

The management of petroleum wealth

Lecture by Governor Svein Gjedrem at the Polytechnic Association, 8 November 2005

The lecture does not contain assessments of the economic situation or the monetary stance.

The oil age in Norway has spanned 30 years and it appears that it will continue for many years ahead. In this lecture, I will attempt to take stock of how we have managed petroleum wealth thus far. Moreover, I will look at the challenges that still lie ahead.

On some scores, our management of petroleum wealth has been very successful. We have managed to define it as national wealth, and have ensured that the bulk of this wealth benefits society as a whole. Both the state's ownership interests through the State's Direct Financial Interest in petroleum activities (SDFI) and the tax system have contributed to this. The companies that extract oil earn a reasonable return on their investments and have incentives to invest, but the economic rent has essentially accrued to the general public.

My theme today concerns the economic challenges linked to petroleum wealth and certain aspects of government wealth management.

The most important economic challenges we would be facing were widely recognised early on. As early as in 1974, in Report no. 25 to the Storting "The role of petroleum activities in Norwegian society", was discussed in depth. I quote: "A transfer of production and employment between firms and industries may occur through higher domestic cost pressures" ² and further ² "How strong the pressures will be depends in particular on how strongly Norwegian business and industry is involved in petroleum activities and the scale of revenues that are used domestically". The report underlines the responsibility that economic policy would have for developments.

Fourteen years later, in 1988, former central bank governor Hermod Skånland summarised the experience gained up to that point in time.¹ He was pessimistic. We had spent a large share of the cash flow from the petroleum sector on costly counter-cyclical policies and a rapid expansion of welfare schemes. Internationally exposed industries were scaled back, and it seemed that the economy was unstable. Inflation had taken root. Skånland concluded the lecture as follows: "We will be facing greater challenges with regard to demand management than countries with a broader industry base. It still remains to be seen whether we are more capable of addressing these challenges."

Experience of other countries

The experience of other countries that had received large, unexpected income from natural resources was not encouraging. The classic example is Spain's substantial revenues from the colonisation of America in the 1600s. The historian David Landes summarised the Spanish experience as follows:

Landes stated that easy money is bad for a country. It is very tempting to live comfortably on this income and be less concerned about safeguarding other revenue sources. In that case, the country is poorly poised to cope with an end to easy money.

The economic literature includes many studies that look at the relationship between income from natural resources and economic growth. An article by Jeffrey Sachs and Andrew Warren entitled "The curse of natural resources"² sets the basic tone: Countries with large income from natural resources have generally recorded weaker economic growth than comparable countries. Professor Thorvaldur Gylfason illustrates this relationship for a large selection of countries in an article published last year.³

Both Gylfason and other authors⁴ in this field point to Norway as an exception to this general rule. Norway's management of its petroleum revenues is often referred to as an example of successful organisation.⁵

The construction of the Petroleum Fund

In 1990, Norway established a transparent system for managing government petroleum revenues. All the revenues are transferred directly into a foreign currency fund, the Petroleum Fund. The Storting (Norwegian parliament) must adopt a resolution on any use of the capital in the Fund.

Spending will be prioritised in the same way as for other government spending. There is no hidden use of revenues, or any use for special purposes. The Fund is strictly and effectively "out of bounds" to special interests.

The system also presents other positive features. The Fund serves as a buffer between wide swings in petroleum revenues and domestic spending. The decisions relating to petroleum revenue spending over the central government budget can be made independently of the size of the revenues in the period. As a result, swings in petroleum revenues do not have an automatic impact on the Norwegian economy.

As I mentioned earlier, however, we spent a large share of our petroleum wealth in the 1970s and early 1980s. In the years 1982-83 to 1986, the state acquired considerable and well hidden savings in the form of higher government deposits with Norges Bank, matched by higher foreign exchange reserves. This capital was used during the recession and the currency crisis in the following years.

It can therefore be said that the entire cash flow from petroleum activities was spent over the central government budget up to 1995. However, the revenues were used to finance current government investments in petroleum activities. After the construction of the Petroleum Fund started in 1996, the spending of petroleum revenues has been fairly independent of the cash flow in each year. This is a positive result.

We also see that oil price swings have had little impact on the krone exchange rate. The correlation between changes in the nominal value of the krone and oil prices has been very low since 1999. This indicates that the system to keep cash flows from the petroleum sector

outside the Norwegian economy functions effectively in that the system has won credibility in financial markets. This is another positive result.

