INTERNATIONAL MONETARY FUND

NORWAY

2013 ARTICLE IV CONSULTATION

September 2013

Selected Issues

This paper on Norway was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on July 19, 2013. The views expressed in this document are those of the staff team and do not necessarily reflect the views of the government of Norway or the Executive Board of the IMF.

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July 19, 2013

Approved By
The European
Department

CONTENTS

LONG-TERM COMPETITIVENESS IN NORWAY[1]

This chapter evaluates Norway's long-term competitiveness. Norway's REER-ULC has appreciated substantially for the past decade, reflecting high wage growth, and the manufacturing sector has lost more than half of its market share since the early 1990s. What emerges from this analysis is that the insulation from Dutch disease might not have been complete even though oil revenue has been well managed and anchored with a fiscal rule. While the mainland and offshore economies were originally thought of as separable, the mainland economy is increasingly dependent on supplying goods and services to the offshore sector. Long-term competitiveness could deteriorate further if the current trend continues.
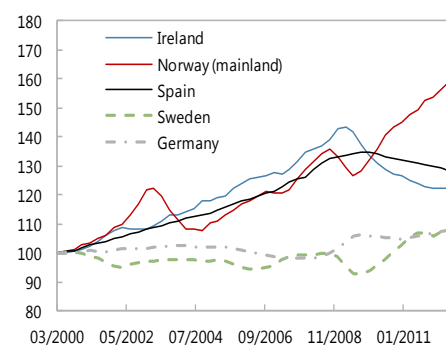
A. Introduction

1.   There has been a growing concern about high wage costs in Norway. Robust oil and gas activities have supported Norway's strong external positions and high wage growth for the past decade. However, high labor costs are increasingly putting pressures on activities in the non-oil part of the economy. Measured in a common currency, unit labor costs in Norway are about 40 percent higher than its peers on average (Figure 1.1).

Figure 1.1. Unit Labor Costs 1/
((Index: 2000Q1=100)

Legend: Ireland, Norway (mainland), Spain, Sweden, Germany

x-axis: 03/2000 05/2002 07/2004 09/2006 11/2008 01/2011

Sources: Norges Bank and IMF staff calculations.
1/ Measured in a common currency.

2.   The success of the oil sector has created new competitiveness challenges. The mainland economy has also become more dependent on the oil sector, with an increasing part of the mainland economy shifting to activities related to oil and gas production. Manufacturing production in recent years has been supported by the strong growth of the engineering industry which is closely linked to oil and gas activities. While this is a positive development in creating more employment opportunities in Norway, higher wage growth in oil-related sectors is gradually undermining the competitiveness of the non-oil-related part of the mainland economy by pushing up the wage costs in these traditional sectors.

3.   Rapid increases in oil wealth are also adding further pressures on the economy despite sound oil revenue management anchored by a fiscal rule. Norway's fiscal rule, established in 2001, is designed to insulate the mainland economy from Dutch disease by allowing only gradual inflows of petroleum revenue into the economy. The Government Pension Fund Global (GPFG) receives all of the government's oil and gas-related income such as taxes, ownership shares, and the state's dividends from the majority government-owned Statoil. The fiscal rule constrains the non-oil deficit as a share of GPFG assets, but not relative to mainland GDP, aiming to delink oil revenue transfers to the budget

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[1] Prepared by Cristina Cheptea and Kazuko Shirono.

from the inflows of oil and gas income. However, GPFG assets are growing faster than Norway's GDP, and this has resulted in a gradual increase in the non-oil deficit as a share of mainland GDP in recent years (Figure 1.2 and see also Chapter 3). Combined with the increasing dependency of the mainland economy on oil sector activities, fiscal policy seems to be adding further pressure on the economy when it is operating at full capacity.

Figure 1.2. Structural Non-oil Deficit
(Percent)

Sources: 2013 Revised National Budget and IMF staff calculations.
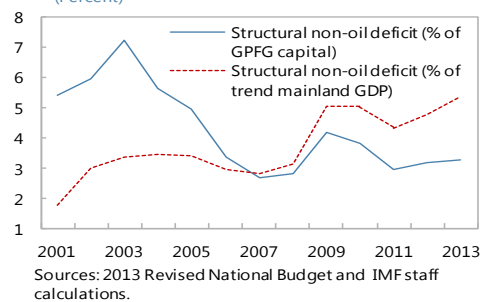
4.   **This chapter examines Norway's long-term competitiveness with a particular focus on the non-oil-related part of the mainland economy.** Section B provides an overview of the external sector in Norway, focusing on the structure of merchandise trade. Section C assesses cost competitiveness measures and labor productivity. Section D examines the trend in market shares in world trade to assess the degree of competitiveness problems in Norway. It also assesses sectoral-level data to characterize the patterns of rising sectors and declining sectors in Norwegian exports. Section E concludes.

B.   Trade Structure

5.   **Oil and gas dominate Norway's goods exports, and the share of "traditional" exports is declining** (Figure 1.3). Oil and gas account for just below 70 percent of total goods exports in 2011, up from about 50 percent in 1990. The share of fish exports has been stable for the past two decades at around 6 percent of total exports. On the other hand, the share of manufacturing exports has declined by half to 19 percent in 2011. The increase in the export share of oil and gas mostly reflects high oil prices since early 2000s.

Figure 1.3. Composition of Exports
(Percent of total exports of goods)

Sources: Comtrade and IMF staff calculations.
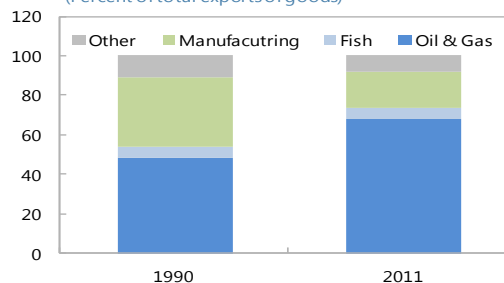
6.   **Norway's merchandise trade surplus has increased substantially since early 2000s, but the non-oil trade balance has been in deficit** (Figure 1.4). The overall trade surplus is largely due to the surplus in the offshore trade balance, reflecting high oil prices in the 2000s. The trade balance of traditional goods (blue line in Figure 1.4) has been negative but remained relatively stable at around -7 percent of mainland GDP during the same period. Aggregate numbers thus seem to suggest that mainland exports have been holding up relatively well for the past two decades.

Figure 1.4. Goods Trade Balances
(Percent of mainland GDP)

Sources: Haver Analytics and IMF staff calculations.
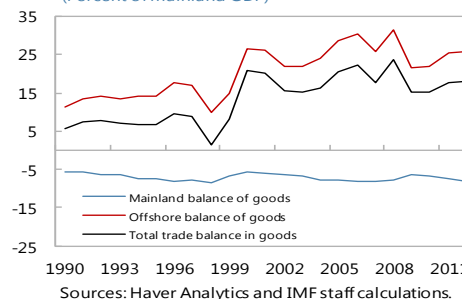
7. The strong external position has been supported by terms of trade growth (Figure 1.5). The terms of trade, including both oil and non-oil sectors, have improved substantially since 2000, driven largely by high oil prices. The terms of trade for the mainland economy, defined by excluding exports prices of oil and gas, have also improved in the past decade, even though the magnitude of the improvement has been much less than for the overall terms of trade.

Figure 1.5. Terms of Trade
(Index, 1990=100)

Sources: Haver Analytics and IMF staff calculations.
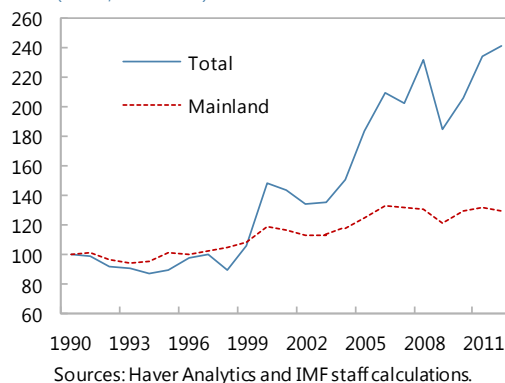
8. The size of the tradable sector is large in Norway, but this is largely due to the hydrocarbon sector (Figure 1.6).[1] The non-oil tradable sector in Norway is much smaller than its peers, and the share has also declined over time. While the declining trend in the share of the tradable sector is observed in most of the OECD peers, the non-oil tradable sector in Norway continues to be the smallest among OECD peers.

Figure 1.6. Share of Tradable Sector in Gross Value Added
(Percent)

Sources: Eurostat, National Statistical Offices, and IMF staff calculations.
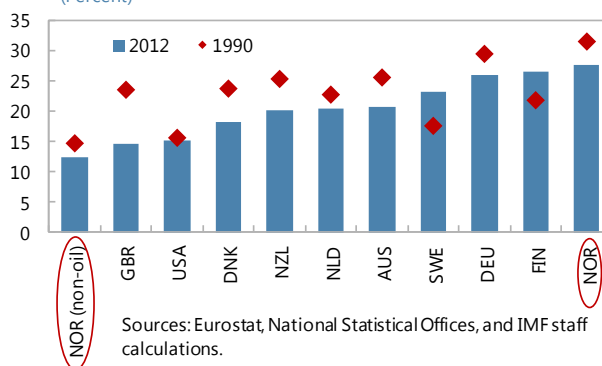
9. Norway's exports are largely directed to advanced economies (Table 1.1). The share of exports to the euro area has increased substantially in the past few decades. On the other hand, the share of exports to emerging and developing economies has been relatively low.

Table 1.1. Norway: Exports Destination by Decade
(Percent of total exports)

	1970s	1980s	1990s	2000s 1/
Advanced Economies	85	91	93	92
of which euro area	27	32	40	43
Emerging & Developing Economies	14	9	7	8

Sources: IMF Direction of Trade Statistics and IMF staff calculations.
1/ 2000-2012.

10. However, emerging markets are increasingly important for Norway's exports given that demand from these economies affect oil prices in the world market. This is likely to explain Norway's strong overall export performance for the past two decades despite the slowing growth in the major trading partners (Figure 1.7).

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[1] The tradable sector is defined as agriculture, mining, and manufacturing.

Figure 1.7. Norway Trading Partners Covering 90% of Trade
(1990-2011)

	Norway's share increases, trading partner having lower growth	Norway's share increases, trading partner having higher growth
	Norway's share decreases, trading partner having lower growth	Norway's share decreases, trading partner having higher growth

Sources: IMF Direction of Trade Statistics, IMF World Economic Outlook, and IMF staff calculations.
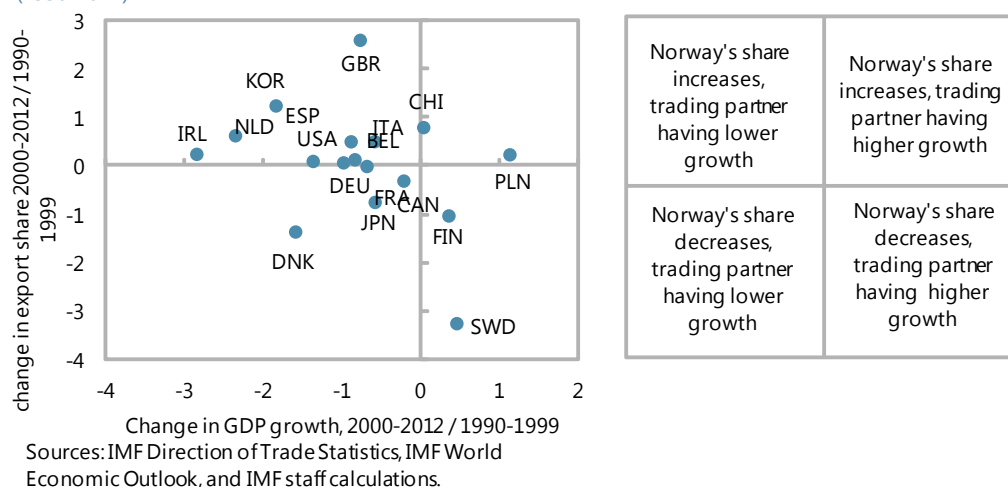
C.   Cost Competitiveness Measures and Labor Productivity

11.   Norway's real effective exchange rate (REER) based on the CPI has been fairly stable, but the REER based on unit labor costs (ULC) has appreciated substantially over the past decade.
(Figures 1.8). The CPI-based REER gives the impression that Norway has maintained its price competitiveness relative to its peers (Figure 1.9), but the ULC-based REER hints an erosion of price competitiveness over time (Figure 1.10). As a small open economy, the CPI-based REER may not be a good cost measure for Norway as prices are largely determined by external price development. The ULC-based REER is likely to reflect actual domestic cost conditions better. Norway's ULC-based REER recorded one of the highest appreciations among its peers and is now significantly above its long-run historical average (Figure 1.11).

