there still remain signs of financial imbalances. In the meantime, banks have time to adjust their behaviour to reach the higher capital

Table 1.1. **Policy instruments for financial stability**

| Category | Measure | Implementation |
|---|---|---|
| Monetary policy | Consideration of financial stability | In place. |
| Macro-prudential policy | Installation of counter-cyclical capital buffer | Announced in December 2013, to be effective as of 30 June 2015. |
| | Setup of a monitoring system | In place (and continuously being developed). |
| Micro-prudential policy (unless indicated otherwise) | Capital Requirement (Basel III/EU CRD IV) | EU CRD IV entering into force in July 2013.<br>– Minimum requirement of 4.5%: In place.<br>– Conservation buffer of 2.5%: In place.<br>– Systemic risk-buffer[1] of 3%: 2% for the first year which will be raised to 3% in July 2014.<br>– Buffer for systemically important bank[1] of 2%: will be introduced in 2015 (1% during the first year). |
| | Adjustment of risk-weights calculated by Internal Rating Based (IRB) approach | The floor of Loss Given Default (LGD, a risk parameter in the calculation of internal model based risk-weights) on home mortgage loans was raised to 20% in October 2013, from 10% previously. This is expected to raise risk-weights on home mortgage loans calculated by banks using internal rating based (IRB) approach to around 20% (from currently 10-13%).<br>Considering similar measures for Probability of Default (PD, another key risk parameter in the calculation of internal model based risk-weights), which would result in higher and more equal risk-weighting of residential mortgage loans among banks, if introduced. |
| | Cap on loan-to-value (LTV) ratios | Guidelines:<br>Limit LTV ratios on home mortgage loans to 85%, reduced in December 2011 from 90% previously;<br>Limit LTV ratios on interest-only loans to 70%;<br>Limit LTV ratios on home equity loans to 70%;<br>If LTV ratios deviate from those guidelines: additional collateral is required, or a special prudential assessment must satisfy internal criteria by banks. |
| | Other measures | Affordability assessment: Loans are basically not given if borrowers' cash flow becomes negative due to the mortgage loan payment, in a stress test where a further increase in the interest rate by 5 percentage points is assumed. |

*Note:* Reciprocity is required for the counter-cyclical buffer and the measures related to mortgage loans, when national authorities impose stricter requirement. Thus branches of foreign financial institutions which reside in Norway are also subject to the same requirement as Norwegian banks.

1. These measures are classified as macro-prudential policy.

requirement. Their effect can then be monitored along with that of the prudential measures on mortgage risk weighting discussed further below.

The optimum level of the counter-cyclical buffer may also depend on the rules for removing it, since its effects may depend on how long it is expected to be in place. The Ministry of Finance has stated that the counter cyclical buffer will be reduced in the event of a severe economic downturn and large banking losses. Norges Bank has suggested that the indicators used to set up the counter-cyclical buffer are not well suited to judge whether it should be removed or reduced. It argues that other factors such as indicators of market stress and the outlook for banks' losses would be taken into account (Norges Bank, 2013). Given the discretionary nature of the use of the buffer, it will be important to avoid implicitly tailoring macroprudential policy to developments in individual banks.

The capital buffer for systemically important banks is another new prudential tool which aims at mitigating long-term non-cyclical systemic risk. The authorities plan to introduce this buffer from July 2015 for banks which will be identified as systemically important. They use such criteria as the share of each bank's assets and lending in the market. In addition to the sheer size of banks, the authorities look at interconnectedness of banks; it is this interconnectedness that is perhaps most important as far as medium-sized banks are concerned. There are new approaches to determine the contribution of

Table 1.2. **Estimated effects of increased capital requirement**

Basis points impact of 1 percentage point increase in capital requirement over 8 quarters

| | After 18 quarters | | After 32 quarters | |
|---|---|---|---|---|
| BCBS (2010a) | | | | |
| Lending rate | 17 | [5, 25] | 15 | [5, 26] |
| Credit | -140 | [-360, -6] | -190 | [-360, -80] |
| GDP: | | | | |
| [standard approach] | -12 | [-96, 39] | -10 | [-314, 3] |
| [DSGE] | -11 | [-41, -1] | -7 | [-25, -2] |
| [reduced form] | -30 | [-87, 18] | -24 | [-88, 2] |
| | | | | |
| Norway:(Akram, 2012) | | | | |
| Lending rate | 14 | {12, 16} | 12 | {10, 13} |
| Credit | -23 | {-31, -16} | -71 | {-97, -45} |
| GDP | -7 | {-11, -2} | -10 | {-20, -2} |

*Note:* The effects are measured in basis points.
Panel I shows median estimates a 1 percentage point increase in the equity ratio reported in BCBS (2010a) Median Estimates of 97 simulations for 17 countries. Minimum and maximum values in square brackets.
Panel II reports comparable evidence for Norway, with the 68% confidence intervals in curly brackets (Akram, 2012).
"Standard approach": The effects for lending rates are derived using an accounting approach and the effects for GDP are obtained by implementing the change in the lending rate in the national models.
"DSGE": An integrated approach where a group of DSGE models with banks are used.
"Reduced form": An integrated approach where a group of reduced-form models are used.
*Source:* BCBS (2010a) and Akram (2012)

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financial intermediaries to systemic risk, such as those based on network analysis and multi-agent financial network models (Markose, 2013).

## Prudential policy and home mortgage loans

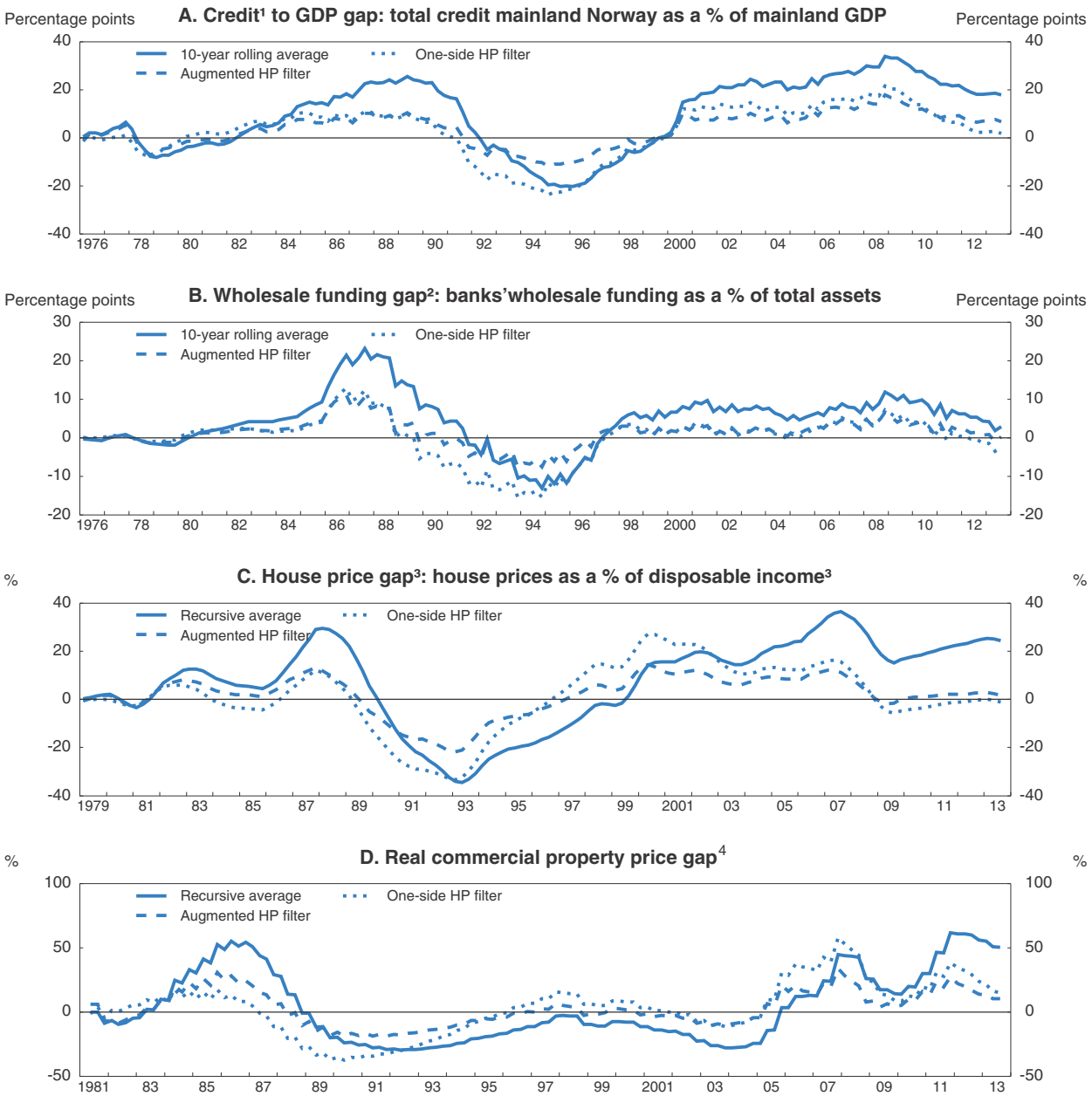
The development of macro-prudential instruments to target wider macroeconomic stability has been paralleled by some changes, or planned changes, in traditional prudential policy. This has been particularly directed at household indebtedness, and concerns that existing regulations may have skewed banks' incentives excessively in favour of such lending. The two key instruments here are the capital requirements and risk weights regime. Appropriate risk-weighting is also important to make the counter-cyclical buffer exert expected effects on mortgage lending. Other specific measures such as limits on loan to value (LTV) ratios also protect individual consumers against potential consequences of risky borrowing. They can promote financial stability and consumer protection and limit the spill-over risk stemming from the housing sector.

### *The implementation of new capital requirements arrangements is well under way*

The implementation of Basel III is progressing in Norway, in some cases well ahead of the required schedule. The capital and buffer requirements of the European Union's CRD (capital requirements directive) IV entered into force in Norway in July 2013. The authorities plan to install a permanent systemic risk buffer of a least 3% and a buffer of 2% for systemically important institutions. The former will be 2% in the first year under transitional arrangements and the latter will be introduced from July 2015. By mid-July 2016 total requirements will be between 10% (for a bank which is not systemically important, and without a counter-cyclical buffer) and 14.5% (for a systemically important institution, if a counter-cyclical buffer is in place at its maximum 2.5%) (Figure 1.12).

Figure 1.11. **Indicators of financial imbalances**

Deviations from estimated trends




*Note:* For Hodrick-Prescott filter, lambda = 400 000. The variable "Augmented HP filter" refers to the one-side HP filter estimated on data augmented with a simple projection.

1. Sum of non-financial corporations in Mainland Norway (total economy pre-1995) and households.
2. All banks and covered bond mortgage companies excluding branches and subsidiaries of foreign banks in Norway. Quarterly figures pre-1989 are calculated by linear interpolation of annual figures.
3. Quarterly pre-1990 figures are calculated with linear interpolation of annual figures. Data have been adjusted for estimated reinvested dividend income for 2000-2005 and redemption/reduction of equity capital for 2006 Q1-2012 Q3.
4. "Imputed" prices using rental prices for high-standard office premises in central Oslo, deflated by GDP deflator for mainland Norway.

*Source:* Norges Bank, *Monetary Policy Report 04/13*.

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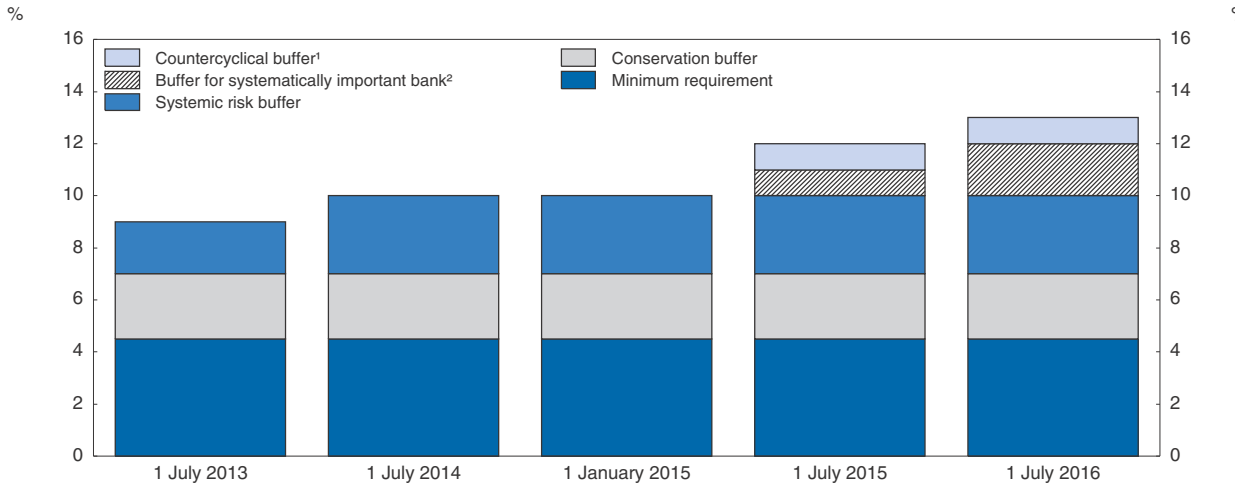
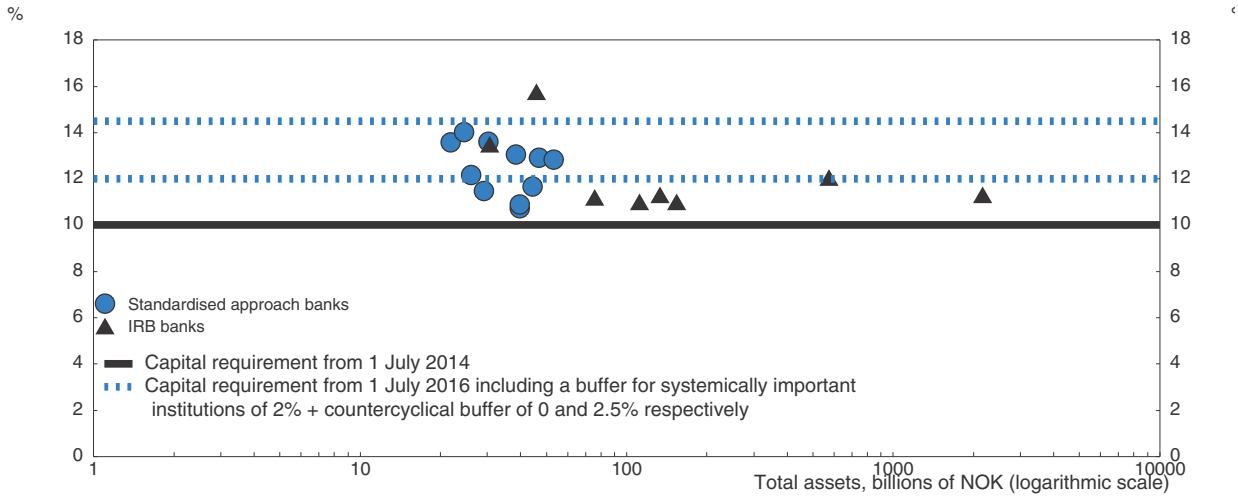
Figure 1.12. **Implementation of new capital requirements**

**A. Common Equity Tier 1 capital ratio requirements in the new regulatory framework**




**B. Banking groups³: common equity Tier 1 capital ratio, 30 September 2013**




1. This can be increased up to 2.5% (or above it with different conditions applying).
2. Only for those banks which are recognised as such (to be determined) by the authorities.
3. Banking groups with total assets in excess of NOK 20 bn, excluding branches of foreign banks in Norway.

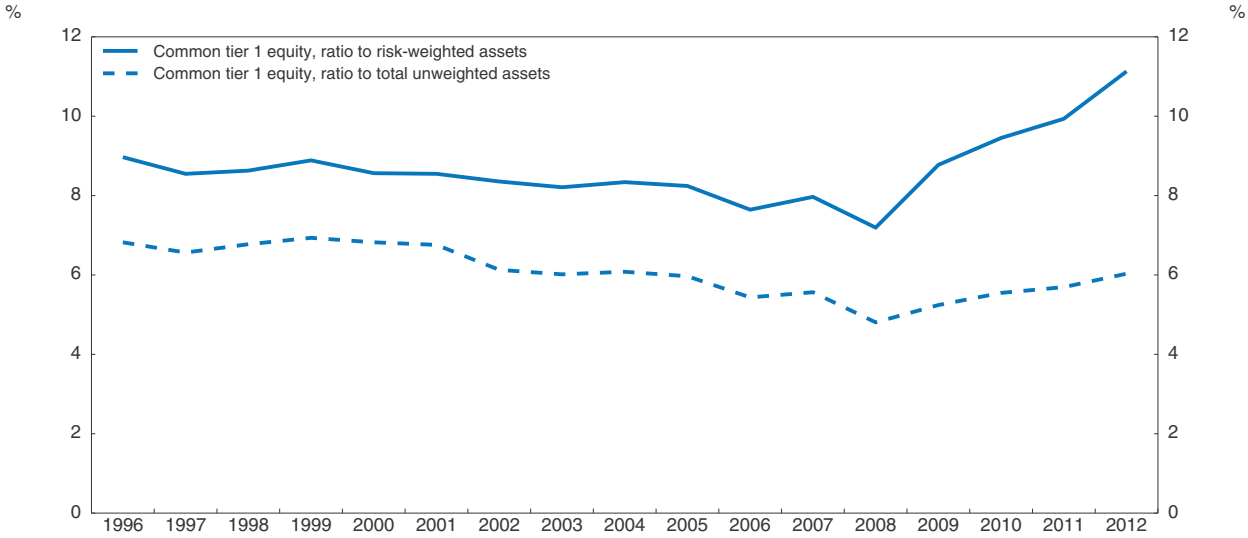
*Source:* Norges Bank, *Monetary Policy Report 04/13*.

StatLink http://dx.doi.org/10.1787/888932998747

The impact of the new capital requirements on the cost of different kinds of lending will be affected by the different risk-weights across assets. Risk weights for mortgage loans are generally low in Norway, reflecting the very low rate of default in the past. Eight Norwegian banks use the Internal Rating Based (IRB) approach. This allows financial institutions to use their own models to set key risk parameters such as the probability of default and loss given default in mortgage lending. Non-IRB banks use standard risk weights. The eight IRB banks accounted for around 75% of total assets in 2012. The standard risk weighting for mortgages is 35%. With the IRB approach, capital requirements for a given loan type, LTV ratio, and other factors, may vary across financial institutions. The resultant risk-weight for mortgage loans on average is estimated to be 10-13% among

banks with the IRB approach, much lower than the standard approach (Finanstilsynet, 2013). By contrast, the risk weight for low-risk corporate loans is estimated to average 60% in IRB banks, higher than the 50% in the standard approach. Some banks have increased their focus on mortgage lending over lending to the corporate sector, likely partly due to the low risk weights on home mortgage loans (Finanstilsynet, 2013). The difference between banks' total assets and risk-weighted assets further widened in 2012 (Figure 1.13) and this may suggest that banks are shifting their exposures to categories with lower risk weights and/or that risk weights are being lowered.

Figure 1.13. **Common equity tier 1 ratio and unweighted capital share**




*Source:* Finanstilsynet.