Since summer 2004, there has nevertheless been a somewhat stronger correlation between the krone and the oil price. A number of factors may have played a role here: There have been expectations that oil prices will remain high for several years. And considerable petroleum revenues have been circulating in the Norwegian economy, partly as a result of government spending and partly due to the high level of petroleum sector investment.

In the elaboration of economic policy in the national budgets, long-term considerations are always discussed when making decisions about the spending of petroleum revenues. Two considerations are of particular importance: The aim of equitable distribution across generations and an industry structure that will in future provide us with solid revenue sources other than petroleum activities. The fiscal rule for the smooth phasing-in of petroleum revenues, which is designed to safeguard such considerations, was introduced in 2001. According to the rule, only the expected real return on the Fund is to be used. The rule has functioned as a budget guideline.

Effects on the Norwegian economy

The question may be asked as to which effects we can observe of petroleum revenue spending in the domestic economy. The risk of "Dutch disease"⁶ has been a common reference in the discussion on petroleum revenue spending. The Dutch disease occurs if spending is so high that the basis for internationally exposed industries is eroded and fluctuations in economic activity are amplified. As mentioned, in 1970s and 1980s there were clear symptoms of contamination.

Norway's fixed exchange rate policy in the years from 1986 to 1992 drove high inflation out of the economy, however. Our inflation targeting regime will achieve the same objective. It appears that the economy has again become more stable. And the fiscal rule has contributed to this. This is then a third positive result.

Shifts in industry structure, with higher growth in sheltered industries, are a feature common to all developed countries. But, it may seem that this shift has occurred slightly faster in Norway than, for instance, among our Nordic neighbours. The changes have also been fairly considerable after 2002. It is reasonable to ascribe this difference to petroleum revenue spending.

In principle, this development should have occurred. If we are to benefit from the petroleum revenues, they must be used to stimulate domestic demand. The wealthier we are, the higher demand for services is. Many services cannot be imported, but must be provided domestically. This requires a higher share of employment in sheltered sectors. The question is how rapidly and to what extent this shift should occur.

Changes in industry structure involve costs in that the capital invested may remain idle and labour resources may be used less efficiently in periods. It may take time and be difficult to re-establish the use of these resources. Restructuring costs are probably so substantial that

we should take them into account when we decide how fast petroleum revenues should be used in the Norwegian economy.

An economist at Norges Bank has looked at the level of petroleum revenue spending that minimises restructuring costs, and in that respect represents the most efficient use of revenues. In his analysis, Farooq Akram⁷ assumes that petroleum revenues are not permanent, and that the mainland economy will continue to expand. This implies that the return on the Petroleum Fund will eventually decline as a share of national income. If we use the entire return as stipulated in the fiscal rule, earlier changes in industry structure will have to be reversed in the long run. Production resources will have to be shifted back from the sheltered to the internationally exposed sector.

The cost level in the Norwegian economy, compared with that of our trading partners, rose substantially with the beginning of the oil age. The level has fluctuated somewhat since then, without exhibiting a clear tendency of being higher or lower, and has, over time, been adapted to the use of petroleum revenues. When we reach a point in the future where the share of imports that can be financed by petroleum revenues declines, the cost level relative to other countries will have to be reduced. Rough estimates indicate that the relative cost level must be brought back to the level prevailing before the oil age started in Norway. The chart shows the demands this will place on developments in the real exchange rate.

This depreciation can be achieved either by lower price and wage inflation in Norway than in other countries or by a nominal depreciation of the krone. The latter would be the least painful channel, and with a flexible exchange rate it is also the most likely.

Petroleum revenue spending could also have an impact on productivity growth in the Norwegian economy. However, there is no significant difference here between Norway and our neighbours. In fact, Norway has scored particularly favourably in recent years by managing to sustain productivity⁸ growth at a strong level. We seem to have avoided this symptom of Dutch disease. Restructuring in the Norwegian economy in the 1990s, changes in the tax system, broader and deeper financial markets, deregulation in trade and service markets and the use of the market mechanism in the telecommunications, postal and transport sectors appear to have contributed to a more efficient use of resources. This is a fourth positive result.

Another wealth effect could be lower labour force participation and higher welfare spending. In Norway, labour force participation is relatively high after lagging behind our neighbouring countries up to the 1990s. The labour force participation rate has declined somewhat in recent years, but is still at a high level. This is a fifth positive result.

However, the average number of person-hours worked is lower than for the other Nordic countries, and this difference seems to have increased through the 1990s to date. The increase in the labour force participation rate during the period does not seem to be the explanation. Reducing working hours is one way of spending income and wealth gains.