Figure 1.8. Real Effective Exchange Rates
(index 1994=100)

Sources: Price and Cost Competitiveness database and IMF staff calculations.
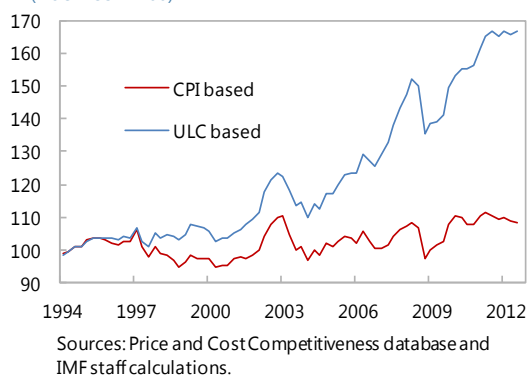
Figure 1.9. REER-CPI based
(index 1995=100)

Sources: Price and Cost Competitiveness database and IMF staff calculations.
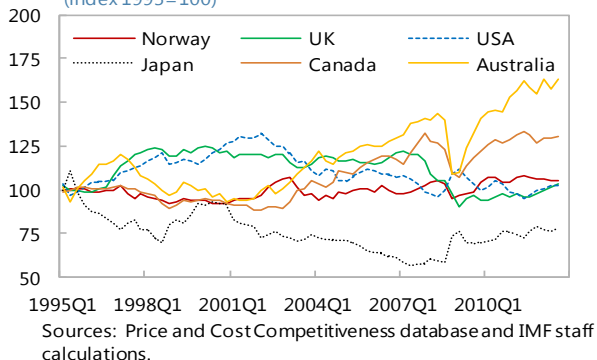
Figure 1.10. REER-ULC Based
(index 1995=100)

Sources: Price and Cost Competitiveness database and IMF staff calculations.
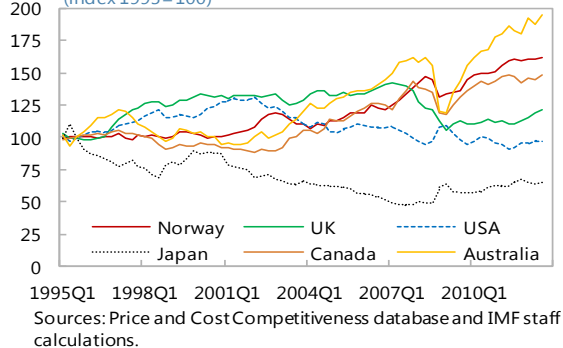
12. **More generally, the relative price of non-tradables to non-oil tradables increased substantially over time in Norway** (Figure 1.12). The increase of the relative price of non-tradable goods relative to non-oil tradables was the highest among its peers. A different picture emerges once the oil sector is included in the analysis, largely due to the effect of rising oil prices since early 2000s.

Figure 1.11. Change in REER-ULC based, 1995-2012 (percent)
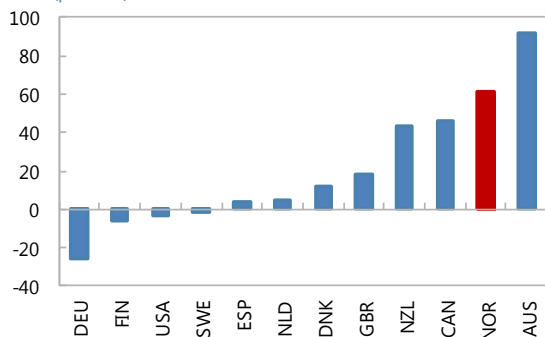
Sources: Price and Cost Competitiveness database and IMF staff calculations.

Figure 1.12. Change in Price of Gross Value-Added by Sector, 2000-12 (percent)
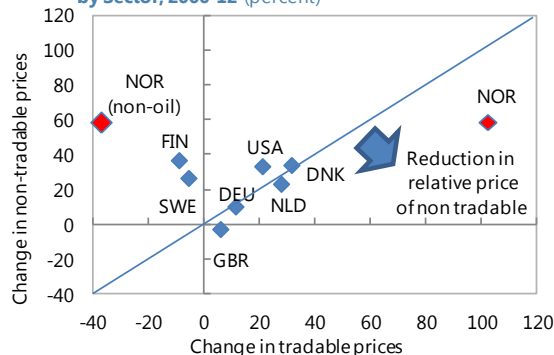
Sources: Eurostat, National Statistical Offices, and IMF staff calculations.

13. **The appreciation of the ULC-based REER reflects high wage growth and low labor productivity growth.** Productivity growth has been much lower for the past decade than two decades ago, and high wage growth has not been in line with productivity growth while hours worked continued to decline (Figure 1.13). As a result, unit labor costs have grown much more in the 2000s than 1990s (Figure 1.14). The disparity between wage growth and labor productivity growth was even more pronounced in some sectors. For example, unit labor costs have increased substantially in the service sector in the 2000s, much more than in the manufacturing sector, and this was largely due to lower productivity gains in the service sector during this period (Figure 1.14). The aggregate number for manufacturing does not reveal the fact that part of the mainland economy is becoming more closely linked to the oil sector by providing parts and inputs.[2] Once this oil-related productive part of

Figure 1.13. ULC Sub-Component
(Cumulative percent change, mainland and offshore sectors)
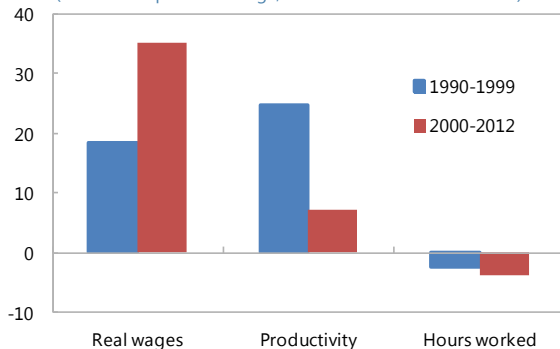
Sources: AMECO and IMF staff calculations.

Figure 1.14. Contributions to Unit Labor Cost Change 1/
(Cumulative percent change, mainland and offshore sectors)
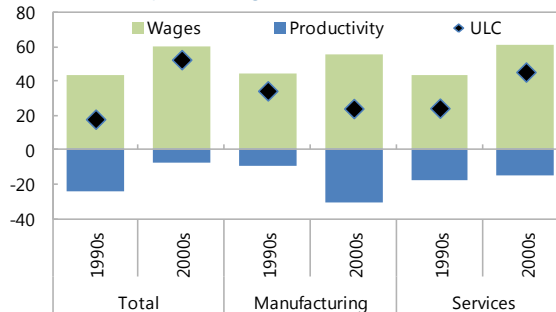
Sources: AMECO and IMF staff calculations.
1/ Negative sign for productivity means growth, not decline.

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[2] Statistics Norway's estimate suggests that roughly 8 percent of employment in Norway comes from both direct and indirect demand of the petroleum sector.

manufacturing is taken out, labor productivity of more traditional manufacturing would be even lower.

14.   Norway's ULC growth is significantly higher than its peers, and productivity growth has been among the lowest (Figure 1.15). Hours worked are also much lower than other advanced economies (Figure 1.16). Again, if the oil sector and oil-related productive part of the mainland economy are taken out, Norway's ULC growth would be even higher. These results thus suggest that through high wage growth, "second-order" effects of oil and gas production have been creating a tendency for real appreciation and possibly a loss of long-term competitiveness in the more traditional non-oil sector (see also the next section).

Figure 1.15. Contributions to Unit Labot Cost Changes, 2000-2012 1/
(Cumulative percent change)

Sources: AMECO and IMF staff calculations.
1/ Negative sign for productivity means growth, not decline
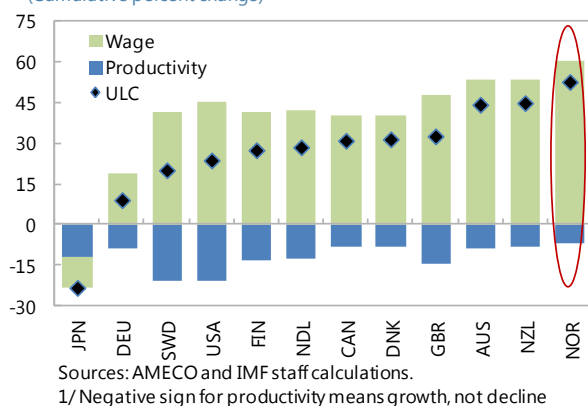
Figure 1.16. Actual Hours Worked Per Employee, 2000-2012

Sources: AMECO. OECD. and IMF staff calculations.
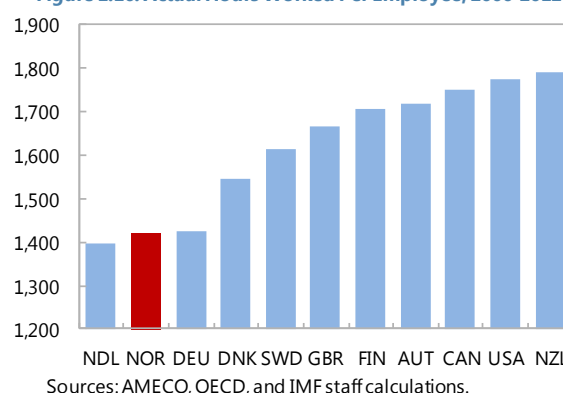
D.   Market Share and Divergent Trends within the Mainland Economy

15.   Norway has maintained a steady world market share of exports of goods and services for the past few decades (Figure 1.17A). As far as total exports are concerned, Norway has been in a better position than its peers as the majority of them are gradually losing their export market share throughout the 2000s.

16.   However, Norway's market share of non-oil exports has declined substantially for the past two decades (Figure 1.17B). While the market share of other advanced economies were also on a declining trend during the same period, Norway's market share of non-oil exports declined much faster than that of other advanced economies.

17.   The loss of the market share in non-oil exports is largely explained by the declining market share of manufacturing (Figure 1.17C). Norway has lost almost 60 percent of its manufacturing share of world exports since 1990, among the largest drops compared with its peers. The market share of manufacturing stabilized in early 2000s, but it has started to decline again since the global financial crisis.

Figure 1.17. Norway: Market Share

A. Total Exports Market Share

Comparison with Other Nordics
(Index, 1970=100)

Norway · Denmark
Finland · Sweden

Comparison with OECD Peers

Norway · United Kingdom
United States · Canada
Australia · New Zealand
Japan
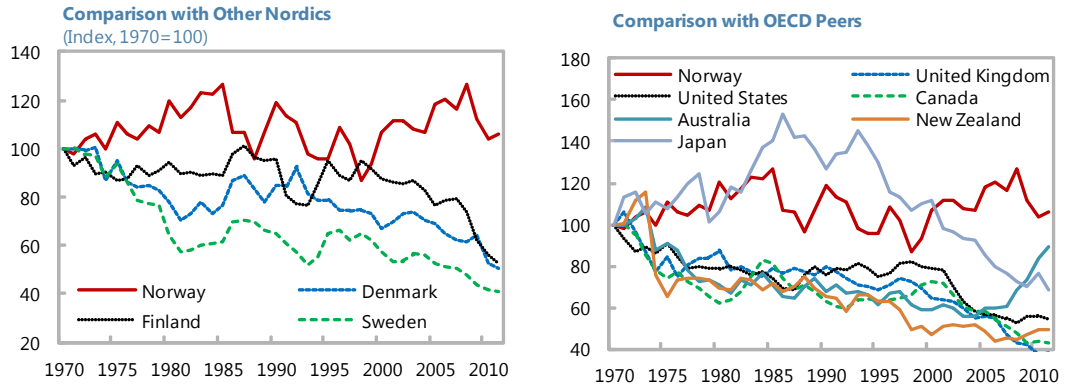
B. Non-oil Exports Market Share

Comparison with Other Nordics
(Index, 1990=100)

Norway · Denmark
Finland · Sweden

Comparison with OECD Peers
(Index, 1990=100)

Norway · United Kingdom
United States · Canada
Australia · New Zealand
Japan
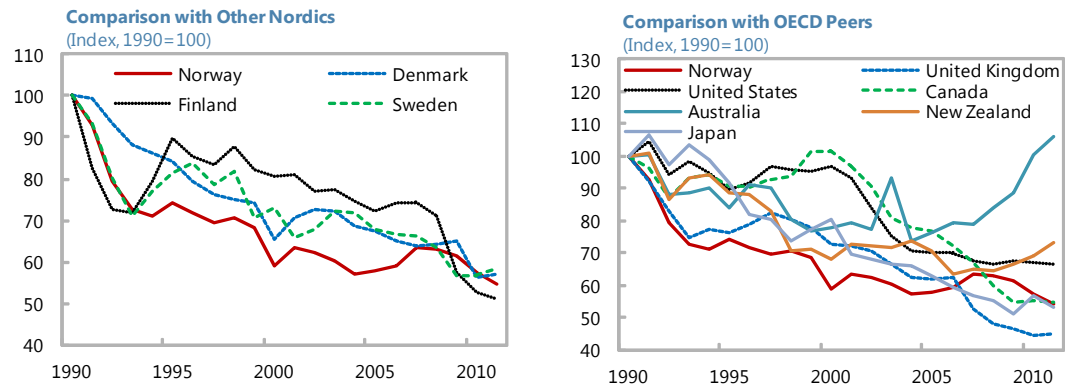
C. Manufacturing Exports Market Share