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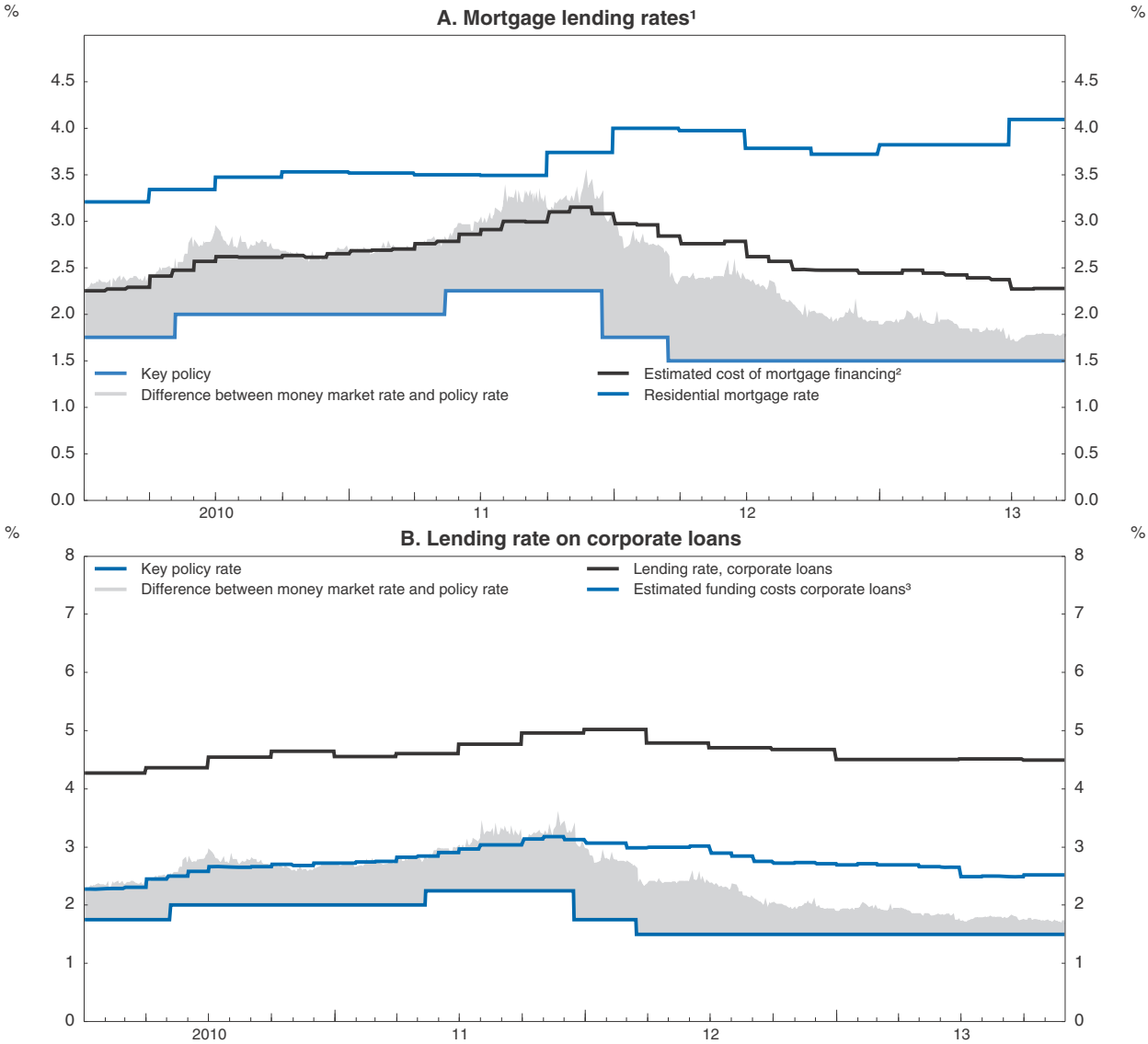
### *The risk of mortgage loans should be correctly reflected in risk-weights*

The European Union's capital requirements directive recommends that national authorities adopt procedures for increasing the risk weights that banks derive from their IRB approach. These procedures can be to impose a minimum weight, or to apply an add-on or multiplier to banks' internal estimates.

In October 2013, the Norwegian authorities decided to increase the floor (the floor imposed on IRB banks' risk models) on the estimate of loss given default from 10% to 20%. This is expected in turn to increase the average risk-weighting of residential mortgage loans to about 20%, according to the Ministry of Finance (2013). This is a welcome step forward. The authorities should monitor its effects and consider whether further tightening might be needed. Andersen et al. (2012) estimate that Norwegian banks would have to raise residential mortgage rates by 0.1-0.4 percentage points in a hypothetical case in which the risk weight on residential mortgage loans is doubled,[5] assuming that banks keep their capital equity ratio and aim at maintaining the return on equity from mortgage lending.[6] This estimate is of a similar order of magnitude to the increase in mortgage rates relative to money market rates that was seen during 2013 (see Figure 1.14). Finanstilsynet also continues to review banks' IRB models with a view to, *inter alia*, raising the lowest estimates of probability of default. This is likely to result in somewhat higher and more equal risk-weighting of residential mortgage loans in Norwegian banks.

Figure 1.14. **Mortgage loan interest rate**




1. The lending rate on lines of credit secured on dwellings provided by all banks and mortgage companies in Norway.
2. Estimated using weighted interest rates on covered bonds outstanding and weighted deposit rates.
3. Estimated using weighted interest rate on senior bank bonds outstanding and weighted deposit rates.

*Source:* Norges Bank, *Monetary Policy Report 04/13*.

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The Basel I floor on total risk-weighted assets serves as a backstop in the capital adequacy framework. The Basel I floor as applied in Norway prescribes that total risk-weighted assets cannot be set lower than 80% of what would have been required under the Basel I regime. This means that if total risk-weighted assets are at or below the Basel I floor (which is the case for the Norwegian IRB banks), the risk weight for home mortgage loans is 40% and 80% for low-risk corporate lending. Thus, mortgage lending would still be favoured relative to corporate lending in terms of capital requirements, but to a lesser degree.

Covered bonds are increasingly being used as a source of finance for mortgage loans. Their increasing use could also lead to higher credit risk if the underlying risk of the securitised assets is not clear. Covered bonds enable financial institutions to fund in a less costly way because of multiple guarantees.[7] In Norway covered bonds must be issued by mortgage lending companies. The majority of such companies are wholly owned by a parent bank. Home mortgage loans are transferred from banks to mortgage lending companies and 60% of all home mortgage loans are estimated to reside in mortgage lending companies. There are considerable financial ties between banks and mortgage lending companies in the form of guarantees and credit facilities available to the latter. Given that many covered bonds are issued by mortgage companies to their parents, and regulatory oversight applies to consolidated accounts, the risks appear limited. But these commitments exist on a large scale, potentially increasing credit risk at parent banks or to outside purchases of the bonds, so it is important to be sure that regulatory arbitrage is not a contributory factor.

Another particular concern in Norway is that tightening risk-weights on home mortgage loans gives an incentive for regulatory arbitrage by foreign-owned branches. Risk-weights on home mortgage loans are very low among banks that use the IRB approach in other Nordic countries. Under CRD IV, reciprocity is now under some circumstances required for real estate exposures when national authorities impose stricter requirements. Reciprocity means a certain prudential requirement will apply for exposures incurred in the country setting the requirement, regardless of whether the exposures are incurred by institutions domiciled there or by branches of foreign institutions. Thus branches of foreign financial institutions are also subject to some measures specifically related to mortgage loans in Norway, which was not the case previously. However, reciprocity is not automatic for all capital requirement, which still leaves potential scope for such regulatory arbitrage. Since 2011, five Nordic countries (Denmark, Finland, Iceland, Norway and Sweden) have been co-operating in order to reinforce reciprocity and this should be pursued.

### *The guideline LTV ratios could be tightened further*

The mortgage market has been characterised by high leverage, as in many other countries. Loan-to-value (LTV) ratios have risen over the past decade, increasing households' borrowing capacity. Both borrowers and lenders may be confident that rising prices will quickly increase the margin between the size of the loan and value of the property for which it is security. High LTV ratios are found to have strengthened the effects of positive economic shocks on house prices across countries (e.g. IMF, 2011, Crowe et al., 2011). This means, however, that house price dynamics would be all the more affected with higher LTV ratios in the downturn. High LTV ratios are also found to have increased home ownership rates across OECD countries (Andrews et al., 2011). In Norway, the overall house ownership rate has been high and has barely changed, but it has increased among young people. This suggests that high LTV ratios have indeed induced housing demand among credit-constrained and lower-income households.

To dampen this part of the potentially self-reinforcing cycle of rising borrowing and rising prices the authorities have sought to limit high LTV loans. Finanstilsynet introduced LTV-related guidelines in early 2010 and tightened them in December 2011. This action is technically part of normal prudential policy in the interests of limiting risk for both

borrowers and lenders, but was taken with a view to the macroeconomic situation as well. The current guidelines prescribe that, for loans given under a bank's normal procedures:

- Loans should not normally be given with an LTV ratio above 85%.
- LTV ratios should not normally exceed 70% for interest-only loans.
- LTV ratios should not normally exceed 70% for equity withdrawal loans.

When these threshold values are exceeded, the guidelines require additional collateral to be posted or a special prudential assessment, which must satisfy banks' internal criteria, to be made. By the autumn of 2013, this applied to 15% of new loans under the first criterion, i.e. where the LTV ratio exceeded 85%. Up to now, these have been guidelines rather than strict regulations, but according to Finanstilsynet banks are largely compliant.

These guidelines on LTV may in effect be less stringent than they appear if house prices are unsustainably high. One possibility would be to adjust the guideline ratios in line with some estimates of financial cycles, as was advocated for the countercyclical capital buffer (see above). This might currently imply more stringent guidelines. An alternative would be to complement the guideline LTV ratios with other measures such as loan-to-income (LTI) ratios. The LTI ratio has the advantage that it more directly measures affordability of borrowers. Also, the evolution of income is more stable through economic cycles (Sutherland and Hoeller, 2012).

### *Borrower protection: Stringent affordability assessment is important for risky forms of lending*

In Norway, affordability assessment of borrowers applying for new loans is quite stringent. When assessing affordability, a borrower's income is typically verified from the most recent tax return form as well as the most recent monthly pay cheque. Borrowers with impaired credit histories are generally identified against customers' payment records. Then, the borrower's net cash flow is assessed with stress tests. Net cash flow, defined as regular income (mainly in the form of salary from their main employer) less total expenditure, should not become negative if the interest rate on the current loan were to increase further by five percentage points. If it does become negative, a loan is normally not granted.

Since the deregulation of the 1980s diverse categories of mortgage product have emerged. Recently, Finanstilsynet has identified the increased use of interest-only loans and equity release loans as factors that may contribute to fast growing household debt, along with macroeconomic forces and other policies such as taxation (Finanstilsynet, 2013).

Interest-only products accounted for 12% of all new loans in 2013. The share of interest-only loans has been especially high among the youngest age group, accounting for roughly 21% in the three preceding years. Experience in other countries suggests that many interest-only mortgages have been taken out on affordability grounds (FSA UK, 2009), and are based on the assumption that the borrower's income will grow over time sufficiently to cover principal repayment. However, with such loans borrowers are entirely dependent on house price increases to build up an equity cushion over time, which can cover them against the need to sell in a falling market. This implies increased risk for the lender on such loans. Lenders should perhaps assess the creditworthiness of borrowers on interest-only loans by assessing them on the basis of the cash flow implied by an equivalent repayment mortgage. This would reduce the maximum amount that less well-off

borrowers could borrow, but protect them and lenders from the temptation to take risky bets on rising house prices.

The share of equity withdrawal loans remains high, some 23% of total new loans in 2013. Equity withdrawal allows borrowers to spend their housing wealth within certain limits. This may conceal, and potentially exacerbate, consumers' affordability problems, but is also a useful facility especially for older home owners. UK experience suggests that, where such loans become problematic, in more than nine out of ten cases the household concerned has other debts or more than one loan secured on the house (FSA UK, 2009). Therefore, the total debt of borrowers should be considered in creditworthiness assessment for loans, and standard metrics such as debt-to-income (DTI) ratios could be used.

## Household indebtedness and the possible process of deleveraging

### *Excessive debt has been problematic in other countries after property prices peaked*

A rapid increase in debt or leverage can potentially lay the ground for a protracted downturn (Sutherland and Hoeller, 2012). Empirically, in periods when aggregate debt in an economy increases rapidly and deviates significantly from trend, there is a higher probability that an economy enters a recession. Also, the expansions associated with much higher debt than trend are typically longer and larger, but the subsequent recessions are on average more severe. Then activity is likely to remain depressed due to tighter credit conditions and balance sheet weakness.

Historical evidence shows that rapid increases in debt ratios during property market booms have tended to be reversed subsequently (Tang and Upper, 2010, see also Figure 1.16). In the United States, Spain and Ireland, which all experienced property booms before the 2008-09 crisis, households' deleveraging has occurred once house prices peaked. Since the most recent peak, house prices declined by around 20.0%, 30.3% and 49.9%, respectively, until they reached the most recent trough (except for Spain where the trough has not been reached yet). In the United States, the debt-to-income ratio declined from 136.8% in 2007 to 111% in 2012. MGI (2012) reports that defaults may account for two-thirds of the decline of US household debt over 2008-11. In Spain and Ireland, the debt to income ratio was 149.3% and 238.4% respectively in 2007, and it has been reduced by slightly less than 10 percentage points in the following five years, reflecting the weak evolution of income in these countries. In contrast with the United States, the banks' main response in Ireland has often been limited to principal payment holidays or extended loan terms – a strategy dubbed "extend and pretend" (OECD, 2013b).

While debt write-downs can hasten deleveraging, the bankruptcy law (see below) is likely to prevent this happening on a large scale in Norway. Thus vulnerability to a rise in interest rates will arise from households' reaction to reduced cashflow after paying mortgage interest. A simulation conducted by Statistics Norway illustrates how vulnerable the Norwegian economy might be to the interaction of high debt and rising interest rates (Cappelen and Prestmo, 2013; Box 1.4). The results show that with an assumption of an increase in the interest rate by five percentage points, household consumption would be lower by some 10% and mainland GDP by 5% in the long-run.

### *Would household debt in Norway be really problematic?*

It is difficult to know *a priori* whether and to what extent deleveraging may occur. Deleveraging tends to occur when associated with such factors as a realisation that house

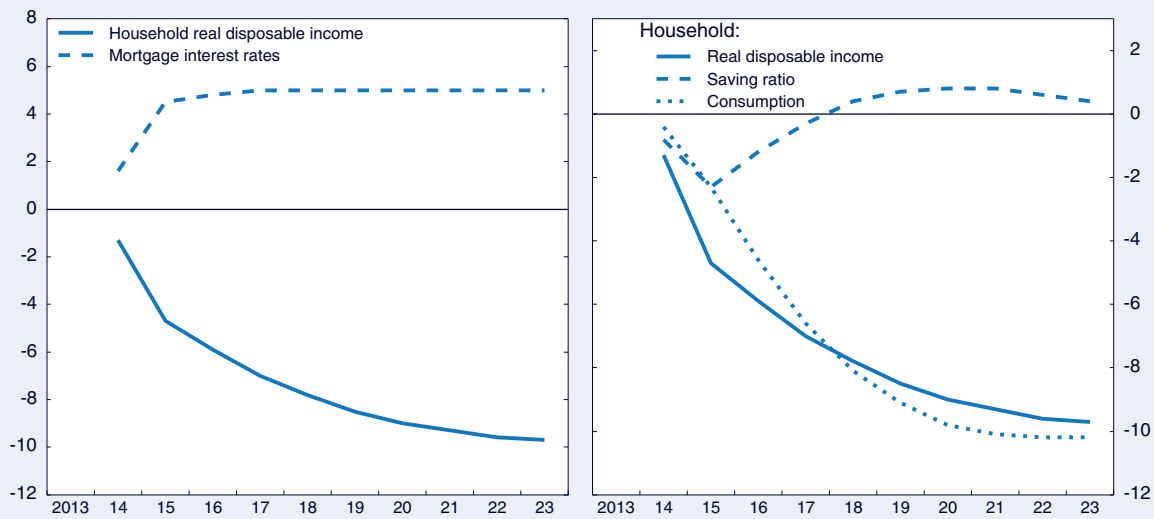
## Box 1.4. **Simulation of an further interest rate increase**

The simulation illustrates how sensitive Norwegian households are to a large increase in interest rates. This simulation uses a large scale macro-econometric model used regularly by Statistics Norway. The baseline is the forecast published by Statistics Norway in December 2013. In the baseline forecast, the three month market rate increases roughly in line with Norges Bank's forecast (MPR 3/13). The simulation assumes an increase in this interest rate by further 5 percentage points (1 percentage point per quarter beginning in Q1/2014). It is also assumed that the exchange rate is fixed.

According to this simulation, compared with the baseline scenario, mainland GDP growth will be lower by 0.2% point in the first year, the effects are gradually increasing. Mainland GDP would be lower by 5% and household consumption by 10% in the long-run.

Figure 1.15. **Simulation results: further increase in interest rates**

Percentage deviation from the baseline projections




*Note:* This chart shows deviations in key variables from those in the baseline scenario when the interest rate is raised further by 5 percentage points. Deviations in household real disposable income and consumption are measured in terms of %. Deviations in mortgage interest rates and the saving ratio are measured in terms of percentage points.
*Source:* Statistics Norway, Cappelen and Prestmo (2013).

StatLink http://dx.doi.org/10.1787/888932998804

The main channels through which the difference between the baseline and the adverse scenario arises are:

- The standard income effect in the household sector: households' assets and liabilities are specified in some detail in the model. Household debt consists mainly of loans from private banks and the interest rate on these loans follows the three month money market rate with a short lag. A large share of household assets is not linked to interest rates. Thus there is a large shock to household disposable income that leads to lowering consumer expenditure and demand for housing with an associated fall in house prices. This leads to lowering housing investment which will further have multiplier effects through the economy.
- The credit channel: the increase in interest rates lowers demand for credit, which affects housing prices and investment in housing through a financial accelerator mechanism (see Anundsen and Jansen, 2013). In 2015 real house prices are already reduced by 15%.

In this simulation, it is assumed that households make no attempt to reduce their overall debt burden. If such deleveraging occurs, which is plausible in a context of an increased interest burden, then it would further weigh on household demand through a rise in the saving ratio.

prices were overvalued and a sharp revision in income expectations (IMF, 2012, and the references therein). Household consumption could be reduced via wealth effects if property prices decline. If housing price fluctuations simply reflect shifts in (broadly accurate) income expectations, then they play no separate causal role for consumption. But if prices overshoot they may in turn influence expectations. Additionally, households might seek to restore assets in response to a negative wealth shock, knowing that they cannot borrow as easily as before to offset negative income shocks (i.e. a precautionary saving motive, see e.g. Mody et al., 2012).

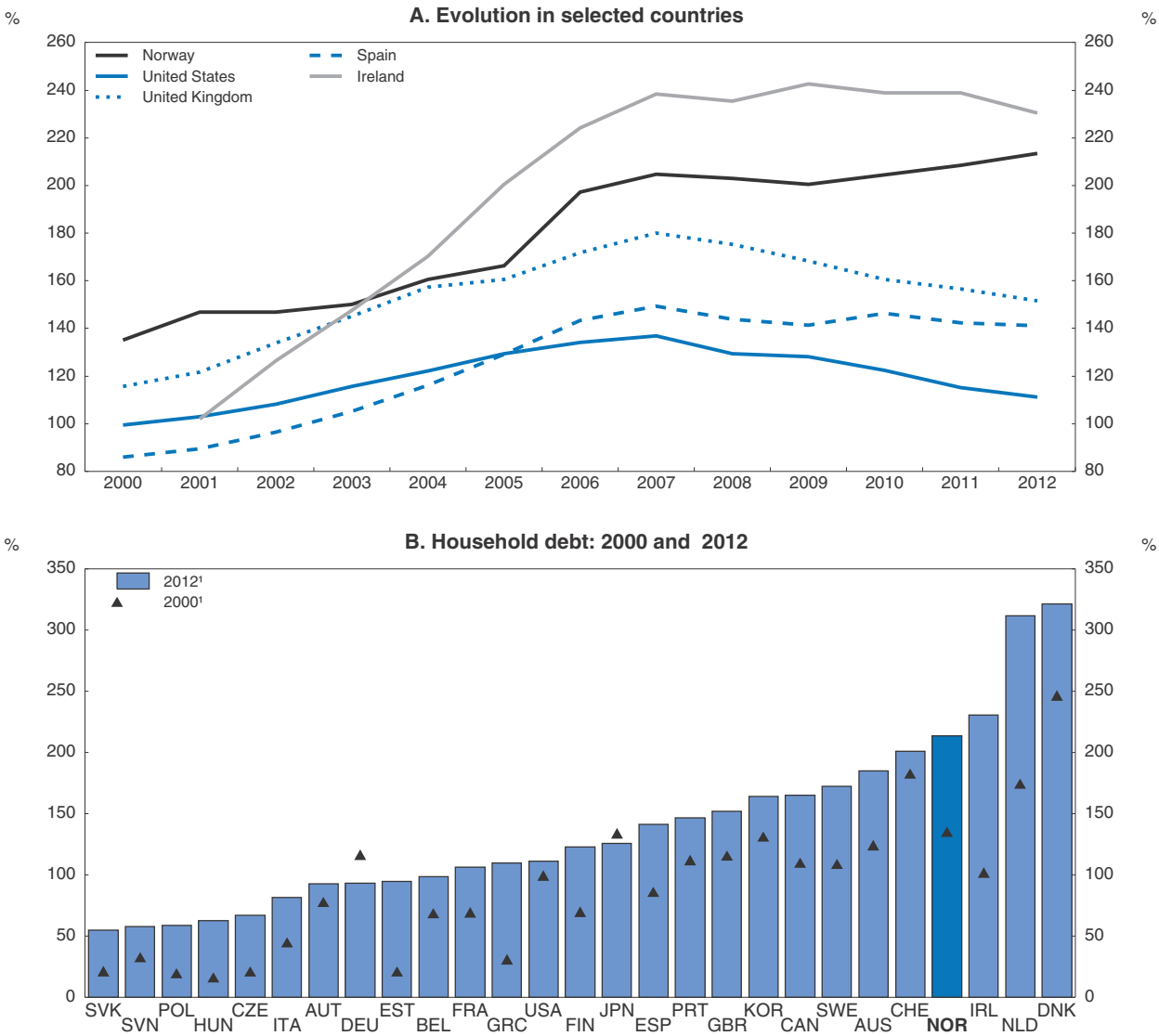
Deleveraging may have significant economic consequences (e.g. Koo, 2011), though these will differ depending on the current pace of debt reduction, the time period over which debt is to be reduced and the debt reduction strategies adopted (Bouis et al., 2013). In Norway, if households in aggregate decided to aim for the pre-boom debt ratios through higher savings, the saving rate would rise by several percentage points for an extended period. Moving close to pre-boom debt ratios by compressing household investment ratios could also have adverse effects on growth. In fact, the adverse effects on economic activity might be larger, given that investment multipliers tend to be stronger than consumption multipliers.