We could also spend wealth gains by reducing the retirement age. OECD figures show that the difference between the official and effective retirement age is wider in Norway than in other comparable countries. Developments in expected retirement age are a cause for some

concern. A working 40-year-old can now expect to retire at around 63. If we include retirement due to disability, the average retirement age is only 60.⁹

The number of persons on benefits in the working age population has shown a marked rise. Up to the beginning of the 1990s, there were small differences between Norway and its neighbours. Over the past decade, however, the increase has been clearly strongest in Norway.

There are two sides to the conclusion as to the question of Dutch disease. On the positive side, we have avoided dramatic changes in industry structure, and we use our resources fairly efficiently. We have managed to insulate the Norwegian economy from oil market fluctuations and gradually managed to keep macroeconomic developments on a fairly steady course. On the negative side, there are signs that labour supply over a life-cycle is falling faster in Norway than in other countries.

This may indicate that, with our current income level, we give high priority to increasing our leisure time. However, it may also indicate that we do not, as individuals, pay the true economic costs of leisure time and early retirement. Pension rules, benefits and taxes contribute to this. Similarly, enterprises are perhaps being offered the wrong incentives.

On balance, the picture is still fairly positive: so far, petroleum wealth has not led to developments in the mainland economy that are negative in relation to other Nordic countries. However, it must be stressed that it is too early to draw a conclusion; there will probably be a substantial increase in petroleum revenue spending ahead.

Long-term saving

A visible difference from the other Nordic countries is that the Norwegian state has capital savings in the Government Petroleum Fund. The Fund has grown rapidly in recent years, and we expect continued strong growth in the years ahead. The National Budget for 2006 presents projections for the period to 2009.

The projections are based on the assumption that the price of oil will fall from the current level to NOK 260 per barrel. This is lower than long-term futures prices but is a high price estimate in relation to historical prices.

We know little about future oil prices. The chart shows actual developments since 1960 and the projections in the last Long-Term Programmes and in the National Budget for 2006. We see that considerable weight has systematically been given to the prevailing oil price when making projections. Just as systematically, there have been surprises that have resulted in a different path for the actual oil price. The lesson is that today's oil price should not be regarded as a forecast of future prices, not even if the level is priced into long-term futures. Substantial uncertainty must be expected.

The management of the Petroleum Fund will be part of the State Pension Fund. This essentially involves a name change. The capital will not be earmarked for pension payments. On the other hand, the intention has long been for the capital in the Petroleum Fund to be used as a means of easing the burden in connection with the large pensioner cohorts

expected from about 2015. With the assumptions set out in the last national budget, only a share of the rise in pension payments ahead can be financed by an increase in returns on the Fund. The bulk of the increase must be financed by higher ordinary tax revenues.

A number of analysts have calculated that with high oil prices the Petroleum Fund will be sufficiently large to finance pension payments. Norges Bank has analysed the uncertainty surrounding such expectations. We have looked at the probability that the capital in the Petroleum Fund will be sufficient by calculating developments in market value and pension payments using a model with uncertainty. We have used Statistics Norway's projections for pension payments. Standard assumptions concerning uncertainty with respect to returns on the Fund's investments have been incorporated.

The main uncertainty is nevertheless associated with the production volume and prices for oil and gas. Not only are production and price developments from one year to the next uncertain in the model, but also the average long-term oil price. The calculations start with today's oil prices, but many of the resulting price paths are far away from this level.

The probability distribution for the oil price that we have used is derived from historical variations. The distribution is highly skewed. The mode is lower than today's oil prices, but we have also incorporated a substantial probability that the average price in the period 2005-2030 will be very high.

Since the oil price and oil production are so uncertain, there will also be substantial uncertainty with regard to the funding of the pension system. It is true that the Petroleum Fund with some degree of likelihood may become sufficiently large to keep tax-funding of pensions at today's level, measured as a share of national income. On the other hand, it is also highly probable that this will not be the case, and that tax-funded pensions will claim a markedly higher share of national income than at present.

Normal prudence implies that we attempt to guard ourselves against the most adverse outcomes. One can find a parallel with the price assumptions applied by oil companies in connection with large investment projects with a long production horizon. Those prices are far lower than today's spot and futures prices.

Management of the Petroleum Fund

The Petroleum Fund is currently one of the world's largest institutional investors, on a par with the largest pension fund in the US and the largest European fund. With the rate of growth that can be expected, the Petroleum Fund will be larger than these two funds in the next year or two.

Norges Bank manages the Petroleum Fund on behalf of the Ministry of Finance. This is a challenging task that has been given high priority within the Bank. We have established what we believe is a professional management organisation. Performance is measured against the benchmark portfolio defined by the Ministry of Finance and the results are published in a quarterly report. So far, Norges Bank has achieved an excess return every year. Management costs have been low. In terms of net earnings, Norges Bank has added close to NOK 15bn to the Fund.