Comparison with Other Nordics
(Index, 1990=100)

Norway · Denmark
Finland · Sweden

Comparison with OECD Peers
(Index, 1990=100)

Norway · United Kingdom
United States · Canada
Australia · New Zealand
Japan
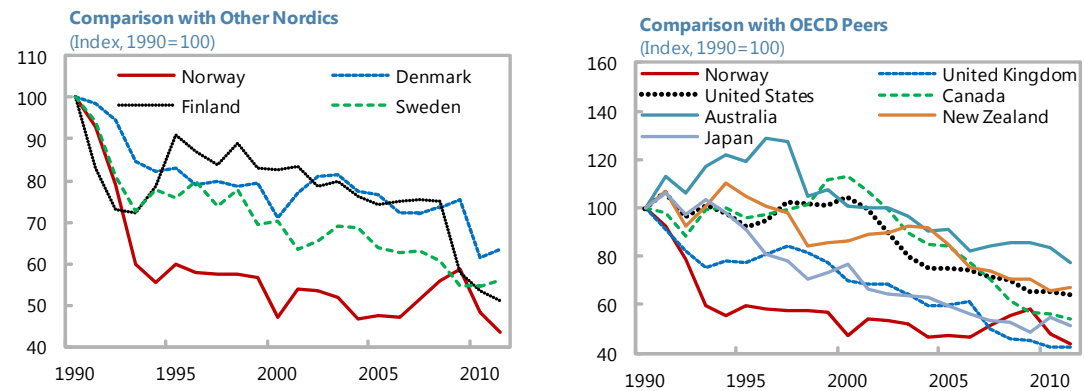
Sources: Comtrade, IMF Direction of Trade Statistics, and IMF staff calculations.

18.   The loss of competitiveness is also partly explained by patterns of specialization. Figure 1.18 shows the evolution of the market share of Norway's exports during 1990-2011 plotted against the share of these sectors in total manufacturing exports of the world.[3] Among the manufacturing sectors in which Norway specializes, Norway has lost its share of world exports in sectors that are currently growing in the world market (quadrant II) for the past two decades.

Figure 1.18. Norway's Manufacturing Exports: 1990-2011
(Largest 15 SITC-3 sectors. Size of bubble proportional to share in total goods exports)
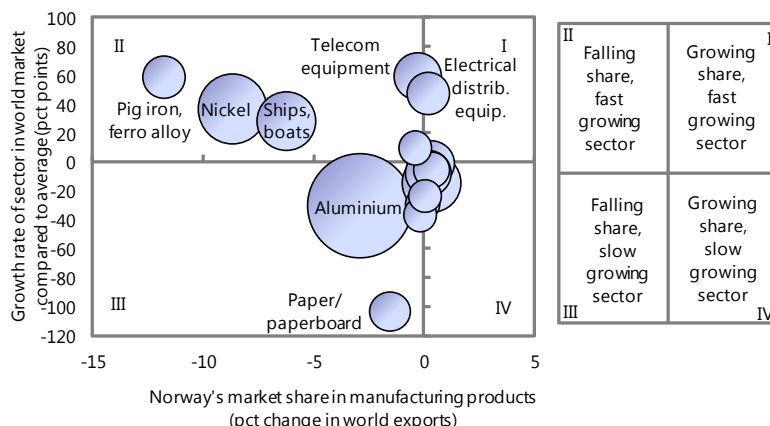
Sources: WITS and IMF staff calculations.

19.   However, a closer look at the data further suggests a two-tier development in the manufacturing sector in Norway, with industries linked to oil and gas expanding and other industries shrinking (Figure 1.19). On one hand, mechanical engineering sectors, which are increasingly closely tied to oil and gas activities, are gaining markets share. On the other hand, more "traditional" manufacturing sectors, such as base metals, are losing market shares in the world trade. Indeed, manufacturing production in Norway has been largely driven by the oil-related engineering industry since mid-2000s while production levels of other more traditional manufacturing sectors has been subdued during the same period (Figure 1.20).

Figure 1.19. Norway's Manufacturing Exports: 1990-2011
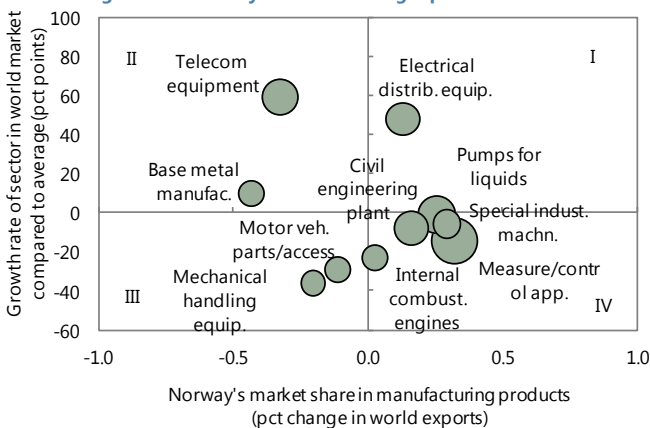
Sources: WITS and IMF staff calculations.

Figure 1.20. Manufacturing Production
(Index: 2005=100)
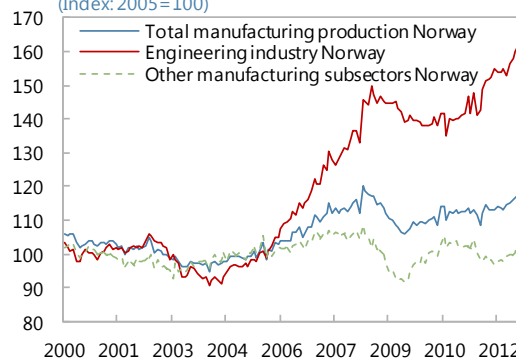
Sources: Norges Bank and IMF staff calculations.

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[3] Data are for the 15 largest manufacturing industries at a 3-digit level in the ComTrade (WITS) database.

20.   The split between the oil-related and non-oil related parts of the mainland economy can be seen in wage shares (Figure 1.21). The "traditional" internationally-exposed (i.e., tradable) industries have sharply rising wage shares in recent years, reflecting the steep increase in unit labor costs. At the same time, the internationally-exposed industries related to the booming oil industry have not only been able to absorb the rising unit labor costs, the wage share in these industries has been falling over the last decade.

Figure 1.21. Wage Shares
(Percent of value added)

Sources: Norges Bank, Statistics Norway, and IMF staff calculations.

E.   Conclusion

21.   The available data suggests that Norway is losing ground relative to its peers as far as more traditional non-oil sectors are concerned. The economy is becoming more dependent on oil and gas activities, and the more productive part of the mainland economy, such as engineering, is closely tied to the hydrocarbon sector. In this sense, the insulation from Dutch disease appears 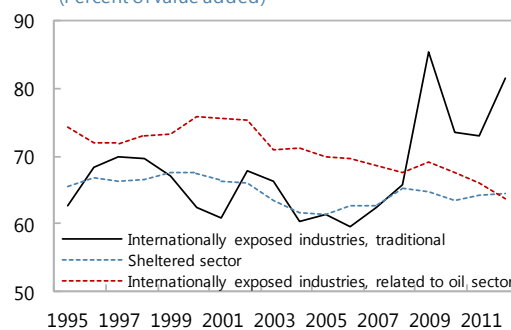to have been incomplete despite the sound management of oil revenue through the fiscal rule. Oil and gas production has been affecting the mainland economy via indirect channels including higher wage pressures in the more traditional non-oil sector where labor productivity growth has been lagging behind. Weakened cost competitiveness is significant as evidenced in the appreciation of ULC-based REER, and this is mirrored in the striking loss of market share for non-oil exports over the past few decades.

22.   This increasing pressures on non-oil parts of the mainland economy raises concerns about resilience of the economy in the event of substantialy low oil prices. While the oil-related parts of the mainland economy are fueling robust growth, this is a narrow basis for long-run growth, and adds to risks to long-run growth and sustainability. If the Norwegian economy continues to be dependent on oil and gas activities, the economy may not have sufficient capacity to supply employment and income in the event of downturns associated with a sustained oil price decline, or after the period when oil and gas extraction activity has peaked.

HOUSEHOLD BALANCE SHEETS IN NORWAY[1]

This chapter examines household assets and liabilities in Norway to assess vulnerabilities associated with high levels of household debt. Norwegian households have sizable net worth, but they have limited financial buffers in the event of loss of income or interest hikes because a large portion of assets are illiquid. Micro data confirms these findings, suggesting that debt burdens are relatively evenly distributed across income groups, and most income groups have limited buffers against adverse shocks.

A. Introduction

1.   Norway's household debt stood at about 200 percent of disposable income in 2011, among the highest in the OECD (Figure 2.1). The sustained boom in housing markets and the associated mortgage debt lies behind this elevated level of household debt. The growth of credit to households has been supported by strong credit demand for residential mortgages. After falling temporarily during the global financial crisis, real house prices in Norway bounced back, rising continuously since 2009 (Figure 2.2). In contrast to house price corrections and balance sheet consolidation in many other OECD countries, house prices and household debt in Norway continue to rise relative to disposable income.[2]

Figure 2.1. Household Gross Debt
(Percent of disposable income)
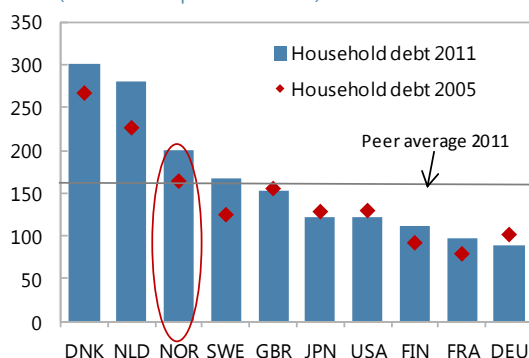
Sources: OECD and IMF staff calculations.

Figure 2.2. Real House Price in Norway and OECD Average
(Index, historical average over 1980-2013Q1=100)
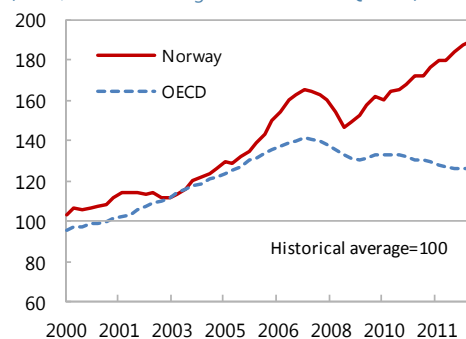
Sources: OECD and staff calculations

2.   House price corrections could pose significant risks to the Norwegian economy, given the high level of household debt. A large house price correction would impact household balance sheets to the extent that households have limited financial buffers. A house price reversal would likely cause households to increase savings to continue mortgage payments given that mortgage lenders have full recourse to borrowers. The correction would also negatively impact the construction sector,

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[1] Prepared by Kazuko Shirono.

[2] See also Norges Bank, Monetary Policy Report with Financial Stability Assessment 1/13, March 2013.

lowering growth and possibly increasing bank losses. A recent study also shows that housing busts and recessions preceded by large run-ups in household debt tend to be more severe and protracted.[3]

3.   This chapter examines household balance sheets in Norway to assess vulnerabilities stemming from the elevated level of household debt. Section B discusses house price valuation gaps in Norway. Section C examines assets and liabilities of households in Norway to evaluate net asset positions of households using aggregate data. Section D uses micro data which show the distribution of assets and liabilities across household with different income levels and assesses their vulnerabilities to house price corrections. Section E concludes.

B.   Are House Prices Overvalued in Norway?

4.   House prices continue to rise in Norway. There was only a brief correction at the time of the global financial crisis. Real house prices increased by nearly 30 percent from its lowest level in 2008. Standard affordability indicators are also worsening. Price-to-income and price-to-rent ratios increased by 14 percent and 23 percent, respectively, from their lowest levels in 2008. Several factors have been identified to explain the upward trend of house prices, including robust income growth and high population growth due to immigration (see Box 2.1). While these factors may partly explain recent house price developments, there are also risks associated with a house price reversal, and household would be vulnerable to house price corrections given the high levels of household debt.