If highly indebted households were to face serious debt-servicing problems, how to write down their debt would become an issue. Debt write-downs on home mortgage loans can hasten deleveraging but these are usually associated with foreclosure. There may be costs related to large-scale home evictions and distressed property prices with the market flooded with foreclosed homes. Foreclosure is also difficult in practice due to highly complex legal procedures which result in discharge, even if it is allowed, only after a long period. This is also the case in Norway and often steers debtors into out-of-court negotiations as a means of solving the problems, according to the Norwegian Advisory Council on Bankruptcy. Most household debt consists of mortgage debt contracted with one bank. Such arrangements enable both parties to negotiate debt restructuring without the framework of a formal bankruptcy procedure (OECD, 2012a). The Irish government introduced a new personal insolvency regime in 2013 to circumvent such complex procedures. This is essentially an alternative debt settlement procedure to bankruptcy for individuals, whereby the debtor and creditors first make an agreement which is then approved by the courts. The advantage of this regime is that the main negotiation is done outside the court, thereby potentially speeding up the process (OECD, 2013b).

More generally, there is an issue as to how the debt burden is split between lenders and borrowers. Debt forgiveness would allow for a swift reduction in household debt without extensive foreclosures. To the extent that banks would ultimately have to write down mortgages if borrowers had repayment difficulties, banks' financial positions would not be affected. Such programmes could also be initiated by the government. In Iceland, the government and mortgage lenders concluded an agreement to introduce mortgage write downs for households deeply "underwater" in 2010. Households with an LTV ratio above 110% were beneficiaries and their debt principal was reduced to 110% of the value of the pledgeable assets. The burden of restructuring the loans fell on lenders, but they signed on because the written-down value exceeded the recovery likely through bankruptcy (IMF, 2012). However, such debt forgiveness would induce undesirable effects such as an increase in costs of capital in general as well as potential moral hazard on the part of borrowers.

Figure 1.16. **Household debts in selected OECD countries**

As a percentage of net disposable income




1. Or nearest/latest year available.

*Source: OECD Annual National Accounts Database* and *OECD Economic Outlook Database*.

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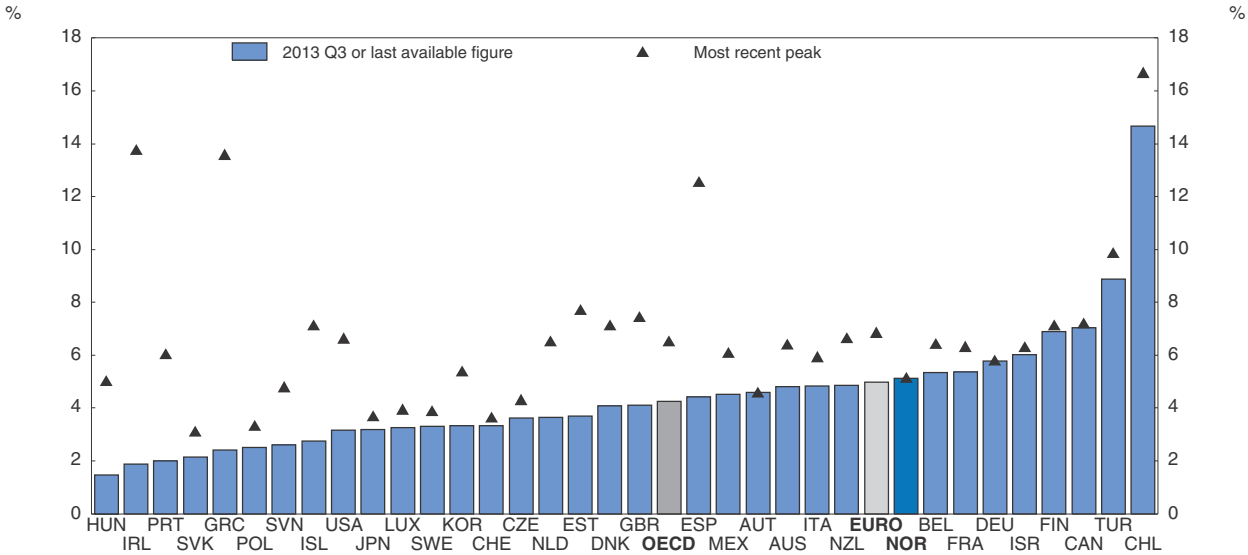
## Better allocation of resources in the long run

The share of housing investment in GDP has been fairly stable in recent years, much more so than in most of the countries that experienced housing boom and bust cycles (Figure 1.17). A large part of the rise in household indebtedness is the counterpart of higher prices for existing dwellings rather than a more rapidly increasing stock.

In Norway, in addition to possible risk-weight effects discussed earlier, the rise in property prices itself seems to have prompted banks to devote more resources to mortgages, to the detriment of other loans, including loans to businesses. The impact could have been strong in a country such as Norway where non-financial corporates

Figure 1.17. **Housing investment as a percentage of GDP**




*Source: OECD Economic Outlook Database.*

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essentially rely on banks rather than capital markets for funding. Chakraborty et al. (2013) provided some evidence with micro-level data that banks may respond by reallocating capital away from more productive uses when asset prices increase in the housing market. Similar evidence can be found for Norway where some banks have increased their focus on mortgage lending over lending to the corporate sector (see above). The relatively low and stable share of GDP devoted to housing investment may be evidence that suggests that these distortions have more effect on the financial structure than on allocation of real resources in the economy.

Other aspects of Norwegian policy may contribute to distorted incentives to borrow against, and invest in, housing, distorting the allocation of resources in the long run. A range of policies promote home ownership, most notably very favourable tax treatment. Since the supply response is rigid, a significant part of higher demand induced by such policies tends to be capitalised into higher prices. Although this may reduce the possible distortionary effects, because fewer productive resources are sucked into the construction sector, they are not eliminated, likely creating economic rents in the area of any bottlenecks in supply. Furthermore, to the extent that some of these policies are intended to increase access to housing, they are undermined and may even be counter-productive if they simply increase prices. Rising prices, other things being equal, represent a shift in wealth towards house-owners, who are typically older and richer. In order to promote home ownership, policies should be coherent both on demand and supply sides.

### *Housing demand has been affected by favourable tax treatment*

Owner-occupied housing has very favourable tax treatment relative to other forms of capital investment in Norway, as documented in detail in the chapter on capital taxation in the previous *Survey* (OECD, 2012b). This favourable tax treatment is a mix of non-taxation of imputed rental income and capital gains, mortgage interest deductibility and undervaluation of housing in the wealth tax. The last *OECD Survey* showed how this

theoretically produces severe distortions in investment behaviour, showing the marginal effective tax rates (METR) on different classes of assets (OECD, 2012b; Denk, 2012).

In Norway, METRs on returns from owner-occupied housing (i.e. the implicit non-monetised returns in the form of housing services) are zero without the wealth tax, since taxation of imputed rental income was abolished in 2005. On the other hand, for financial assets, including equity investment, METRs can be more than 100% when the wealth tax is included, while housing receives very favourable treatment in the wealth tax (OECD, 2012b). At the same time, mortgage interest payments are deductible from ordinary income at the tax value of 28% just as interest income is deductible for other assets whose returns are taxed. As argued in the last Survey, either taxation on imputed rents should be reintroduced, which is theoretically the best choice if the same statutory rate applies to other investment, or mortgage interest deductibility should be abolished as a second-best option. One advantage of the latter approach is that it can be applied progressively, as in the United Kingdom, and it may be easier to achieve when the interest burden is effectively low, as at the moment.

Some small steps have been taken recently to reduce the housing bias in the wealth tax. Net wealth in excess of NOK 1 000 000 is subject to tax on assessed wealth at the rate of 1.0%. The threshold was increased from 700 000 to 1 000 000 NOK in the 2014 budget, and the rate was reduced from 1.1% (national tax 0.4%; municipal tax 0.7%), but this will reduce the still high METRs only slightly. In 2010, the government introduced a new formula for assessing the tax base, according to which a market value is estimated for each dwelling using housing market statistics. In 2013, the tax-assessed value of the primary residence is set to 25% of the estimated market value, while other dwellings are valued at 50% of the estimated market, up from 40% previously. According to the National Budget 2014, the valuation of second properties will rise further, from 50% to 60% of market value.[8]

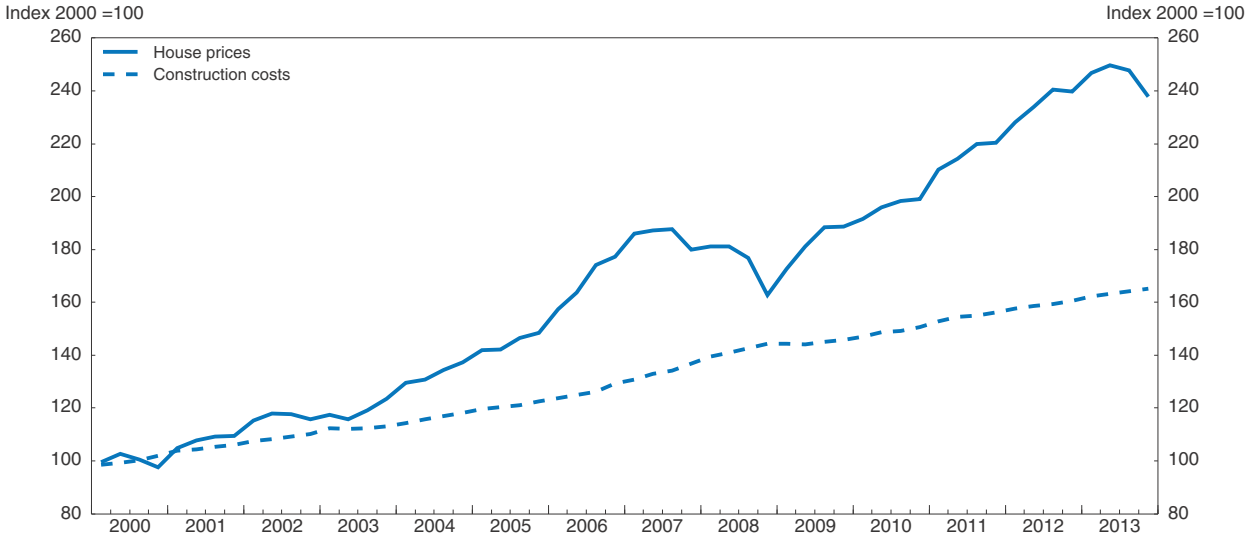
Exemption of taxation on capital gains on the sale of property may also favour home ownership. In Norway, capital gains tax is not payable if the owner has occupied the house in 12 out of the last 24 months. Different conditions apply to vacation homes. Capital losses are deductible to the extent that capital gains are subject to tax.[9]

### *Housing supply is less responsive due to regulations*

Housing supply responsiveness to price changes varies widely across OECD countries and it is estimated to be lower in Norway than the OECD average (Caldera Sánchez and Johansson, 2011). The low supply response to rising prices is surprising because a comparison of house prices and construction costs suggests that profitability should be very high (Figure 1.18). However, actual costs may have increased more than those reported in the building cost statistics, since land costs, which account for a substantial portion of the total, are not included. Land costs seem to be squeezing the margins of development projects, particularly in areas where demand is high (Barlindhaug and Nordahl, 2011).

Regulations in the housing market, as in many countries, constrain housing supply. Cumbersome land use and planning regulations are found to be correlated with a less responsive housing supply across OECD countries (Caldera Sánchez and Johansson, 2011). In Norway, the number of completed houses has fallen short of the increase in the number of households for many years (Figure 1.19). This may suggest a structural shortage of housing and perhaps the existence of a bottleneck due to regulations. But on the other hand, the average size per dwelling has increased (Figure 1.20).

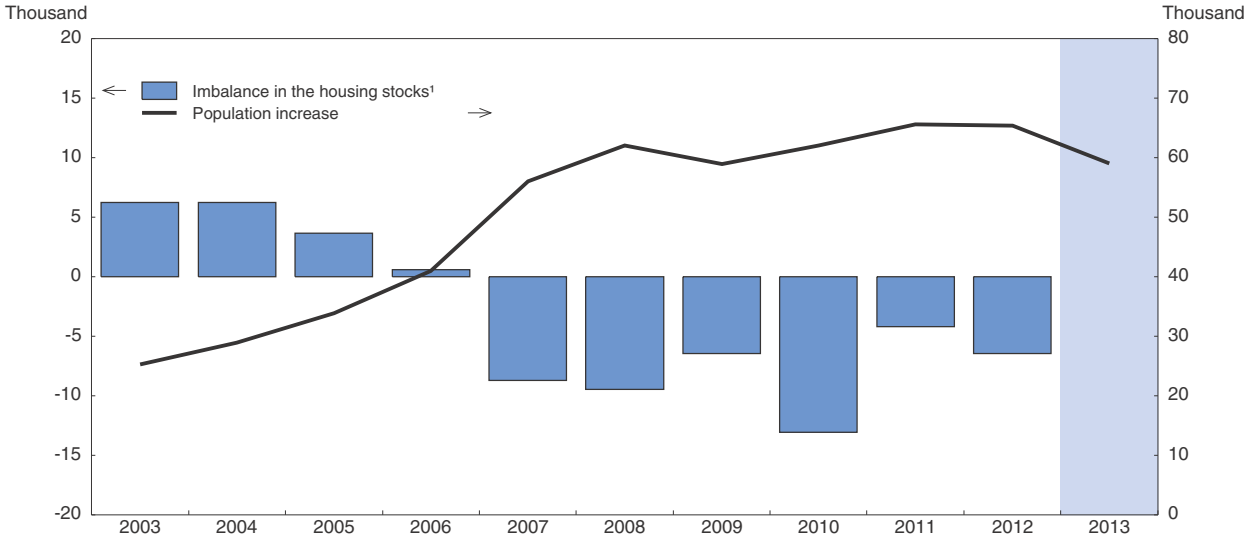
Figure 1.18. **House prices and construction costs**




*Source:* Statistics Norway.

StatLink http://dx.doi.org/10.1787/888932998861

Figure 1.19. **Structural shortage of housing**



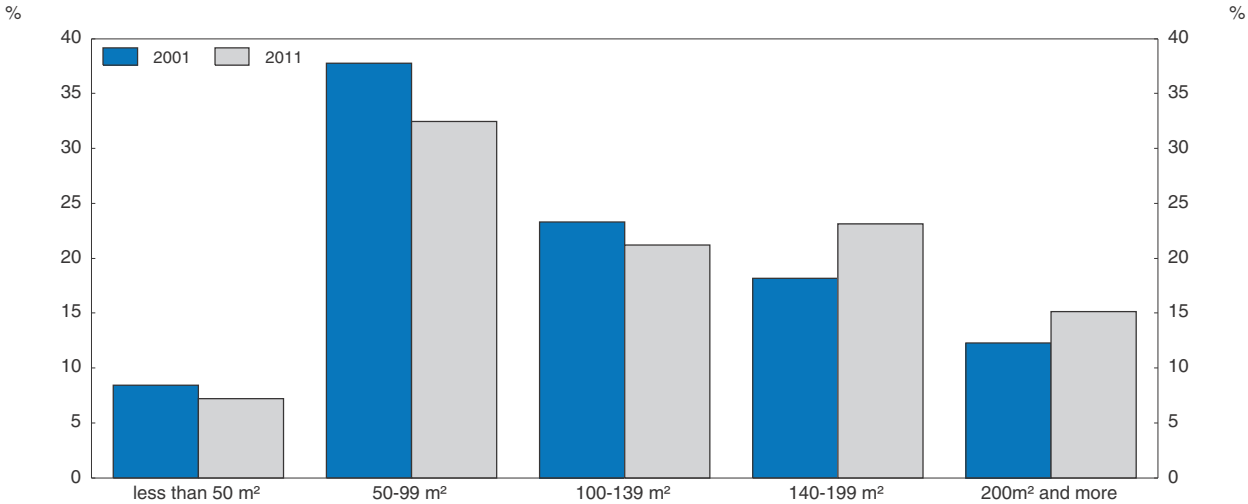

1. Difference between the number of completed houses and the increase in the number of households in each year.
*Source:* Norges Bank, *Monetary Policy Report 04/13*.

StatLink http://dx.doi.org/10.1787/888932998880

The national guidelines on land-use and planning overall aim at enhancing densification and avoiding urban sprawl and abuse of valuable natural land. Thus, existing built-up areas are to be utilised more intensively, which is associated with public transport planning in urban areas. The central government is responsible for national legislation and develops national guidelines for planning in municipalities. The local authorities are responsible for a municipal master plan that provides the framework for land use, or zoning. The municipalities play a key role in housing policy and have primary

Figure 1.20. **Households by size of dwelling**

**As a percentage of total occupied dwellings**




*Source:* Statistics Norway.

StatLink http://dx.doi.org/10.1787/888932998899

responsibility for local policy implementation. If planning regulations *per se*, which have a wide range of policy objectives, do not have to be modified, there is a scope for time spent and uncertainty on planning to be reduced. These are also reported to be major obstacles for developers (Barlindhaug and Nordahl, 2011).

In recent years, regulations on building have been strengthened. The 2006 law on development agreements requires that developers contribute more to building local infrastructure. In 2007, new minimum standards for technical features of new buildings (TEK07) came into force, which require that new buildings be 25% more energy efficient. In 2010 new technical regulations (TEK10) were introduced concerning accessibility requirements for the bulk of new residential building and dwellings. The background to the measures taken is the ageing population and lack of accessible dwellings. Before the strengthened requirements were put into force, the government carried out an analysis on the impact on construction costs among other factors. According to the government's assessment, the new accessibility regulations produce an additional construction cost of approximately NOK 1 000 per square meter, depending on the way houses are built and dwelling size. This might not be the most cost-effective way to achieve the desired objectives, and it is not clear if cost benefit analysis has been conducted before the measure was adopted.

There is a case to be made that more housing supply is needed, but as housing demand is currently severely distorted by the tax system the apparent supply shortage might diminish if the tax system were corrected. Relaxing supply constraints should lower the overall level of prices, but would exacerbate boom-bust cycles as housing booms would be translated into stronger fluctuations in construction activity, as in the United States, Spain, Ireland and the United Kingdom in the run up to the 2008-09 crisis.

### Summary of recommendations on the real-estate market and financial system

**Financial stability**

- Monitor whether the macro-prudential tightening has the intended effect on financial stability. If necessary, revise the system of indicators and decision-making processes in line with evolving experience.
- The financial vulnerabilities resulting from high household indebtedness at floating interest rates should continue to be addressed, notably by further action on prudential policy, e.g. on loan-to-value ratios and borrowers' debt servicing capacity.
- Consider tightening further the guideline loan-to-value (LTV) ratios and possibly set them in a counter-cyclical way. Consider supplementing LTV guidelines with guidelines on loan-to-income ratios which are less affected by cyclical developments.
- Closely monitor affordability of borrowers for risky lending. Substantially reduce the extension of interest-only loans, and, require affordability assessment for such loans to be based on equivalent repayment mortgage cash-flow.
- Where prudential regulation or guidelines may still give an incentive for regulatory arbitrage by foreign-owned branches or subsidiaries, aim to introduce measures in co-operation with relevant foreign regulators.
- Ensure that regulatory arbitrage does not encourage the use of covered bonds and that the underlying risks, and who is bearing them, are clear.

**Taxation**

- Reduce the implicit tax subsidy to owner-occupied housing. This implies valuing all assets at market prices in the wealth tax. In the income tax system, either tax the imputed income on owner-occupied housing or abolish mortgage interest deductibility.
- Levy a capital gain tax on net sales of housing on the same basis as for other assets.

