



Norway 2050

Evaluating policy alternatives for long-term economic growth

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Summary

The starting point of this thesis is to explore the causes behind human welfare, but measuring the happiness of people and build the findings on economic theory is hard, so the level of economic growth is used as a proxy. Economic security lays the foundation for people to pursue their happiness, in most cases at least.

The thesis elaborates on the possibilities to increase the economic growth in Norway, through the lessons of both economic theory and history. The variables behind economic growth are explained, and policies within four areas are assessed by how the general welfare of the inhabitants could increase, although not for all groups.

The strong economic growth itself and the resource richness are the biggest threats to a continued stable and sound growth path for Norway. The temptations of more spending today should not jeopardize the possibilities of a sound growth path in the future.

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1. Foreword

This thesis embarks on a journey to the core of economic theory; how to create economic growth. The problem at hand is indeed extensive, and probably not something two master students should try to surmount. The danger of taking a journey into nonsense land is highly present. Still, when evaluating policy alternatives and their contribution to long-term economic growth, the time perspective might give an opportunity to get into the essence of the problem definition. A large number of variables may well be excluded as their relevance in the future is insignificant, or their development is highly uncertain. By looking only at Norway, the specific characteristics and challenges of this country also give opportunity to say something more definite. Seeking to analyse the possible policy alternatives, but not by giving an entire prophecy of the future, the thesis hopefully has some message to give after all.

The authors would like to thank our supervisor, Agnar Sandmo, for invaluable help during the endeavour to finalize the thesis, and for his patience while the process dragged on. Other contributions are not made, except in the form of inspiration and ideas of great thinkers, which is given an account of in the reference list.

2. Problem definition

Decisions made by politicians today will ultimately constitute the foundation for future economic growth. Analyzing the consequences of different policy alternatives may provide decision makers guidance to where the greatest ‘benefit versus cost’-ratio would occur. The problem definition of this thesis is as follows:

Which policy alternatives can most efficiently create long-term economic growth in Norway?

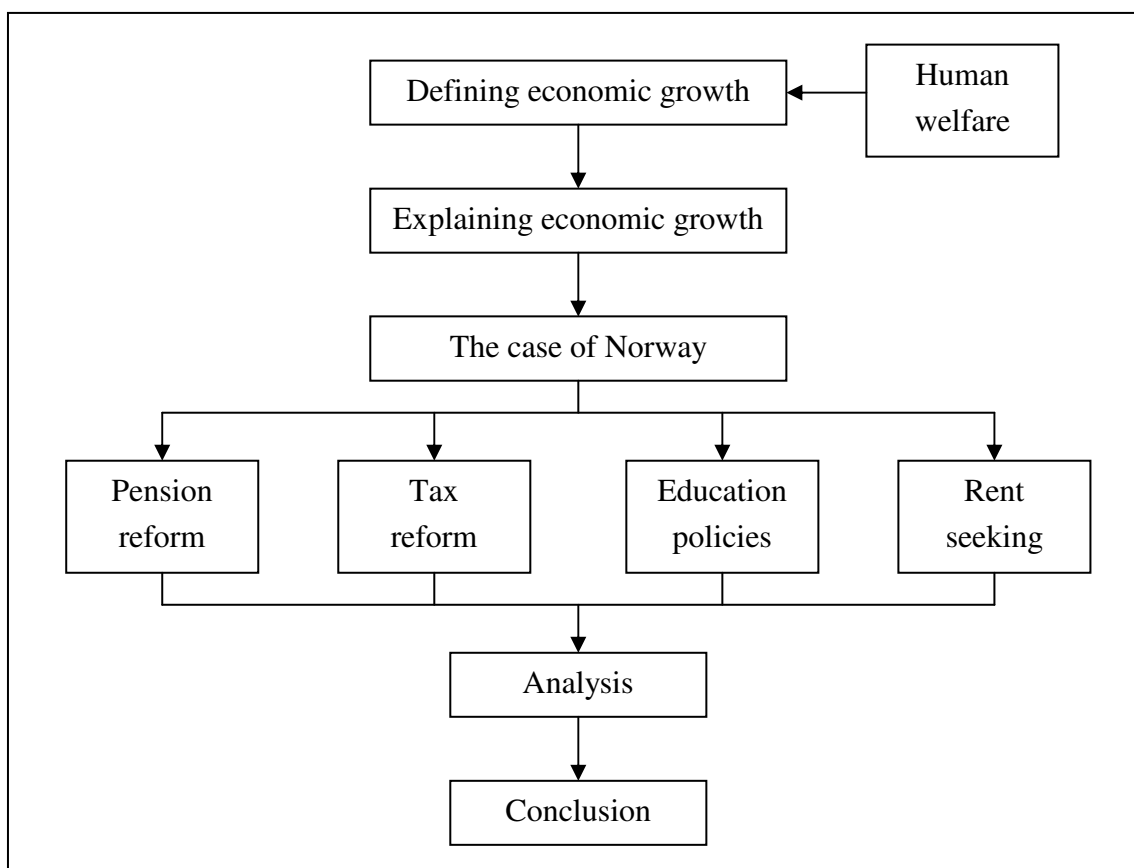


Figure 1: The composition of the thesis

3. Specification of main objectives

Objectives for the thesis include:

- Address the problem of measuring the welfare of a human being.
- Elaborate the different theories of economic growth, and give a historic evaluation of what generates economic growth.
- Examine the variables influencing the growth path of Norway, and predict their paths in the future where possible.
- Estimate the need for reforms to maintain a sound and stable long-term growth path for the Norwegian economy.
- Evaluate how different policy alternatives may improve or harm the economic growth.

4. Human welfare development and economic growth

Measures of economic growth are often used to assess the level of progress between different countries. The most common measure is the growth rate of gross domestic product (GDP), where GDP is defined as the market value of all final goods and services produced within a country in a given period of time (Wikipedia web encyclopaedia). But the material level of a society is just an element, although an important one, of the total welfare of the inhabitants. Even though economic growth usually is a prerequisite for improving life standards, sometimes there may be a conflict between them, as when industrialization triggers environmental problems. So if economic growth is not identical to changes in human welfare, what measurements should be used?

Amartya Sen (1999), awarded the 1998 Nobel Prize in economics, focuses in his capability approach on “*freedom, seen in the form of individual capabilities to do things that a person has reason to value*”. The parallel can be seen in Maslow’s hierarchy of needs (Maslow 1943), shown in Figure 2, where self realization stands at the top. Sen defines freedom in the widest sense; both freedom from suppression and freedom to achieve are essential for a human being. Millions of people are denied elementary freedoms and remain imprisoned in one way or another by economic poverty, social deprivation, political tyranny or cultural authoritarianism. Economic growth is a key provider to realize the full potential of the capabilities, but not a goal in itself.

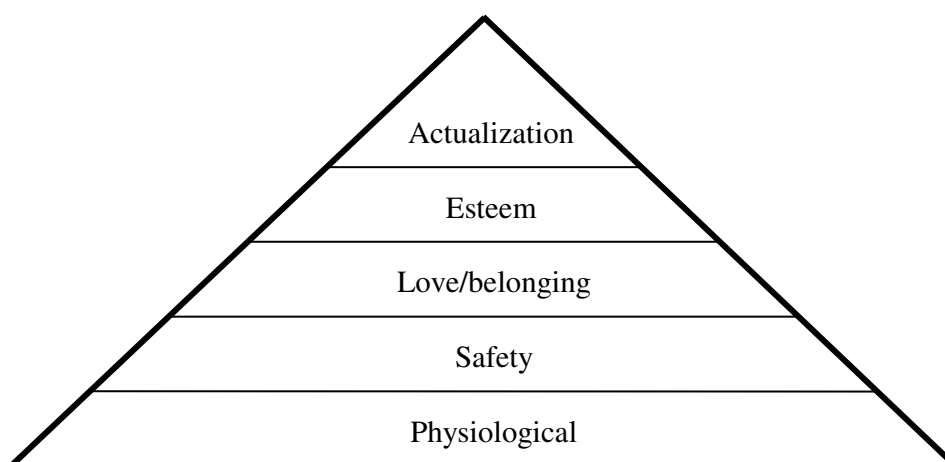


Figure 2: Maslow's hierarchy of needs

UN Human Development Index is an often cited measure which draws on the ideas and attempts to include more features when determining the possibility to fully enjoy one's capabilities¹. The index is composed of three equally weighted parts; longevity, knowledge, and decent standard of living (as indicated by GDP). The score of some selected countries is shown in Figure 3. Other similar indexes include income distribution and gender-related measures. The goal is to 'put people back at the centre of the development process in terms of economic debate, policy and advocacy' (UNDP web site).

The national wealth approach, promoted by The World Bank (2006) among others, assesses the compositions of wealth and indicates how a nation may protect and further build up their wealth. This measure is often linked to the sustainable development of a nation, as an increase in the national wealth over time is a prerequisite for being on such a path. The national wealth concept is not necessarily closer in measuring human welfare than the traditional concept of GDP, as the calculations take the national accounts as a starting point, but it effectively reveals unsustainable use of the nation's resources².

Obviously, a diverse and wide range of variables have an impact on the general welfare of a human being. But some of the variables would be impossible to quantify, others would be a matter of taste and preferences. For example, climate certainly has an impact on the welfare of a human being, but to which extent? Who is the happiest, the Thai enjoying the sun every day or the Norwegian travelling to warmer countries whenever he/she wants?

Several happiness indexes tries to calculate happiness directly and ranking countries following the quantity of enjoyable life years (happiness multiplied with longevity) (Veerhoven web site). As the only country in the world, Bhutan replaced GDP and uses Gross National Happiness instead, as proposed by the king himself (Wikipedia). But measuring happiness will always be a subjective matter, asserting differences between countries more than explaining them. Psychological factors also play a crucial role, being deprived among poor may be a lot easier than being just as poor in a wealthy society.

¹ Mahbub Ul Haq, a close friend of Sen (Asia Source web page), pioneered this work.

² This is just partly true, not all elements are possible to measure and include in the national wealth concept. Examples may be transborder ecosystems or the climate system. A well functioning earth lays the foundation for the wealth of nations, so the sustainable path of all nations may be threatened by climate change, even though it is not reflected in the more narrow definition of national wealth.

In this thesis the human welfare essentially ends up being formulated in economic terms, considering the intricacy of determining a complete index of all variables related to human welfare. We will do this while acknowledging the shortcomings of the GDP growth rate: firstly, that it measures some things that do not contribute to human welfare (e.g. traffic accidents), while not measuring others (e.g. environment, distribution, the value of leisure). And secondly, that the relation between economic growth and general welfare of the individuals is far from perfect.

HDI rank		Human development index (HDI) value 2004	Life expectancy index	Education index	GDP index	GDP per capita (PPP US\$) rank minus HDI rank
High human development						
1	Norway	0.965	0.91	0.99	0.99	3
2	Iceland	0.960	0.93	0.98	0.97	3
3	Australia	0.957	0.92	0.99	0.95	11
5	Sweden	0.951	0.92	0.98	0.95	11
7	Japan	0.949	0.95	0.94	0.95	11
8	United States	0.948	0.88	0.97	1.00	-6
21	Germany	0.932	0.90	0.96	0.94	-2
36	Argentina	0.863	0.83	0.95	0.82	10
53	Mexico	0.821	0.84	0.86	0.77	7
Medium human development						
65	Russia	0.797	0.67	0.95	0.77	-6
69	Brazil	0.792	0.76	0.88	0.74	-5
76	Saudi Arabia	0.777	0.78	0.72	0.82	-31
81	China	0.768	0.78	0.84	0.68	9
108	Indonesia	0.711	0.70	0.83	0.60	8
121	South Africa	0.653	0.37	0.80	0.79	-66
126	India	0.611	0.64	0.61	0.58	-9
Low human development						
159	Nigeria	0.448	0.31	0.63	0.41	-1
177	Niger	0.311	0.33	0.26	0.34	-7
Developing countries		0.694	0.67	0.72	0.70	
Least developed countries		0.518	0.45	0.50	0.60	
Arab States		0.679	0.70	0.61	0.72	
East Asia and the Pacific		0.768	0.76	0.83	0.71	
Latin America and the Caribbean		0.797	0.78	0.87	0.74	
South Asia		0.628	0.64	0.58	0.67	
Sub-Saharan Africa		0.515	0.35	0.56	0.63	
Central and Eastern Europe and		0.802	0.72	0.94	0.75	
OECD		0.892	0.88	0.95	0.85	
High-income OECD		0.911	0.90	0.98	0.86	
High human development		0.895	0.88	0.96	0.85	Source:
Medium human development		0.718	0.70	0.75	0.70	United Nations
Low human development		0.486	0.35	0.53	0.58	Development
World		0.741	0.70	0.77	0.75	Programme

Figure 3: Chosen countries and their HDI score, 2004

Even so, Norway scores high on most³ of the indexes here mentioned, ranking first on the Human Development Index and top three when it comes to GDP. In a sense, this thesis examines the possibility of keeping status quo.

³ Norway does not rank as high on some of the happiness indexes mentioned earlier. This may further question the link between economic prosperity and the general happiness of the population.

5. Explaining economic growth

When analysing different policies and their impact on economic growth, the definition of economic growth and its components should be readily available. This section will elaborate on the evolution of the theory of economic growth, and give historic and empirical examples of the main variables concerning growth.