5.   Staff estimates suggest that house price valuation gaps could be substantial. The 2011 Norway Article IV report concluded that house prices in Norway might be overvalued by

15–20 percent, based on an econometric model used for IMF's Vulnerability Exercise for Advanced Economies (VEA). More recently, the staff has estimated house price valuation gaps for Nordic countries.[4] The new estimates are based on (i) an econometric model used for IMF's VEA; (ii) deviation of the price-to-rent ratio from its historical average; and (iii) deviation of the price-to-income ratio from its historical average. The average estimate of house price valuation gaps based on these three measures in 2013Q1 is a little over 40 percent (the red line in Figure 2.3).[5]

Figure 2.3. Estimates of House Price Valuation Gaps
(Percent)

Sources: IMF staff calculations.

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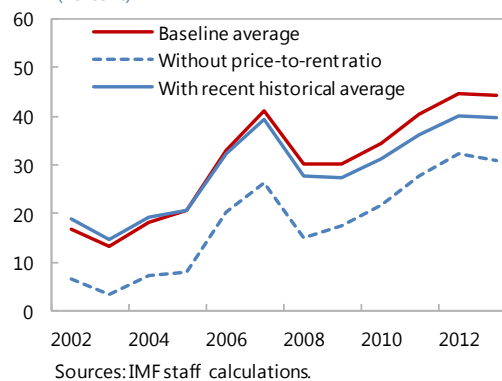
[3] See International Monetary Fund, *World Economic Outlook*, April 2012.

[4] See Ruchir Agarwal, Eugenio Cerutti, and Kazuko Shirono, "House prices and household debt" in Nordic Regional Report Selected Issues, 2013.

[5] These estimates are the *average* of the three measures of house price valuation gaps, so these are not directly comparable with the estimate reported in the 2011 Norway Article IV report which is based on one model.

Box 2.1. Factors Contributing to House Price Increases in Norway

Several factors have been identified as possible explanations for rising house prices in Norway.

Demand factors

- High wage/income growth – Reflecting the high oil price in recent years, Norway recorded high wage growth both in the offshore sector and the mainland economy. Growing income, combined with low unemployment, has contributed to strong demand for housing.

- Population growth – There has been a steady inflow of immigration, pushing up total population in Norway in recent years. Population growth has been about 1 percent on average for the past decade, with an average annual immigration growth at around 8 percent.

Wage Growth and Unemployment Rate
(Percent)

Sources: Haver Analytics, Norges Bank, and IMF staff calculations.

Population and Immigration
(Mil. persons)

Sources: Haver Analytics and IMF staff calculations.

- Low interest rate – Lending rates have gone down substantially since 2000 and remained low in recent years, stimulating credit demand for residential mortgages.
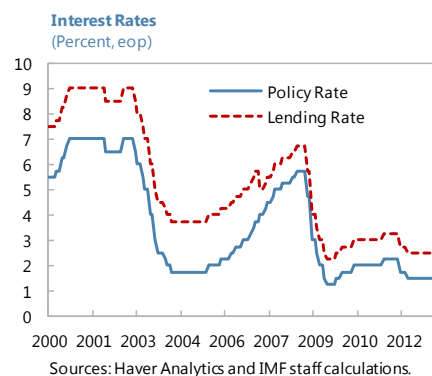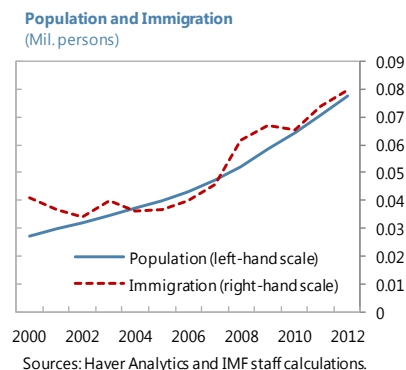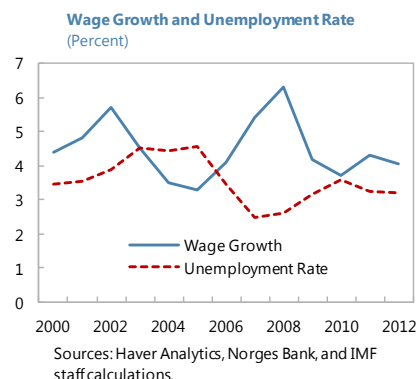
Supply factors

- Supply constraints – The supply of housing is limited, particularly in the Oslo area where many immigrants concentrate, due to regulations on land use and minimum unit size. The supply of housing is falling behind the increasing number of households, although it is not clear how much effective housing demand immigrants represent, particularly for owner-occupied homes.

Interest Rates
(Percent, eop)

Sources: Haver Analytics and IMF staff calculations.

Institutional factors

- Preferential tax treatment – Owner occupied properties receive preferential tax treatment relative to other investments, including full deductibility of interest payment on mortgages and lower effective tax rates.

- Lower risk weights of residential mortgages – Risk weights of residential mortgages tend to be much lower than corporate loans, creating incentives for banks to lend more to households than to companies to improve their risk weighted capital ratio.

Housing Completions and Population Growth

Sources: Norges Bank and IMF staff calculations.
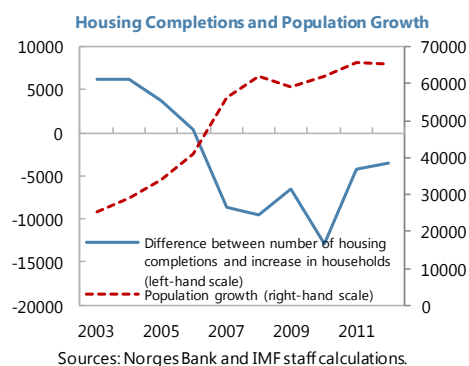
6. **Various factors may affect the estimates of house price misalignment.** For example, the price-to-rent ratio is often used to gauge house price misalignment, but rent controls or a downward bias in the measurement of rental price increases could lead to an overestimation of house price gaps using this measure. In the case of Norway, the rent series is thought to mostly capture the rent developments of existing rental contracts, which tend to move at the rate of CPI inflation due to regulations.[6] Another source of uncertainty could be that the long term historical average may not correctly capture the "fair" values of these affordability indexes because housing markets in Nordics were highly regulated in earlier years. To take account of these possibilities, house price valuation gaps were recalculated using different assumptions.

7. **Robustness checks suggest that these estimates vary under different assumptions, but the overall conclusion remains the same.** One robustness check is to exclude the price-to-rent ratio from the gap measures. This reduces the average estimate of Norway's house price valuation gap to about 30 percent (the blue dotted line in Figure 2.3). On the other hand, the estimates are fairly robust to different assumptions about historical averages; the average estimate changes very little even if a different time period (e.g. using the period from 1990 to present which excludes the heavily regulated era) is used to compute historical averages (the blue solid line in Figure 2.3). These robustness checks demonstrate that the estimates are sensitive to different assumptions, but estimated valuation gaps for house prices in Norway are still sizable.

8. **Some models relying on potentially volatile "fundamentals" may show smaller overvaluations.** Box 1 lists various factors contributing to house price increases, but many of them have been supported by high oil prices. However, if the oil price drops significantly, wage/income growth and immigration inflows could also reverse, which in turn could trigger house price corrections. If "fundamentals" are subject to rapid change when a shock hits the economy, they may not provide much reassurance about the risks of a house price correction.

C. Do Households Have Sufficient Buffers?

9. **A house price correction is more likely to induce households to reduce consumption rather than default on mortgages.** Bank losses in residential mortgages have been low in Norway, even during the financial crisis in early 1990s. In the event of a house price reversal or a loss of income due to an economic downturn, households are likely to adjust expenditure downward to continue to service mortgage payments. The more buffers households have, the better they would be able to cope

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[6] Statistics Norway has introduced recently a new method of collecting rental data to better capture rent movements associated with new lease agreements. This change is expected to increase measured rent inflation slightly. However, given the relative small share of new contracts compared with existing lease contracts in the rest survey, the upward revision could be also rather limited. See http://www.ssb.no/en/priser-og-prisindekser/statistikker/kpi/additional-information/new-tenants-in-cpi-rent-indices.

with such shocks. This section examines household balance sheets to assess households' financial buffers to withstand shocks.

10.   Aggregate household net worth in Norway is smaller relative to income than its peers

(Figure 2.4). Household debt in Norway is high as a share of disposable income, but household assets are also sizable, with net worth at a little over 200 percent of disposable income. Put in an international context, however, this level of net worth is not as large as in similar OECD countries. However, non-financial assets (mostly housing) are based on tax valuations, which are believed to understate market values by about one third.[7] Once this is taken into account by adjusting tax valuation to market values, Norwegian households' net worth would increase to 340 percent of disposable income, but it would be still the second lowest among its peers.

Figure 2.4. Household Assets and Liabilities, 2011
(Percent of disposable income)

Sources: OECD and IMF staff calculations.
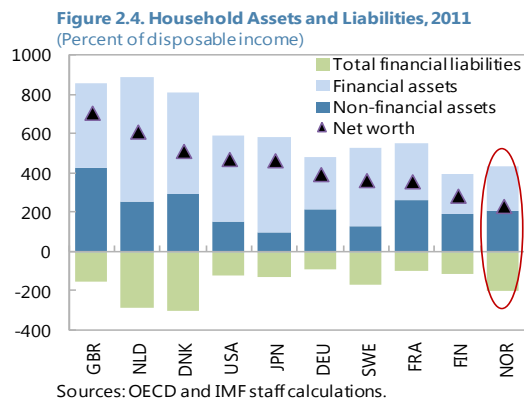
11.   Moreover, the share of liquid household assets is relatively small in Norway.[8]
Non-financial assets account for about half of the total household assets in Norway (Figure 2.5).[9] Illiquid pension assets account for another 20 percent of assets. If non-financial assets are evaluated at market prices (assuming the same correction as above), the share of illiquid assets rises to nearly 80 percent of household financial assets. As a result, liquid assets are smaller than the sum of the mostly-floating-rate mortgages and other household financial liabilities with the gap growing steadily over time (Figure 2.6). This suggests that households have limited liquidity buffers in the event of an

Figure 2.5. Norway: Composition of Household Assets, 2011
(Percent of total household assets)

Sources: OECD and IMF staff calculations.

Figure 2.6. Household Net Worth and Liquidity Buffer
(Percent of disposable income)

Sources: OECD and IMF staff calculations

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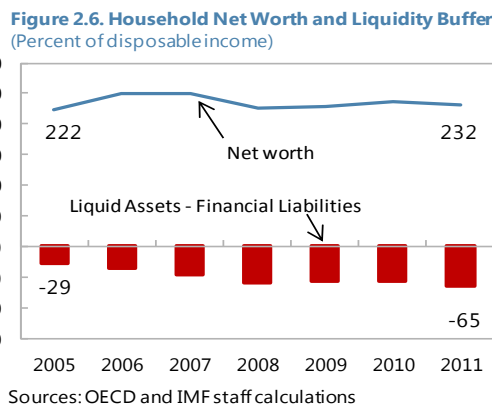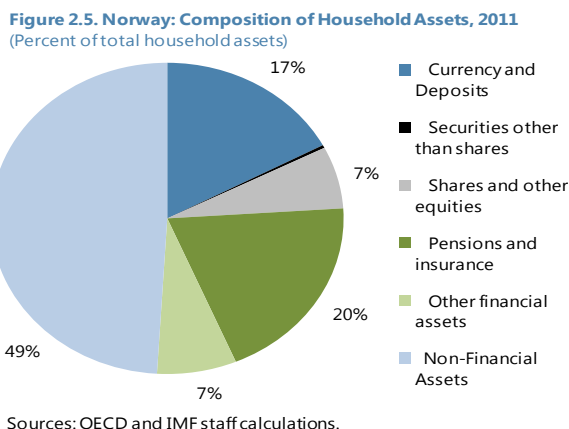
[7] See Jon Epland and Mads Ivar Kirkeberg, "Wealth Distribution in Norway: Evidence from a New Register-Based Data Source," Statistics Norway, 35/2012.

[8] Liquid assets are defined as total assets minus illiquid assets which are defined as the sum of non-financial assets and pension assets.

[9] Figure 2.5 does not take account of possible undervaluation of house values reported in the tax register data.

economic downturn or interest rate hikes, events that would also likely be associated with a decline in the value of house prices.

D. How Are Assets and Liabilities Distributed Across Households?

12.   Risks are heightened because assets, liabilities, and income are unevenly distributed across households. More disaggregated data reveal that high levels of household debt are not necessarily concentrated among high income households in Norway, and limited financial buffers are prevalent across income groups:[10]

Box 2.2. Micro Data on Household Balance Sheets

This box provides technical details of the micro data on household balance sheets used in the analysis of Section D.

The data were provided by Norges Bank based on tax registry micro data on households' after-tax income, assets and liabilities collected by Statistics Norway. Households are divided into ten income groups with a roughly equal number of observations in each income group. The sample period of the data is 1987–2010, but given that pre-2005 data are based on surveys, the analysis focuses on the period starting from 2005.