**Planning and building regulations**

- Reduce incentives of local authorities to withhold land for development, other than those related to clear externalities that cannot be compensated with revenue raised from sales.
- Examine costs and benefits *ex ante* when additional measures are adopted in building regulations.

## *Notes*

1. Expectations of future price increases can increase demand even in the absence of speculators purely motivated by the prospects of capital gains. This is because the risk of being priced out of the market is a major concern for potential home buyers, even if they are not generally driven by prospects of investment returns (BSA, 2007). Also, price expectations are essential determinants of demand in the investment or buy-to-let segment.
2. Jurglias and Lansing (2013) for example found a positive correlation between the current price-to-rent ratios and future realised returns in Norwegian data. Gelain and Lansing (2013) show that this situation is better explained when expectations are modified so that they are simply of extrapolative nature (i.e. moving-average) compared with the baseline case where expectations are rational (even when the latter takes into account such factors as changes in risk-aversion) within a framework of the capital asset pricing model.
3. One estimate of the impact of this on house prices suggests that, assuming that the policy interest rate has been effectively lower by one percentage point, house prices in real terms would have been 3-5% higher, all else equal (Bjørnland and Jacobsen, 2009). Such a reduction in house prices would in turn have reduced credit to the household sector in real terms by more or less the same magnitude, according to estimates by Akram (2012).

4. In general, difference arises from: the method chosen, period under analysis, how the central bank's reaction function is quantified, assumptions regarding the length of the phasing-in period, etc.
5. These estimates of the effects from increasing risk weights on residential mortgage loans depend largely on the required equity return on such loans by banks. If the required equity return on mortgage loans is 30% then banks would have to raise mortgage rates by 0.5 percentage point; if the required equity return is 10%, they would need to increase residential mortgage rates by around 0.15 percentage point. This was calculated on the basis of several assumptions, such as the banks would keep their capital adequacy ratio at 10%, banks have ample access to capital, the funding structure for mortgage loans does not change, etc.
6. The increase in mortgage rates will be smaller if banks do not pass on all costs to residential mortgage borrowers. In the long run, it is expected that banks would adjust their lending rates across different loan products and the risk-adjusted returns on equity to different sectors would be approximately the same.
7. Covered bonds are debt obligations secured by a dedicated reference (or "cover") portfolio of assets, with the issuer remaining fully liable for all interest and principal payments. In the event of issuer default, investors have a preferred claim on the assets in the cover portfolio. In order to ensure that the payment obligations are sufficiently over-collateralised, issuers are obliged to immediately replace any nonperforming loans with performing loans. If these assets fail to generate sufficient cash flows upon liquidation to repay these investors, issuers may be fully liable up to their registered capital (IMF, 2011).
8. In Norway, each municipality decides whether to levy property tax (as distinct from wealth tax) and on which property to levy (e.g. only commercial property). The tax-assessed values are based on an assessment by the municipality and in most cases are lower than market values. The tax rate is set within the range of 0.2-0.7%, with standard tax value reductions and basic deductions being allowed. 45% of all municipalities levied a property tax on housing and vacant homes.
9. There are other measures which support housing demand in Norway. Housing allowance is a government-financed support scheme for partial coverage of housing expenses for households with low income. About 5% of households receive housing allowance each year and in average, each household receives NOK 2 200 per month.

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*Chapter 2*

# Entrepreneurship

*Innovation is often, and correctly, thought of as the source of productivity growth and thus of increases in material well-being. But innovation does not occur in a vacuum, it occurs in firms and organisations that bring together resources – people, knowledge, physical and financial capital – to undertake projects with uncertain outcomes. The people that bring together these resources, and take risks in doing so, are entrepreneurs, though not all of them successfully innovate. This chapter notes that entrepreneurship is useful in the private and public sectors and in both small and large firms, new and old. With its wealth, generous welfare system and even income distribution, Norway might not be a fertile ground for entrepreneurial risk taking. Indeed self-employment and new firm creation are relatively low in Norway, although the survival rate of start-ups is higher than in many countries. Policy in Norway avoids pursuing too specific industrial or employment targets. It mostly refrains from protecting uncompetitive industries, with the notable exception of agriculture. And judging by continuing productivity growth and fairly healthy rates of firm creation, outcomes are satisfactory, even though some countries appear to do better. Best practices for policy are often not clear, but policy can move incrementally towards improvement in the education and research systems, as well as re-evaluating the role of competition policy and public ownership.*

## The need for productivity growth

For many years the Norwegian economy has been boosted by its natural resource endowment – mainly petroleum (oil and gas) production, but abundant resources for hydro-electric power are also important. Hydro-electric power is a long-standing and durable advantage; petroleum resources, though of major significance, are temporary. Direct employment in petroleum extraction is not large, but a significant proportion of the mainland economy is sustained directly or indirectly by it.

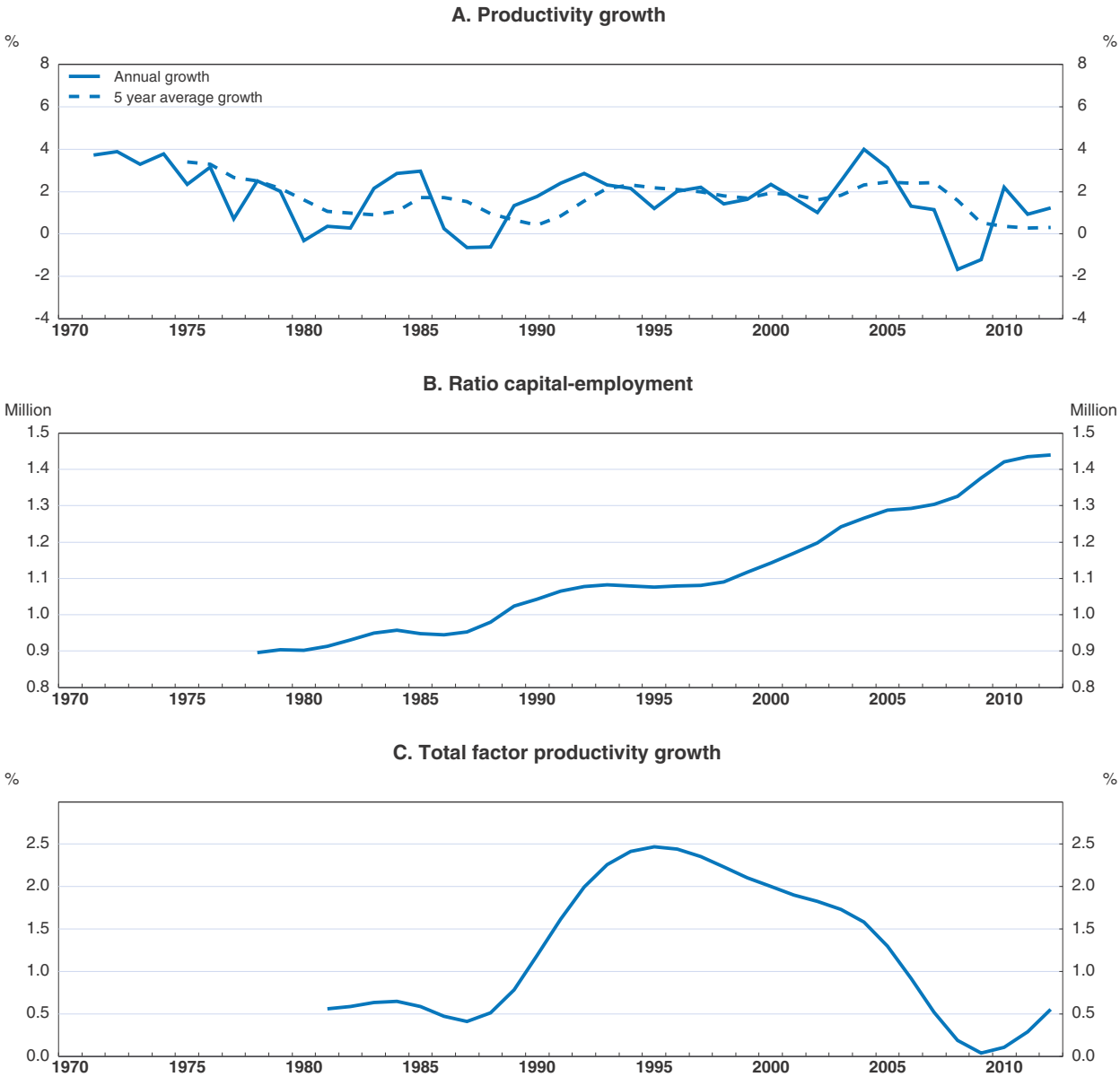
The danger that natural resource wealth would lead the rest of the economy to become "lazy" has largely been averted: labour force participation is high and unemployment low. On the other hand, the lowest average working hours in the OECD, a high level of registered disability in the labour force and a large and well-paid public sector are signs that the "Dutch disease" could be lurking if vigilance is relaxed or if the benefits of petroleum wealth were to diminish much more rapidly than expected, for example if energy prices fell sharply and for a sustained period. Productivity growth in the non-oil, so-called traditional sector has been quite good for much of the period since the 1980s and a number of new industries have grown up apart from petroleum, even though in many cases they are related to the petroleum supply sector.

The contribution of petroleum to income growth is set to decline, even as it is likely to absorb more resources needed to extract more marginal deposits. At the same time, the pattern of production in the economy is likely to need to change significantly, in addition to changes that would follow from changes in population, technology, tastes and the pattern of world trade and production. Mainland productivity growth has also shown some signs of slowing. Although this slowdown is perhaps largely due to the effects of the financial crisis and recession elsewhere, some countries have nevertheless done better in terms of underlying productivity growth, such as Sweden and the United States. The aim of this chapter is to look at entrepreneurship in Norway in the light of the need to maintain and improve productivity performance.

## Innovation and productivity

The 2007 *Economic Survey* of Norway noted an innovation "puzzle": while available measures of innovation and of expenditure on research and development indicated only mediocre performance, productivity growth was above average. With the benefit of hindsight it can be seen that a five-year average of labour productivity growth (whether defined for the whole economy or just the mainland) was at that point beginning to fall, after peaking in the early 1990s, even before the crisis hit (Figure 2.1). Good performance in 2004-5 was offset by a fall back in 2006-7. This was against a background of rising capital intensity, which should have meant growing labour productivity. The capital intensity increase of nearly 10% between 1998 and 2008 might normally be expected to generate an annual increase in labour productivity of around 0.3-0.4% relative to growth during the 1990s. It is this influence that means that Norway's performance on productivity adjusted

Figure 2.1. **Productivity growth: mainland economy**




*Note:* Total employment is on National Accounts basis.
*Source:* *OECD Economic Outlook Database.*

StatLink http://dx.doi.org/10.1787/888932998918

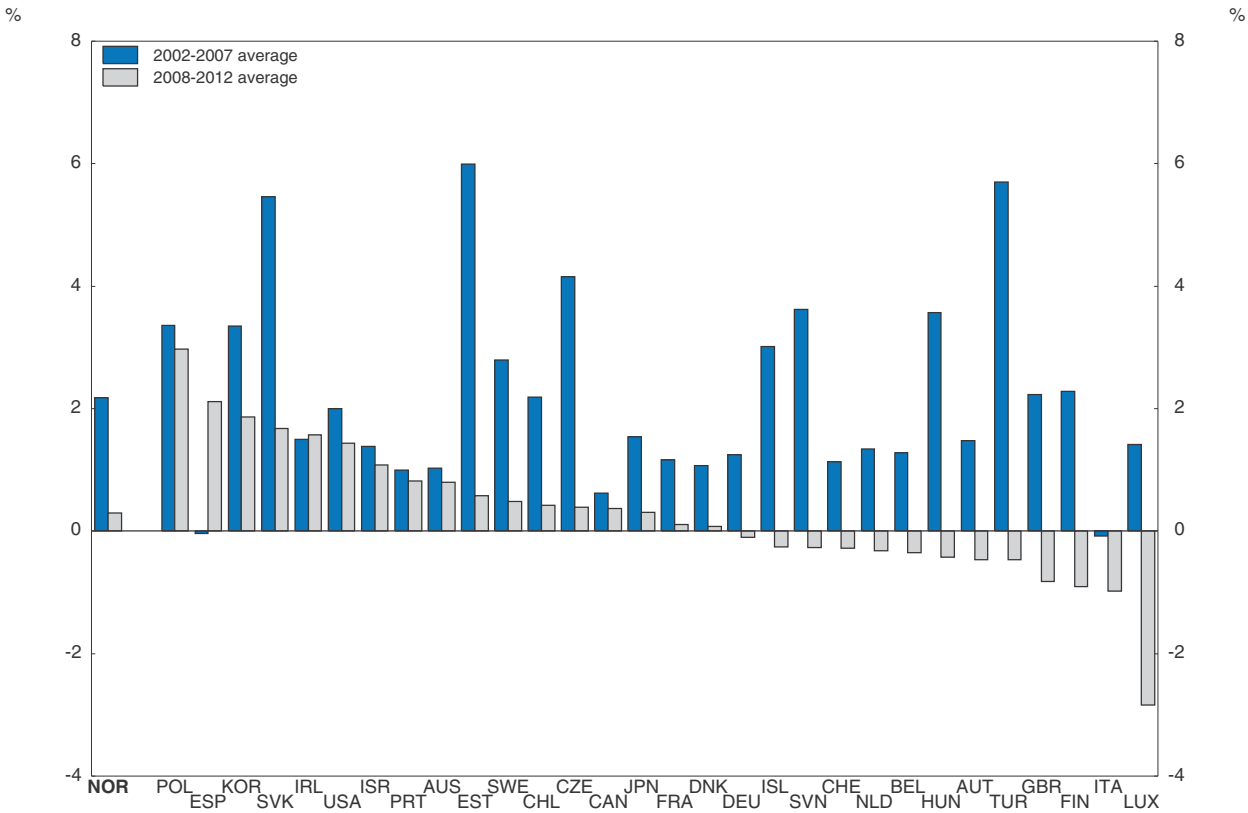
for the role of capital – total factor productivity (TFP) – is less favourable than a comparison of simple labour productivity (Figure 2.1 panel C).

Norway is not alone in experiencing a TFP slowdown. The recent productivity slowdown visible in Figure 2.1 is clearly related to the crisis. But other countries suffered similarly, and the slowdown in Norway seems to have been particularly acute given that overall growth did not seem to suffer as much from the crisis as in most countries (Figure 2.2). The recently issued OECD *Productivity Scoreboard* shows a slowdown in TFP for all G7 countries in the 2000s compared with the 1990s. Other interpretations of Norwegian

data are also possible. For example, the adjustment of whole-economy productivity growth for the impact of consumption of non-renewable resources, rather than separating out the offshore sector, provides another way of looking at the growth of productive potential and suggests no lower underlying growth in the 2000s compared with the 1990s (Box 2.1).

Figure 2.2. **Productivity growth before and after the crisis, OECD countries**

GDP per person employed, national accounts basis




*Note:* Norway, mainland GDP.
*Source:* *OECD Economic Outlook Database.*

StatLink http://dx.doi.org/10.1787/888932998937

This productivity story is not a clear indication of a pressing problem of entrepreneurship. Indeed, maintaining productivity growth in the mainland economy during a period in which the offshore economy was being developed and then yielding huge revenues is already a significant achievement, though perhaps itself owing something to the high levels of demand that the petroleum industry's development supported. It also required considerable restructuring of the economy away from some of its earlier mainstays such as shipbuilding and electricity-based processing towards serving the offshore industry.

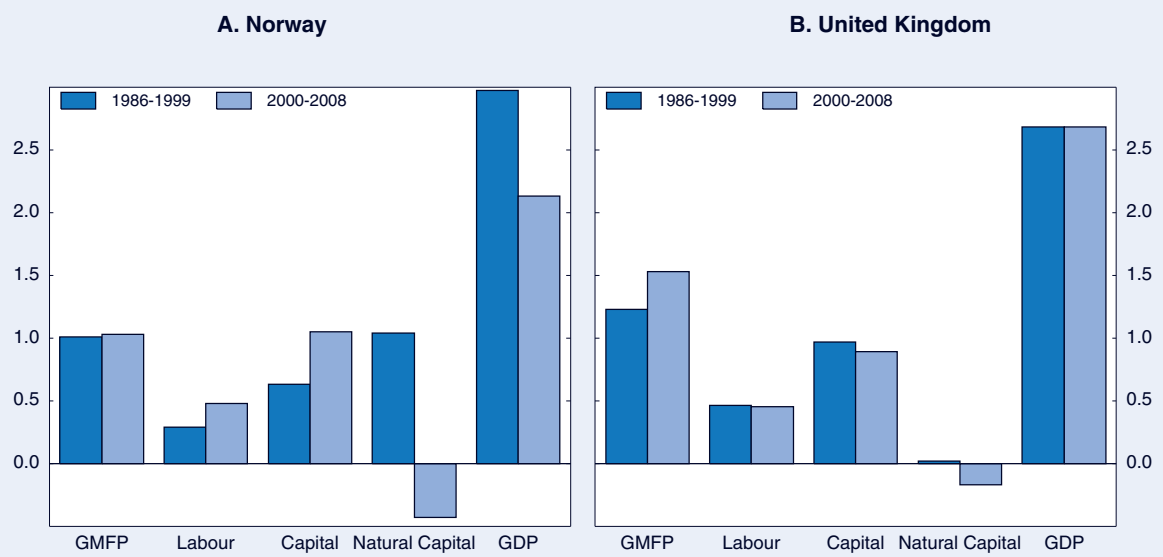
In Norway, past structural changes can be seen to have been associated with different models of entrepreneurship and different roles for public policy. Two important developments that illustrate this range were the development of the offshore industry itself and the growth of aquaculture (fish farming) (Box 2.2).

## Box 2.1. **Growth accounting and non-renewable resources**

To understand what drives economic development in Norway, it is interesting to look at a growth accounting exercise. Given the importance of oil and gas for the Norwegian economy, natural resources are explicitly taken into account as an input factor to understand their role for economic growth. From the mid-1980s to 2000 the growth contribution of natural capital was relatively large in Norway and turned negative thereafter, as oil reserves started to diminish (Figure 2.3). Although the growth contribution of other factors of production increased a little, GDP growth declined almost in tandem with the growth contribution of natural capital. This decline in GDP growth can, in fact, entirely be attributed to declining oil and gas production. Growth in generalised multi-factor productivity (GMFP; i.e. total factor productivity treating oil and gas as an input like labour and capital), was broadly unchanged. Still, one interpretation of the picture shown in Figure 2.3 would be that during times of resource abundance Norway did not invest sufficiently in other forms of wealth, such as human or physical capital, to maintain its ability to generate increases in income at the same rate as during times of resource abundance. Promoting innovation and entrepreneurship could help to attain higher productivity growth to make up for the vanishing growth contribution of gas and oil. The United Kingdom seems to have been able to maintain GDP growth across the two periods, despite a negative growth contribution of natural capital after 2000, by increasing productivity growth.

It should be noted that this picture does not change when taking into account that Norway has been investing a good part of its oil and gas revenues in foreign assets through its sovereign wealth fund, thus transforming natural into financial capital for the benefit of future generations. While the income generated from foreign assets does not contribute to GDP, it is included in national income (GNI). Yet, the average annual growth rate of GNI declined as much as the GDP growth rate over the two periods considered here. Income from foreign assets during times of resource abundance was not sufficient to make up for the declining rate of resource extraction. Accumulating financial assets with the revenues from resource extraction is one way to improve sustainability, but strengthening alternative, domestic sources of growth would be an important to increase incomes in Norway even further.

Figure 2.3. **Contributions to total GDP growth, Norway and United Kingdom**




*Note:* GMFP: Generalised multi-factor productivity.
*Source:* Brandt et al., 2013.

StatLink http://dx.doi.org/10.1787/888932998956

The offshore industry was very much guided by the state, following the setting up of Statoil in the 1960s and the intelligent use of exploration licences tied to use and development of Norwegian capacities. Although, according to Engern (2009), there was embryonic capacity in the private sector in the early 1960s, the creation of research and development and innovation capacity followed the same pattern of resources directed either directly by the state or by private and public sector companies following public policy incentives.

Aquaculture, on the other hand, was initially a bottom-up development which drew on both pre-existing academic research and trial and error by small entrepreneurs. At one point its development was being significantly slowed by regional policy considerations which aimed to keep individual firm size low and insisted on local ownership of facilities. When these restrictions were relaxed the industry became more capital intensive and, in parallel, governments put more public resources into the R&D effort. Its contribution to GDP is now greater than the caught fisheries or of agriculture. It should be noted that its success, while owing a lot to Norway's rare combination of many suitable sites and well-developed fishing industry, has also benefitted from some aspects of regulation, for example preventing fish farming installations being too close to each other, which appear to have avoided severe problems with disease that have afflicted other countries, notably Chile.