5.1 The theory of economic growth: a historical perspective⁴

5.1.1 The early theories: the classical proclamations

The theory of economic growth extends as far back as economics itself. Prior to Adam Smith, David Hume criticized the mercantilist view of favourable balance of trade as a precondition for increased national wealth. Hume argued that the total trade, not only the export but import as well, increases economic growth. Adam Smith (1776) expanded these arguments of economic growth and made links to the division of labour, efficiency, and the size of the market. According to Smith, economic growth could be ascribed to the quantity and quality expansion of the three main factors of production: labour, capital, and land. High levels of saving and investment stimulate growth, both through direct effects (the resulting accumulation of capital) and its indirect effects on labour productivity as well as the interaction with exchange and trade. As stated in *Wealth of Nations*:

“When we compare, therefore, the state of a nation at two different periods, and find, that the annual produce of its land and labour is evidently greater at the latter than at the former, that its lands are better cultivated, its manufactures more numerous and more flourishing, and its trade more extensive, we may be assured that its capital must have increased during the interval between those two periods, and that more

⁴ This section draws heavily on the discussion of roots and branches of economic growth in Thorvaldur Gylfason, *Principles of economic growth*

must have been added to it by the good conduct of some, than had been taken from it either by the private misconduct of others, or by the publick extravagance of government.”

The benefits of the division of labour are an essential observation by Smith, as this specialization increases efficiency and thus economic growth. These findings are general, as anything that increases the efficiency by the same amount should have the same effect on growth. This generality has major implications on economic policy, suggesting making the effort to economize where the biggest reward can be reaped.

In the coming decades many great economists followed Adam Smith's line of thought. Thomas Malthus underlined the problem of multiplicative rate of population increase contrary to the slower rate of land accumulation. Through Malthus economics earned the reputation of the 'dismal science', since his theories concluded that the standard of living would ultimately drop to a subsistence level. Malthus modified these theories when he saw that food production depended on the quality of the land as well, which improved through technological progress. David Ricardo claimed that these differences in the quality of land were the causes of rent, and also put forward an important concept in economics, namely the law of diminishing returns. His consistent and clear formulation of the classical system has led many to name it 'the Ricardian School'. But while the theories of Smith, Malthus and Ricardo essentially were about distribution, John Stuart Mill directed the attention to the role of production in the science of economics (Heilbrunner, 1999). He also argued that population growth could be constrained by more and better education.

5.1.2 The neoclassical model

Harrod (1948) and Domar (1946) created a model which expressed the dynamic relationships between the flows and stocks in a simple equation, thus giving the growth theory a mathematical approach. The warranted economic growth depended on three factors; the saving rate, the capital/output ratio, and the depreciation rate. Some weaknesses proved fatal to the model; the equation did not take into consideration the labour force growth, as output was determined solely by saving and efficiency. Another weakness was that neither theory nor empirical evidence seemed to support the assumption of the firms wanting to keep the capital stock in a fixed proportion to their output.

Roy Harrod distinguished between the warranted and natural rate of growth, the latter depending on population growth. If warranted growth failed to keep up with natural growth, unemployment would arise. Robert Solow (1956, 1957) argued for the convergence of these rates of growth in the long run in his Nobel-winning neoclassical model. Using the assumption of constant-returns-to-scale, in Solow's model the capital stock adjusts to a long-run steady-state equilibrium path where output, capital, and quality-adjusted labour grow at the same rate. This rate is exogenously given by the population growth and the technological progress. In this steady-state the saving equals the investments needed, as shown in the equation below, and the GDP per capita grows at the rate of technology growth:

$$sf(k^*) = (n + g + \delta)k^*$$

where

s = the rate of saving

k* = the capital stock per efficiency unit (K/AL) in steady-state (indicated by *)

f(k*) = the production function

n = the rate of population growth

g = the rate of growth in technology

δ = the capital depreciation rate

The convergence between countries predicted in the neoclassical model is not found in the empirics, apart from smaller samples like the OECD countries (Barro and Sala-i-Martin 1991). The disparity in living standards between rich and poor countries is much higher than what the neoclassical model predicts. It is of course important to remember that the convergence implied is conditioned on countries having identical steady states – something which in the model is determined by the saving rate and population growth. But correcting for this 'conditional convergence' does not solve the puzzle.

An investigation into the properties of the growth function reveals the important role of the capital share in the economy. By differentiating the production function one obtains⁵:

$$\frac{\dot{y}}{y} = \frac{f'(k)k}{f(k)} \cdot \frac{\dot{k}}{k}$$

⁵ Tutorage by Agnar Sandmo, April 5th 2005

This relation shows that the convergence is decidedly dependent on the first factor on the right hand side of the equation, the capital share. Mankiw (1995) demonstrates that the neoclassical growth model is more consistent with empirics when increasing the share of capital in the production. The broader concept of capital includes human capital, strengthening the role of knowledge in creating growth (Mankiw et. al. 1992), and positive externalities to capital. This extended Solow model explains income disparities by differences in investment rates in physical capital, time spent on education, population growth rates and levels of technology.

5.1.3 Endogenous growth revisited

In endogenous growth models the pace of technological progress is believed to be influenced by economic variables, not just exogenously given (Romer 1986). Since the growth rate in such models is not dependent on the initial capital stock, endogenous growth models do not imply convergence. Quite the contrary, policies can have permanent effects.

More sophisticated variants of endogenous models shows “*how the long-run growth rate is determined by such parameters as the discount rate [...], the productivity of resources in production [...], the size of the economy [...], the intensity with witch fixed resources are used in production [...], the productivity of the research sector [...], as well as the strength of externalities in production [...] and in research*” (Hammond and Rodriguez-Clare 1993). Much research has also tried to investigate the more fundamental determinants of economic growth, like trade, education, different demographic characteristics, financial systems, fiscal policy and social norms.

The classical view of economic growth depending endogenously on economic factors, in particularly saving, efficiency, and depreciation, has in this way been extended into the contemporary theories. The question whether the variables cause or are affected by economic growth could be widely debated; the answer is probably both in most cases. Secondary education and economic growth would be good examples of this mutual influence. But many of these factors affecting economic growth are within human reach, indicating the importance of sound economic policies.

5.1.4 Knowledge, production and innovation: Alternative theories

The difficulties of the neoclassical growth model in explaining what drive economic growth and incorporating innovation and knowledge may foster two responses: improving the neoclassical model, as we have seen attempts at within endogenous growth theory, or abandoning the classical tradition altogether. The latter approach unites many of the opponents of neoclassical economics in a critique of the ‘Ricardian vice’, what they see as a static analysis relying only on a few variables, an increasingly mathematical formulation of problems, and hence a too limited toolbox in trying to explain economic growth.

Perhaps the foremost challenger to the most orthodox interpretations of neoclassical economics is the Schumpeterian tradition, named after Austrian economist Joseph A. Schumpeter, or termed ‘evolutionary economics’. Contributions within this school of economic thought see innovation as the source of economic growth (Bruland 1997). New knowledge and innovations bring about a growth phase until a stationary state is arrived at. Here the role of the entrepreneur becomes important in disrupting this equilibrium and setting the economy on a new growth path. Economists like Alexander Gerschenkron and Moses Abramovitz have pointed to the role of national and regional innovation systems and ‘tacit knowledge’ inherent in organisations and innovation systems, and how this makes the neoclassical assumption of technology as a public good unsatisfactory (Fagerberg 1997).

The Norwegian economist Erik S. Reinert (1999) goes even further. He acknowledges the contribution by the Schumpeterian evolutionary economics in bringing in technology and innovation into the analysis of economic growth. But he extends the list of causes to “[*the attitude to new knowledge (men’s and nations’)*”, “[*systemic*] aspects giving rise to positive feedback mechanisms (increasing returns, ‘scale and scope’)” and “[*man’s*] rational will”. Reinert revives doctrines from mercantilist economics when he distinguishes between high- and low-quality economic activities. The former is characterized by increasing returns to scale, high R&D-content, rapid technological progress and imperfect information and competition. In this view the ‘development state’ gains an important role in “*taking the nation-state into increasing return activities*” (Reinert 1999, p. 300). Another important point is that the gains from these increasing returns mostly will be transformed into higher monetary wages inside the producing nation, and not as lower process for customers abroad. In this the ‘production-centered, activist-idealistic’ approach of Reinert and the mercantilist

tradition purports to explain why some countries are propelled into a virtuous circle of development, while others remain underdeveloped.

Reinert provides an interesting account of how such factors as economies of scale and scope, the size of the market, innovation, knowledge and the role of the state can contribute to economic growth. He also offers an insightful account of the mercantilist tradition in the history of economic thought. What are lacking in this somewhat anecdotal argument are both a coherent theory and the amount of facts that are needed to support the claims. Why the peculiar silence about the fairly large amount of underdeveloped countries that have followed Reinert's prescription of import substitution – and failed? Norwegian economist Kalle Moene (2005) has argued that Reinert's description of neoclassical economics is essentially the creation of a straw man. Economics of today covers a much more diverse field than Reinert portrays it as. In the next section, which has economic history and empirical research as its starting point, we show how 'conventional economics' has come up with a multitude of factors in trying to explain economic growth.

5.2 The lessons of history⁶

When leaving the last millennium a few years ago, world population was 22 times as large as when we entered it, and during the same period per capita income had increased 13-fold. Although impressive enough by itself, this sketch merely contributes to hide the large variations, between time periods and between regions and countries, disguised in these numbers. To give some examples, from 1500 to 1820 growth averaged only 0.3 per cent a year, a number that increased to 1.6 in the years between 1820 and 1950, and then again to 3.9 in the last fifty years of the twentieth century. These gains have not been evenly distributed. The rise has been most rapid in what we call the western world. These countries had in 1820 an income level which doubled that in the rest of the world. Since then it has only increased, until a factor of 7:1 in 1998.

⁶ This chapter draws heavily on two main sources, namely Angus Maddison, *The World Economy: A Millennial Perspective* and David Landes, *The Wealth and Poverty of Nations*

	1000- 1500	1500- 1820	1820- 1870	1870- 1913	1913- 1950	1950- 1973	1973- 1998
Western Europe	0,13	0,15	0,95	1,32	0,76	4,08	1,78
Western Offshoots ¹⁾ ...	0,00	0,34	1,42	1,81	1,55	2,44	1,94
Japan.....	0,03	0,09	0,19	1,48	0,89	8,05	2,34
Asia (excl. Japan)	0,05	0,00	-0,11	0,38	-0,02	2,92	3,54
Latin America.....	0,01	0,15	0,10	1,81	1,42	2,52	0,99
Eastern Europe.....	0,04	0,10	0,64	1,15	1,50	3,49	-1,10
Africa.....	-0,01	0,01	0,12	0,64	1,02	2,07	0,01
World.....	0,05	0,05	0,53	1,30	0,91	2,93	1,33

1. Includes USA, Canada, Australia and New Zealand.

Source: Maddison (2001).

*Figure 4: Historic growth rates in GDP pr. capita, world and major regions,
1000 - 1998*

Surely, considering these figures the economic historians must be able to teach us something about economic growth.

Such numbers expose a range of questions that this thesis in the following will try to explain. First of all these two: What has contributed to this leap in prosperity? And why the disparities? We will go through the most important factors that scholars of economic history have put forward as explanations of the wealth and poverty of nations.

5.2.1 New land and geography

The Chinese settlement of the lands south of the river Yangtse from the eight century, and the European ‘invasion’ of America beginning in 1492, both gave access to new resources and encouraged the introduction of new production methods. The result was increased production, population growth and rise in per capita income. The strong performance of the American economy in the 19th century gives another example; the larger market created by population growth, combined with an abundance of natural resources, helped spur the development of new technologies that use these resources (Romer 1996).

Research at the Harvard Institute for International Development in the 1990s found “*that location and climate have large effects on income levels and income growth, through their effects on transport costs, disease burdens, and agricultural productivity*” (Gallup et. al.

1999). These studies find that the geographical and political conditions most conducive to economic growth are “*Northern Hemisphere, temperate zone, coastal, non-socialist, and non-war torn*”. Landes (1998) presents a similar view with his ‘climate thesis’ that in addition to the factors above add that the warmth and humidity of tropical zones plainly are more unfitting for work.

5.2.2 Trade

Periods of increasing international exchange of goods has brought with it prosperity and rising standards of living. This is due to exploitation of comparative advantages, but also because of the diffusion of technology that these international interactions bring with them. During Venice’s years as a hub for international exchange from the ninth to fourteenth centuries, Asian and Arab innovations were introduced to Europe and helped to spur economic growth. Another example is the dissemination of technology throughout the West during the golden age (1950-73) which stimulated growth in the aftermaths of World War II.

Even though history is rich with examples of how trade is beneficial to economic growth, several countries’ rise to economic and political strength has come about through protectionist and mercantilist policies. Holland, Britain and the US all used tariffs and discriminated foreign competitors during their own growing stage. But while these strategies may have enhanced the position of the beggar, it came at a cost to the neighbour.