One peculiarity of these data is that the group in the lowest income decile 1 has large financial assets while the value of non-financial assets is rather small. This reflects the fact that this lowest income group is highly heterogeneous, containing diverse groups such as pensioners who tend to have large financial assets and students and immigrants who are likely to have lower earnings. A combination of very low income and high financial assets due to the heterogeneity of the sample gives an implausibly high share of financial assets relative to income for the lowest income group. It is thus generally difficult to interpret the results for this income group. For this reason, part of the analysis above focuses on income deciles 2-10 to assess the distribution of vulnerabilities.

Average Disposable Income by Income Deciles in 2010
(Thousands NOK)
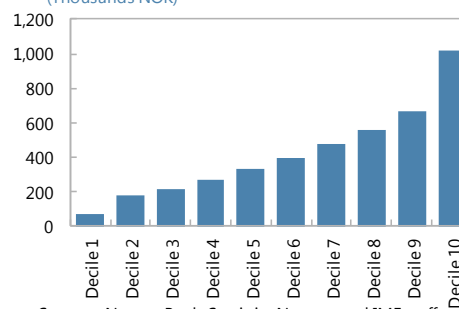
Sources: Norges Bank, Statistics Norway, and IMF staff calculations.

Household Income and Assets in 2010
(Millions NOK)

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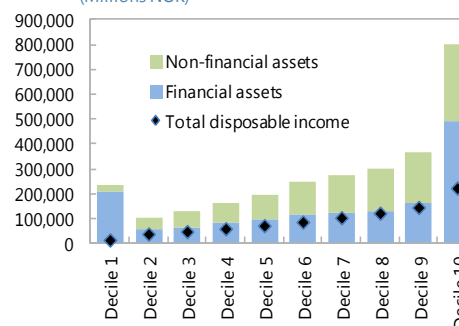
[10] The data used in this section were provided by Norges Bank based on household micro data collected by Statistics Norway. See Box 2.2 for some technical discussion on the data.

- Household debts are largely aligned with income levels, but the levels of debt to income ratio do not differ considerably across income groups, particularly for income deciles 4 and above (Figure 2.7). The exception is the heterogeneous lowest income decile, which comprises students and immigrants, but also low-income, high-net-worth pensioners. Household debt rose since 2005 in all income groups.

Figure 2.7. Household Debt by Income Deciles
(Percent of disposable income)
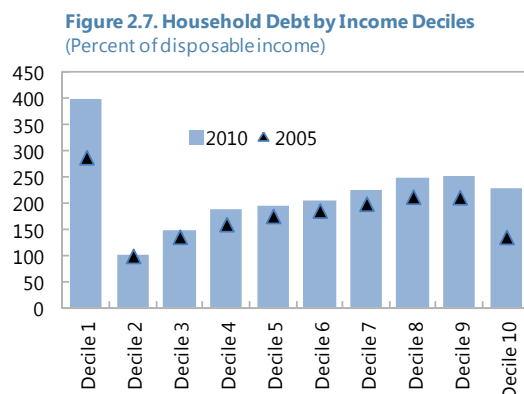
- Net worth in some higher income groups (income deciles 8 and 9) is near-zero (Figure 2.8). These two income groups also have the highest debt to income ratio. Non-financial assets (housing) are almost evenly distributed across different income groups. Financial assets (which include both liquid and illiquid financial assets) are generally lower than total liabilities with the gap being negative for most income groups.[11] These results suggest that debt burdens are relatively evenly distributed across income groups in Norway, and most income groups (except very low income deciles) appear to have relatively limited buffers in the event of income loss associated with an economic downturn. A house price reversal could have significant impact on consumption among these households.

Figure 2.8. Household Balance Sheets by Income Deciles in 2010
(Percent of disposable income)
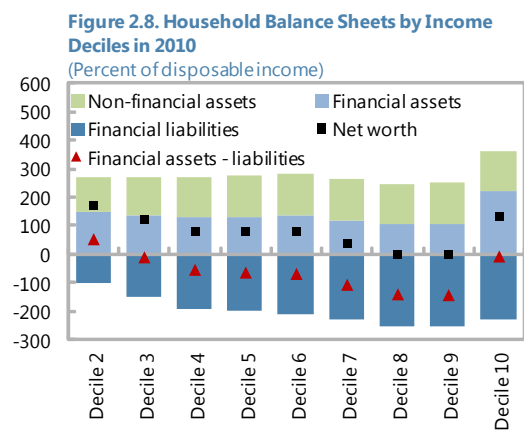
Sources: Norges Bank, Statistics Norway, and IMF staff calculations.

13. **The number of households that are highly indebted is also on the rise** (Figure 2.9). The share of households whose debt is more than 500 percent of disposable income has risen significantly from 4 percent in mid-1990s to 11 percent in 2010.[12] Consistent with the analysis above, this tendency is prevalent in almost all income groups. These households would be even more vulnerable to a house price correction and other negative shocks.

Figure 2.9. Households with Debt Burden of 500 Percent of Income
(Share of total households)
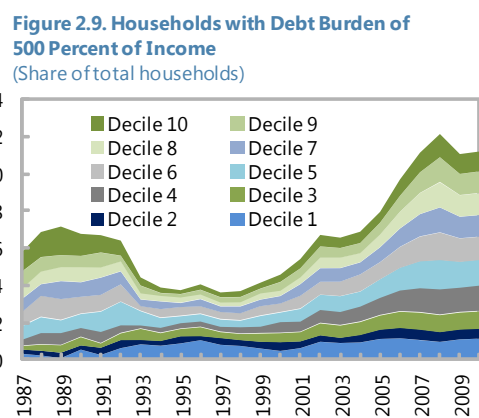
Sources: Norges Bank, Statistics Norway, and IMF staff calculations

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[11] The breakdown of liquid and illiquid assets was not available to the staff, so the gap between financial assets and financial liabilities is adopted as an alternative measure for "liquidity buffers" used in Section C.

[12] See also Norges Bank, *Monetary Policy Report,* 2012/2.

E. Conclusion

14.   Norwegian households have limited financial buffers in the event of a house price correction or other negative shocks to the economy. This result tends to hold regardless of household income levels.

15.   On the other hand, there are signs that risky household debt is stabilizing. For example,

new loans exceeding the FSA-recommended 85 percent LTV cap fell to 17 percent in 2012 (Figure 2.10).[13] The share of interest-only loans among new loans has also declined from 23 percent in 2011 to 17 percent in 2012 (FSA). Saving rates are also rising recently, suggesting that households are increasingly becoming more cautious.

16.   Nevertheless, elevated household debt in Norway poses a significant challenge. A house price correction could significantly reduce household consumption through wealth effects. Banks' losses

Figure 2.10. Distribution of LTV for New Loans 1/
(Percent)
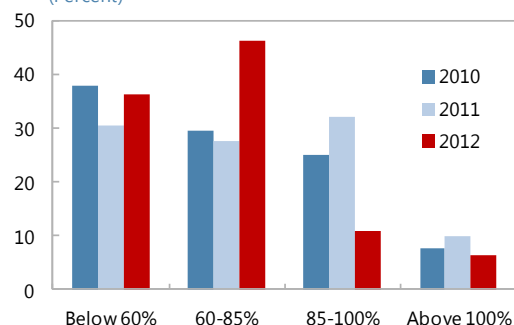
Sources: Norway FSA and IMF staff calculations.
1/ Based on FSA's annual survey.

related to residential mortgages may not increase much, but financial stability could be undermined if lower consumption impairs business activity and thus pushes up bank losses associated with enterprise loans. The ongoing strengthening of capital requirements for banks will help mitigate some of these risks, but rigorous monitoring needs to continue on residential mortgage lending.

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[13] The FSA tightened the LTV cap by lowering it from 90 percent to 85 percent in December 2011.

LONG-RUN FISCAL CHALLENGES[1]

This chapter considers the longer term implications of Norway's fiscal rule under different scenarios, by varying assumptions on real rates of return, the share of the Government Pension Fund Global (GPFG) – Norway's sovereign wealth fund) assets that is transferred to the budget each year, and oil prices. The analysis indicates that a lower real rate of return has large implications for the long-run value of the sovereign wealth fund, but that the rate of fiscal transfer is the key parameter that would mitigate or exacerbate "Dutch disease" pressures on the economy arising from increased oil-related activity in the mainland economy and the increasing non-oil fiscal deficit. Oil prices have limited impact on the rate of transfer unless there are sustained deviations from the baseline over the next couple of decades, after that, they become less important as most of the oil will have already been extracted. These scenarios are combined with long-run aging related costs to show that further pension reforms are needed to address long-run aging related costs.

A. Introduction

1.   Norway faces long-term fiscal policy challenges related to the use of its oil and gas revenues as well as pensions and other aging-related costs. [2] Oil and gas revenues are an enormous positive development for the economy, but they create economic challenges. The fiscal rule designed to largely insulate the economy and the budget from the effects of oil revenue is creating a sustained positive fiscal impulse in an economy at its potential. And over the next decade this may compound competitiveness problems (see Chapter 1). Further out, the fiscal rule implies that the fiscal impulse will turn around and begin a sustained decline well before aging-related fiscal costs reach their peak.

2.   This chapter describes some fiscal choices facing the Norwegian people and authorities. Section B discusses the institutional framework for managing oil wealth, often cited by IMF staff as the model for managing natural resource wealth to other countries. Section C presents scenario analysis for the value of the wealth fund and its fiscal transfer based on authorities' and alternative assumptions, with a focus on the net fiscal impact assuming the continuation of current welfare policies. Section D concludes.

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[1] Prepared by Cristina Cheptea, Aurora Mordonu, and Kazuko Shirono.

[2] "Oil" is used as shorthand to refer to oil, natural gas, and other hydrocarbons except when different patterns among these resources are explicitly noted.

Figure 3.1. Norway: Production, Reserves, and Exports of Gas and Oil

A. Norway Oil Production
(Million tonnes)

B. Norway Gas Production
(Billions Sm3)

C. Proven Oil Reserves
(Percent of world reserves, 2012)

D. Proven Gas Reserves
(Percent of world reserves, 2012)

E. Largest Oil Exporters, 2011
(Millions barrels per day)

Saudi Arabia	8.4
Russia	7
Kuwait	2
Nigeria	2
Iraq	1.9
Iran	1.9
Norway	1.8
UAE	1.7
Angola	1.7
Qatar	1.6

F. Largest Gas Exporters, 2011
(Billions Sm3)

Russia	193.9
Qatar	120
Norway	97.3
Canada	58.2
Algeria	50.3
Indonesia	38.7
Turkmenistan	36.9
Netherlands	32.9
Malaysia	31.1
Australia	25.2

Sources: BP Statistical Review of World Energy June 2013, KBC Market services, and IMF staff calculations.

B. Resource Wealth and the Fiscal Rule

Norway's Resource Wealth

3.   Oil production and related activities are enormously important to the Norwegian economy. Oil was discovered off of the Norwegian coast in 1969 and production began in 1971. Oil production now accounts for over one fifth of total GDP, one quarter each of g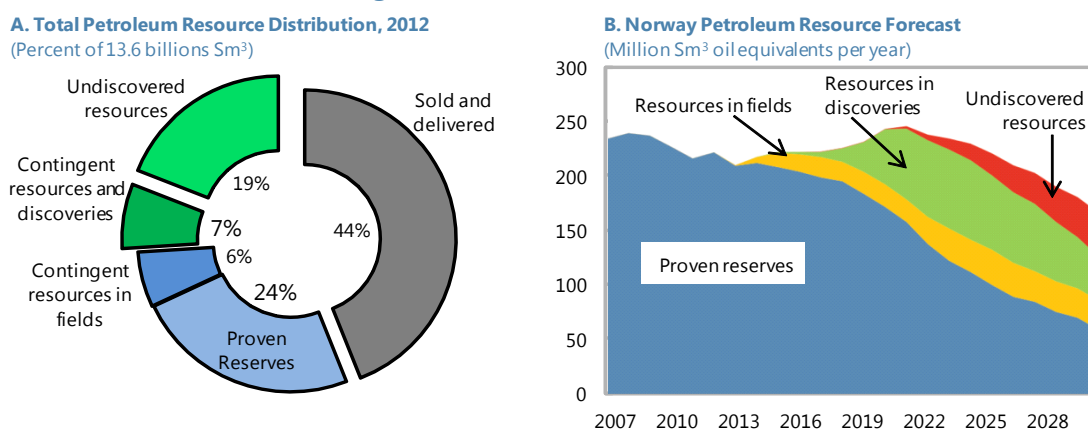overnment revenues and total investment, and over fifty percent of total exports. Norway was the world's third largest exporter of gas and the seventh largest exporter of oil in 2011 (Figure 3.1).