### Box 2.2. **Entrepreneurship in key sectors: Aspects of the development of the petroleum and salmon-farming sectors***

**Petroleum**

In the early 1960s, Norway had no oil industry, though 20% of the world's oil tanker tonnage was registered in Norway. Norway's shipbuilding industry had developed certain techniques that prepared it for building oil platforms, but little other expertise was in the country. Norsk Hydro, the only significant Norwegian company (with a majority of shares held by foreign, notably French, companies) in the energy exploration business, was planning to develop capacity for exploiting North Sea petroleum resources.

The Norwegian government adopted a strategy that allocated North Sea exploration and production concessions conditional on substantial utilisation of Norwegian companies and labour, even though Norwegian engineers were in short supply through to the 1980s. Such a policy had also been used in the development of hydro-electricity generation in the early 20th century; a major actor in that development is now the state-owned company Statkraft. By-passing Norsk Hydro, the government set up Statoil which became the dominant company in the sector (and in 1970 the government took a majority shareholding in Norsk Hydro, whose petroleum-related businesses were merged with Statoil in 2007). Very high profit margins allowed the sector to tolerate substantial cost overruns, until the 1980s oil price fall forced serious attention to cost-cutting. Significant direct involvement of the state-supported R&D effort did not develop until approximately this time. It can be argued that indirect state support was, and remains, substantial however (see below Box 2.4).

Around this core company, subcontracting construction and service companies developed, some of which originated in the shipbuilding sector, including some very large companies. It is estimated that supplying and maintaining the petroleum sector directly or indirectly accounts for around 8% of total employment.

**Salmon farming**

Salmon farming originated in the 1970s in independent small-scale experimentation in fishing communities. Though it partly followed experiments in other countries, such as Denmark, favourable geography helped it quickly to become a world leader. From grassroots origins, the industry became an instrument of public policy – in particular, regional policy – in the late 1970s: licensing was suspended in

Box 2.2. **Entrepreneurship in key sectors: aspects of the development of the petroleum and salmon-farming sectors*** *(cont.)*

1977 and then resumed under 1981 legislation that favoured small scale, locally-owned producers. A related approach still obtains in regulation of the caught fisheries (O'Brien, 2010). This contrasted with many other countries where larger, multi-plant firms operated, but did not prevent rapid expansion of Norwegian output.

In the early 1990s, licensing restrictions were changed to ease the establishment of multi-plant firms and in the following 10 years the share in gross output of the largest 10 firms rose from under 10% to 46% in 2001. This was achieved with many mergers and a number of closures of smaller producers, suggesting that policy had suppressed the 'natural' evolution of the industry, though many small enterprises still exist.

According to Aslesen (2009) innovation in the industry is still a relatively open process with both learning-by-doing and sharing of ideas and techniques, especially among the small scale enterprises, very common. Since the consolidation of the 1990s, gross output has continued to rise, approximately tripling in the decade to 2012. Employment fell for the first part of this period leading productivity to rise dramatically, unlike in the related agriculture industry, protected by high barriers to trade. However, since 2005 employment has been rising significantly.

* This box is largely based on Engern (2009) and Aslesen (2009).

### *Entrepreneurship and firm size*

The aquaculture industry was clearly a creation of small-scale entrepreneurs, even if there was a wave of amalgamations after the regulatory changes in the 1990s. This is in line with the idea that has become popular that innovation and employment creation occur disproportionately in small firms. Following this idea, many governments have developed policies that favour smaller firms in various ways, partly in the hope that such policies favour employment and productivity growth (partly also on the grounds that the regulatory burden of some modern economies can reasonably be differentiated between large and small firms).

Both Norwegian experience in the petroleum sector and recent academic work caution against the assumption that either productivity or employment growth is, at least in any simple way, promoted by policies that are specifically directed towards small firms. For example, Hurst and Pugsley (2011), looking at small firms in the United States, find that key characteristics of small firms are their relative concentration in certain industries and the absence of much desire to grow or innovate. Because new firms are almost necessarily small, it is generally quite difficult to identify distinct impacts from being small independently of being new, or vice-versa. Haltiwanger et al. (2013) show, also for the United States, that as far as employment creation is concerned, the important distinction is between new and old firms, not between small and large. New firms tend to create more employment than older ones but, apart from this effect, this work implies that small firms *per se* do not create much employment. Anyadike-Danes et al., (2013), on data for Norway and several other European countries and Criscuolo et al. (2014), using new OECD data, reach similar conclusions.

While job creation is important, it is insufficient in itself to provide higher overall living standards which have to come from increases in average productivity. More productive jobs in new firms is not the only way to achieve this, it could in principle come from productivity improvements in existing jobs even if new ones were generally of low

productivity. Some work on the United States has indeed argued that most "new" jobs occur in low productivity service sectors (Haltiwanger et al., 2013).

### *Creative destruction: Entrepreneurship, intrapreneurship and the public sector*

Creative destruction, the idea that economic growth may require some firms or even industries to contract or close in order to release resources for use in more efficient ways, is an important part of understanding the growth process, and is perhaps part of the reason for the focus on small firms and start-ups. However, there is no necessary reason why the process should not operate within existing large firms as well. Indeed, Norway shows some examples of how existing firms can adapt to changing circumstances. Norway's marine construction industry switched from being a major shipbuilder to now concentrating largely on oil installations (including, but not only, specialised ships). Many installations or firms closed (despite significant industrial aid programmes from the government) but some firms themselves changed and survived to form key companies in the current marine industry.

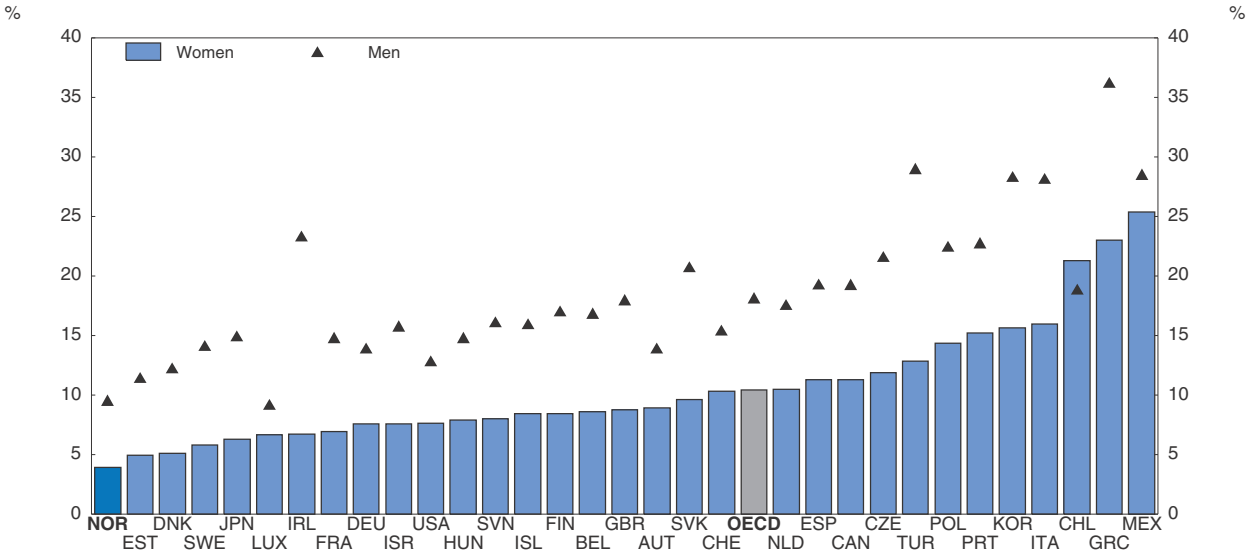
For existing companies to change, whether by changing their product mix, or geographical market or production technology, individuals within them have to have many of the characteristics of an entrepreneur in terms of identifying opportunities and bringing together the necessary resources and technologies. Such activity might be thought of as "intrapreneurship". Bosma et al. (2011a) refer to "entrepreneurial employees" rather than intrapreneurs, being those who "have a leading role in the creation and development of new business activities for the organisation in which they work". Such people might be less likely to put their own money at risk than entrepreneurs, although Bosma et al. (2011a) report that nearly half of the people identified as intrapreneurs say that they do so risk their money. Empirical work on entrepreneurship suffers somewhat from lack of clear conclusions and unanswered questions (see Terjesen et al., 2013), while that on intrapreneurship is even more sparse. The idea of intrapreneurship is nevertheless important, serving to guard against assuming that creative destruction can only occur through the creation of new legal entities. It is possible that spinoffs, an important source of innovative new firms, are – sometimes – a second-best response to initial intrapreneurial activity which meets unnecessary resistance in the originating firm.

It is clear that in Norway a variety of mechanisms are at work in generating industrial change and that the state is frequently involved. In some cases government is actively involved through specific companies, in others it acts to promote particular locations or kinds of firm (see Box 2.2). The public sector itself is very large in Norway, both directly through a large public administration and indirectly through state participation in a number of private sector companies. The public administration is not typically thought of as an area in which entrepreneurship is important. However, the definition of entrepreneurial employees quoted above as being those who "have a leading role in the creation and development of new business activities for the organisation in which they work" can be seen as having a role: while "new business activities" should not generally be the aim of the public administration, new and more efficient ways of carrying existing functions should be. This requires that (some) public sector employees share at least some of the characteristics that entrepreneurs or entrepreneurial employees in the private sector require.

## Are Norwegians entrepreneurial?

Academic work on the nature of entrepreneurship and any cross-country comparisons of its link with employment and growth has been plagued by difficulties of definition. Self-employment is one indicator of the extent of entrepreneurship. The self-employment rate in Norway reported in the OECD's publication *Entrepreneurship at a Glance*, is very low in comparison with other countries (Figure 2.4). It is even more so for females than for males, which might be surprising given the relatively low gender gap in Norway on other measures. Such cross-country comparisons of self-employment are subject to two key measurement difficulties. One is that self-employment status is sometimes favoured by tax and social security provisions, or other regulatory practices, which differ across countries. The other is that individuals who own all or part of a small firm may well be recorded as employees of the firm rather than as entrepreneurs.

Figure 2.4. **Self-employment as a percentage of total employment, 2011**[1]




*Note:* Countries are arranged in ascending order of the percentage of women who are self-employed.
1. 2010 for Chile.
*Source:* OECD, *Entrepreneurship at a Glance 2013*.

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The second key problem is that defining a start-up is difficult mainly because it can be difficult to distinguish a genuinely new company from a new legal entity which might arise, for example, from the spin-off of a division from a large company. Such spin-offs might be due to a variety of very different motivations, from a desire to separate the core company from loss-making activities or, on the contrary, to allow a potential growth centre to develop without the constraints of the larger firm. Eurostat has issued guidelines for national statistics offices in identifying genuinely new firms from others, but it is not clear to what extent the Norwegian statistics office or those of other countries have yet put them into practice.

It is difficult to provide more direct cross-country evidence on whether entrepreneurship is widespread in the population from official statistics. One source of cross-country information is the *Global Entrepreneurship Monitor*, which has collected

survey-based information for some years, including a one-off 2011 survey focusing on intrapreneurship (Bosma et al., 2011a; insufficient responses for Norway in this survey mean that no figures for Norway on intrapreneurship were published).

The *Global Entrepreneurship Monitor* (GEM) presents a more positive view of entrepreneurship in Norway than the self-employment figures. While entrepreneurial intentions are below average, the gap is not large, similarly for whether entrepreneurship is a good career choice (Table 2.1). "Necessity-driven" entrepreneurship is very low, which is not surprising given low unemployment. Despite a relatively low comparative assessment of their abilities as entrepreneurs, the proportion of Norwegians who report that fear of failure would stop them becoming an entrepreneur is not particularly high. Norwegians view their economy as being full of opportunities for entrepreneurs but they are among the most frequent in reporting that they do not feel they have entrepreneurial capabilities. Among comparable countries (those classified in the GEM as "innovation driven" countries, covering mostly, though not only, OECD countries), only Japan, Taiwan and Korea recorded self-perceived capabilities as low as in Norway, but in those countries perceived opportunities were also very low.

Table 2.1. **Entrepreneurial attitudes and perceptions in the GEM countries**

% of population aged 18-64

| | Perceived opportunities | Perceived capabilities | Fear of failure | Entrepreneurial intentions | Entrepeneur-ship as a good career choice | High Status to successful entrepreneurs | Media attention for entrepreneurship |
|---|---|---|---|---|---|---|---|
| Australia | 48 | 47 | 43 | 12 | 54 | 68 | 70 |
| Belgium | 43 | 44 | 41 | 11 | 64 | 55 | 47 |
| Czech Republic | 24 | 39 | 35 | 14 | | 49 | |
| Denmark | 47 | 35 | 41 | 7 | | | |
| Finland | 61 | 37 | 32 | 7 | 46 | 83 | 67 |
| France | 35 | 38 | 37 | 18 | 66 | 68 | 47 |
| Germany | 35 | 37 | 42 | 5 | 55 | 78 | 50 |
| Greece | 11 | 50 | 38 | 10 | 61 | 69 | 32 |
| Ireland | 26 | 46 | 33 | 6 | 46 | 83 | 56 |
| Japan | 6 | 14 | 42 | 4 | 26 | 55 | 57 |
| Korea | 11 | 27 | 45 | 16 | 61 | 67 | 62 |
| Netherlands | 48 | 42 | 35 | 9 | 83 | 67 | 62 |
| **Norway** | **67** | **33** | **41** | **9** | **53** | **80** | **60** |
| Portugal | 17 | 47 | 40 | 12 | | | |
| Singapore | 21 | 24 | 39 | 12 | 54 | 63 | 77 |
| Slovenia | 18 | 51 | 31 | 9 | 54 | 70 | 45 |
| Spain | 14 | 51 | 39 | 8 | 65 | 66 | 45 |
| Sweden | 71 | 40 | 35 | 10 | 52 | 71 | 62 |
| Switzerland | 47 | 42 | 31 | 10 | | | |
| Taiwan | 39 | 29 | 40 | 28 | 69 | 63 | 86 |
| United Arab Emirates | 44 | 62 | 51 | 2 | 71 | 73 | 63 |
| United Kingdom | 33 | 42 | 36 | 9 | 52 | 81 | 47 |
| United States | 36 | 56 | 31 | 11 | | | |
| Average (unweighted) | 35 | 41 | 38 | 10 | 57 | 69 | 58 |

*Source:* Bosma et al. (2011a).

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Table 2.2 presents a list of the kinds of skills entrepreneurs might need, while Table 2.3 presents an attempt to contrast the role of an entrepreneur with that of other actors needed for productivity growth.

Table 2.2. **Types of skills required by entrepreneurs**

| Technical skills | Business management skills | Personal entrepreneurial skills |
|---|---|---|
| Written and oral communication | Planning and goal setting | Self-control / discipline |
| Environment monitoring | Decision making | Risk management |
| Problem solving | Human resource management | Innovation |
| Technology implementation and use | Marketing | Persistence |
| Interpersonal | Finance | Leadership |
| Ability to organise | Accounting | Change management |
| | Customer relations | Network building |
| | Quality control | Strategic thinking |
| | Negotiation | |
| | Business launch | |
| | Growth management | |
| | Compliance with regulations | |

*Source:* OECD (2014); Hisrich and Peters (1992); OECD (2010); OECD (2012a).

Table 2.3. **Entrepreneur, intrapreneur or innovator, or ...?**

| | | Researchers (employees or academics) | Innovators | Entrepreneurs | Intrapreneurs (entrepreneurial employees) | Self-employed |
|---|---|---|---|---|---|---|
| Innovate | | No | Yes | Maybe | Maybe | Maybe |
| Invest | | No | Maybe | Yes | No | Likely |
| Employ | | No | Maybe | Yes | No | Maybe |
| Manage | | No | No | Yes | Yes | Yes |
| Deal with public administration | | Maybe | Maybe | Yes | Maybe | Yes |
| R&D | sponsor | No | No | Maybe | Maybe | Unlikely |
| | conduct | Yes | Likely | No | Maybe | Maybe |
| Risk own cash | | Unlikely | Maybe | Yes | No[1] | Yes |
| Risk other | | No | Yes (time, status…) | Maybe | Yes (career path, status…) | Maybe |
| Key skills, (relative to typical salaried employee) | | Technical | Technical | Managerial, financial, vision | Managerial, vision | Financial |
| Contribution | | New knowledge | New products, techniques | More, better, or lower-cost, production | More, better, or lower-cost, production | |

1. Bosma et al. (2011) shows that intrapreneurs report that they take financial risk.

**How to read this table:** the entry in each cell indicates to what extent the actor in the column is, or is not, concerned by the activity or characteristic in the row. Thus, Entrepreneurs and Self-employed risk their own money but Intrapreneurs probably do not and researchers would be unlikely to. Entrepreneurs may sponsor R&D but will not do it themselves, while for Innovators the opposite is likely true.

Education has a potential role in developing entrepreneurship, though it may be hard to assess how much attention to entrepreneurship, compared with other educational objectives, is appropriate. Norway has had a specific strategy for Entrepreneurship in Education since 2004 (Box 2.3).

### *Incentives*

Probably the two key characteristics of entrepreneurship are: i) the bringing together of people and resources to produce something that the individuals could not do on their own; and ii) the taking of significant risk in doing so. In both cases, the decision to take up entrepreneurship is likely to respond to incentives to take risk as opposed to the "safe" option. If the safe option is thought of as regular employment, in Norway the level of

### Box 2.3. **The Norwegian Action Plan for Entrepreneurship in Education and Training**

A programme to promote entrepreneurship in education was first set up in 2004 and renewed in 2009. One definition of what is concerned is the following: "Entrepreneurship is a dynamic and social process where individuals, alone or in collaboration, identify opportunities for innovation and act upon these by transforming ideas into practical and targeted activities, whether in a social, cultural or economic context." By contrast with e.g. Table 2.3 above, this definition emphasises innovation as a necessary component with less specific mention of the co-ordinating and risk-taking role of an individual entrepreneur.

The approach differentiates between compulsory education and post-secondary education, with the main emphasis being in the latter.

In compulsory education the key approach is to develop entrepreneurship awareness programmes, at the discretion of individual educational institutions, for example through the Norwegian branch of the European Junior-Achievement – Young Enterprise (JA-YE) programme. One programme, the Company Programme, is quite widely used in Norway and involves teams of students role-playing in setting up and developing company and reporting to shareholders. According to JA-YE Norway, students who have followed the company programme are around 50% more likely to eventually start their own business than others, although there may be some self-selection bias in this result.

In secondary and post-secondary vocational education guidelines require entrepreneurial skills to be included as part of the instruction.

In higher education, the Action Plan has both taken the form of including short entrepreneurship-related modules, or full semester courses, in many degree programmes and the setting-up of specific courses in entrepreneurship including at masters level. For example, the Norwegian Technical University in Trondheim offers a 2-year masters course in which teams of students have the opportunity to commercialise a technology-based product that they develop themselves.

unemployment indeed makes it relatively safe. However, the relatively flat wage distribution, and the high degree of income redistribution (especially through the free provision of key public services such as health and education) mean that the material returns to skill and effort as an employee are relatively low. Although average taxation is relatively high because of high public expenditure, the income tax system is not particularly progressive so would not excessively penalise high incomes; in fact, since parts of entrepreneurial income are taxed at a lower rate than earnings the reverse may be the case (Berglann et al., 2011). The wealth tax penalises (successful) entrepreneurs to some extent though it is better thought of as penalising saving rather than profits themselves.

Necessity driven entrepreneurs may be relatively few in Norway because of low unemployment, but people do respond to the incentives generated by the threat of unemployment or unemployment itself. Displaced workers – those whose firms become bankrupt – are twice as likely to try entrepreneurship as other workers, an effect which is felt not only once the original firm has closed but also in the period prior to bankruptcy (Røed and Skogstrøm, 2010).

The phenomenon of "entrepreneurial dropouts" is also interesting. Another study provides an interesting perspective on the role of education in Norway. In many countries,

self-employment rates are highest at the tails of the education distribution i.e. among both the highly educated and the least educated (Blanchflower, 2000). Looking at entrepreneurs in Norway, Skogstrøm (2012) finds that a fraction of high-ability people, who would stand to benefit significantly from following through to reach a high educational level, instead choose to drop out of education and become entrepreneurs. Skogstrøm analyses the phenomenon in terms of a labour market signalling model: high-ability dropouts may leave education because they find that the school system does not "recognise" their ability. There may be many possible reasons for this, for example Skogstrøm cites studies showing that dyslexia is much more common among entrepreneurs than among managers.