The total return for the Fund is largely determined by the benchmark portfolio. Since 1997, the real return has averaged 4.2 per cent. Of this, 0.4 percentage point can be attributed to active management, for which Norges Bank is responsible.

The Fund has become a large investor in international equity markets. Norges Bank recently established a group dedicated to actively supporting best practice corporate governance in companies where the Fund has ownership interests. Norges Bank already makes extensive use of its voting rights and has voted in about 17 000 cases this year. Because it is a major investor, the Fund can contribute effectively to the promotion of recognised principles of corporate governance. We believe that this will result in higher returns on the Fund's equity investments in the longer run.

The size of the Fund allows us to keep management costs low. We have built up an infrastructure that can handle large transaction volumes. Investments involving much larger amounts can be made without expanding the current infrastructure.

Even though the Fund is a large institutional investor, it is not one of the world's largest investment managers. Companies like UBS, Allianz, Barclays and State Street invest up to ten times as much as the Petroleum Fund, and these companies have funds in a much larger number of accounts with different investment mandates than the Petroleum Fund. Although the challenges facing the Petroleum Fund are considerable, the Fund's structure is nevertheless much simpler than that of the largest investment managers.

Government reserve funds

Norway is not the only country to establish a reserve fund to be used in periods of fiscal stress. The age structure of virtually all the developed countries will lead to substantial changes in the ratio of pensioners to the working-age population over the next ten years or so. The working age population must be prepared for a larger share of national income to be spent on pensioners and others outside the working population. Substantial increases in pensions, benefits and health service costs will be necessary. When that time comes, having reserves to draw on will be a welcome option.

France, Ireland, Australia and New Zealand have all established government reserve funds in recent years in preparation for the age wave 15-20 years ahead. Sweden has restructured its four AP funds. Like the Petroleum Fund and the new State Pension Fund, these funds are not pension funds in the usual sense. Annual allocations to the funds are not dependent on growth in government pension obligations in the period. However, one of the main objectives of these funds is to cover some of the increased pension payments in the future. Allocations to most funds are set at around 1-2 per cent of national income every year until the funds' capital is to be used from 2020 or 2025. One drawback of some of these funds' structures, such as the French fund, is that they are not financed through increased government saving, but in reality by borrowing.

Fund-based pensions

The Norwegian National Insurance Scheme is a pay-as-you-go system, where annual payments are financed by current tax revenues. The pension scheme for public employees is not fund-based either. An international comparison shows that pension obligations in Norway are fund-based to a very limited extent.

Some other countries base their pension obligations on funds to a far greater extent. This applies for example to Canada, the Netherlands, the UK and the US. In these countries, fund-based occupational pension schemes account for a large portion of the pension system, in the public as well as the private sector.

If we include the Petroleum Fund and the National Insurance Fund at current market values, the picture changes, and funds in Norway are then higher than the OECD average. But even today, the level in Norway is below that of the Netherlands in 2003.

Long-term investment strategy

The Petroleum Fund employs a very careful investment strategy, with broad diversification. Large pension funds in other countries employ the same kind of strategy. Like the Petroleum Fund, these funds are intended to secure future payment flows. The consequences of large losses over time would be severe. For pure pension funds, this would mean they would not be able to honour their obligations to their members. For the Petroleum Fund, it would mean that the state would have to find other ways to finance the costs of the age wave that we know is approaching.

Because of the prudence requirement, return requirements cannot be the same as for many private investors. It is important to remember that for every successful investor that achieves high returns, there are many other investors that have the same level of ambition and risk willingness, but a far poorer track record and a history of insolvencies. The Petroleum Fund cannot run the risk of joining the worst group.

Some large institutional investors have tried to copy successful private investors. One example is Kuwait, which for a period chose large strategic investments instead of diversifying more evenly. To our knowledge, the results were not positive. Another example is the oil fund in the Canadian state of Alberta, where investments up to the end of the 1990s were partly influenced by political considerations and a large share of the capital was invested in local businesses. This resulted in far lower returns than in other comparable Canadian funds.

The best pension funds stand out as highly professional investors. Norges Bank has had close contact with the largest funds in the Netherlands and Canada for many years, and we have learned a great deal from them about our own fund management. These funds have broadly diversified portfolios. As an example, I would like to draw your attention to the composition of investment portfolios in the largest European fund, ABP.