4.   Norway's oil-related income will pass quickly. Oil output peaked in the late 1990s and combined oil and gas output peaked in the early 2000s. New technologies, new discoveries and estimates of output from as-yet-unexplored areas suggest that oil output may be maintained and even reach a second peak around 2021. However, the government estimates that nearly half of the oil resources, including likely new discoveries, have already been extracted and sold (Norwegian Ministry of Finance, 2013b) as illustrated in Figure 3.2.

Figure 3.2. Petroleum Resources

A. Total Petroleum Resource Distribution, 2012
(Percent of 13.6 billions Sm³)

B. Norway Petroleum Resource Forecast
(Million Sm³ oil equivalents per year)

Sources: The Norwegian Petroleum Directorate *Facts 2013* Report and IMF staff calculations.

The Government Pension Fund Global – Norway's Sovereign Wealth Fund

5.   The state's oil revenue is not treated as general fiscal revenue. Instead, it is invested in a sovereign wealth fund, the Government Pension Fund Global (GPFG). The government's revenues from taxes related to oil production, transfers and dividends from oil-related public enterprises, such as the majority state-owned oil producer (Statoil), are all transferred directly to the GPFG.[3] The GPFG is among the world's largest sovereign wealth funds with total assets of $713 billion at end-2012.

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[3] The full definition of the income stream for the GPFG can be found, inter alia, in the Summary of the National Budget, 2012 (Norwegian Ministry of Finance 2012).

6.   The GPFG serves variously as a vehicle for investment of resource income for future generations, as a source of fiscal financing for the non-oil fiscal deficit according to Norway's fiscal rule, and as a means of insulating the economy from "Dutch disease." Notwithstanding its name, there is no direct connection between the GPFG and the state's pension obligations. The GPFG's only outflows are the fiscal transfers to the budget that finance the non-oil deficit and the management cost of running the fund.

7.   The GPFG is a recent innovation in Norway's approach to resource revenue management. Oil production in Norway began in 1971, and revenues from oil and gas were treated as ordinary fiscal revenues in the first decades of production. However, in the 1990s the authorities created new institutional arrangements to insulate the budget and the economy from oil price swings, motivated in part by large volatility in resource revenue in the late 1980s and early 1990s and the financial crisis that Norway and other Nordic countries went through in the same period. The first inflows of investible resources began only in 1996.

8.   The GPFG makes well-diversified investments in a manner similar to a global index fund. Initially the GFPG was mainly a fixed-income portfolio. However, equities quickly became the largest share of assets and (very recently) a small share is being invested in real estate. The current target portfolio is 60 percent equity, 35 percent fixed-income, and 5 percent real estate, with assets distributed across advanced and higher-rated emerging markets. Because portfolio reallocations are infrequent and gradual, they can be implemented through new purchases without selling assets. As a result, management costs are low (7-10 basis points annually).

9.   The governance of the GPFG mostly insulates decisions about the investment of oil income from political considerations. The GPFG is under the ownership of the government through the Ministry of Finance but managed by the Norges Bank (the central bank). The Ministry sets the investment strategy and broad asset allocations, but delegates the management to the Norges Bank Investment Management (NBIM). The NBIM is charged with achieving the highest possible return, subject to the limitations included in the investment strategy and good governance, environmental and social concerns. An independent Council on Ethics advises the Ministry on the exclusion of specific firms (e.g., tobacco and nuclear weapons production).

The Fiscal Rule in Design and Practice

10.   In 2001, the authorities created a fiscal rule that ties the non-oil fiscal deficit to the investment returns on the GPFG. Specifically, the 2001 fiscal guidelines provide that: "Petroleum income should be phased into the economy on par with the developments in expected returns on the Government Pension Fund Global. Considerable emphasis must be put on stabilizing the economy."[4]

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[4] From the Norwegian Ministry of Finance website: http://www.regjeringen.no/en/dep/fin/Selected-topics/economic-policy/economic-policy.html?id=418083.

In subsequent elaborations of the rule, the expected real return has been estimated at 4 percent, and the government has noted that "The fiscal rule permits spending more than the expected return on the Fund in a cyclical downturn, while the use of oil revenues should lie below the expected return when capacity utilization in the economy is high" (Norwegian Ministry of Finance, 2012). The rule is flexible: there are no specific guidelines or metrics for interpreting how smoothing over the business cycle should take place or how else the rule should contribute to stabilizing the economy across other economic cycles (e.g., oil price fluctuations, global asset price cycles, or domestic asset cycles such as housing prices). Also, while the government has estimated the expected real rate of return at 4 percent for purposes of establishing the trend fiscal transfer, there is no prescription as to how this should be estimated or when and if estimates would be revisited.

11.   The fiscal policy rule constrains the structural non-oil deficit as a share of GPFG assets, but not as a share of mainland GDP. Because the GPFG has been growing much more rapidly than the economy as a whole over an extended period, this rule has allowed for a steadily rising non-oil deficit as a share of mainland GDP (Figure 3.3). This has been true even as the deficit has been on a slightly declining trend as a share of the GFPG's assets. However, when GPFG assets start to decline relative to mainland GDP (as is expected starting in about two decades), transfers would also decline as a share of mainland GDP.

Figure 3.3. Non-oil Fiscal Transfer

A. Structural Non-oil Deficit (Percent of GPFG)

B. Structural Non-oil Deficit (Percent of mainland GDP)
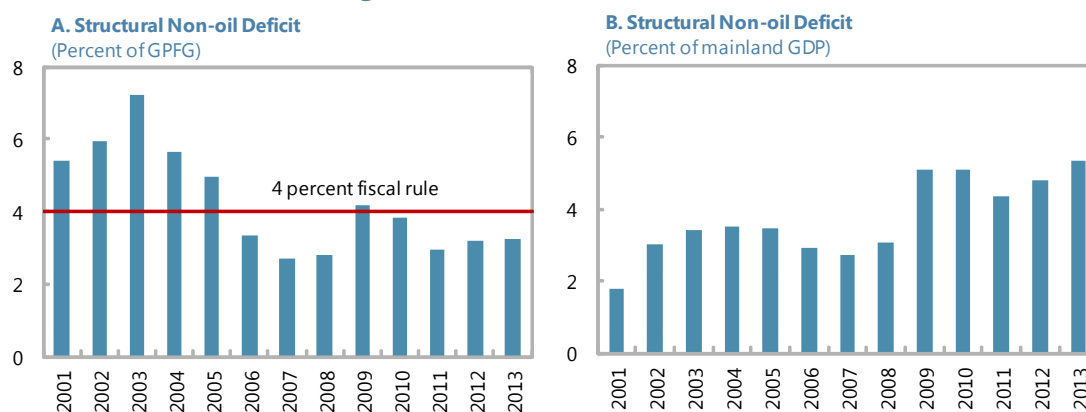
Sources: Ministry of Finance and IMF staff calculations.

C.   Challenges to the GPFG and the Long-Term Fiscal Outlook

12.   There are considerable uncertainties about real rates of return and the path of oil prices, and small differences in economic outturns or how the authorities implement the rule could have large effects. To account for uncertainties in long-run oil prices and asset returns, this section compares: (i) a baseline scenario based mainly on authorities' assumptions; (ii) alternative scenarios that individually consider the real rate of return in line with or lower than historical experience rather than the assumed 4 percent, a more conservative approach to fiscal transfers than implied by an average of 4 percent of GFPG assets per year, and lower oil prices individually; (iii) combined scenarios

in which multiple parameters are varied at the same time; and (iv) scenarios comparing projections of pension expenditures and fiscal transfers.

Baseline scenario

13.   The GPFG peaks at about 265 percent of mainland GDP by 2030 and declines thereafter under the baseline scenario (see the red line in the left chart of Figure 3.4A). This baseline uses the authorities' projections for oil production volumes; a 4 percent real rate of return; and an average fiscal transfer to the budget (i.e., the assumed trend real rate of return) of 4 percent. Oil price projections are based on WEO price projections and futures markets (which are close to the authorities' projections) and remain constant in real terms after 2022. Population growth is projected to decline gradually from the current 1.3 percent to 0.2 percent by 2100 under the authorities' projections. Real GDP growth is taken from staff projections through 2015 and the authorities' projections thereafter, largely paralleling the declining rate of population growth (3.3 percent in 2015 declining to 1.8 percent in 2060-2100).
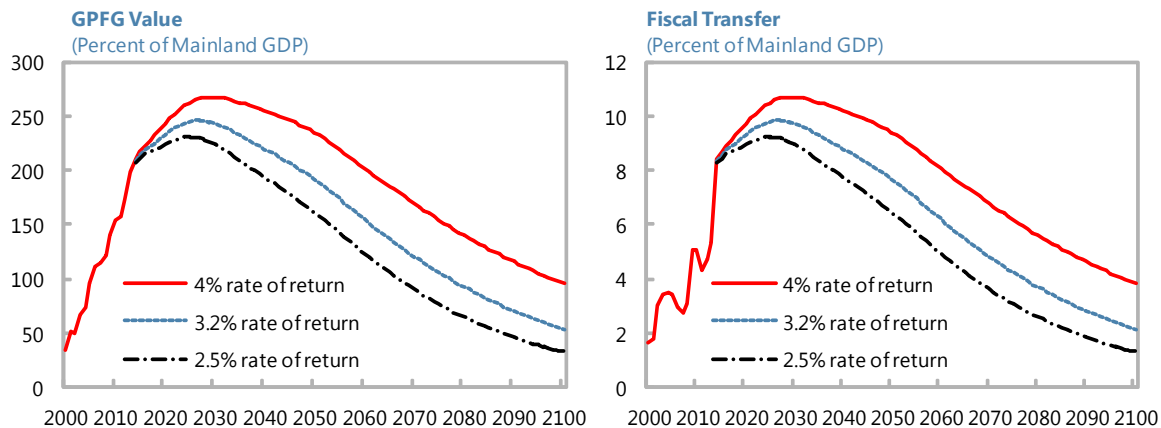
14.   The fiscal rule would preserve the real value of the oil wealth in perpetuity if it operates as intended, in particular if the fiscal transfers are equal to the ex post real return. Because oil production is expected to continue for several decades, the real value of the fund should continue to grow for most of this century. However, the value of the fund would eventually decline as a share of GDP if real GDP grows and oil revenues are no longer replenishing the fund. The authorities have expressed the view that preserving the real value of the GPFG is an appropriate approach to inter-generational transfers, but maintaining the value of the GPFG relative to a growing real per capita GDP would be a regressive transfer from less wealthy current generations to wealthier future ones.

15.   High oil prices and oil resource discoveries have pushed up the assets of the GPFG more rapidly than originally anticipated and imply a strong sustained increase and subsequently a steady fall in the non-oil deficit as a share of mainland GDP (see the red line in the right chart of Figure 3.4A). The fiscal rule smoothes short-term business cycle fluctuations. However, the non-oil deficit rises sharply as a share of mainland GDP over the next decade and a half, peaking at just below 11 percent of mainland GDP by 2030 and decline thereafter with transfers of just below 4 percent of mainland GDP by 2100. This uneven pattern of fiscal stimulus could have significant implications for competitiveness and the preservation of a tradable goods and services sector outside of the oil sector and the oil-related goods and services production in the mainland economy.

16.   The long-term fiscal outlook is subject to considerable uncertainty. Relatively small changes in key economic assumptions and parameter values in implementing the fiscal rule can have very large effects on long-run projections due to compounding. Long-term horizons are important to assess the fiscal implications because key long-term fiscal obligations, including fiscal expenditures for aging-related pension expenditures, are similarly long-term. However, other challenges, such as managing the crowding out pressure on non-oil related tradable sectors will be more acute in the next two decades and call for focus on shorter time horizons as well.