Therefore, when governments have agreed to abstain from the most aggressive beggar-thy-neighbour policies, the benefits of free trade have been the greatest and shared most widely. The history of the last two hundred years gives two such examples, both when a hegemonic power has contributed to the creation of a liberal economic order. The first was under British ‘free trade imperialism’ (1850-1914) when Britain abolished tariffs and protective measures and helped open up trade and capital flows. The second when after a period of wars, depression and protectionist economic policies the United States and western countries established a regime for trade and capital flows that brought about a growth higher than ever before in history.

Although an openness to trade on balance seems to be positively correlated with economic growth, some question how large this contribution is. The coincidence of movements

towards freer trade in the post-war period with significant and negative structural trend breaks in most western countries suggest in fact the opposite relation between openness and prosperity (Ben-David et. al. 1999), although this probably is due to a return to more normal growth paths after a period of catch-up grow. American-based economists Nancy Birdsall, Dani Rodrik and Arvind Subramanian (2005, p. 137) purports that a “*further opening of wealthy countries’ markets are [a tool] with only a limited ability to trigger growth, especially in the poorest countries*” and that internal factors are much more decisive for a country’s economic performance. On the other hand, others do seem to find a positive impact of trade on economic growth⁷.

5.2.3 Capital

As the saying goes, money makes the world go round. There is a lot of objections to such a statement (i.e. money is a veil, hard work makes the world go round), but the point here is that availability of capital has been crucial to economic growth. This availability has two aspects: firstly the degree to which the financial system is developed. A range of studies has come to conclusions similar to Robert King and Ross Levine (1993) who find that “*financial services stimulate growth by increasing the rate of capital accumulation and by improving the efficiency with which economies use that capital*”. European history is abundant with examples that prove this claim; periods of economic success in Venice, Holland and Britain during the last thousand years have been accompanied by institutional innovations in finance, banking and foreign exchange markets.

But availability of capital also comes from openness to international capital flows. It is useful to distinguish between short-term and long-term capital flows. The latter seems to have an unambiguous positive impact on economic growth. Witness for example the large inflow of foreign capital to the United States (mainly from Britain) during the nineteenth century. One of the most important contributions from these investment flows is as being “*an important vehicle for the transfer of technology*” (Borenszteina et. al. 1998). When it comes to more short term capital flows – speculation – the benefits of fully and unconditional liberalization have come under scrutiny, especially after the Asian crisis in the late 1990s. It seems clear

⁷ See for example Sachs and Warner (1995).

that full capital market liberalization, without the necessary regulatory framework can have disastrous consequences (Stiglitz 2000).

5.2.4 Migration

Migration brings with it labour, capital and ideas. One example is of Portugal, to which a great number of Jews emigrated after having been evicted from Spain following the end of Muslim rule in Iberia. This gave a significant enhancement to Portuguese business life, science and the central role in the world economy the small country obtained during the 15th century. The history of Portugal also exhibits the opposite case, when the Holy office of the Inquisition throughout the 16th century established its thought-controlling rule in the country. This led Jewish scientists and merchants to flee the country, taking with them capital, knowledge, connections and “*those immeasurable qualities of curiosity and dissent that are the leaven of thought*” (Landes 1998, p.134)

But migration has also the potential of bringing with it culture clashes, instability and problems of integration. Difficulties that directly and/or through the effects they can have on public policy (for example debates about curbing flows of foreign workers) may impact the economic growth. History shows different ways of dealing with this, from the fairly successful integration of newcomers into the United States, via the recent difficulties concerning integration in several European countries, to the often tragic history of the Jews, Calvinists, Jesuits and other religious minorities in Europe.

5.2.5 Culture

Why it is that Americans of Jewish, Japanese or Chinese origins earn considerably more than other groups in the US (Lundestad)? Why is Malaysian business life completely dominated by Chinese expatriates? Why have Calvinists and Jews shown such entrepreneurial spirit and significant contributions to commerce in Europe during the last millennium? These questions do not call for simple answers, but reasonable explanations must at some point touch upon matters concerning culture. Using culture as an explanatory variable of economic growth is controversial, both because it is difficult to use scientifically (how do you run a regression of culture on GDP growth rates) and due to the odour of stereotypes and racism that easily will accompany such an endeavour.

Nevertheless, there are those – like Landes (1998, p.516) – that come to the conclusion that “*culture makes all the difference*”. He advocates the strong correlation between a culture of “*work, thrift, honesty, patience, tenacity*” (Landes 1998, p. 523) and economic growth. According to his view this is what one finds (at least significant elements of) in the Judaeo-Christian culture in Western countries, in the ethic of collective responsibility in Japan and in the work ethic of the Asian Tigers. For example is the commercial success of Protestant regions and countries explained by an emphasis on reading and hence improvements in literacy, and by the importance attributed to the value of time.

Critics of Landes argue that his glorification of European culture fails to acknowledge enhancements in other parts of the world, and that Europe’s rise to prosperity was as much due to “*being able to seize vast amounts of gold and silver in the New World and to create other forms of wealth through colonial trade*” (Stokes 2001). José Cuesta (2004, p.872) claims that “‘*over-grand*’ *culturalist theories*” of (among others) Landes fails to explain *how* culture influences economic growth. On the other hand he finds that specific values and cultural aspects have an impact on economic growth.

5.2.6 Institutions and government’s role

“Studies that claim to address the overall impact of something as complex as government on something as complex as economic prosperity face difficult challenges.”

– William G. Gale, quoted in Slemrod (1995), p. 416

Markets need regulations – a framework to operate in – to function properly. The most important of these being protection of property rights and contracts, and a government that is stable, transparent, not corrupted, and responsive to complaints from inhabitants and business. The lack of such conditions will seriously hamper trade, investments, and the development of a functioning market economy.

It may now not come as a surprise that where Landes finds such institutions and policies is in Europe and the western world. He traces this to the European, medieval political system characterised by what one can call regulatory competition – between small kingdoms, between king and lords, state and the church, and between feudal power and cities with special privileges. The citizens of medieval Europe had to a greater extent than in other parts

of the world an exit from suppression, arbitrariness and serfdom. This contributed to protection of property and responsive government.

More recent empirical research has run into problems when trying to estimate the link between the role of the government and wealth. In a survey of cross-country studies Joel Slemrod (1995) finds “*no persuasive evidence that the extent of government has either a positive or a negative impact on either the level or the growth rate of per capita income*”. This is largely due to the problem of identification, in particular finding explanatory variables determining the optimal level of government spending that neither affects the level nor the growth rate of GDP. In addition finding the appropriate measure of ‘the extent of government’ is far from simple, and such attempts will encounter a wide range of problems: estimating the costs and gains of government policies; accounting for policies through budgets and policies through regulations (the latter does not show up in national accounts); measuring the correct marginal tax rate and correcting for transfers from the government.

Acknowledging the difficulties of aggregate cross-country studies, one can turn to what Slemrod calls the bottom-up approach. Such studies estimates the effects of different taxes, spending programs and regulations on labour supply, saving and investments. Much of the research on these subjects shed light on the apparently insignificant effect of government on economic growth by taking into consideration the behavioural responses to taxes and government interference in the economy. We will return to this later, when analysing some of the policy alternatives facing Norway in maintaining economic growth.

5.2.7 Human capital, knowledge and technology

Modern management gurus sometimes speak about ‘the war for talent’. Never mind the feeling of a fancy ‘new economy’ catch-phrase – the concept is old. In the eighteenth century, countries on the European continent eager to close Britain’s economic lead engaged in their warfare for the most skilled craftsmen. The competition was so intense that Britain passed a law that prohibited certain types of labour from leaving the country. Britain’s superior human capital during the first Industrial Revolution was due to a great tradition of learning by doing. In the second Industrial Revolution formal knowledge taught in schools and universities came to play a larger role. This came as an advantage to France with its superior system of schooling. In fact it is the merger of science and technology that began the

rapid increases in income during the nineteenth century that Simon Kuznets (1966) has labelled “*modern economic growth*”.

Together with new resources and exchange of capital, goods, labour, and ideas has innovations in technology laid the foundations of empires and eras of prosperity. For most of the last millennium the only way to power and glory was to rule the sea. Improved techniques of shipbuilding, navigation, and seamanship were thus the foundation of the empires both in Venice, Portugal, Holland, and Britain. New technologies in the branches of textiles, iron, energy, and power paved the way for the Industrial Revolution in Britain. And innovations such as railroads, the steamboat, the telegraph, and later electricity brought about a rapid rise in income during the nineteenth century.

Conventional economic theory have seen technology as a public good, but according to this line of reasoning, different levels of technology cannot explain income disparities. This theory will also even out most comparative advantages – why, after all, should England be better at producing cloth than Portugal? The role of knowledge and human capital seem crucial here. Many scholars have maintained that the degree to which countries develop and adapt to new technologies is determined by how they are able to use and understand it (Mankiw 1995).

5.2.8 Natural capital and windfall gains

The apparent paradox of natural capital and other windfall gains is this: economic growth has been higher in countries with limited natural resources than in those ‘fortunate ones’ which nature or history has bestowed sudden wealth upon. Spain in the seventeenth century with its resource-richness is a well-known example of this; witness how the Moroccan ambassador in Madrid describes the country in 1690 (Lewis 1982):

“... the Spanish nation today possesses the greatest wealth and the largest income of all the Christians. But the love of luxury and the comforts of civilization have overcome them, and you will rarely find one of this nation who engages in trade or travels abroad for commerce as do the other Christian nations (...). Similarly, the handicrafts practiced by the lower classes and common people are despised by this nation, which regards itself as superior to the other Christian nations. Most of those

who practice these crafts in Spain are Frenchmen [who] flock to Spain to look for work ... [and] in a short time make great fortunes.”

Thorvaldur Gylfason (2002) has tried to explain the relationship between natural capital and economic growth. His research sheds light on the difficulties Spain, Holland, and other countries with windfall wealth seems to run into. First of all natural resource abundance is negatively correlated to economic growth mainly because of excessive rent-seeking and an appreciated national currency that harms export industries (Dutch disease). But that is not all. Gylfason in addition finds that natural capital has a detrimental effect on the other types of capital:

- Social capital diminishes because of rent-seeking, corruption and tendency of resource-rich countries to have excessive inequality.
- Human capital is depleted due to lower school enrolment, substandard educational quality and a fall in the rate of technological progress.
- Increased output from natural capital crowds out real capital and leads to lower real interest rates and puts a dent on growth.
- Because saving and dissaving will occur through depletion of the natural resource, resource abundance tends to produce less developed domestic financial intermediaries and a suboptimal allocation of capital.
- An overvalued currency will lower cross-border trade and rent-seeking often takes the form of demands from protection against foreign competition. Hence a reduced inflow of foreign capital.

Since all these other forms of capital have a positive effect on growth, Gylfason finds that natural capital reduces the growth rate of national economy both directly and through its influence on other types of capital.

5.2.9 ...and the winner is: Norway

At the start of the 19th Century, most of the population of Norway existed on a subsistence level, consistent with Malthus' earlier theories. GDP per capita in 1830 were about as low as

in 1530 (Bergh et. al. 1996). From then on the progress of growth caught speed, the productivity growth accelerating faster than the population growth. Although on the outskirts of Europe, the country enjoyed high levels of literacy and an atmosphere of political stability and public order. Many of the institutions necessary for economic growth, like property rights and free enterprise, enabled Norway to take part in the industrialization process spreading from Great Britain. Although the growth at times has been mediocre, as the Long Depression from 1875, Norway has slowly managed to rise to the top of the food chain.

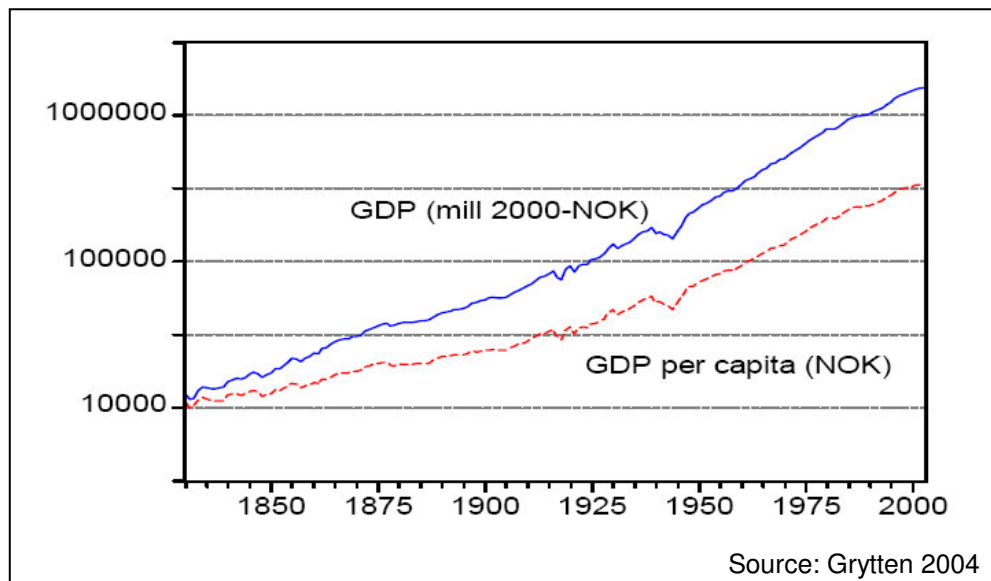


Figure 5: GDP growth of Norway 1830-2003

Measuring Norway and the other Scandinavian countries against ‘the criteria’ spelled out in the last pages, one cannot refrain from the conclusion that we have a winning combination. On top of this combination the only substantial ‘negative’ deviation from the history lesson is in fact favourable! While the histories of Spain and Holland, together with the empirics of Gylfason, suggest that Norway should have encountered problems due to an abundance of natural resources, the opposite seems to hold. In a comparison of Norway and Sweden, Ola H. Grytten and Magnus Lindmark (2006) find that the two significant divergent phases in national income growth between 1830 and 2003 cannot be explained by institutional differences. Instead their research points to Norway’s windfall gains⁸ as the reason why

⁸ Britain’s huge demand for merchant fleet services in the nineteenth century and the exploitation of petroleum reserves on the Norwegian continental shelf after 1970.