This is particularly interesting as the dropout rate in Norwegian education, especially upper secondary, is surprisingly high, has been noted in previous *Economic Surveys* (OECD, 2008; Boarini, 2009). This is a priority concern for the Ministry of Education, and is one of the issues that has arisen most frequently in Norwegian discussions of the Skills Strategy (OECD, 2014). Generally, the concern has been to reduce the dropout rate so that young people will be better prepared for the labour market, implicitly as employees. The phenomenon of "entrepreneurial dropouts" suggests that entrepreneurship should also be taken into account.

The newly published OECD data on adult skills is particularly interesting in this context. The PIAAC (Programme for the International Assessment of Adult Competences) data show that Norwegian adults score much better, relative to those in other countries, than might be expected from the PISA assessments of children at age 15, especially given the high dropout rates of young people in the years after the age of PISA assessment. Norwegians rank fifth and sixth for literacy and numeracy respectively, and fourth for "problem solving in technology-rich environments". The better relative performance under PIAAC than PISA is hard to explain with existing knowledge but something in the tertiary and post-secondary education systems, or the cultural background would appear to be offsetting what might be expected to follow from PISA data. Indeed, PIAAC data also show high participation (the highest in the PIAAC sample of countries) in education and training among those adults with low proficiency in literacy, numeracy and problem solving. The good performance in "problem solving in technology-rich environments" is interesting alongside Norway's very rapid adoption of ICT in all walks of life but especially in public and private services.

Another interesting aspect of entrepreneurship in Norway is that the share of entrepreneurs who are female is low, even though in many other domains the gender gap is relatively small, partly due to active policies such as requiring a 40% share of females in listed company board members. The share of females in entrepreneurship varies according to precisely what is being measured. Berglann et al. (2011) report that, while 13% of males qualify for their definition of entrepreneurs, this was true of only 4% of females. This definition covers not just the self-employed but those who have a significant ownership interest in a firm that they themselves effectively manage (in some cases as employees); but it does not cover intrapreneurs (i.e. employees who have no ownership interest). The dataset is also unusually comprehensive being based on administrative sources rather than sample surveys. Labour force survey data for 2012 show that 3½ per cent of females were self-employed as opposed to just over 9% of males. Finally, according to Goduscheit and Norn (2011), while female entrepreneurship is generally rising in many countries, it has been stable for some time in Norway. For the moment, whether this is a matter of education or because conditions for female entrepreneurs in Norway are relatively worse

than in many other countries, or because other more favourable factors such as generous maternity leave and the wide availability of part-time work, is a matter of speculation.

### *The origins and performance of entrepreneurs*

Berglann et al. (2011) provide a wealth of information on the personal characteristics of entrepreneurs in Norway. The sample is large, effectively covering the entire working age population. In addition to descriptive statistics on actual entrepreneurs it can throw light on the decision to take up entrepreneurship by looking at transitions between employee status, unemployment and entrepreneurship. According to this research, "… Entrepreneurship tends to be profitable. It also raises income variability, but the most successful quartile gains much more than the least successful quartile loses. Key determinants of the decision to become an entrepreneur are occupational qualifications, family resources, gender, and work environments. Individual unemployment encourages, while aggregate unemployment discourages, entrepreneurship."

As regards the influence of education, the level of education reached seems much less relevant than the differences in entrepreneurship rates according to subject studied. Entrepreneurship rates are highest among those who study dentistry, veterinary science and hairdressing, and the lowest among PhDs (though this last observation is undifferentiated across subject). Among those who study at masters level, entrepreneurship is higher among "engineers, architects, etc." than among those studying "business and administration", which is in turn higher than among scientists (including computer scientists) and mathematicians. As Figure 2.5 shows, relatively few recent graduates in Norway have specialised in areas thought to be those which increase the degree of research and innovation in the economy. As far as promoting entrepreneurship is concerned, i.e. an environment within which innovators can operate, from the Berglann et al. (2011) results it would be ambiguous whether promoting STEM or business studies students would be more effective.

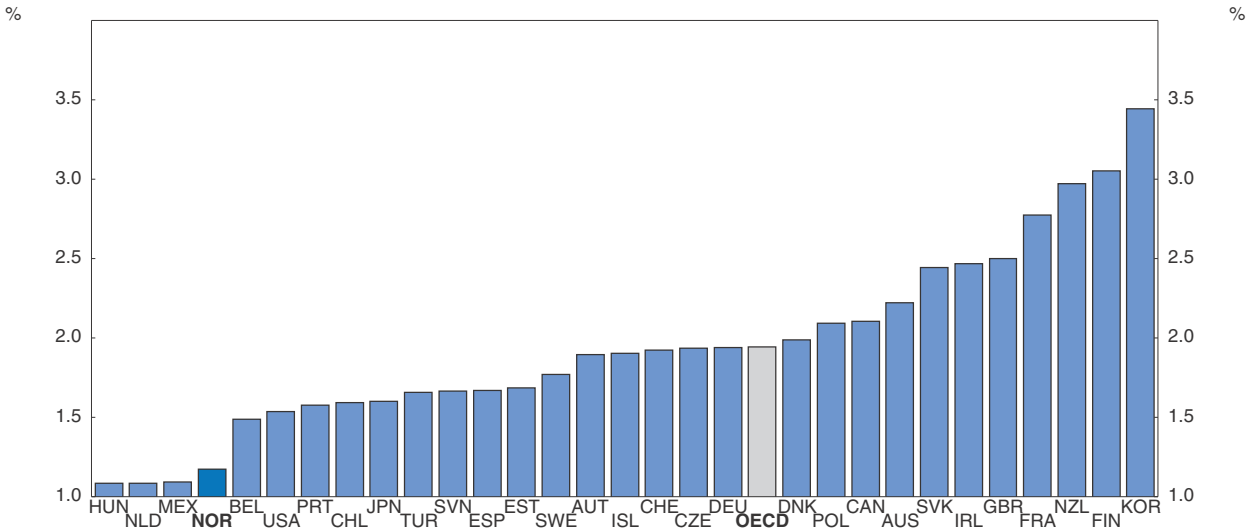
The results on the influence of education from the econometric analysis of Berglann et al. (2011) are broadly similar – but not identical – to a comparison of subjects studied by entrepreneurs identified in a recent Statistics Norway study (Table 2.4). There is a striking difference between males and females, however. Female entrepreneurs are much less likely than males to have a technical or scientific education, but more likely than males to take up entrepreneurship given that they have a humanities or social science background. It seems unlikely that this implies that such courses are specific preparation for entrepreneurship. Also, it would appear that females who have a business and administration background are more likely than males with the same background to become entrepreneurs. This may be a sign that females more than males have entrepreneurship already in mind in when choosing their studies.

Other notable impacts of family circumstances are the strong influence of having an entrepreneur parent and the complicated influence of income and wealth on transitions into entrepreneurship. A wife's wealth has a significant positive impact on male entrepreneurship, but the husband's wealth has a very small influence on female entrepreneurship – for unemployed females the influence is (insignificantly) negative.

Although the dataset used in Berglann et al. (2011) is one of the most comprehensive available, many of its conclusions are suggestive of further work being needed. For example, while the econometrics is able to identify a number of statistically significant

Figure 2.5. **The share of STEM graduates is low**

Share of total employment of persons aged 25-34, 2010[1]




*Note:* Scientific fields include life sciences; physical sciences, mathematics and statistics, computing; engineering and engineering trades, manufacturing and processing, architecture and building.

1. For Australia, Canada and France: data refer to the year 2009.

*Source: OECD Education at a Glance 2012.*

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Table 2.4. **Education field of entrepreneurs at start-up compared with the reference population (in 2011)**

| Education field | Male entrepreneurs (%) | Female entrepreneurs (%) | All entrepreneurs (%) | Population (%) |
|---|---|---|---|---|
| General programmes | 23 | 25 | 24 | 46 |
| Humanities and arts | 3 | 10 | 4 | 4 |
| Teacher training, social science, law | 4 | 11 | 7 | 6 |
| Business and administration | 17 | 21 | 18 | 9 |
| Natural sciences, vocational and technical subjects | 42 | 6 | 36 | 22 |
| Health, welfare and sport | 4 | 18 | 6 | 7 |
| Primary industries | 3 | 1 | 2 | 2 |
| Transport and communications and other services | 4 | 9 | 5 | 3 |

*Source:* Statistics Norway.

**How to read this table:** 9% of the population with a tertiary education studied business and administration, while 18% of entrepreneurs (17% for males, 21% for females) with a tertiary education studied business and administration.

StatLink http://dx.doi.org/10.1787/888932998310

influences on entrepreneurship, especially on transitions between employment or unemployment and entrepreneurship, such equations "explain" only a minute proportion of the variation in the data. And many of the "influences" identified are likely to be mixed up with descriptive characteristics of different industries. This includes, for example, the high rate of entrepreneurship among hairdressers and the fact that the rate of transition from employment to entrepreneur among those employed in construction or private services is higher than in manufacturing (these gaps are much smaller for females than for males).

### *Entrepreneurial income*

The success of a decision to take up entrepreneurship is not necessarily the same as the success of the undertaking itself. Berglann et al. (2011) used a dataset monitoring the incomes of all Norwegian individuals who became entrepreneurs in the year 2000 for the following 6 years. They are compared with the average incomes of a control group based on personal characteristics. This dataset provides evidence that for the unemployed, starting one's own business can be a route into subsequent employment, even if the business itself fails. Average incomes over time for those whose start-up fails do fall slightly behind those of non-entrepreneurs of similar background, however, though the variance is high.

Successful entrepreneurs more than make up for the small average losses of the others. This is especially true for those for "pro-active" entrepreneurs (those who leave employment to start a business, as opposed to the "reactive", who move from unemployment to entrepreneurship). It seems to be more rewarding to set up a company than to be self-employed. For at least half the people trying entrepreneurship, incomes remain within about 10% of the average incomes of a control group. But the top decile receives incomes at least 50% higher than the control group.

Another interesting difference between males and female entrepreneurs in the group investigated by Berglann et al. (2011) is that the distribution of entrepreneurial incomes is much wider among males than females. The most successful males earn more than the most successful females, but the least successful males do worse than the least successful females.

### *Enterprise creation*

Entrepreneurship is not all about starting new companies but this is likely to be an important indicator. OECD data on start-up rates show that firms up to 2 years old represent about 12% of all firms in Norway, compared with between 15 and 20% in countries such as Sweden, Austria and New Zealand (Figure 2.6). Of the 15 countries in the OECD Dynemp project, only Italy and Japan have lower start-up rates. The number of start-ups declined since the recession, a phenomenon common to all countries.

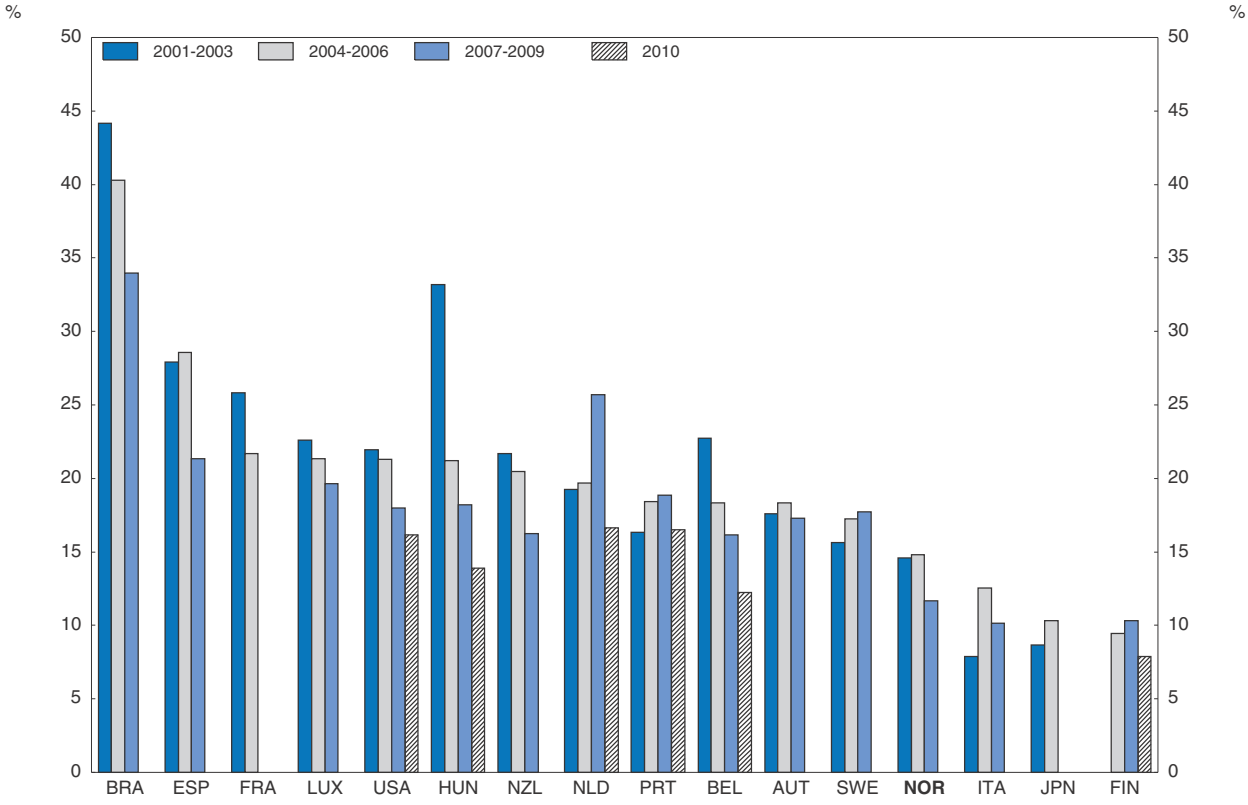
## The performance of start-ups

The performance of firms themselves is probably more relevant for overall economic performance than outcomes for individual entrepreneurs. High survival rates, or high growth among survivors, could compensate for relatively low firm creation. Few start-ups or small firms are very successful at growing. Across most countries, around 98% of start-ups with less than 10 employees still have less than 10 employees after 3 years, and around 20% have ceased activity. In certain countries, notably the United States, the Netherlands and Japan, the rate of exit is more like 30% or higher.

Given the observation that by no means all small companies or start-ups play a key role in the innovation process, attention is often focused on very high growth start-ups, or "gazelles". Their number is small in absolute terms in all countries, but Norway has somewhat fewer of them than other countries (Figure 2.7).

Data suggest that Norwegian start-ups are larger than in many other countries, especially in the manufacturing sector (Figure 2.8). This may influence the frequency with which gazelles are observed, if Norwegian firms start nearer their desirable size than in other countries. Alternatively, a spurious statistical effect may be the explanation; data

Figure 2.6. **Norway has a lower start-up rate than many countries**




*Note:* The graph reports country averages in start-up rates (defined as the fraction of start-ups among all firms) over the indicated periods. Start-up firms are those firms which are from 0 to 2 years old. The period covered is 2001-11 for Austria, Belgium, Finland, Hungary, the Netherlands, Norway, and the United States; 2001-10 for Brazil, Spain, Italy, Luxembourg and Sweden; 2001-09 for Japan and New Zealand; 2001-07 for France; and 2006-11 for Portugal. Sectors considered are: manufacturing, construction, and non-financial business services. Owing to methodological differences, figures may deviate from officially published national statistics. One-employee and short lived firms (which enter and exit in the same year) are excluded. Differences in accounting for mergers and acquisitions may influence the determination of firm age. For Japan data are at the establishment level, for other countries at the firm level. For further details on the OECD *DynEmp* project, see Criscuolo et al. (2014).

*Source:* Preliminary results from the OECD DynEmp project, as reported in Criscuolo et al., 2014.

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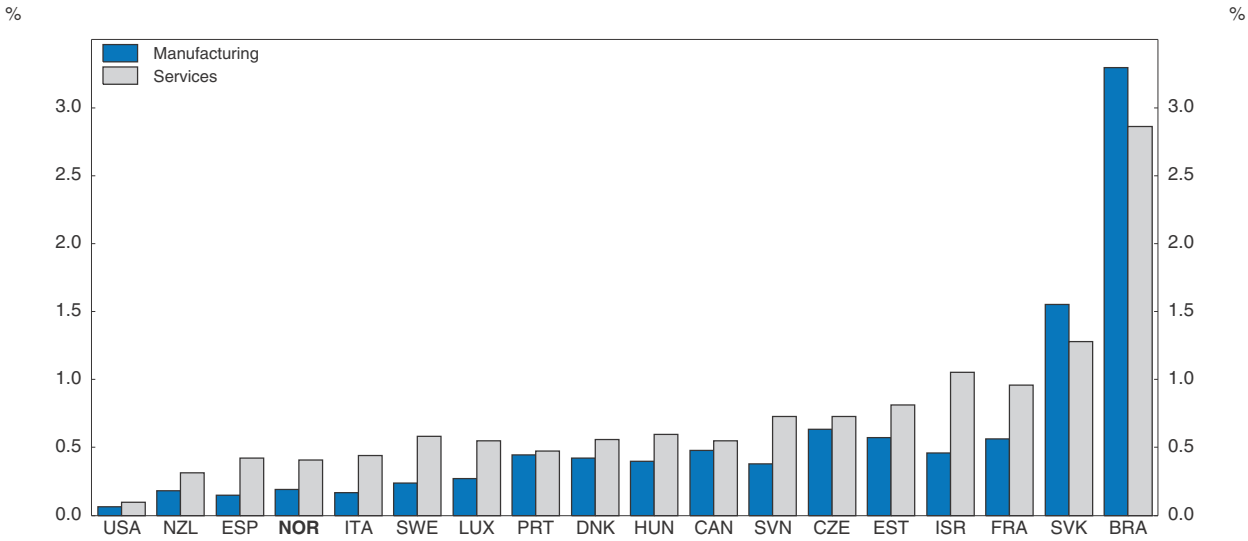
limitations mean that firms are classified into size groups and gazelles are defined as firms that change group rather than which exceed a certain growth threshold. In a cross-country study (Anyadike-Danes et al., 2013) of one particular cohort of firms (set up in 1998) there is evidence that size at start-up is correlated with survival (Table 2.5). There was a tendency in all countries for firms in that study that survived ten years to have had above-average employment at start-up. It is possible that this is because some of the larger start-ups are in fact spin-offs from existing firms with some advantages in human capital or marketing that gives them better survival chances. Average employment *growth* of survivors in Norway is somewhat lower than in the other countries except for Sweden, corroborating the evidence on gazelles.

Other evidence suggests that survival rates among start-up are relatively high in Norway. According to OECD *Entrepreneurship at a Glance*, in most countries at most 50% of start-ups from the years 2004-06 are still trading five years after their creation. This period

Figure 2.7. **Number of gazelles**[1]

As a percentage of enterprises with ten or more employees, 2010[2]




1. Gazelles are enterprises that have been employers for a period of up to five years, with average annualised growth in employees greater than 20% a year over a three-year period and with ten or more employees at the beginning of the observation period.
2. Or latest available year. 2006 for Norway. For Denmark, Slovenia and Sweden, figures refer to 2007. For Brazil, Canada, Estonia, and Slovenia, figures refer to 2009.

*Source:* OECD, *Entrepreneurship at a Glance 2011*, 2012 and 2013.