Figure 3.4. Norway: Scenario Analysis

A: Different Rates of Return

GPFG Value
(Percent of Mainland GDP)

Fiscal Transfer
(Percent of Mainland GDP)

4% rate of return
3.2% rate of return
2.5% rate of return

B: Different Rates of Fiscal Spending
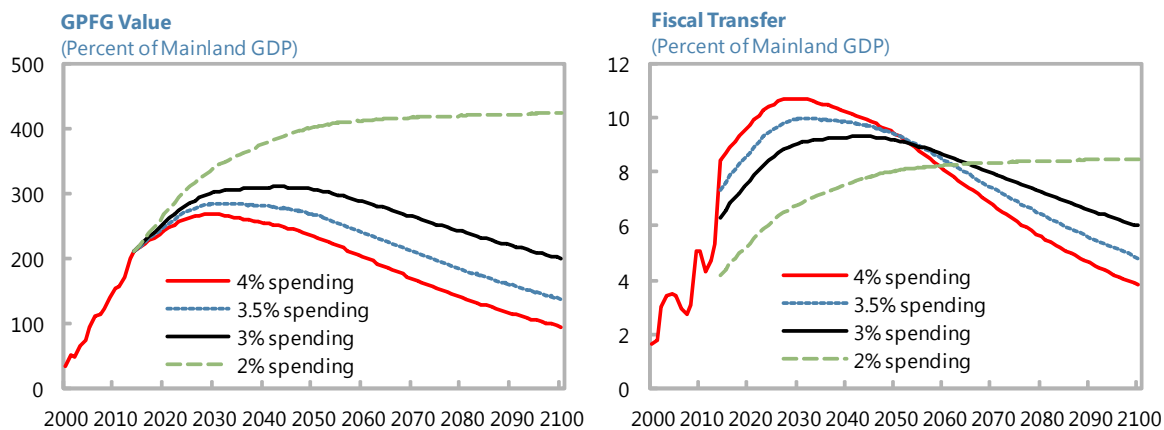
GPFG Value
(Percent of Mainland GDP)

Fiscal Transfer
(Percent of Mainland GDP)

4% spending
3.5% spending
3% spending
2% spending

C: Different Oil Prices
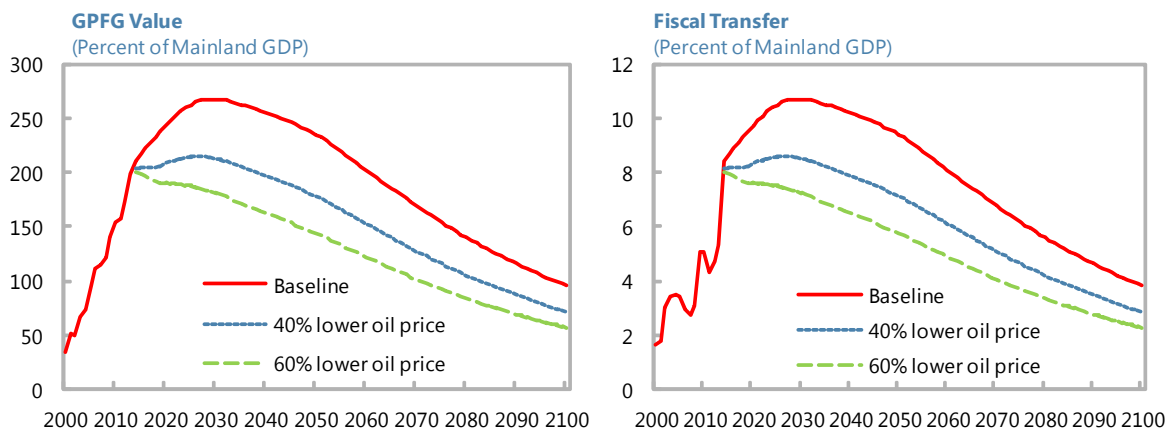
GPFG Value
(Percent of Mainland GDP)

Fiscal Transfer
(Percent of Mainland GDP)

Baseline
40% lower oil price
60% lower oil price

Sources: IMF World Economic Outlook, Ministry of Finance, Norges Bank, and IMF staff calculations.

Alternative scenarios

A Real Rate of Return Below 4 Percent

17.   The assumed 4 percent real rate of return for the GPFG is high compared with its past performance and that of other long-run portfolios. The lifetime (1997–2012) real rate or return on the GPFG is 3.2 percent, and some similar portfolios have lower returns over longer periods (see Figure 3.5 and Box 1).[5] While 3.2 percent may not be significantly below 4 percent in a statistical sense, a difference of 0.8 percent would have substantial consequences for the long-run value of the GPFG and would reduce the fiscal transfers it can finance. The GPFG outcome of 3.2 percent real return is relatively close to 3.7 percent real rate of return earned by a global benchmark portfolio mix of 60 percent equities and 40 percent bonds for the past 113 years (see Box 3.1). But 3.7 percent real rate of return is still lower than the assumed 4 percent, and it may be associated with risks that might not be tolerated by the GPFG mandate.

Figure 3.5. Evolution of Real Returns of GPFG 1/
(Percent)

Sources: Norges Bank (NBIM) and IMF staff calculations.
1/ Data for 2013 are as of March 31.

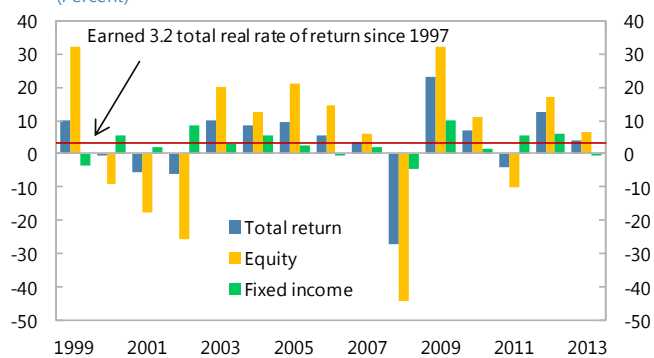**18.   Moreover, there is a risk that the GPFG may not even maintain the historical average level of returns.** This could happen if asset price cycles align with oil prices and production in a manner that results in a large share of investments being made when markets are high or if longer run rates of return fall below those experienced in the last several decades as discussed in Box 3.1.

19.   Variations in the ex-post real rates of return could have a significant effect on the size of the fund and the fiscal transfers it could support in the very-long term, but only a modest effect over the next decade. Figure 3.4A compares the baseline scenario (4 percent) with the average historical real rate of return (3.2 percent) and a lower rate (2.5 percent). Until about 2030, the rates of fiscal transfer differ by less than one or two percentage points of mainland GDP between the highest and lowest projections. These assumptions also have little impact on when the value of the GFPG and the fiscal transfer peak, and a relatively modest impact on the peak values. The real rate of return becomes progressively more important over time, lowering the fiscal transfer relative to the baseline with 1.7 and 2.5 percentage points of mainland GDP by the end of the century.

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[5] The real rate of return is measured net of management costs and is measured in the currency basket of the GPFG. A detailed discussion of the management of the Fund can be found in the "Government Pension Fund Global Annual Report 2012" by NBIM.

Box 3.1. Long-run Cross-Country Performance of Various Asset Classes

Dimson et al. (2002, 2013) have extensively studied long term real returns on equities, bonds, and bills, covering 25 countries over 113 years. They report that the world average real return on equity from 1900 to 2012 was 5 percent. Equities have significantly outperformed bonds since 1900 with a global average of 1.8 percent. European rates of return were lower than the world for both equities and bonds at 4.2 and 0.8 percent respectively.

Real Returns on Equities (Percent)

Real Returns on Equities and Bonds, 1900-2012 (Percent)
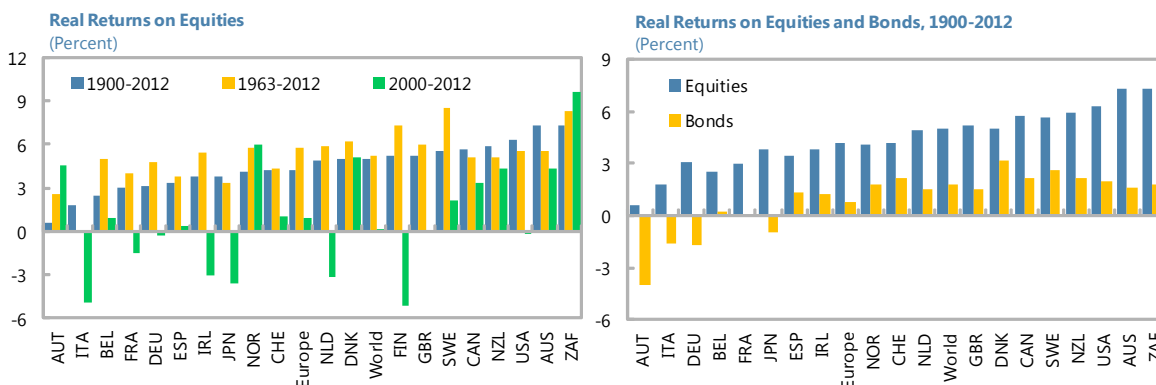
Sources: Dimson et al. (2013) and IMF staff calculations.

Using real rates of return reported in Dimson et al. (2002, 2013), real returns of a hypothetical portfolio consisting of 60 percent equities and 40 percent bonds, approximating GPFG's portfolio allocation, were computed for available samples during 2000–2012. The GPFG's rate of return was 2.8 percent, outperforming the world, which earned 2.5 percent, and underperforming Europe, which earned 3.3 percent during this time period.

Real Returns of 60/40 Mix of Equities and Bonds, 2000-2012 (Percent)

4 percent real rate of return

2.8
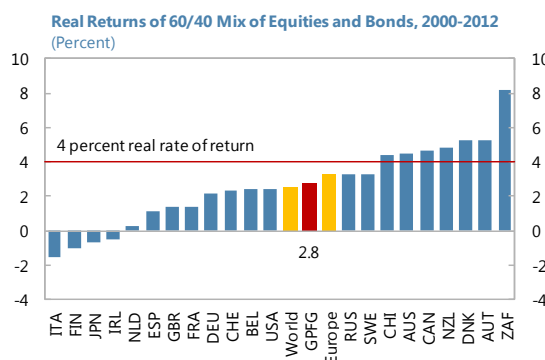
Sources: Dimson et al. (2013), Norges Bank, and IMF staff calculations.

A similar exercise was conducted to compute real rates of return of a portfolio mix of 60 percent equities and 40 percent equities for the past 113 years (1900–2012). Real rates of return of the world and Europe are 3.7 percent and 2.8 percent respectively. If history is a good predictor of the future, by investing in regionally diversified portfolio (i.e. the world), the GPFG would earn 3.7 percent real rate of return in the long run, but this is still lower than 4 percent and may also involve risks that might not be tolerated by the GPFG mandate.

Long run rates of return cannot exceed long-run economic growth. Because of the global financial crisis and the associated reduced expectations for long-run growth, some analysts believe we have transitioned into a world with lower real interest rates and cheaper and more readily available capital than in recent decades. McKinsey (2010), Siegel (2012) and Dimson et al. (2013) argue that today's low interest rates are the best estimate for the expected real return over the next two decades, and that lower interest rates should be considered as the new equilibrium.

A Lower Rate of Fiscal Transfer

20.   The percentage of the GPFG assets transferred to the budget each year has a direct and immediate impact on the non-oil deficit. Figure 3.4B compares the baseline with alternative scenarios that assume lower rates of fiscal transfer. A lower rate of fiscal transfer results in a higher peak GPFG asset level and a smoother decline relative to mainland GDP. A transfer rate of 3.0 percent of GPFG translates into lower fiscal transfer as share of mainland GDP than in the baseline scenario until 2054, but higher thereafter. A transfer of only 2 percent of GPFG assets translates into lower fiscal transfer in percent of mainland GDP in the coming years which increases to about 8 percent of mainland GDP in 2050-2060 and remains roughly in that range through 2100.

Lower Oil Prices

21.   The long-term fiscal implications of lower oil prices are less than might be expected for an oil fund. A permanent, 40 percent decline in real oil prices affects short- and medium-term fiscal transfers somewhat (2 percentage points) but less so the long run fiscal transfer (see Figure 3.4C). The proportional impact of an oil price shock on GPFG assets is slightly more than half of the percentage change in oil prices because nearly half of the total oil resources has been extracted (44 percent as of 2012), and that part of the oil wealth is now immune to oil price fluctuations. The impact is phased in more rapidly than the rate of return assumptions; while the later cumulate indefinitely, the impact on GPFG assets and the fiscal transfer from an oil shock is largely phased in by mid-century, by which time nearly 90 percent of the remaining oil resources will have been extracted.

Combined scenarios

22.   The asset-accumulation dynamics are illustrated in Figure 3.6 and Table 3.1 with alternatives to the baseline scenario. These illustrate the joint effect of changes in assumptions on the real rate of return and the fiscal transfer. Each scenario is defined as follows:

- In the **"baseline"** scenario, the real rate of return and the fiscal transfer are aligned at 4 percent.

- In the **"conservative"** scenario, the projected fiscal transfer is cut to 3 percent of the GPFG and hence kept lower than the rate of return which is assumed at the same level as in the baseline (4 percent). This scenario is close to the current practice where the authorities use the flexibility in the fiscal rule by spending less than 4 percent.

- A **"constant 4% transfer"** scenario combines a constant fiscal transfer (4 percent of GPFG assets) with the historical real return of 3.2 percent, to provide an example of a higher rate of spending than the long-run rate of return.

- In the "**prudent"** scenario the projected fiscal transfer is kept at 3 percent and the rate of return at the historical level of 3.2 percent, to provide an example of a roughly aligned rate of spending with the historical rate of return.

- In the "**low transfer**" scenario, the projected fiscal transfer is cut to 2 percent of the GPFG and the rate of return is at the historical level of 3.2 percent; it is similar to the optimistic scenario with respect to the difference between the rate of spending and the real rate of return, but it provides a very conservative fiscal rate of spending.