Norway from 1830 to 1870 and 1980 to the present experienced a significant higher growth rate than its (in other aspects very similar) neighbour.

6. Maintaining economic growth: the case of Norway

6.1 The explanatory variables of growth

Designing a model explaining all differences in economic growth between countries, consequently the level of development, would be difficult if not impossible. In any case, such a model would in the end be incomprehensible. But distinctive factors separating rich countries from poorer ones exist, and these independent variables can be used in a regression model explaining differences in economic growth. This chapter analyse the condition of these explanatory variables in Norway, and how these will alter the coming decades. The discussion below will roughly involve the same variables examined in the chapter above.

6.1.1 Capital

In this section the discussion will revolve around two types of capital: financial and real capital. Four other types of capital (natural, human, foreign, and social capital) are discussed in the following sections respectively.

Financial capital

Looking into the future, will Norway be supplied by the amount of capital it needs to sustain economic growth? Classical economic theory answers in the affirmative, depending on the degree to which capital is internationally mobile. As long as there are no barriers, the investment decision is determined by the real interest rate given by international market conditions. Projects that have a rate of return higher than this interest rate will find financing.

Research made by Feldstein and Horioka (1980) show that the observed correlation between national saving and investments is close to unity, indicating a far from perfect mobility. In a world where institutional barriers to capital are close to non-existent, this imperfection can have two reasons. First, a preference for investing in near proximity of oneself, the second being limited information about foreign investment conditions. Several studies confirm the

existence of this home bias, but a study on Norway found a high degree of capital mobility in Norway⁹.

A report prepared for the Norwegian Ministry of Finance (2004) concluded that there is not sufficient evidence to support claims of overall capital shortages in Norway. On the contrary, some evidence points in the direction that the rate earned on investments are relatively low. Even though the report opens up the possibility for certain capital market imperfections, it prescribes a general scepticism to what possible governmental interventions can achieve in trying to correct these.

Given that Norway will remain an open economy without barriers to international capital flows, it is not likely that the possible imperfections and immobility of capital will increase. The continuing development of financial markets will rather tend to reduce these.

Real capital

As long as there is no scarcity of financial capital, there should be no limitations on the opportunities to invest in real capital. But large volumes of investments in real capital provide no guarantee of rapid growth, as the examples of the Soviet Union and its communist allies make clear (Gylfason 2002). The high quality of investments in real capital is crucial to long-term growth, and the market-based system achieves this through the profit incentives of the firms.

The share of government ownership on the Oslo Stock Exchange per February 2006 is 34.5 percent (Landsnes 2006), which is high compared to other countries. As the pension fund further increases, so will the motive for rent-seeking in various industries. The case of a lobbying society will be strengthened as everyone wants their piece of the fortune. The quality of the real capital in Norway will diminish if the politicians chase their 'white elephants'. The problem of diminishing quality of real capital under politically motivated investments will be further elaborated under the analysis of a rent-seeking policy agenda.

⁹ Matsen, E. and Ø. Thøgersen (2002): *To what extent is capital really internationally mobile? – Assessments from a Norwegian perspective*, cited in "Sandmo-utvalgets innstilling" (2004)

6.1.2 Natural capital and windfall gains

The petroleum wealth of Norway is the value of the oil resources at the bottom of the North Sea. This wealth is calculated according to the amount of oil and gas (in existing and new fields), the future oil prices, the pace and costs of production, and the discount rates used. Unnecessary to say, there are a lot of uncertainties when assessing the value of the petroleum wealth, therefore the size of the wealth fluctuates significantly. In the National Budget of 2007 the petroleum wealth still not extracted is valued at 4,160 billion NOK (all numbers given in 2007-prices) (Nasjonalbudsjettet 2007 p. 37), where the government share equals 3,660 billion NOK. The government share of the petroleum wealth may be asserted as the discounted value of the government's net cash flow from this sector.

Crucial to the success of the policies is the managing of the petroleum wealth to avoid a re-entry problem (when the natural resources are depleted). Although empirical evidence in support of a resource curse (rent seeking behaviour displaces productive activity) seems strong (Sachs and Warner 2001), Norway has established sustainable growth through sound institutions and sensible policies (learning from other countries' mistakes). Norway insisted on developing a Norwegian oil industry and know-how, making positive synergies to other sectors of the economy. Even so, it seems likely that the rapid expansion of oil exports since the mid-1970s crowded out non-oil exports, since the ratio of total exports to GDP remained unchanged since before the oil discoveries (Gylfason 1999). Norway experienced a whiff of the Dutch disease in 1986, when a fall in the oil price forced the politicians to reverse the increases in welfare goods.

Policymakers in resource-rich nations might disregard the need for diversification and growth-stimulating policies, as oil revenues are sufficient to balance budgets. By establishing the Petroleum fund, now the Pension fund, the government separated extraction of the natural resources from the consumption of the revenues. By doing this, the windfall gains of the oil extraction could be distributed among future generations as well as the existing ones. The size of the Pension fund (the part invested abroad) was estimated at 1,756 billion NOK at the beginning of 2007 (Nasjonalbudsjettet 2007 p. 38).

The size of the Pension fund and the government share of the petroleum wealth combined are around 5,400 billion NOK and might give yearly revenue of over 200 billion NOK

(according to the 4 per cent target of the fiscal rule). Even though some of the gas depletion still remains in 2050, this thesis uses the estimate of 5,400 billion NOK as the size of the Pension fund in 2050. This divergence may signal a belief in a petroleum price slightly higher than the analysis in the National Budget. The significant disparities in calculations of the petroleum wealth, i.e. due to the volatility of the oil price, make this number as good as any. A new energy invention or some other shock would change these numbers in an instant. The Pension fund plays a central role considering the changes in demographics (see the next section), and the analysis of policies to maintain a stable long-term growth path for the Norwegian economy.

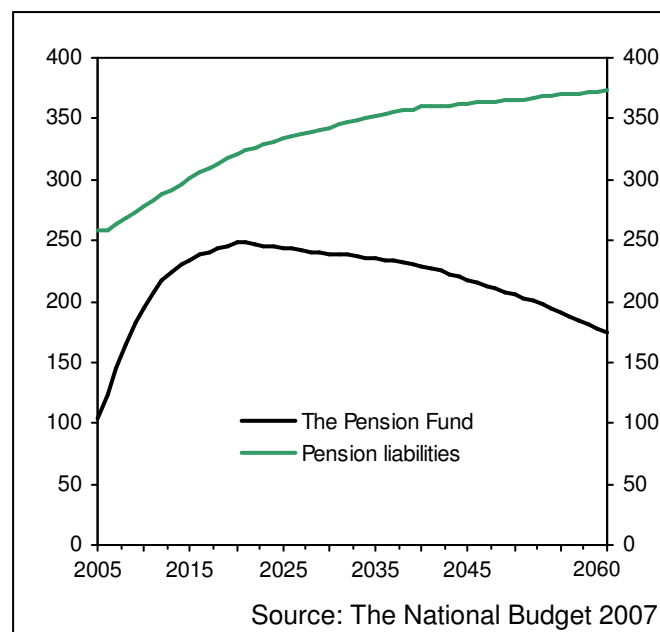


Figure 6: The Pension fund and pension liabilities, in per cent of GDP, 2005-2050

6.1.3 Labour force and human capital

When evaluating the factors affecting long-term growth in Norway, there are hardly more quantifiable variables to study than the population size and the demographic changes. But the labour participation ratio and the quality of the human capital are also of great interest for economic growth, and the projections face higher uncertainties as these indicators are included. Nevertheless, when analysing the policies in the next chapter, a model to evaluate the consequences of the quantity and quality of the labour force will be used.

Population projections towards 2060 made by Statistics Norway (SSB) reveal a steady increasing population size (SSB web site), assuming the fertility rates and net immigration remain unchanged. This midrange projection presumes a fertility rate of 1.8 children per woman and a net immigration of 16 000 a year. Using an interpolation between now and 2060, the life expectancy in 2050 ends up at 84.7 for men and 88.9 for women, and this development is used in the calculations. The uncertainty of the projections is taken into consideration by combining different low-, mid-, and high-range values of these variables to provide a range of different scenarios. The distribution of alternative scenarios around the midpoint for the analysis illustrates the lack of certainty.

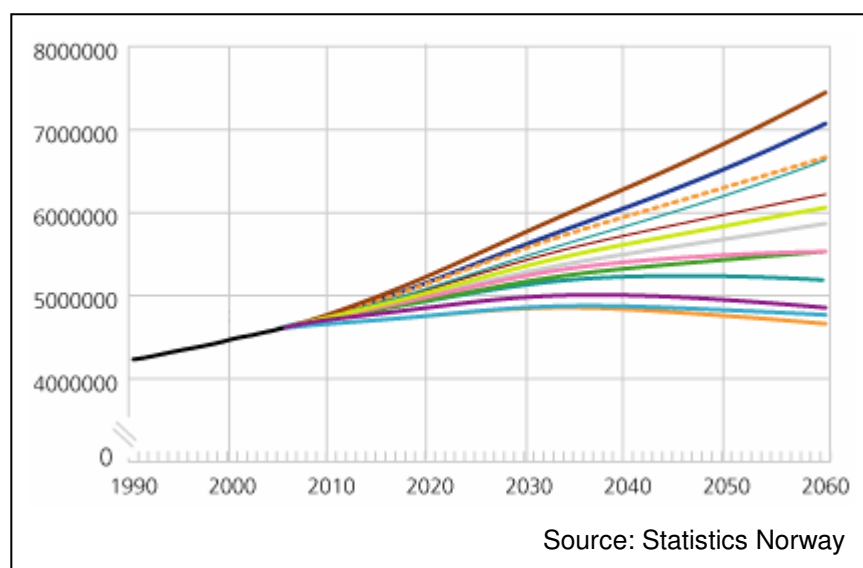


Figure 7: The different population scenarios up to 2060

Whilst the total population may increase the next fifty years, the demographics change radically, leaving substantial disparity between population growth and labour force growth. As shown at the next page, the population pyramid¹⁰ in 2050 (the mid-range projection) become even more top heavy than as of today. Whereas the population age 67 + makes up 13.1 per cent of the population in 2005, this number increases to more than 20 per cent in all of the scenarios by 2050. Figure 8 shows the per cent changes in some selected age brackets. The large increase in population size for the 67 + indicates a diminishing labour force participation rate, all other things equal.

¹⁰ The term population pyramid corresponds best to less economically developed countries today, as the cohorts take this form. The pyramid shape indicates a combination of high birth rate and death rate, and a short life expectancy. However,

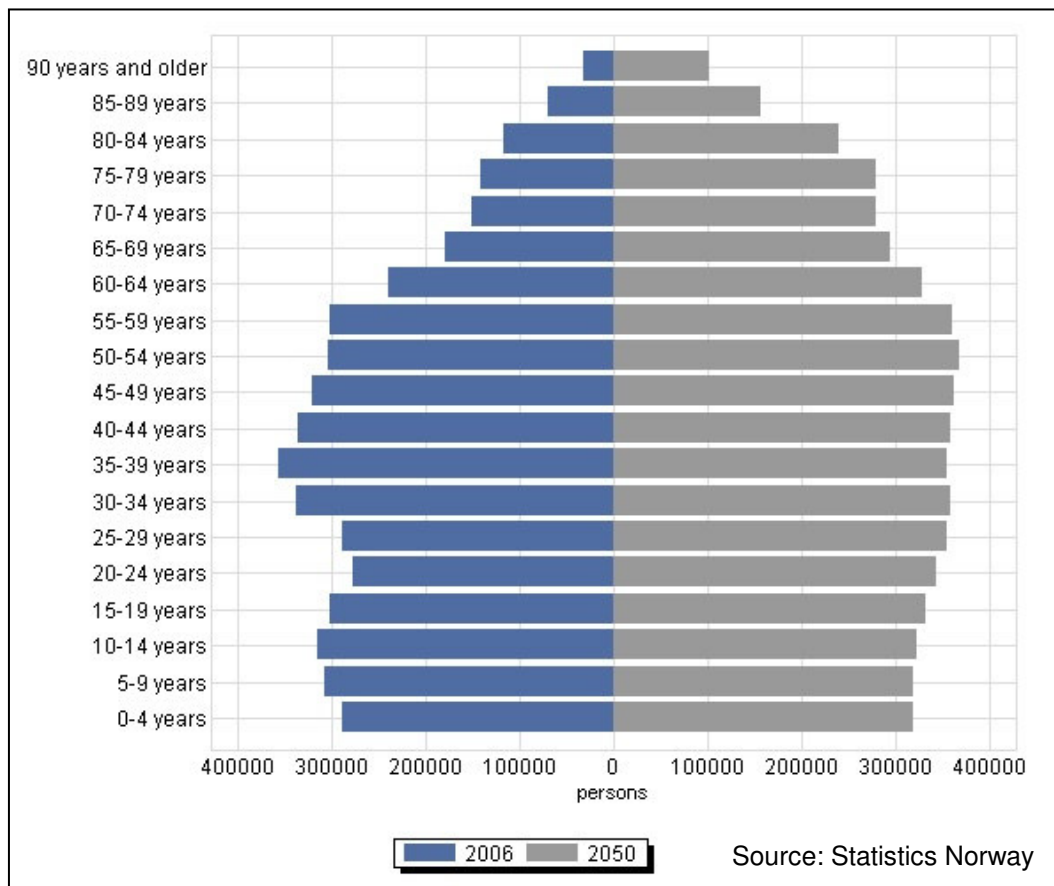


Figure 8: The population pyramid today and the mid range projection of year 2050

The size of the labour force do not solely depend on the population distribution, the work participation rates, especially within the age brackets usually having a full-time job (25 – 67 years old), must be taken into consideration as well. Historically, Norway is among the OECD countries with the lowest unemployment rates (Aetat web site). The significant participation rates of women pushes total labour force further up. Working in the other direction is the sinking participation rates of men and the increases in people on social security benefits. In their evaluation of the labour market in 2030, Aetat process three different scenarios: the mid-range scenario of participation rates as today, the optimistic one where the women catches up to the men's rate and the 60 + age group work more, and the pessimistic where the men continue to work less and less.

population pyramid is used to describe all types of cohort distribution, even where they follow a completely different pattern.