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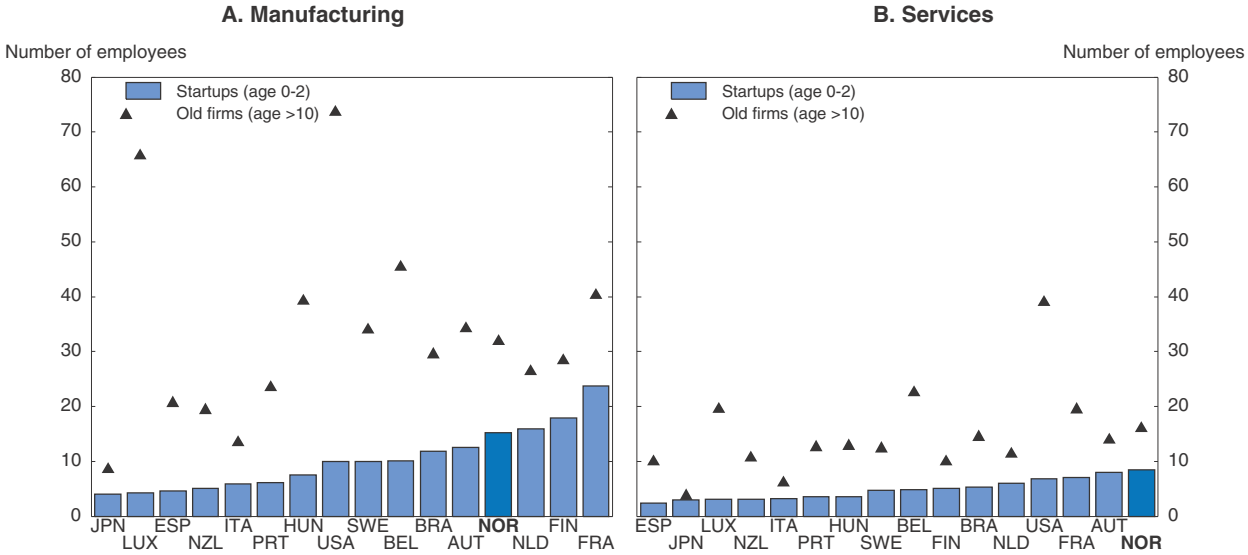
Figure 2.8. **Norway has relatively large startups**




*Note:* The graph reports the average size of start-up firms (from 0 to 2 years old) and firms more than 10 years old, as the average over the available years. The period covered is 2001-11 for Austria, Belgium, Finland, Hungary, the Netherlands, Norway, and the United States; 2001-10 for Brazil, Spain, Italy, Luxembourg and Sweden; 2001-09 for Japan and New Zealand; 2001-07 for France; and 2006-11 for Portugal. Sectors considered are: manufacturing, construction, and non-financial business services. Businesses never growing above one employee and those living only for one year are excluded. Owing to methodological differences, figures may deviate from officially published national statistics. For Japan data are at the establishment level, for other countries at the firm level.

*Source:* Preliminary results from the DynEmp project (Criscuolo et al., 2014).

StatLink http://dx.doi.org/10.1787/888932999051

Table 2.5. **Jobs per firm created in 1998, selected countries**

Austria, Finland, Germany, Norway, Sweden, United Kingdom

| | Average size at birth (1998) persons | Surviving firms at birth persons (2) | Surviving firms in 2008 persons (3) | Col. 3/Col. 2 | Growth rate of survivors per cent |
|---|---|---|---|---|---|
| Austria | 3.4 | 4.5 | 7.7 | 1.71 | 5.5 |
| Finland | 2.6 | 4.5 | 9.1 | 2.02 | 7.3 |
| Germany | 3.1 | 3.7 | 6.9 | 1.84 | 6.3 |
| **Norway** | **9.0** | **11.4** | **17.4** | **1.53** | **4.3** |
| Sweden | 7.1 | 10.2 | 13.6 | 1.34 | 3.0 |
| United Kingdom | 4.7 | 5.5 | 11.3 | 2.06 | 7.5 |
| Memo: Norway, data by person[1] | 8.2 | 10.6 | 16.1 | 1.51 | 4.3 |

1. The memo item uses an alternative calculation method feasible only with the Norwegian data. See source.
*Source:* Anyadike-Danes et al. (2011).

StatLink http://dx.doi.org/10.1787/888932998329

includes the recent severe recession but the figure is similar for Australia, where, as in Norway, the impact of the recession was less than elsewhere. *Entrepreneurship at a Glance* does not cover Norway for this statistic, but data from Statistics Norway suggests that even the 7-year survival rate is just above 60% (Fjaerli et al., 2013). Hence, the picture is indeed that while firm creation is lower in Norway than elsewhere, new firms are on average somewhat more resilient.

### *Productivity performance*

As mentioned earlier, employment growth – which forms the basis of most comparisons of start-up dynamics, is not necessarily the main issue. If only one of employment and productivity growth is higher in new firms than in existing firms, their contribution to overall productivity growth is ambiguous. In fact some data suggests that new firms in Norway do show both faster employment growth and faster productivity growth than existing firms. Taking firms that were first active in 2001, by 2011 the value added per employee among survivors – firms still trading under the same administrative identifier – had risen by 20% relative to existing firms.

However, only 60% of 2001 start-ups survived until 2011. If all of those who exited had simply ceased trading and their employees were not employed elsewhere, the overall impact on productivity of that cohort of start-ups could be negative. The overall impact on productivity depends on the reason for exit from the register since exit does not necessarily mean that employees and equipment become idle. Of firms that exit the business register each year, about one third are voluntarily dissolved and a slightly smaller proportion are bankruptcies. Less than 10% are taken over as going concerns. About half of those that exit do so for unknown reasons. Those formally taken over would have to have extremely high productivity growth to tip the balance on their own. But some bankruptcies and voluntary dissolutions may also be a means for parts of start-ups to continue in activity within other firms, so a definitive answer on the direct overall contribution of start-ups to productivity remains elusive.

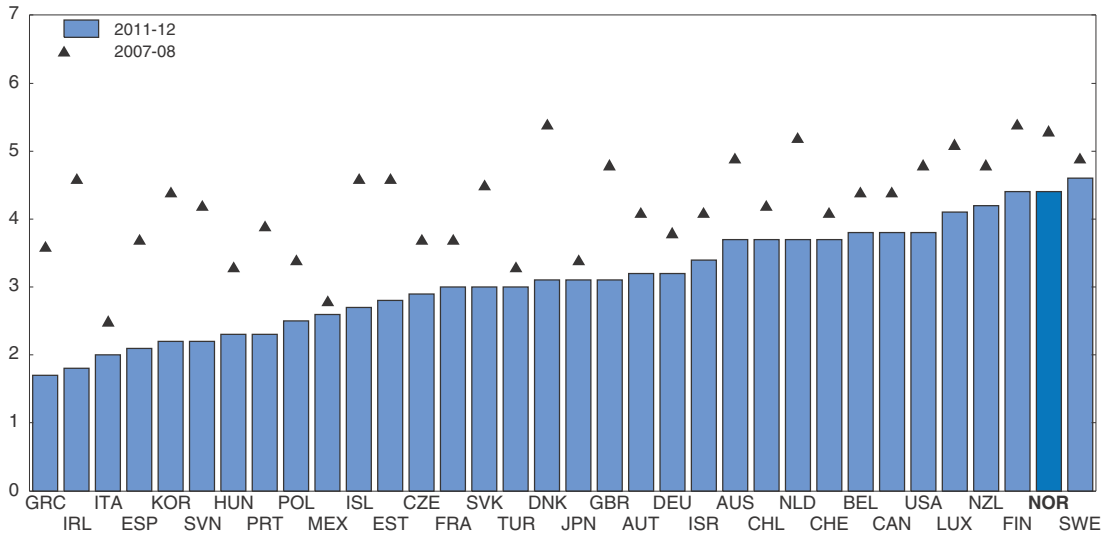
## Finance for growth

In surveys of views on constraints on growth, representatives of small and medium-sized enterprises typically argue that insufficient finance is available; Norway is no exception. Since the Norwegian domestic market of no more than 5 million people is quite

small, it would not be surprising if finance for very small, domestically oriented companies were somewhat restricted. Indeed, the overall rate of new enterprise creation is low compared with other countries (see Figure 2.6). The relatively high level of employment in start-ups (see Figure 2.8) might suggest that finance is not too problematic, given that it is above that in the average of OECD countries for which information is available. This would suggest that initial finance is not a crucial stumbling block, though one possibility is that financial constraints make it difficult for very small companies, hence the high average size of start-ups. According to a survey of access to loans, Norway is indeed well-placed compared with other OECD countries. Along with Sweden and Finland, Norway comes at the top of the ranking for ease of access in 2011-12 (Figure 2.9). Norway was relatively little affected by the recession from this point of view; prior to the recession other countries such as Ireland and the Netherlands ranked similar to or above Norway, and there were a large number of countries quite close which have also fallen much further behind.

Access to bank loans may be suitable when a business has physical collateral to post as security (for example for businesses such as hairdressing where the high level of entrepreneurship has been noted) but less relevant for start-ups where knowledge-based capital is more important. In these cases, start-up finance – "seed" money – beyond the

Figure 2.9. **Ease of access to loans, 2007-08 and 2011-12**




*Note:* Scale from 1 to 7 from hardest to easiest, weighted averages.
*Source:* *OECD Science, Technology and Industry Scoreboard 2013.*

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entrepreneur's own resources, or family and friends, is sometimes provided by venture capital investors. It does seem that seed money may be one area where finance is difficult in Norway. A report on private equity funds by the Norwegian Venture Capital Association shows that almost no private equity investment is seed money for completely new start-ups (NVCA, 2012). Instead, between one quarter and one third of private equity investment is in the "venture" stage, when successful start-ups are looking to expand, with the rest – twice as much – being "buyout" finance. The funds put into a typical buyout are a multiple

of that at the venture stage, however: in terms of the number of projects, the venture stage dominates buyouts by about five to one.

With nearly 50 private equity firms active in Norway and a reasonably competitive banking system, it is unlikely that the infrastructure of financing for entrepreneurship is a problem. The one public scheme that aims directly at finance for entrepreneurship is therefore focused on start-ups through a start-up grant scheme, run through Innovation Norway, whose funding was strengthened in 2013. Wilson and Silva (2013) summarise evidence that public stakes in equity instruments can increase the overall supply of venture capital funds but that it is important that individual public stakes not be too high lest private finance be crowded out; a "commonly held view" is that 50% should be the limit on a public stake (EVCA, 2005; Wilson and Silva, 2013).

The supply of finance from Norwegian personal investors may be affected by the tax system. As previous Economic Surveys have pointed out, although the income tax system is well-structured and not strongly progressive, the wealth tax theoretically penalises saving very significantly, except if that saving is directed into residential housing (Denk, 2012; chapter on capital taxation in OECD (2012b); and Chapter 1 of this Survey). Steps have been taken to reduce (but not eliminate) the favourable treatment of housing in the wealth tax, and the new government has reduced the wealth tax rate from 1.1% to 1.0% in the 2014 budget.

Another indirect impact from the tax system likely affects the allocation of expenditure on research and development although it is less clear how it affects entrepreneurship. The special petroleum tax regime raises the marginal tax rate in that sector to around 80% or more (Box 2.4). Expenses such as R&D are deducted from pre-tax income in calculating the tax liability so in a sense there is a tax subsidy to such expenditure.

The petroleum tax regime does not give any final subsidy for R&D devoted to petroleum extraction in Norway, since the returns will also face the same high tax rate. But R&D that leads to results that can be used in other industries, or in the petroleum industry abroad, does receive an implicit subsidy. Although potentially inefficient, this may not be the worst way to spend petroleum revenue. There can be spillovers from the development of R&D capability itself and, even if petroleum production in Norway is set on a long-term decline, it remains by far Norway's most important industry and improved techniques can create high returns. As discussed earlier (see Box 2.2) path-dependency characterises the evolution of Norway's industrial structure, so the development of a cluster of activity around the petroleum industry is to be expected. Measured total R&D expenditure, despite this potential effect (and some other measures, see Box 2.5) is a relatively low, and fairly stable, share of GDP by international comparison (Figure 2.10).

It is also striking that use of private equity funds in the petroleum industry is particularly intensive; it is centred around buyouts. Measured by number of investment projects in 2011-12 the three most important sectors by number of private equity investments were Information Technology (IT), Clean Technology and Communications (Figure 2.11). Most of these were follow-up investments. The number of investment projects in IT (similar to the number in Clean Technology) was 3 times the number in Petroleum. But when ranked by the amount of money invested, the Petroleum sector was more important than IT and Clean Technology combined, and nearly all such investment

Box 2.4. **R&D expenditure in the petroleum industry: Heavy state support or rational use of resource rent?**

Central government direct support for innovation or R&D expenditure comes either through Innovation Norway, which provides project related financial grants, or Skattefunn which provides grants* through the tax system. Innovation Norway, brings together a number of separate programmes that were previously implemented through separate institutions but which retain a degree of "tied" funding, concerning agriculture and regional support, for example.

In the petroleum extraction industry the effective rate of deduction for R&D and other expenditure is much higher than this. This is because the effective tax rate on earnings (through a 50% tax on income from petroleum production but also through government "participation" fees) is much higher than the standard 28% tax rate on profits. For each NOK 100 spent on R&D (as indeed any expenditure that counts as a current cost), tax liability is reduced by around 80 NOK. Hence the post-tax cost of carrying out R&D expenditure in Norway is much lower for companies subject to the petroleum tax regime, including foreign companies, than for "normal" Norwegian companies.

Since the same tax reduction occurs for all current expenditure, such as wage costs, and since the returns to any innovations that result from R&D that improves net revenues from petroleum extraction, will be taxed at the same high rate, there is no net additional support to R&D, with one possible exception. R&D that can be expensed against petroleum revenues but whose results increase revenues in sectors with significantly lower taxation does receive an implicit subsidy. This could apply to domestic spinoffs, or the R&D carried out in Norway which is used to improve profitability in other countries.

The main R&D "cluster" in Norway, associated with the petroleum industry, with some widening to maritime industry more generally, may therefore be supported as much by tax advantages as by skills availability or other real advantages. If foreign companies use Norway as a tax-sheltered place to finance R&D, where they retain intellectual property rights in the results, the gain to Norway may not be very large.

Under current fiscal practice, profits that were not used in R&D in this way would accrue to the government and be invested in the pension fund. Their use to develop an R&D capability might still be a useful investment, even if many of the returns currently accrue to foreign companies.

* Skattefunn support benefits firms even when not paying tax, hence their description as grants.

was in buyouts. These figures are no doubt influenced by the relative capital intensities of these different sectors.

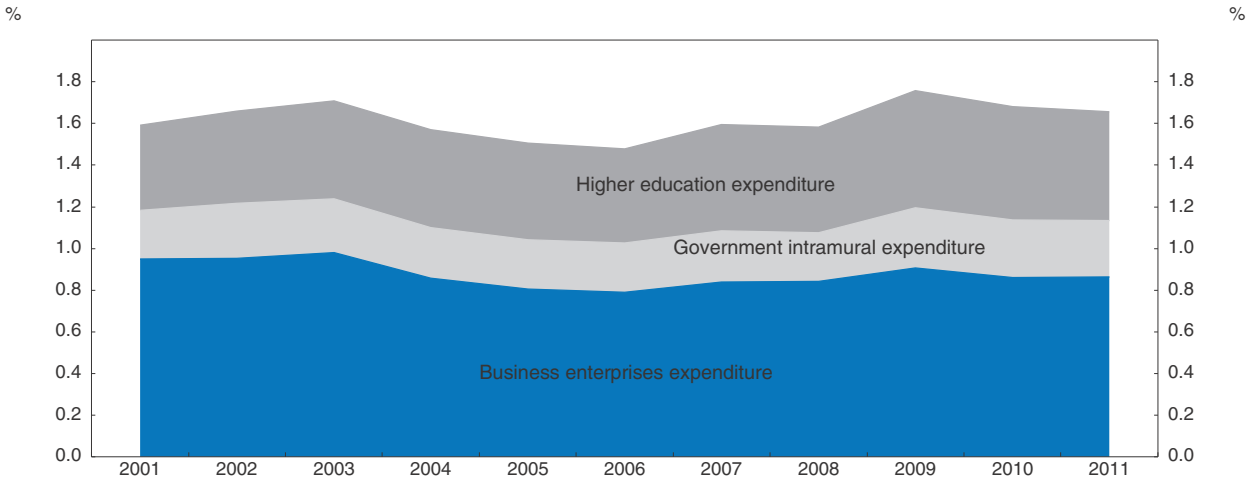
## Clusters, and direct support for innovation

The development of geographical clusters of activity is practically universal and many argue that agglomeration economies are such that clusters are highly beneficial. From this it may follow that policy should actively promote clusters. But how to do this in a cost-effective way is hard to see unless impediments to some normal mechanism can be identified. There do not seem to be such impediments in Norway. The main geographical clusters are around some sites associated with the petroleum industry, some high technology associated with the main technical university in Trondheim, and in Oslo. In addition fishing and, especially, aquaculture are a kind of diffuse cluster, concentrated on the coast but spread out along the very long coastline.

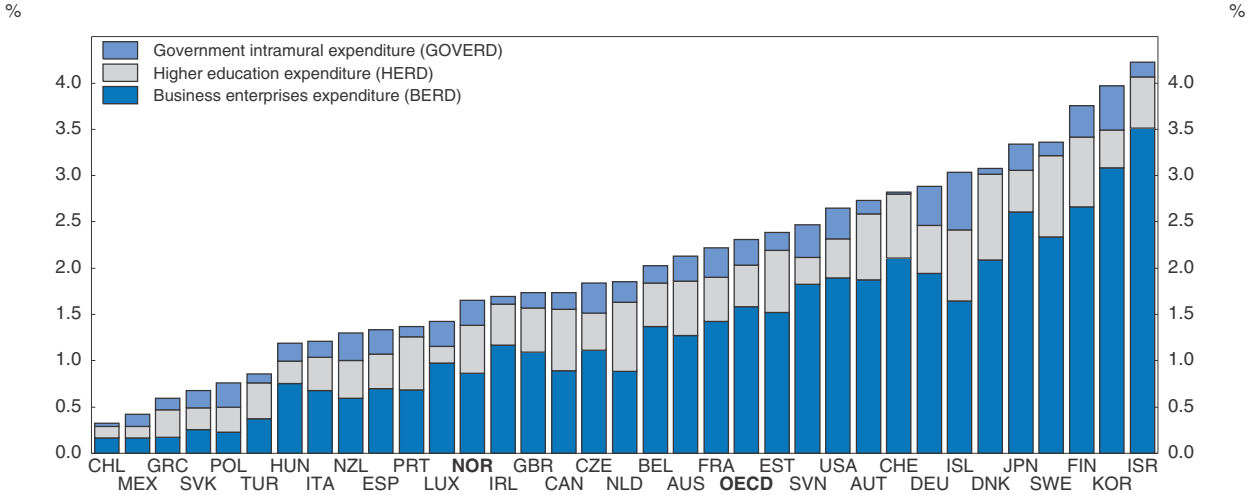
Figure 2.10. **R&D intensity**

As a percentage of GDP

**A. Business, government and high education, gross R&D expenditure in Norway**




**B. Expenditure on R&D by sector, 2011[1]**




1. Or latest year available.

*Source:* OECD, *Main Science and Technology Indicators Database*.

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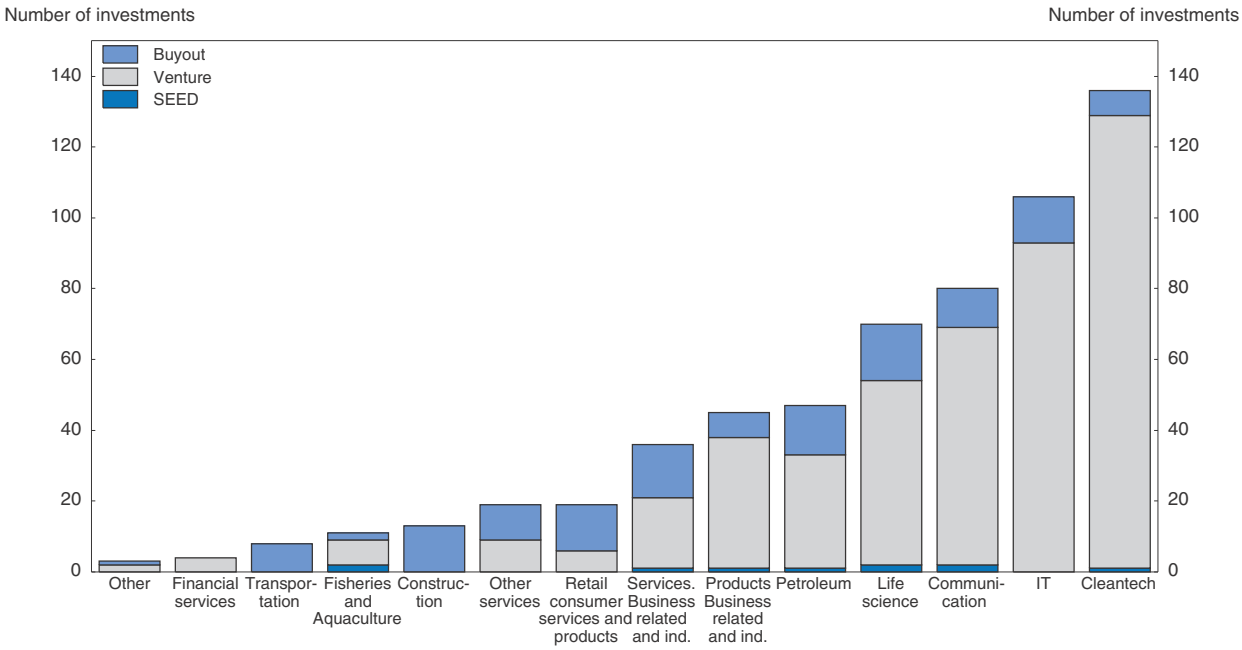
In a country with a small population like Norway there cannot be many clusters, especially because for geographical reasons much of the population lives in a small number of sites suitable for urban development. Public policy towards clusters (through the programme "Arena – Innovation in networks", established in 2002, and the "Norwegian Centres of Experience" programme (NCE) established in 2006) therefore sensibly concentrates not on developing clusters *per se*, but on facilitating effective development within clusters (Røtnes and Jakobsen, 2012). Furthermore, no attempt is made to use the programmes to halt, or compensate for, the economic decline of particular industries or areas.