Figure 3.6. Combined Scenarios
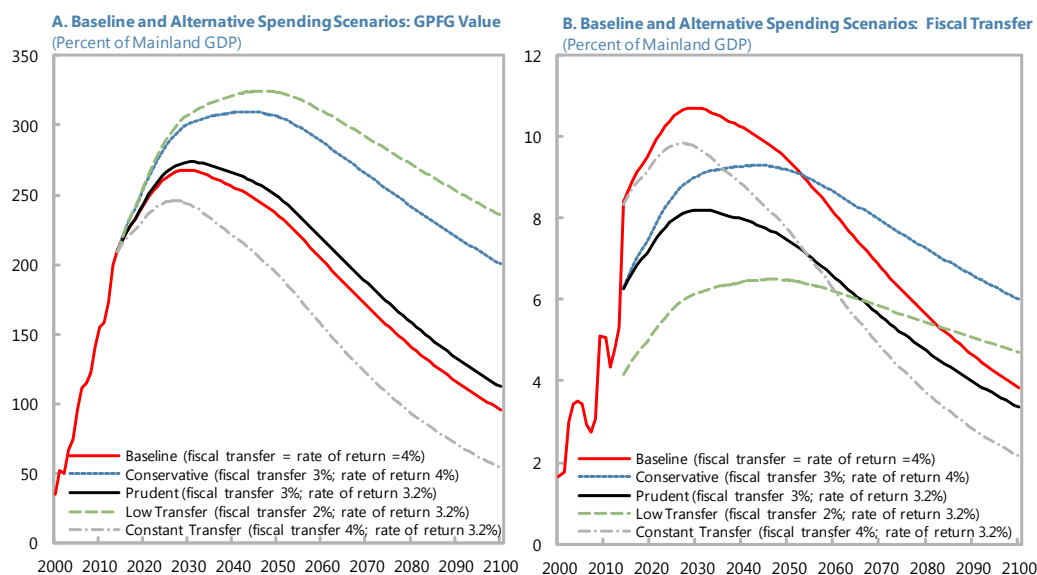
A. Baseline and Alternative Spending Scenarios: GPFG Value
(Percent of Mainland GDP)

B. Baseline and Alternative Spending Scenarios: Fiscal Transfer
(Percent of Mainland GDP)

Baseline (fiscal transfer = rate of return =4%)
Conservative (fiscal transfer 3%; rate of return 4%)
Prudent (fiscal transfer 3%; rate of return 3.2%)
Low Transfer (fiscal transfer 2%; rate of return 3.2%)
Constant Transfer (fiscal transfer 4%; rate of return 3.2%)

Sources: IMF World Economic Outlook, Ministry of Finance, Norges Bank, and IMF staff calculations.

23.   The difference between the realized rate of return and the amount of assets transferred has a key influence on the long-run value of the GPFG. In the prudent scenario (3 percent fiscal transfer and 3.2 rate of return), the GPFG value remains close to the baseline where the transfer and return rates are also aligned. If the real rate of return ultimately exceeds the rate of the fiscal transfer (conservative and low scenarios), the maximum value of the GPFG exceeds that under the baseline and result in higher fiscal transfers as a share of mainland GDP after mid-century and twice as much wealth at the end of the century (see Table 3.1). Where the reverse is true (the constant 4% transfer scenario), the GPFG is decapitalized quickly relative to mainland GDP and fiscal transfers fall below those of other scenarios in the latter part of the century (see also the "low return" scenario in Table 3.1).

Table 3.1. Summary of Scenario Results

	Rate of return (percent)	Rate of fiscal transfer (%MGDP)	Fiscal transfer 2020 (%MGDP)	Fiscal transfer 2060 (%MGDP)	Fiscal transfer 2100 (%MGDP)	GPFG peak year	GPFG assets 2020 (%MGDP)	GPFG assets 2060 (%MGDP)	GPFG assets 2100 (%MGDP)
Baseline	4.0	4.0	9.7	8.1	3.8	2029	243	203	95
Constant 4% transfer scenario	3.2	4.0	9.3	6.2	2.2	2027	233	155	54
Low return	2.5	4.0	9.0	5.0	1.3	2025	224	124	33
Conservative scenario	4.0	3.0	7.7	8.6	6.0	2043	255	287	200
Prudent scenario	3.2	3.0	7.3	6.5	3.4	2030	245	218	112
Low transfer scenario	3.2	2.0	5.1	6.2	4.7	2046	257	310	235
Low oil price (40% lower), high return	4.0	4.0	8.3	6.1	2.9	2027	208	153	72
Low oil price (40% lower), historical return	3.2	4.0	7.9	4.6	1.6	2013	199	115	40

Sources: IMF World Economic Outlook, Ministry of Finance, Norges Bank, and IMF staff calculations.

Long-Run Aging and Health Related Costs

24.   Fiscal policy is facing major long run challenges over the next several decades as the result of the increased fiscal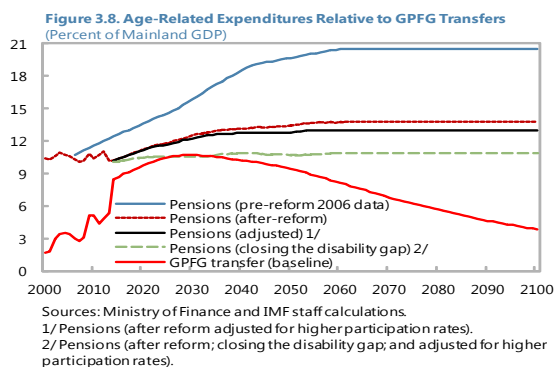 costs associated with pension obligations. The ratio of elderly (65 years and above) to working age population (20–64 years) is projected to nearly double from 2013 to 2060 (Figure 3.7A).

Figure 3.7. Pressures on Aging and Health Related Costs

A. Ratio of Old Age to Working-Age Population
(Share)

B. Paid Sick Leave Benefit, 2000-2010
(Percent of GDP)

Old-age dependency ratio 65+/(20-64)
Old-age dependency ratio 70+/(20-69)

Sources: AMECO, Eurostat, Ministry of Finance, OECD, United Nations, and IMF staff calculations.
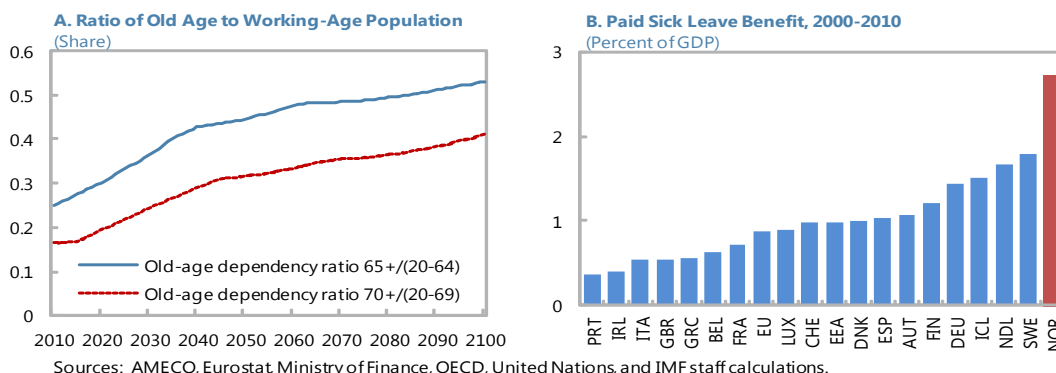
25.   The authorities have recently implemented a pension reform, but there remain large future fiscal liabilities from an aging population (Figure 3.8). The pension reforms have mostly affected private sector old-age pensions, but there has been less change in public sector and disability pensions. The private sector reform aligned pension with retirement life expectancy in an actuarially balanced way to remove financial incentives for early retirement and disincentives for working past normal retirement age (these incentives are still present in the pension system for public sector workers). The authorities' estimates of the savings from pension reform are conservative in that they do not assume a change in the participation rate, even though the reform is explicitly designed to reorient incentives toward a longer working lifetime relative to the system it replaces. However, a study by Statistics Norway estimated that the reform would gradually raise the participation rate by 8 percent by 2060. This increase in participation would bring pensions down further as shown in Figure 3.8 (black solid line).

Figure 3.8. Age-Related Expenditures Relative to GPFG Transfers
(Percent of Mainland GDP)

Pensions (pre-reform 2006 data)
Pensions (after-reform)
Pensions (adjusted) 1/
Pensions (closing the disability gap) 2/
GPFG transfer (baseline)

Sources: Ministry of Finance and IMF staff calculations.
1/ Pensions (after reform adjusted for higher participation rates).
2/ Pensions (after reform; closing the disability gap; and adjusted for higher participation rates).

26.   Pension expenditure would decline further if disability pension expenditure could be aligned with that in peer countries. Norway's rates of high sickness and disability pensions and leave are high (Figure 3.7B), in spite of Norway's generally good health indicators, and disability pensions are 1.6 percentage points of GDP higher than the average of higher-income OECD comparators in 2013.[6]

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[6] These are Australia, Canada, Denmark, Finland, Germany, Netherlands, New Zealand, Sweden, the U.K., and the U.S.

The additional savings that would results from closing the gap in disability pensions vis-à-vis these peers would results in significant additional saving (green dotted line in Figure 3.8).[7]

27.   However, pension expenditure would remain higher than the fiscal transfers from GPFG even with these reforms. While a reduced rate of fiscal transfer and/or higher returns would mitigate the decline in fiscal transfers from the GPFG, they cannot make up for the progressively widening gap between pension expenditure and the fiscal transfer (Figure 3.9A). Only when additional pension reforms are undertaken along the lines described above (i.e. 8 percent increase in the participation rate and reducing disability pensions to the OECD average) will the fiscal gap narrow significantly (Figure 3.9B).

Figure 3.9. Net Fiscal Impact

A. Difference Between Transfers from GPFG and Pensions (Percent of Mainland GDP)

- Baseline (fiscal transfer = rate of return = 4%)
- Conservative (fiscal transfer 3%; rate of return 4%)
- Prudent (fiscal transfer 3%; rate of return 3.2%)
- Low Transfer (fiscal transfer 2%; rate of return 3.2%)
- Constant Transfer (fiscal transfer 4%; rate of return 3.2%)

B. Difference Between Transfers from GPFG and Adjusted Pensions (Percent of Mainland GDP)

- Baseline (fiscal transfer = rate of return = 4%)
- Conservative (fiscal transfer 3%; rate of return 4%)
- Prudent (fiscal transfer 3%; rate of return 3.2%)
- Low Transfer (fiscal transfer 2%; rate of return 3.2%)
- Constant Transfer (fiscal transfer 4%; rate of return 3.2%)

Sources: IMF World Economic Outlook, Ministry of Finance, Norges Bank, and IMF staff calculations.

D.   Conclusion

28.   The various challenges posed by the fiscal rule are affected differently by different parameters. Because the only variable that would have significant effect on the size of the fiscal transfer over the next two decades is the amount of the annual fiscal transfer itself as a share of GPFG assets, this parameter is the key to addressing concerns about the effect of the fiscal transfer on the competitiveness of non-oil related parts of the mainland economy. However, the realized real rate of return and the oil price become more important at longer time horizons, and the difference between the real rate and the fiscal transfer would be more important in addressing concerns related to intergenerational equity or aligning the fiscal transfers more closely with aging-related costs.

29.   In sum, there are several reasons why the authorities might want to consider a rate of fiscal transfer below 4 percent of GPFG assets.

- The real rate of return might be in line with history rather than the authorities' current assumption.

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[7] Reductions in sick leave and extension of the pension reforms to public sector workers couldn't be quantified for this paper, but they would be likely to have a significant impact on long-run costs of aging and disability related expenditures.

If the long-run real rate of return is below 4 percent, this will be known only after a very long lag when it is too late to easily adjust.

- Stabilizing the economy to prevent Dutch disease might require a lower rate of spending from the GPFG regardless of the true real rate of return. The growth of the oil-related part of the mainland economy is welcome for the high-wage jobs and contracts for firms in the mainland economy supplying the offshore sector. However, this is crowding out other "exposed industries" (see Chapter 1 on competitiveness). To address this concern, a reduction in the rate of transfer would help to stabilize the economy by lessening the joint impact of the growth of oil-related parts of the mainland economy and the rising non-oil deficits over the next couple of decades when oil production is near peak levels.

- A slower rate of spending could better align the expected fiscal transfers with the expected long-run aging related costs that peak only after oil production is largely over. As with most advanced economies, aging-related pension costs are expected to rise steadily until at least mid-century. This needs to be directly addressed by pension reforms, but a slower rate of spending could help to mitigate the fiscal gap between expected fiscal transfers and long-run aging related costs.

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