ABP is the pension fund for public sector employees in the Netherlands. Forty-four per cent of the fund is invested in fixed-income instruments. Investments with more variable returns account for 56 per cent of the portfolio. Fixed income investments are intended to contribute to a relatively stable return on the fund as a whole, while the rest of the portfolio is to achieve high expected returns. To minimise risk, investments are spread across many countries and companies.

Investments with variable returns also include what are usually known as "alternative investments" i.e. private equity, real estate, commodities and investment in hedge funds and the like. The advantage of these investments is that returns show no strong correlation with the return on fixed income instruments and listed equities.

The Petroleum Fund's portfolio is also broadly diversified in global equity and fixed income markets. Equity investments are diversified across the 27 countries in the benchmark portfolio and across some countries that are not included in the benchmark. All of the BRIC countries (Brazil, Russia, India and China) are, for example, represented in the portfolio. So far, the Petroleum Fund has no alternative investments, although this option may become more likely as the Fund becomes very large. The costs of investing in new asset classes may then be divided on larger volumes.

Whether or not alternative investments are included, the most important strategic decision for the Petroleum Fund concerns the equity portion. The equity portion essentially decides the level of risk in the Fund.

There is a trade-off between expected value and the standard deviation for the annual return on the Petroleum Fund, i.e. between the return that can be expected and the risk that is taken. Calculations¹⁰ indicate that we for example must accept an increase in the standard deviation of one percentage point if we want to increase the expected return by 0.3 percentage point. Such a rise in the level of risk could be achieved by increasing the equity portion by about 10 percentage points. This would imply slightly larger swings in the Fund's annual return. The probability that the cumulative real return over a period of 15 years will be negative would also increase somewhat, although not markedly. I have included this comment because these kinds of assessment are central to the choice of investment strategy for a fund such as the Petroleum Fund.

Long-term plan

The Petroleum Fund is a very long-term savings plan. The notion of a fund arose in the early 1980s, and the Fund was adopted in 1990 before the government had received any positive net cash flow from petroleum activities. Up to 1995, government investments in petroleum activities were so large that all the revenues were used for investment and to cover budget deficits during the recession around 1990. Now we have ten years of a rapidly expanding Fund behind us.

Ahead of us, we still have at least 50 years, and perhaps more, where the Petroleum Fund or the Pension Fund will, I hope and believe, be an important part of the Norwegian economy. Every year, the Storting will have to decide the scale of petroleum revenue spending over

the central government budget. There is a long time ahead before the savings plan has been carried through.

Footnotes

¹Hermod Skånland, "Norge og oljen - gamle eller nye utfordringer".(Norwegian only). Lecture, 2 November 1988.

²Jeffrey D. Sachs and Andrew M. Warner, *The Curse of Natural Resources*. European Economic Review 45 (2001), pages 827-838.

³Thorvaldur Gylfason, *Natural Resources and Economic Growth: From Dependence to Diversification*. Discussion paper No. 4804, CEPR

⁴See for example Terry Lynn Karl, *The Paradox of Plenty: Oil Booms and Petro-States*. University of California Press 1997.

⁵See for example:

- J.M. Davis, R. Ossowski, J. Daniel and S. Barnett, *Stabilization and Savings Funds for Non-renewable Resources: Experience and Policy Implications*. Occasional paper 205, IMF 2001.
- J.M. Davis, R. Ossowski and A. Fedelino (eds.), *Fiscal policy Implementation in Oil-Producing Countries*. IMF 2003
- J. Wakeman-Linn, C. Aturupane, S. Danninger, K. Gvenetadze, N. Hobdari and E. Le Borgne, *Managing Oil Wealth: The Case of Azerbaijan*. IMF 2004
- World Bank report No. 32700-TP: Country Assistance Strategy for Timor Leste.

⁶The expression "Dutch disease" originates from the Netherlands, where the government rapidly spent large revenues from the extraction of gas in the 1960s.

⁷Q. Farooq Akram: "*Efficient consumption of revenues from natural resources - An application to Norwegian petroleum revenues.*" Working Paper 2005/1.

⁸Productivity growth in service industries is compared here. There may be sources of error due to choice of method in the production of national accounts figures, but the main impression can also be supported by the use of other sources. Comparing developments in productivity in manufacturing is of little relevance since the structure of this industry varies widely among the Nordic countries.

⁹*Seniorpolitikk og IA-avtalens delmål om å øke pensjoneringsalderen*. (Norwegian only) Report no. 04/2005. National Insurance Administration

¹⁰The calculations are based on the market assumptions that formed the basis of our most recent review of the investment strategy for the Petroleum Fund.