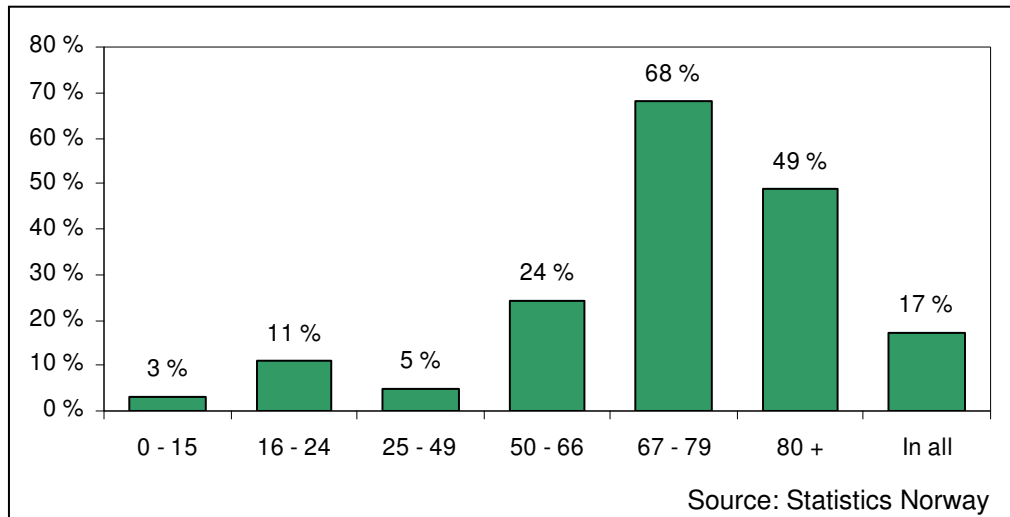


Figure 9: Changes in population brackets between 2005 and 2030

Human capital can be defined as the people of a nation and their ability to be economically productive (Unesco web site). The quality of the labour force determines how efficiently workers use existing capital, and correlates positively with the rate of technological progress (Gylfason 2002). Education, training, and health care usually increase human capital. Indicators of school enrolment and life expectancy at birth, both used in the Human Development Index, are crude measures of the level of human capital. School enrolment measures the quantity of education, but says nothing of the quality of this education.

Norway ranks as number 1 on the HDI, signalling a high level of human capital on the indicators used by this index. However, the quality of the education is concerning the policy makers, as Norway does not rank as well on international studies as ardently desired (OECD PISA web site). There is no certain way of knowing how the quality of the education system and other variables affecting human capital will evolve. But the policy analysis will evaluate different educational reforms and try to measure the impact of quality changes in human capital.

6.1.4 Trade and capital flows

Trade

As a small country, Norway has always been dependent on trade to exploit the benefits of the division of labour and a sufficient market size. The export ratio to GDP today in Norway is

equivalent to the average of other small countries, at around 40 per cent (Gylfason 1999). The phenomenon of globalization will probably boost this ratio the next decades. The International Monetary Fund defines globalization as “*the growing economic interdependence of countries worldwide through increasing volume and variety of cross-border transactions in goods and services, free international capital flows, and more rapid and widespread diffusion of technology*” (Wikipedia). This strengthened competition opens up new markets for exports, as well as providing the possibility of importing more and better products at lower prices. But the process of globalization increases the necessity of change in many businesses, putting more pressure on the capability to successfully innovate.

Norway’s ability to successfully export their goods in the non-oil sector depends on whether the policy makers follow the doctor’s prescription against the Dutch disease. Avoiding the crowding-out of the traditional traded sector via real appreciation of the exchange rate (by regulating how the resource rents are absorbed into the economy, as discussed in the previous section) is necessary if Norway should be able to benefit from the globalization. As of today, the increasing prize of the export goods of Norway (not just the oil) has a positive effect on economic growth. But these alterations in the terms of trade may reverse itself.

The future evolution in the WTO trade talks, or other international events that may have an impact on the trade level of Norway, is impossible to predict in the long run. Within the legal ground of the international agreements, national policy makers also influence the trade level of the specific country (the influence on others depending on their size). Theory of trade shows that the vast majority of the population would be better off with lower tariffs, but powerful interest groups may lose. The total benefits are greater with freer trade, so the whole population may be better off if the losers are compensated in some way.

Capital flows

At the start of the 20th Century, the process of industrialization in Norway was fostered by foreign direct investments (Hodne and Grytten 2002), mainly from Great Britain. This period saw a similar globalization process as the start of the 21st Century. As pointed out in the capital section, there are almost no institutional barriers for capital flows nowadays. Through membership of the European Economic Area, Norway is obliged to the free movement of goods, persons, services and capital between the participating countries. The introduction of

capital flow barriers in the near future is highly unlikely, even though there are proponents of a Tobin tax to stop 'hot money' flows.

Conclusion

The forces of globalization are strong, as most consumers and producers benefit from increased trade and capital flows, and economic theory and most of its proponents supports it. But history has shown that major disruptions may quickly turn the trend. Excluding the possibility of such circumstances, a further expansion of the process of globalization – implying more trade and additional economic growth – still depends on the willingness of political leadership to support such a development, or at least not actively working against it. This thesis holds the current trend as the main hypothesis, as there is not enough proof to reject this for an alternative hypothesis. Cross-country trade and capital flows should therefore increase in the future, both absolute and relative to GDP.

6.1.5 Culture and institutions

Globalization is not just an economic phenomenon, it relates to the cultural integrations across borders too. As the countries in all sense are more intertwined, the complex whole of a society get new impulses. Americanization of the society relates to the domination of United States in exporting their way of living, especially through their domination of the media. But new cultural expressions may be more directly imported through immigrants coming to a country as well.

The Protestant heritage of Norway has laid some of the foundation for economic growth, as mentioned in section 5.2.5. Opening of borders and the need for immigrant workers make the culture more of a melting pot. The higher share of non-ethnic Norwegians may enlarge the pool of innovations and ideas, leading to more technological process. But the culture may face a backlash in the integration process, as public opinion may increasingly become sceptical to new cultural impulses. The clash of civilizations theory of Samuel P. Huntington (2002) paints a bleak view of the collaborations between cultures, and this clash may take place within national borders as well. The culture of Norway will be ever more internationalized, but the impact on economic growth would be impossible to forecast.

The culture of a country determine the shape of the institutions (Avner Greif 2006), it be the formal establishments or the social mechanisms. The role of the formal institutions, especially the government and the policies they conduct, is covered in the next chapter. The social mechanisms as part of the cultural legacy are irrelevant in this analysis, as their influence on economic growth in the future is hard to tell. However, the role of sound institutions should not be underestimated, as underlined by Avner Greif (2006):

“Socially beneficial institutions promote welfare-enhancing cooperation and action. They provide the foundations of markets by efficiently assigning, protecting, and altering property rights; securing contracts; and motivating specialization and exchange. Good institutions also encourage production by fostering saving, investment in human and physical capital, and development and adoption of useful knowledge. They maintain a sustainable rate of population growth and foster welfare-enhancing peace; the joint mobilization of resources; and beneficial policies, such as the provision of public goods.”

6.1.6 Geography

Adam Smith pointed out in *Wealth of Nations* that “*the nature of its soil, climate, and situation*” determines the country’s progress of wealth. Contemporary investigations suggest that variables such as the ratio of coastline distance to land and the country’s distance from the equator (Asian Development Bank 1997) positively correlates with economic growth. Norway scores particularly high on both of these factors, further explaining the affluence of the country. The climate obstructs diseases which countries in the tropic areas have to deal with. As of the future, the distance from the equator hopefully stays the same. Changes in geographic variables, if any, are of no concern for this thesis.

6.1.7 Conclusion

The relative wealth of Norway compared to other countries can be explained by an array of variables, some of them mentioned above. As Norway’s economic growth the next 30-50 years ahead will be studied, many of the variables mentioned above become irrelevant when comparing the same country. Others are hard to predict. Although some of these fundamentals for economic growth within Norway may alter during the coming decades, the

main focus of this thesis will be on the explanatory variables where we can predict the change.

The value of the human capital makes up over 80 per cent of Norway's national wealth, as shown below. Therefore, the changes in demographics, labour force, and the quality of this human capital will be of main concern. The relative ease of predicting changes in these sizes when evaluating the policies further delineate the road of this thesis. Even though the evolution of the culture in Norway the next 50 years would be an interesting topic to study, the pleasure of this work is hereby handed over to others.

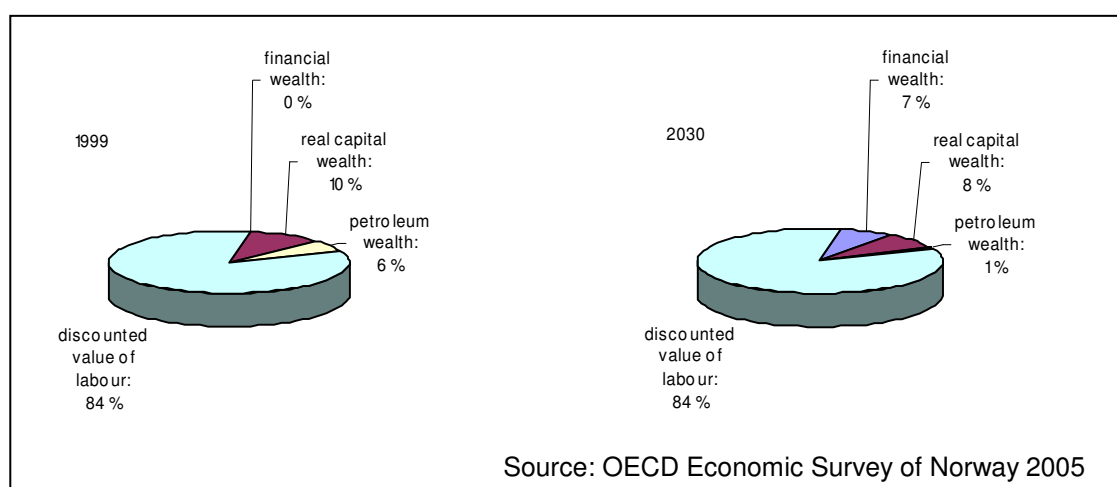


Figure 10: National wealth in 1999 and 2030

6.2 The role of policies

The discussion in the section above indicates the importance of sound policies when enhancing economic growth. Every variable may in some way or another, usually in several aspects, be influenced by decisions of the policy makers. Some variables, like the countries' openness to trade and investments, are directly linked to the policies of this area. More indirectly, but still important, the tax system influences economic growth through the participation rates of the labour force, the number of hours worked, and so on¹¹. In the widest

¹¹ Even the decision of having babies (and thereby the demographics) is influenced by policy makers, most common indirectly by welfare goods like paid child care leave. Singapore have tried a more direct approach, giving life-long tax exemptions to parents with higher degrees if they get three children before the age of 30 (in addition to several other benefits).

sense, considering the alternative costs of each decision, all policies have some impact on the rate of economic growth.

What this thesis seeks to analyse is policy areas where the largest benefits for long-term growth would occur, including the costs of these policies. Where the market should regulate itself and where the state should intervene will always be subject to different political opinions. Still, taking economic theory as a starting point, subjects like these will be touched in a more objective manner. As promised in chapter 4, the analysis will not be purely based on economic growth, but also touch the consequences for human welfare not covered in the GDP measure.

7. The analysis of the policy alternatives

7.1 The framework of the analysis

This section presents the policy areas which the thesis will focus on, and an in-depth analysis of how policies within these areas may affect long-term growth in Norway. The best approach would be to measure the effects quantitatively wherever this is possible. This may make sense when looking at pension reform and some parts of the education policies, if the right assumptions are made. But most of the policy alternatives condition a more qualitative analysis, where the size of the changes may be elaborated upon even though there are considerably uncertainties involved.