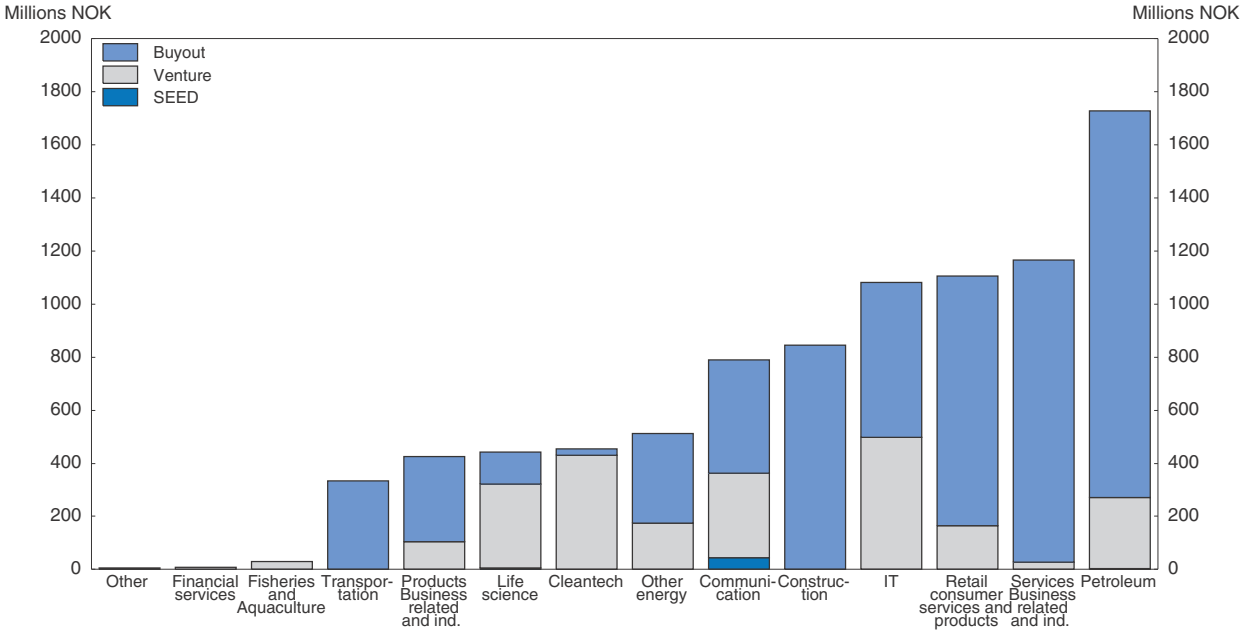
In the ARENA and NCE programmes public funds are available for projects, including training and promotion of inter-firm communication, that should improve interaction

Figure 2.11. **Private equity in Norway, 2011-12, by sector**

**A. Number of investments in Norwegian enterprises made by Norwegian and foreign PE firms**




**B. Total amount invested by Norwegian Private Equity firms**




*Source:* Norwegian Venture Capital and Private Equity Association (NVCA), Private Equity Funds in Norway, Activity Report 2011 and 2012.

StatLink http://dx.doi.org/10.1787/888932999108

between firms and other agencies in clusters. The projects are selected by competition. Røtnes and Jakobsen (2012) assess these programmes as rather successful, but this is an assessment based on the opinions of those who have taken part in the programmes rather than on objective results. As Røtnes and Jakobsen themselves argue, more objective assessment of the results should be built into the programme in the future, though this may be easier said than done. Although many important industry success stories around the world have involved, or generated, cluster activity, research has not yet clearly identified what this means for efficient policy. For example, Uyarra and Ramlogan (2012) warn that "... there is no clear and unambiguous evidence that clusters policy is able to sustainably deliver innovation outcomes; or improve levels of entrepreneurship and employment or firm productivity and competitiveness." Schmiedeberg (2010) reviews evaluations of cluster policy, concluding that few if any have actually been evaluated properly (largely because it would be very difficult to do).

One possible area for action is Technology Transfer Offices (TTOs). Such offices are relatively new in Norway and could perhaps do more to facilitate the involvement of academic researchers in entrepreneurship. There is relatively little involvement of university researchers in the cluster system (Røtnes and Jakobsen, 2012; Reve and Sasson, 2012). Academic researchers are not necessarily the best people to undertake entrepreneurship themselves but TTOs can help to ensure that the intellectual property rights in potential innovations are exploited in the interests of both the sponsoring institutions and the researchers, for example through links with entrepreneurs or suppliers of finance already linked with clusters. Røtnes and Jakobsen (2012) argue that relatively low involvement of academic researchers is not necessarily a significant handicap because there is a high level of focused demand for specific industry innovation. This could be true, for example, if the supply of profitable potential innovation already exceeded currently available finance, which is unlikely. There is currently a need to diversifying away from petroleum extraction now so as to be prepared for its future decline. TTOs should be able to facilitate this, at least by facilitating contacts and communication.

More direct support for innovation, also based on competition for project funding, is available through the tax credit programme, Skattefunn, and Innovation Norway (the latter also runs the Arena and NCE cluster programmes). Both are designed to support specific innovation projects, rather than supporting entrepreneurship. Except for Skattefunn, programmes are subject to annual ceilings on available funding. Projects are selected on the basis of competitions, though much of Innovation Norway's funding is tied to particular sectors such as agriculture. This is a consequence of its origin in the merger of several separate support agencies, such as those responsible for agriculture and regions, for example. The Skattefunn scheme is not limited by an annual budgetary ceiling; its yearly cost depends on the number of applications and approvals by the Norwegian Research Council.

## Regulatory policy and public ownership

In most domains, public policy in Norway appears relatively conducive to entrepreneurship. OECD indicators of product market regulation show that regulatory barriers to entry are below those of most, though not all, countries (Figure 2.12). The only significant exception is the level of public ownership, which is quite high in a range of industries, even including commercial activities such as food-processing, for example. In some countries, public ownership can be associated with potential inefficiencies because

### Box 2.5. **Main support programmes for R&D and Innovation in Norway**

**R&D, Project-based tax breaks – Skattefunn**

Introduced in 2002 for SMEs and expanded to all firms in 2003, the tax credit scheme Skattefunn is the biggest individual support programme for R&D. Up to a ceiling of NOK 8 million (increased from 5.5 million in the 2014 budget) for R&D expenditure conducted by the firm itself, and 22 million for the sum of in-house R&D and that purchased from universities and research institutes, firms can make a claim against taxes for 20% of the expenditures (18% for large firms). The R&D contents of the project must be endorsed by the Research Council in advance. If the claim exceeds taxes due, the excess amount is paid as a grant.

**R&D, Project-based grants**

Norway has generally moved away from technology and thematic programmes, preferring a competitive approach across industries and firms. The project-based innovation arena (Brukerstyrt innovasjonsarena, BIA) is the biggest support programme for R&D grants and operated by the Research Council of Norway (RCN). Projects are ranked against other projects on dimensions such as clear and ambitious R&D and innovation content, indicators for firm and social returns such as partners, publication and patenting plans.

The second biggest programme for R&D and innovation is the IFU/OFU scheme, which offers grants for product development between a small or medium-sized supplier and a demanding customer, which can either be a major foreign or Norwegian enterprise, or a public organisation. This scheme is also neutral with respect to technology and thematic orientation.

Evaluations of the Skattefunn and grant programmes focusing on additionality of R&D expenditure have found that they are all effective in generating increased expenditure (Cappelen et al., 2008; Technopolis, 2012).

**The broader picture – measures for the development of new or better products or processes**

Innovation Norway, funded primarily by the Ministry of Trade and Industry and the Ministry of Local Government and Regional Development, provides industrial support for issues not covered by the RCN's mandate, including national and regional goals. It encourages private-sector innovation, especially in start-up firms, for which it provides grants, loans and seed capital in co-operation with the private sector. Innovation Norway also provides grants for testing and demonstration projects related to the commercialisation of environmentally friendly technology. The government has announced a substantial reduction in such activities from 2014.

**Growing attention for financing instruments**

Over the last decade, interest in public seed and venture capital has increased. Several different investment vehicles has been established, some of them with regional mandates. These include Argentum, Investinor and several seed funds. Argentum participates as a minority owner in private equity funds. Its mandate is to stimulate the growth of private equity investment groups, increase the competitiveness of firms and investors, and contribute to increased research and innovation in Norway. Investinor acts as a direct investor in Norwegian based, high potential companies that are internationally oriented and ranging from early growth to expansion.

**Subsidies for energy and climate technologies are on the rise**

Since 2001, targeted programmes and support schemes have been on the rise. Enova SF was established in 2001 in order to promote more efficient energy consumption and increased production of "new" renewable energy, financed through funds allocated from the Energy Fund. This fund is financed by a charge on electricity bills and has also been endowed with NOK 35 billion from The "Green Fund for Climate, Renewable Energy and Energy Efficiency Measures."

Box 2.5. **Main support programmes for R&D and Innovation in Norway** *(cont.)*

The recent reappearance of technology and industry specific programmes, such as those for energy related purposes, suggests a change to the long dominant approach of thematic and technology neutrality. Rather than being handled by the Research Council and Innovation Norway, these structures are duplicated in Enova as far as the energy sector is concerned.

*Source:* Ministry of Industry.

of the possibility of implicit or open subsidies, favouritism for public procurement and so on. In Norway the authorities argue that public ownership rights are exercised through an effective "arm's-length" approach so that companies in which the public sector has a full or controlling stake are nevertheless run as any other private sector company. This is hard to verify, but public sector companies do not typically make losses that have to be made up out of the budget, at least one sign that they are relatively well managed. Public ownership is also used in some sectors to avoid foreign takeovers of what might be strategic companies, especially in the energy sector. For genuinely strategic industries this may be a sensible approach, but vigilance is required to ensure that the definition of strategic companies is not stretched to include protection of inefficiency.

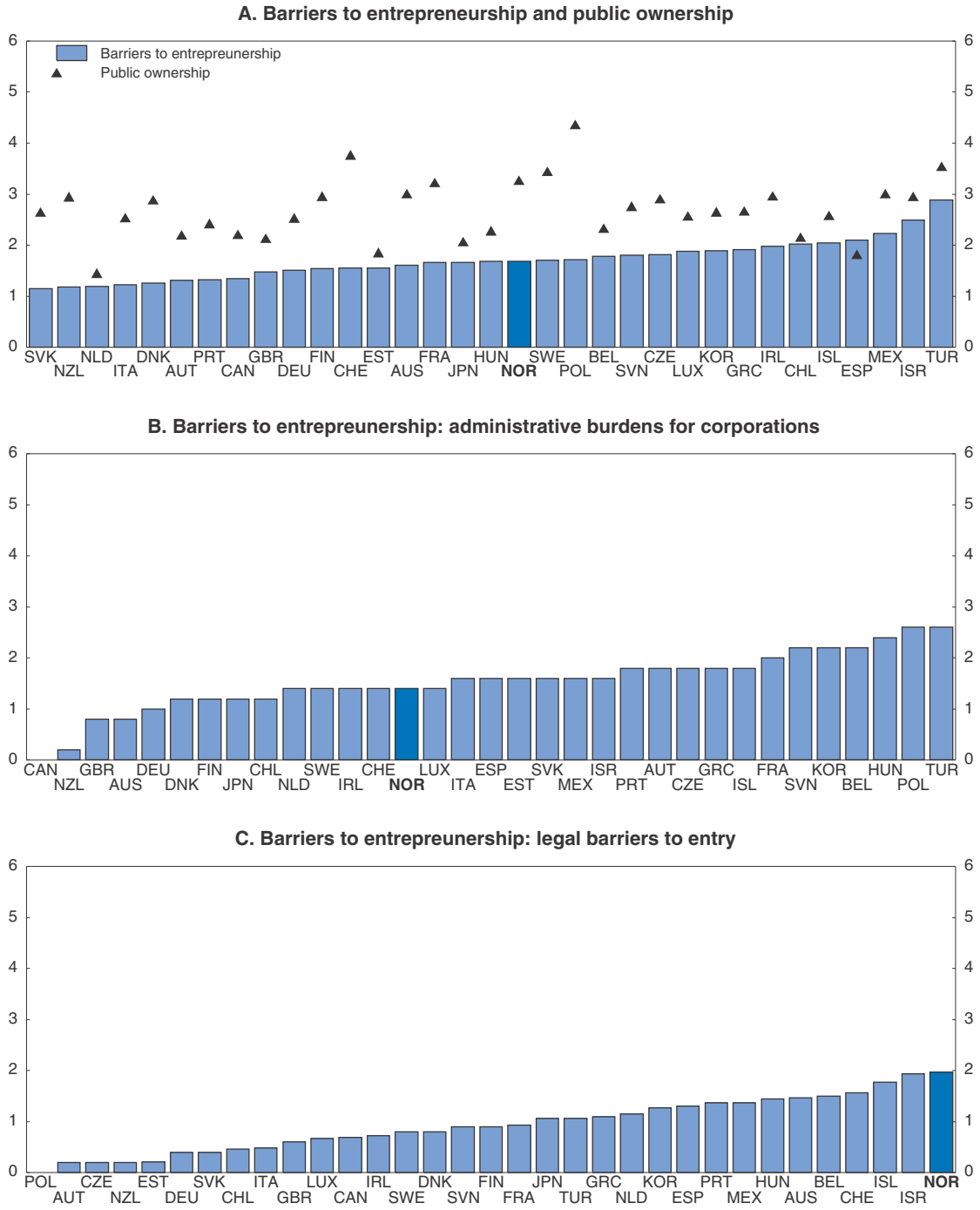
An unusual aspect of Norwegian competition law is the key criterion laid down for the competition authority to apply in investigating mergers and takeovers. In most countries, consumer welfare is treated as the main objective, which usually benefits from increases in competition. Norway operates a "total welfare" principle, including efficiency benefits to merging companies. Thus a highly-profitable merger that restricts competition could be approved. A total welfare criterion, if by that was meant the sum of consumer and producer surplus over time, might be attractive in theory. But, given information asymmetries between companies and the competition authority (as well as between companies and the consumer), most countries give much more weight to consumer welfare and to competition *per se*. It is, for example, possible that the high level of consumer prices in Norway is not just a natural result, in a strongly petroleum-influenced economy, of high incomes pushing up non-tradable prices, but also of a sequence of decision or non-decisions that have strengthened suppliers' abilities to maintain high profit margins.

In the past a commission on competition policy had suggested moving to a consumer welfare standard, but this was not taken up by the government. New Zealand's competition policy uses the same total welfare criterion. It may be argued that, in small remote countries, a criterion that allows economies of scale to be more easily exploited is appropriate.

## Policy implications

There are many dilemmas in policy related to entrepreneurship, and research has yet to throw light on how to resolve them. The evolution of the understanding of employment creation and innovation over past decades is a warning: policies across OECD countries have varied from favouring large national champions to small companies to young

Figure 2.12. **Product Market Regulation, 2013**[1]




*Note:* OECD indicators of Product Market Regulation (PMR) measure legislation on a scale from 0 to 6, where 0 indicates the least restrictive and 6 the most restrictive.

1. The reported indicators for Mexico, Poland and Turkey are based on preliminary estimates as some of the underlying data has not been validated with national authorities. Subsequent data validation may lead to revisions to the indicators.

*Source:* Koske et al. (2014).

StatLink http://dx.doi.org/10.1787/888932999127

companies, as successive waves of research have changed the view of the processes at work. The dilemmas include:

- whether to treat independent entrepreneurship and employee-entrepreneurship (or intrapreneurship) as equally important for public policy;
- whether education should focus on developing technical skills or increase the focus on skills for entrepreneurship;
- whether indeed the skills for entrepreneurship are really technical ones traditionally associated with research and innovation or whether more people-oriented skills or business management should have more emphasis, and at what stage of education;
- whether to focus on small, or new, or high-growth companies;
- whether to promote clusters actively or have a more passive enabling approach.

Productivity growth in Norway has been reasonably strong but seemingly on a downward trend, especially after the financial crisis, whose impact was in any case much less severe in Norway than elsewhere. Low self-employment rates and a relatively low rate of new firm creation are not necessarily at the root of this but low unemployment, the welfare state, and high taxation could help to explain a certain lack of entrepreneurs – even though it is clear that for many entrepreneurs material reward is often secondary to independence and other types of fulfilment as an incentive. Norway's entrepreneurship-oriented policies are generally framework-based rather than chasing specific targets while part of the support for innovation is based on competitive bidding and subject to budgetary ceilings, so that the degree to which public money can be "wasted" is to some extent limited. Commendably, many policies are subject to some kind of evaluation although it is noticeable that this is frequently based on customer-satisfaction based surveys rather than the more difficult but more useful assessment of relevant outcomes.

Some of the potential incentive problems mentioned above – low unemployment, the welfare state, and high taxation – are either good outcomes or deliberate policy choices for other reasons so cannot be discarded lightly. Suggestions for action should therefore be for incremental changes, especially given that best practice in many relevant areas is not obvious. One is to pay more attention to entrepreneurship in the development of the Norway Skills Strategy (currently under way in partnership with the OECD). Here the phenomenon of "Entrepreneurial dropouts" is particularly interesting: action to reduce dropout needs to avoid an unintended reduction in entrepreneurship if something about the process of dropout reveals how entrepreneurial skills can be developed. Another is to further encourage the development of Technology Transfer Offices in universities and facilitating appropriate contractual arrangements between public sector researchers, their institutions and private sector collaborators.

There is also room for better information on some aspects of enterprise functioning and on policies. As regards the functioning of enterprises, three stylised facts stand out for start-ups in Norway – their relatively large size measured by employment, their relatively low attrition rate, and the relatively low number of very high growth companies. Further work is needed to verify that these are real facts rather than related to data comparability. Assuming they show the true picture, does the large size mean that Norwegian entrepreneurs are good at pulling people together to set up fully-functioning firms very quickly or is it a sign of enlightened spinning-off of innovative divisions from existing companies?

As far as policy evaluation is concerned, in an echo of the assessment of public expenditure management in a chapter in the 2012 *Economic Survey* (which criticised the lack of appropriate or complete cost-benefit or other evaluations of public expenditure), more attempts to assess the results of policy measures in terms of productivity gains, or net employment creation (depending on the policy aim) would be useful. This would be better than many current evaluations which look – for example – at measured R&D or training activity, or customer satisfaction. Such analyses can be difficult but hopefully not impossible. Indeed, if such analysis of a particular policy is impossible, there can hardly be a good case for supporting the policy in question.

The only area where Norway stands out on product market regulation indicators is public ownership, and stated policy actually stands up well to good practice; nevertheless, some independent assessment of its impact, and comparison with other countries, including not only other Nordic countries, would be useful. Similarly, the "total welfare" criterion for competition policy could also be compared in action with alternative criteria used in other countries.

**Recommendations on entrepreneurship**

- In addition to focus on STEM-type skills for innovation, ensure that skills useful for entrepreneurs such as risk assessment, people management, project planning and finance are also given a place in the national skills strategy. Follow up the Global Entrepreneurship Monitor evaluation to see why Norwegians view Norway as full of opportunities for entrepreneurship but on average do not feel capable of it themselves.
- Noting that the previous Economic Survey already recommended abolition of the wealth tax because of its effect on investment in existing firms, consider whether reductions in the wealth tax would in addition effectively increase incentives for entrepreneurs.
- Encourage universities to further develop Technology Transfer Offices (TTOs) both as support services for potential academic entrepreneurs and as potential revenue earners for research institutions. TTOs should be able to facilitate appropriate intellectual property arrangements between researchers, their institutions and outside companies to both encourage research and best exploit its results commercially.
- Continue to base innovation support on a competitive bid based approach, rather than automatic support. Equally, continue to focus policy on clusters pragmatically on improving framework conditions and information flows rather than promoting clusters *per se*.
- Public support programmes, as for other public expenditure, should be subject to evaluations against counter-factual outcomes (i.e. what would have happened without the policy, including to non-participants) not just evaluations of the experience of participating individuals or companies.
- The total welfare criterion of competition policy, and the size and extent of public sector holdings in private companies should be subject to some independent assessment.

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