Solow's main finding in the neoclassical model is that GDP grows at the rate of technology in the steady state. Even if the rate of technology progress was given (and exogenous), the economic growth of Norway in the long run is not that predictable. One key assumption in the neoclassical model is the constant relationship between the total population and the work force. The work force is utilised to its full potential, or alternatively, a constant rate of unemployment is included without interfering with the main findings. But the demographic steady state is not reached for a long time to come in Norway, probably never at all. Policy makers too may always affect the participation rates through more or less efficient policies, so the violation of the assumption gives opportunities to say something more than an analysis of technology changes in the long run.

The elaboration in Chapter 5 on theories of economic growth included endogenous growth theory, and how the technology parameter is influenced by economic variables and therefore by the policies. Especially in the analysis of the resource curse the discussion goes beyond participation rates of the work force, and focuses on how capital abundance and rent seeking will might hold back the progress of technology changes and thereby economic growth.

7.1.1 The quantitative approach

Using the mid-range population scenarios from Statistics Norway and the labour force participation rates from Aetat (extrapolating the 2030 rates), the alterations in demographics and labour participation rates make the foundation for a simple prediction of the labour force size in 2050. Different dependency ratios may be used to assess the burden on the labour force, to find out the number of ‘mouths to feed’ of each worker. This thesis operates with total economic dependency ratio (TEDR), as this is both the most comprehensive ratio and easy to calculate. The ratio is defined as:

Total economic dependency ratio = total non-working population / total labour force

The ratio shows the economic burden of the labour force that pensioners, disabled, unemployed and youngsters represent. The groups could have dissimilar weights attached to them to represent different burdens on society, but for simplicity this is not done here. These weights would in any case be estimates and open for discussion.

The TEDR may be used in the analysis of some of the policy alternatives, by trying to distinguish the economic burden of the work force in the different policies. The projected total economic dependency ratio in 2050 is 107 per cent, implying less than one worker for each person outside the labour force.

7.2 Pension reform

In the summary of Report No. 12 (2004-2005) to the Storting: Pension reform – Safeguarding our pensions, the argument for having a pension system is stated as follows:

“The basic purpose of the pension system is to provide financial and social security by securing the income of those who cannot be expected to support themselves by their own work, as the result of old age, long-term disability or loss of breadwinner. [...] Basic security implies that all retirees are guaranteed a minimum income as retiree, irrespective of their previous income. Its purpose is to prevent poverty. Relative security implies that pensions shall be related to one's income as

occupationally active, in order that no one shall experience a too strong decline in their standard of living upon retirement.”

A formal pension system induces savings to make individuals smooth the income over their lifetime. The redistribution aspect of the pension system is clearly stated in the quotation above, shifting lifetime income from one person to another. A third function is insurance through the pooling of risk (even though this aspect may be considered as a part of the redistribution) (World Bank, 1994).

7.2.1 Different features of a pension system

When assessing different types of pension systems, there are some distinctive features in each model that can tell them apart (Lindbeck and Persson, 2002). Most real-life systems would not be clear-cut cases, but include different components to place themselves somewhere along a dimension. The pension systems could be analysed along several dimensions, one worth mentioning would be the degree of privatization in the system. Other main features are:

Degree of funding

This dimension focuses on how the aggregate saving takes place. In a pay-as-you-go (PAYGO) system the benefits of the current pensioners are financed by taxes on currently working generations, implying no funding whatsoever. Contrary, in a fully funded system the benefits are financed by the return on previously accumulated pension funds made by the same generation that receives the benefits. The risk exposure in the two models is different; in a PAYGO system it depends on the growth of the economy (the combined growth of the work force and productivity growth), while in a funded system the risk is linked to the return on the accumulated funds (Thøgersen, 2005).

Contribution/benefit relationship

Actuarial fairness measures the degree to which the benefits received relates to the contribution made by each individual. If the expected net present value (NPV) of the benefits equals the NPV of the contribution, the system is fully actuarially fair. A system giving a flat

benefit to all, independent of their contribution made, is the other extreme. A fully actuarially fair system gives the highest incentives to work, but have no redistribution effects between individuals.

Another distinction that may be made between different pension systems is whether the contribution or the benefits are defined. In a system with defined benefits, the workers must bear the inherent risk of the system as the pensioners are guaranteed their payments. Contrary, in a system where the contributions are defined the pensioners have to put up with the risk.

7.2.2 The multipillar approach

When designing a pension reform, the model being proposed should be fitted to the specific institutional settings of the country involved. As stated by Orszag and Stiglitz (1999), “*an idealized model is likely never to be realized in practice and choices are inevitably characterized by degrees of gray rather than being black or white*”. A new pension system needs to take into consideration the existing one, as the transition costs between the systems must be included when selecting the optimal alternative.

Still, the World Bank has made some general recommendations on the framework of a pension system (World Bank, 1994). The multipillar approach rests on the theory that a combination of different policies is more effective than any single approach. The three pillars recommended are:

- i. a publicly managed system with mandatory participation with flat (or close to flat) benefits
- ii. a privately managed mandatory savings system
- iii. a voluntary savings system

The two mandatory pillars fulfil the role of redistribution and savings respectively, both by being a clear-cut case: the first pillar is publicly defined benefit, the other privately defined

contribution. The multipillar approach is not meant to be a single answer on how to construct a pension system, but a framework showing how to combine assumingly opposing goals.

7.2.3 The need for a pension reform in Norway¹²

Since the introduction of the National Insurance Scheme (NIS) in 1967, the strong growth in the working population has contributed to limiting the growth in overall pension expenditure as a share of national income. However, the National Insurance Scheme is facing mounting challenges in terms of the long-term sustainability of the pension system. The finances of the NIS faces increasing pressure as a result of lower growth in the working population, higher average benefits and increased life expectancy amongst retirees:

- i. The problems caused by the changes in demographics, and thereby fewer workers, are reinforced by the fact that the pension system does not offer older workers sufficient incentives to continue working.
- ii. In the existing pension system, the average old age pensions may increase by about 30 percent relative to the wage level in society up to 2050. The increase has two explanations; the current NIS is still not fully phased in, as well as the pension entitlements of future female retirees will be higher.
- iii. Whilst the remaining life expectancy at the official retirement age of 67 years has grown to 17 years today, this may further increase to 22 years in 2050.

In the absence of reforms to the present system, the result will be more than a doubling of the old age pension expenditure of the NIS by 2050 as a share of Mainland Norway's GDP, from 6 per cent in 2003 to 15 per cent in 2050. This share will be some of the highest of the OECD countries, as shown in Figure 11. All countries in this table have more (Italy, Germany) or less (United States) the problem of an aging population. Still, the differences in the increases up to 2050 have other explanations as well. Some of the countries have already

¹² This chapter and the next draws heavily on the descriptions made in the white papers St.meld. No. 12 (2004-2005) and St.meld. No. 5 (2006-2007).

made reforms in their pension system, like Sweden and Denmark. The large increase in Norway's pension expenditures can, half and half, be explained by the changes in demographics and the maturing of the NIS (Antolin and Suyker 2001). If all the expenditures in the NIS system are included, the share of Mainland Norway's GDP increases from today's 10 per cent to above 20 per cent in 2060 (National Budget 2006).

Another drawback of the current NIS is the weak relationship between contributions and benefits. The role of relative safeguarding has been diminished, as the ratio between the highest and lowest old age pension has declined from 4.2 in 1970 to 2.2 at the present. The 'best earnings rule' and the upper limit on the number of contribution years may result in large differences in pension payments to persons with the same lifetime income. These rules make the relationship between income whilst working and subsequent pensions unnecessarily complex, often without this being attributable to any clear wealth distribution motive.

Countries	2000	2050
Denmark	6,1	8,8
Finland	8,1	12,9
Sweden	9,2	10,8
France	12,1	16,0
Germany	11,8	16,8
United Kingdom	4,3	3,6
Italy	14,2	13,9
Spain	9,4	17,4
United States	4,4	6,2
Average of selected OECD countries ¹	7,4	10,8
Norway, as percentage of Mainland Norway GDP ²		
- under the current rules	5,9	15,2
- under the proposal of the Pension Commission	5,9	12-12½

Source: The Pension Commission

Figure 11: Pension expenditures in selected OECD countries, in per cent of GDP

The petroleum revenues place Norway in a more favourable financial position than most other countries when it comes to dealing with the growth in pension expenditure. But contrary to popular beliefs, the oil wealth cannot cover the expected increases in the total

pension expenditures. It is necessary to carry out reforms to make the welfare system sustainable in the longer run. The alternative to a pension reform that contributes to curbing the growth in pension expenditures would be correspondingly tighter policies in other areas through higher taxes or cuts in the state budget. A pension reform is necessary to safeguard the pension payments of tomorrow's retirees, whilst at the same time avoiding an excessive burden on the future working population. In addition, making the system simpler and more 'fair' in the process would be a further advantage.

7.2.4 The proposed pension reform

A central principle in The Pension Commission's proposal (Official Norwegian Report No. 1 (2004)) is the closer correlation between individual income and pension, or a more actuarially fair system in the terms used above. The proposed pension system by the Stoltenberg II government autumn 2006 (The white paper St.meld No.5 (2006-2007)), which was slightly adjusted in the pension agreement between this government and the opposition (except The Progress Party) at March 21st 2007, maintains this principle. Proportional pension entitlements accumulate from the first penny (or NOK in this case) earned, and there are no limits on how many years that give pension entitlements. Still, the systems include a redistribution element as it provides basic security in the form of a guaranteed pension.

As Figure 12 shows, the Government proposal has a larger redistribution effect than the modernized NIS, as the lower income deciles improve their pension entitlements. Since the pension acquisitions stop at 7 Basic amounts (B.a.) in the Government proposal, while at 8 B.a. in the modernized NIS, the high income groups reduce their pension entitlements. Calculated pension premiums, as a share of income, increase for low income levels in both systems compared to the current NIS. In the Government proposal this share is 18.9 per cent. Since all occupational active years count, not just the 20 years with most earnings as in the current NIS, the pension acquisition becomes more visible.

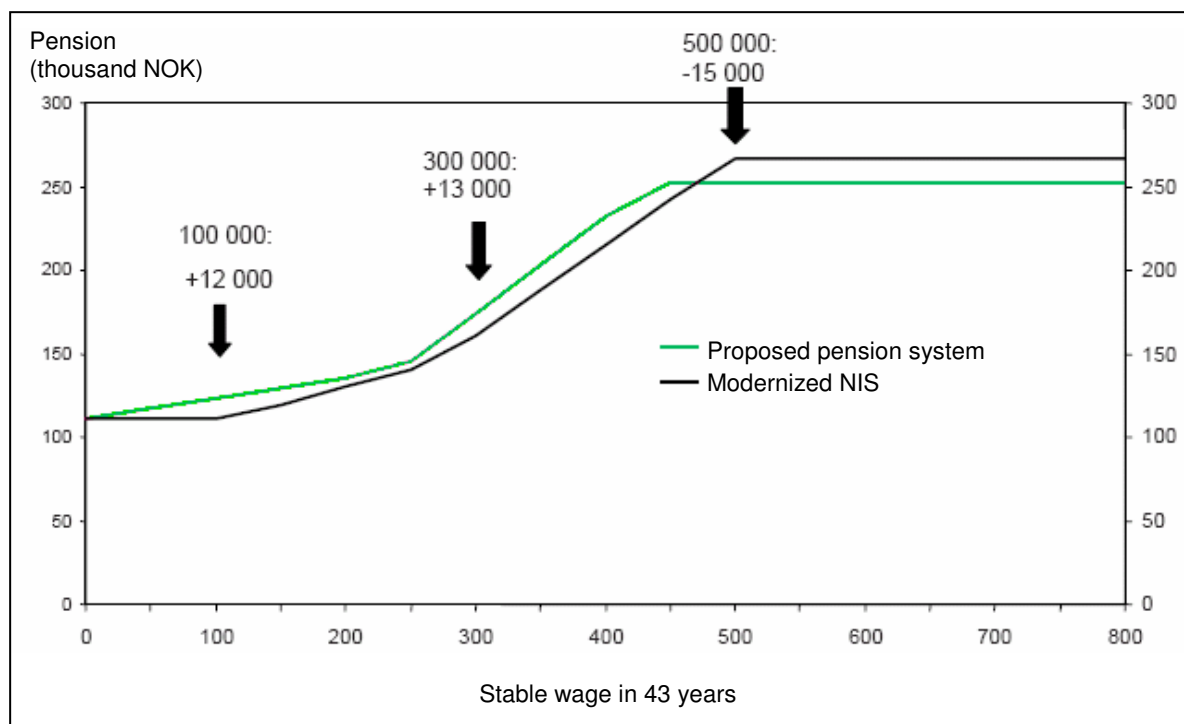


Figure 12: Comparison between the Government proposal and current NIS

The proposed system intends to meet continued increases in life expectancy amongst retirees by measures to increase the average retirement age. The way of achieving this is to introduce a life expectancy adjustment ratio, smoothing out the consequences of changes in life expectancy. The annual pension is lowered in line with future increases in life expectancy amongst retirees. At the same time, individuals are enabled to compensate for this by deferring the time of their retirement. The longer one remains working, the higher the annual amount of pension will be, especially since the limit of 40 years of pension acquisitions in the current NIS is removed. The underlying principle is that each individual shall finance the main part of the costs related to the choice of early retirement. At the same time, after the age of 62, a person may combine income from work and pension under the NIS, without the income being set off against the pension. During the contribution period, pension entitlements adjust in line with wage growth. Old age pension payments after retirement are adjusted annually by a factor corresponding to the average of wage and price growth, making the pensioners share in on some of the productivity growth.

The Pension Commission suggested a mandatory element to the pension system on top of a modernised NIS. Alternative models were examined; the two recommended was a defined contribution scheme featuring individual accounts managed by approved pension providers,

or a statutory obligation for individual enterprises to establish a supplementary old age pension scheme (OTP). An OTP scheme was already introduced for public employees as well as parts of the private sector, but in 2006 the OTP was made universal, giving the reform in Norway a touch of the multipillar approach recommended by the World Bank. This comparison is even more accurate after the pension agreement between the Government and opposition mentioned above, which struck a deal about a voluntary individual pension saving scheme.

7.2.5 The effects of the pension reform

As shown in Figure 10 above, the Pension Commission estimates (through Statistics Norway) that its proposals would contribute to reducing expenditure on old age pensions as a share of Mainland Norway's GDP by about 20 percent in 2050¹³. The same estimate of savings is used in the proposed pension system in the White paper on the Pension Reform. These calculations rest on some crucial assumptions though, as the early retirement scheme (AFP) and public pension benefits are supposed to be adjusted accordingly to the intentions of the pension reform. The first assumption is partly true; the second is not yet decided. The potential transition to other types of benefit, like unemployment or disability benefits, because of the pension reform, is not taken into account.

Calculations by Statistics Norway predict that the reform will increase the work force participation by around 10 per cent in 2050. A rough estimation, where the estimated changes in work force participation is combined with the mid range population scenario, show that the TEDR decreases by around 20 per cent, from 107 to 88 per cent. For each group of 10 workers, there are close to 9 people outside the work force instead of close to 11.

7.2.6 Policy alternatives for improving the pension system

As mentioned earlier in the chapter, when reforming the pension system the new model must adapt to the existing one. This adaptation must find a balance between deviating from 'the

¹³ The estimated savings will be even more after 2050, as the proposed system stabilizes around 12 per cent of GDP, while the existing system would continue to increase as a share of Mainland Norway's GDP.

ideal system' and the transition costs. A new model will always have their losers, especially since reforms usually are made because of the lack of sustainability of the existing system. When the Government presented their proposed model, everybody seemed to benefit from the new system, as Figure 13 illustrates. This may be true today, but as the life expectancy adjustment is made, the average pension of future generations will be downgraded. Pensioners in 2050, according to the projected increases in life expectancy, receive benefits 18 per cent lower than without this adjustment, or alternatively, must work 2½-3 years longer.

A pension reform, where one of the key purposes is to improve the budget balance of the future, may meet more resistance than, for instance, a tax reform with a similar purpose. The workers feel entitled to the pensions they will receive in the old system, as they consider these payments to be their earned rights, independent of how these pensions are linked to their lifelong earnings. These feelings of entitlements increase the transaction costs between the old and new system, all other things equal. Still, as most of the political parties share the view of the current system as unsustainable and in need of reform, the reform may be decided upon in spite of these popular sentiments.

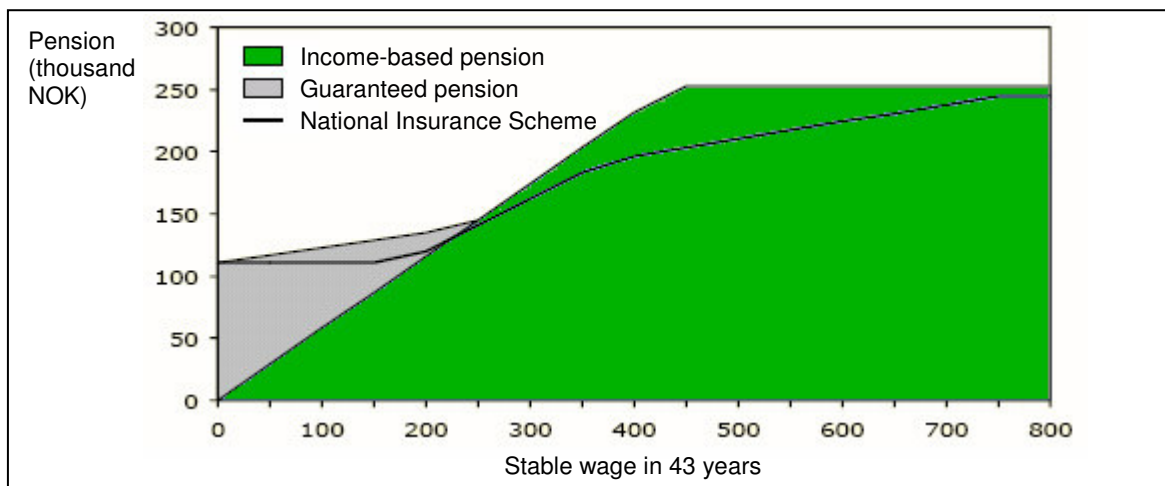


Figure 13: Comparison between the Government proposal and current NIS

Redefining guaranteed pension

Some of the specific characteristics are noticeable from Figure 13. The model shows that increases in the pension entitlements start from the first NOK earned, but the guaranteed pensions are reduced by 80 per cent of the additional income as well. This translates to an effective pension premium of less than 4 per cent of the marginal (and, in this case, total)

income (20 per cent of 18.9), indicating that the incentives to work more because of increased pension entitlement surely must be insignificant. The Government is aiming for a system where no-one becomes minimum pensioners, and that the pensions accrue from the first NOK earned, but this reduces the work incentives for those that are covered by guaranteed pensions. A system which decreases the reduction in guaranteed pension for the main share of this group can easily be designed, which is more in line with the Pension Commission system.

By holding the guaranteed pension flat up to 1.5 B.a., the reduction in guaranteed pensions may be lowered for higher incomes. The group with income of less than 100 000 NOK (in 2006 prices) on average throughout their life (a lifetime income of around 4 million NOK) will not receive additional pension earnings at all. But the size of this group with a lifetime income below 4 million NOK is an insignificant share of the work force covered by guaranteed pensions. The exact number is not available, but 4 per cent of the population has an income below 50 per cent of median income.

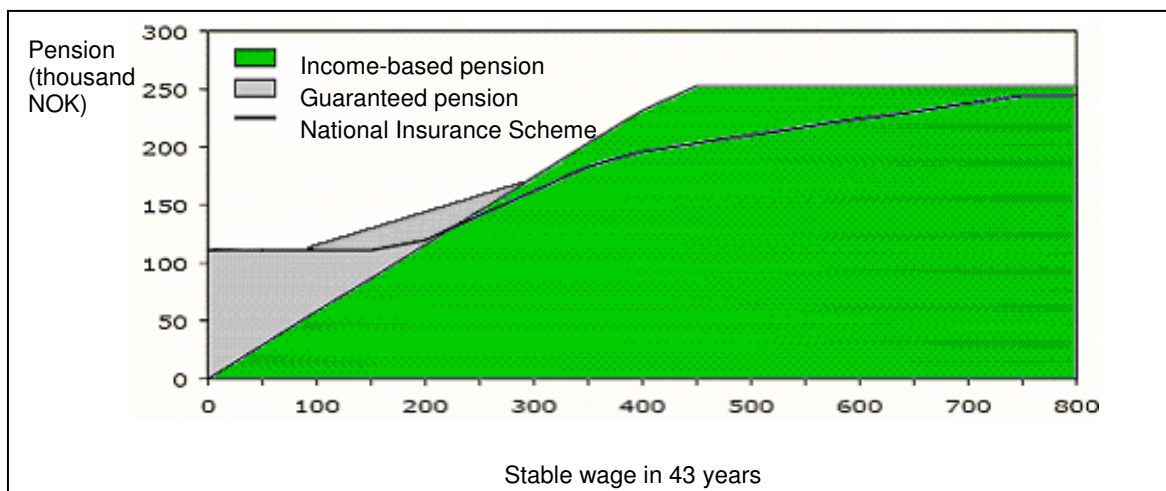


Figure 14: Comparison between the Government proposal and current NIS

By lowering the reductions in the guaranteed pension to 50 per cent, as an example, from 1.5 B.a., the effective pension premiums for this group increases (by 150 per cent) to 9.45 per cent. The share of the population getting some form of guaranteed pension may be around 50 per cent, as the limit is close to median income (NOK 245 000 for singles age 30 – 45 in 2005). Figure 14 shows this adjustment to the Government proposal of a new pension system.

The line of reasoning of this adjustment is the possibility of increasing the (total income related) incentives to work for a group of workers which are 10 times bigger than the group that loses their incentives, hence increasing the total work supply and further improve long term growth. But this demands that the principle of avoiding minimum pensioners is put aside, and that pension earnings are not accumulated from the first NOK earned. The share of minimum pensioners has already fallen drastically since the introduction of the NIS, first and foremost because of women entering the work force, and the rate will continue to drop.

The proposed change in how the guaranteed pension is distributed has certainly some disadvantages as well. The group afflicted by the guaranteed pension increases, up to almost stable earnings of 5 B.a. (over 300 000 NOK in 2006 prices). A system may be designed to avoid workers being afflicted by the guaranteed pension beyond the Government proposal to a new system (4 B.a.). The solution is simply to increase the level of pensioners receiving only the guaranteed pension and/or increasing the reductions in the guaranteed pensions up to, for instance, 60 per cent. The proposed changes may also be considered to have negative redistribution effects. There are possibilities to compensate the lowest earners through direct transfers, although this may discourage this group beyond the changes here made to the pension system.

The size of the incentives to work more related to pension accruals may also be discussed, which are the topic of the next policy alternative.

Exploit the size of the time lag between earnings and pensions

Workers in different stages of life surely face different incentives of earning pension entitlements, depending on how much time there is left to when the first pension payment are received. An analysis based on net present value may suggest otherwise, as long as the pension entitlements are regulated according to the wage growth in the society. But considering the time preferences for each individual, a close-to-be pensioner should value the increase in pensions more than new employee in their first job. The motivation for working more throughout the career changes; opportunities for a promotion for the new employee, financial security after retirement for the senior worker, hopefully the job satisfaction for the both of them; so maybe the pension system should be adjusted accordingly to enhance these motives?

Such an adjustment, giving senior workers more pension accruals than other workers, would certainly make the pension system more complicated. Still, different pension premiums at the margin already exist because of the reduction in guaranteed pension with increasing income for low paying groups. A higher pension premium for workers above, for instance, the age of 62 should give incentives for working more, and therefore cover the increased pension payments through increased production and tax income. The extra compensation may also make more seniors combine income from work and a pension under the NIS, which was one of the ambitions of the modernized system.

Certainly, if the effective pension premium for senior workers is raised from the roof of 18.9 per cent of the marginal income to e.g. around 25, the effect on work supply for this group should be bigger than for graduates in their first job. But even if the supply of experienced workers increases, there are no guarantees that this will translate into more employment. But with changing demographics more and more companies are realizing that they have to keep their senior workers for a longer time. And as the perverse incentives of the contractual pension (AFP) are toned somewhat down, the future job market ought to look bright for the senior workers.

Refinancing non-liquid assets

Most elderly people have invested some of their lifetime income in properties and other non-liquid assets. 82 per cent above the age of 67 own the house or apartment they are living in. When economists are proposing increased real estate taxes, the effects on poor widows living in their own big house are one of the main arguments against raising these taxes. But refinancing the house to increase the liquidity, either to pay real estate taxes or add to the pension payments, is a real option. Increasing the debt rate of the real estate for elderly with reduced income is probably one of the best ways to use the option of refinancing loan.

Through refinancing the bank gets entitled to more of the real estate, so the share of what the relatives succeeds will fall. But the social custom of inheriting is broken by more and more people, and a new pension system should reflect these financial possibilities. All in all, since the share of elders living in their own estate is so high, the general level of pensions could be lowered significantly compared to a system where only pensions and liquid savings are used and most of the estate is inherited. The savings of a tighter pension system passes on to the next generation through e.g. a lower tax level, compensating the generation that loses some

of their inheritance. The incentives to work more through lower taxes depends on the relative importance between the income and substitution effects, but the incentive is sure better than what a lump sum through inheritance gives.

Such a system would once again be considered to have negative effects on redistribution, as a general cut in pensions would hit the low earners hardest, which also have less real estate than the average. Again, direct transfers to low earning pensioners with limited real estate assets could be considered, but this gives an incentive for these groups to consume more of their earnings instead of investing them. Therefore, the point of refinancing must be seen in relation to the proposal of increasing the real estate taxes. The implication is that low pensions are not an excuse for high taxes on properties, as long as the same properties can be used to finance the taxes and add to the pension payments.

7.3 Tax reform

7.3.1 The Purpose of Tax Systems

“In this world nothing is certain but death and taxes”, Benjamin Franklin is quoted saying. For inhabitants of modern states this statement is true, even though how much tax you must pay or the time of your death is still uncertain. Every government needs to finance its expenses and far the most find taxes the best way to do it. During the twentieth century modern welfare states were established all over the western world and with it the extent of taxation grew. In addition to the role as a financing source for government expenditures, taxation has taken on new objectives. Most countries use taxes to distribute income and wealth between its citizens because the income distribution given by markets is viewed as unfair. Taxes are also used as an instrument to correct other shortcomings and imperfections of markets; a typical example is externalities like environmental damage.

Another historical figure, Winston Churchill, purportedly declared that there is no such thing as a good tax. The proclamation reflects the philosophical view that every tax in some way is an aggravation of the individual's property rights and autonomy, but in a way much of the

academic literature on taxation share a similar position. Namely that taxation has its costs – both administrative costs and distortion costs – that must be minimized. Tax systems are therefore designed to fulfil its aims, but in a way that is simple, fair and distorts economic decisions the least. The demands on Norwegian tax designers will probably increase in the future as an ageing population pump up public expenditure on health care, sickness benefits and of course pensions. If this lead to a need for more taxes the challenge of designing the least distorting and costly system will be even more difficult, and equally important.

7.3.2 Optimal taxation

Already the earliest thinkers of economics were concerned with the question of how to tax. Adam Smith (1776) wrote in *Wealth of Nations* that an optimal tax system was characterised by proportionality and equality, non-arbitrariness, convenience and cost effectiveness. Like so many other of his ideas, some of these principles can be found to still be a part of the works of his successors, as when many scholars of taxation two hundred years later made significant contributions within a normative approach labelled ‘optimal taxation’. They acknowledged the potentially large efficiency cost of taxation and saw the scientist’s role as advising on how to reduce these. The models developed to assist this mission consisted of (Slemrod 1989):

- i. an explicit representation of individuals’ preferences, technology and market structure
- ii. the government’s optimization problem as how to raise a fixed amount of revenue with a limited set of tax instruments which can be costless administered
- iii. a criterion function ranking outcomes and choosing the best system among a limited set

This formulation of the government’s financing problem is named after Frank P. Ramsey and is a important pillar in taxation studies: “*Given a welfare criterion, which the government uses to evaluate different allocations [of goods, services and prices, that reflects the*

behavioural response of individuals and firms], the Ramsey problem for the government is to pick the fiscal policy that generates the competitive equilibrium allocation giving the highest value of the welfare criterion” (Erosa and Gervais 2001). In his seminal article Ramsey (1927) also formulates the general public finance principle that tax rates should be inversely proportional to demand elasticities in order to reduce the excess burden of taxation.

This result is derived from maximising a representative consumer’s social utility function

$$U = U (x_o, x_1, \dots, x_m)$$

which satisfies the usual concavity properties of consumer theory. Here x_i is the quantity of commodity i in an economy with $m+1$ commodities, the first being labour. The maximisation is done subject to the public sector’s fixed tax revenue constraint

$$\sum_{i=1}^m t_i x_i = T$$

where t_i is the tax on commodity i and T is the given amount in terms of units of labour that the public sector has to collect in taxes. Setting partial derivatives of the problem’s Lagrange function L with respect to the tax rates equal to zero gives us a result that lends itself nicely to interpretations of the Ramsey problem. We do not state this result here, but notes in passing that analysing it shows that deviations from the general result – taxing all commodities at equal percentage rates – is only optimal when elasticities of income are equal.

Optimal taxation: The practical implications

A common theme in all studies of taxation is the trade-off between efficiency and equity. The most efficient way of raising government revenues is taxes on activities creating negative externalities, to the extent that the taxes reflects social costs. If these taxes do not add up to the needed revenue, they should be supplemented by lump-sum income tax levied on all citizens, in that this does not distort the decisions of firms and individuals. But because

such a tax is seen as highly unfair, one needs to consider taxation of both commodities and income.

On efficiency grounds goods with more elastic demands and those that are complementary with leisure should be taxed more lightly, while concerns with equity points towards lower rates on goods consumed by those with lower income. From an efficiency angle labour supply responsiveness is crucial in determining how income should be taxed, such that marginal tax rates should be lower the more elastic labour supply is, the smaller the dispersion of skills and the less society is concerned with equality. In fact, raising the marginal tax at the top above zero distorts the labour supply decision of the highest earner but raises no revenue, according to the most stylized models. Equity considerations, on the other hand, lead to higher taxation of high-income individuals and consequently higher marginal tax rates. In his celebrated article from 1971, Mirrlees finds by calculating complete income tax schedules that the optimal income tax schedule is fairly close to a system with constant marginal rates. When it comes to the level of the rate, Stern (1976) shows that it is higher for lower values of the compensated elasticity of labour supply, higher concern for inequality, greater dispersion in pre-tax wages, and higher government revenue requirement.

Many of these results hinge on extremely strong conditions that are unrealistic in practice. One example is that the principle of production efficiency rules out any taxes on production when there are no constraints on commodity taxes and no privately received economic profits (due to constant returns to scale or 100 per cent profit taxation.) In practise not all types of commodities will be taxed and privately received economic profits will exist. Thus the optimal structure of commodity taxes and factor taxes are changed; for example can a tax on certain production serve as a substitute for a commodity tax on the good resulting from that production.

Optimal taxation: Two special cases

Two important frameworks have been used to state the Ramsey problem. One with infinitely-lived individuals rooted in the standard neoclassical growth model, and another that tries to

model the life-cycles of several overlapping generations. The two frameworks have much in common, but differ on some crucial points.

Infinitely-Lived Agent Models

The neoclassical growth models formulate the maximand of the Ramsey problem in the following way:

$$\max_{\{\pi\}} \sum_{t=0}^{\infty} \beta^t U(c_t(\pi), 1-l_t(\pi))$$

where π denotes a fiscal policy, β^t is the discount rate used by individuals to discount utility in future time periods t into current utility, and the utility function U is strictly increasing in both consumption (c_t) and leisure ($1-l_t$). Leisure is here the total endowment of productive time, one in each period, minus time committed to work (l_t). This maximization is done subject to feasibility (i) and the government budget constraint (ii):

$$(i) \quad c_t + k_{t+1} - (1-\delta)k_t + g_t \leq y_t$$

$$(ii) \quad (1+\hat{r}_t)b_t + g_t = b_{t+1} + (\hat{r}_t - r_t)a_t + (\hat{w}_t - w_t)l_t$$

where y_t , k_t and l_t denote the aggregate levels of output, capital and labour, g_t is government consumption at time t , b_t is government debt, a_t is private wealth, δ is the depreciation rate of capital, and \hat{r}_t and \hat{w}_t is the before-tax prices of capital and labour, respectively. The feasibility restriction (i) states that total consumption plus investment be less than or equal to aggregate output, while the government budget constraint (ii) implies that government expenditures has to be financed by issuing new debt, or by taxing interest or wage income.

These indefinitely-lived agent models make two central propositions. The first one being the seminal Chamle-Judd result that capital income should not be taxed *in the long run*. This is because a positive capital tax implies an indefinitely increasing tax rate of consumption over

future periods, while the elasticity of demand for consumption is equal over all periods. Capital taxation thus breaches the general public finance principle that tax rates should be inversely proportional to demand elasticities in order to reduce the excess burden of taxation. In the long run these models suggest that only labour income is taxed.

The second implication is surprisingly enough that it is efficient for the government to tax capital at very high rates *in the short run*. The reasoning behind this is that a capital income tax has two elements, it replicates a lump-sum tax because the initial capital stock is given and it distorts the savings decision. The first dominates at periods close to date zero and the second in later periods. It is the ‘surprise effect’ that makes the policy of taxing individual’s capital stock at time zero optimal. This of course gives rise to time inconsistency problems, but confiscating initial holdings of financial assets remain an integral part of the solution to the Ramsey problem. The amount of this initial capital levy, and the subsequent returns from it that is available to finance future government expenditures, decides how much labour income needs to be taxed in the long run.

Overlapping Generations Models

Modelling a framework with many overlapping generations, one can state the maximand of the Ramsey problem as follows:

$$\max_{\{\pi\}} \sum_{t=-J}^{\infty} \gamma^t U^t(\pi)$$

where γ^t is the intergenerational discount factor and U^t is the indirect utility function of generation t as a function of the government fiscal policy. This utility function is of the same type as in the infinitely-lived agent economy, in that it presents the consumer with a problem of choosing between consumption and leisure. The maximization is subject to the equivalent feasibility and budget constraints as in the case of an infinitely-lived agent (although with slightly different notation.) The difference is that utility is calculated over $(J+1)$ periods, the lifetime of each generation. U^t thus describes the maximum lifetime utility obtained by an individual from generation t under tax policy π .

The conclusion from infinitely-lived agent models that capital income should not be taxed in the long run holds because elasticity of consumption expenditures is assumed to be constant. Overlapping generations models are used, among other reasons, because one observes that the typical individual do not have flat consumption and leisure profiles and constant elasticity is therefore not a reasonable assumption. Following the general public finance principle outlined above this leads to the conclusion that capital and labour income taxes should vary over the lifetime of individuals. In infinitely-lived agent models the level of rates is determined by the size of the initial capital levy. In a life-cycle economy this amount is driven down by the positive weight attributed to the utility of early generations. The long-run need for tax revenue is instead determined by the discount factor γ^t . A relatively low factor, for example, indicates that the government puts low weights on future generations relative to current generations. This will lead the government to acquire debt and consequently raise taxes in the future.

7.3.3 Optimal tax systems

The optimal taxation approach has shed light on some broad normative guidelines in designing a tax system and the trade-offs inherent in such decisions. Nevertheless, it has come under criticism the last couple of decades. On one hand for its reliance on very strong assumptions and highly stylized versions of the environment it models. In addition, scholars such as Joel Slemrod (1989, p. 17) have maintained that its “*critical problem is the failure to consider the technology of collecting taxes*”. Tax systems have administrative costs that are far from negligible and the ease of administration can be an important factor when choosing which taxes to levy.

The common assumption that it is costless for individuals and firms to comply with the tax system, would be tolerable if these costs are insignificant. Quite the contrary, some studies indicate that compliance costs can be large, up to seven percent of revenue in income tax systems (Slemrod and Sorum 1984), and up to 24 percent for other selected taxes (Alm 1996, p. 121). Collecting taxes also come at a cost to the government, depending on uniformity of rates, economies of scale in collection and in general the simplicity of the system. A range of scientific evidence point towards governmental costs in excess of one percent of revenue,

although they can be substantially higher. Sandford et al. (1981) estimate that the cost of introducing a value added tax in Britain amounted to three percent of revenue – a cost that certainly would have been lower if that revenue had been raised through existing taxes. These administrative costs are an example of how the technology of collecting taxes can alter the results from the ‘costless’ optimal taxation approach: while the latter recommend differentiating commodity taxes according to demand elasticities, such non-uniformity clearly adds to the budget costs of tax collection.

In stylized optimal taxation-models everybody pay their taxes. In the real world individuals and firms try to reduce or altogether avoid their tax payments in a number of ways. This creates misallocation of resources, alters the distribution of income, and incurs non-compliance costs for economic agents and enforcement costs for the government. Much of the work on tax evasion builds on Allingham and Sandmo’s article from 1972, which models the agent’s decision on whether and how much to comply with the tax system as a choice under uncertainty. Crucial in determining the amount of tax avoidance and evasion is unsurprisingly the extent of audit and control systems, and the penalty if being caught. A number of articles have also addressed the enforcement structure of tax systems¹⁴. These derive the optimal enforcement costs by equating the marginal resource costs of raising the probability of being detected to the marginal social benefits of such detection. Because the additional revenues are just a transfer from the private to the public sector, benefits should as well as the extra revenues also acknowledge the impact of greater provoked truthfulness and the loss in individual expected utility.

Optimal Tax Systems: The practical implications

The wide range of studies aiming to address not just taxation, but also tax systems, have not yet come up with an general theory incorporating all aspects of the government’s decision on what and how to tax. When evaluating reform proposals and policy recommendations one must complement optimal taxation models with empiric and theoretical ‘micro studies’ on specific taxes and their compliance, evasion and enforcement costs instead. This will be our

¹⁴ See for example Sandmo (1981) and Alm, Cronshaw, and McKee (1993).

approach when analysing the long-run growth effects of possible Norwegian tax reforms. However, the American economist James Alm (1996, pp. 129-130) has tried to incorporate the literature on taxation and tax systems into broad guidelines for what he calls “*optimal taxation in the real world*”:

“Optimal Commodity Taxes

Commodity tax rates should be largely proportional. [...] Divergences from proportional commodity tax rates should be minimal and should largely take the form of marginally higher tax rates on goods that are unresponsive to price changes [...], on goods that generate significant negative spillovers [...], on goods consumed by higher income groups [...], and on goods for which taxes can be easily and cheaply collected [...].

Optimal Income Taxes

Income taxes should be imposed at constant marginal tax rates on broadly defined tax bases above some level of income determined by generously defined exemptions and (standard) deductions with minimal use of special tax incentives. [...]

Optimal Tax Mix

Both direct and indirect taxes should be levied. Use of both taxes allows each tax to be imposed at lower marginal tax rates, which reduces distortions and, most likely, non-compliance. Use of both taxes also gives the government more flexibility to achieve its equity and its revenue-yield goals, especially given the limitations that administrative considerations impose on the scope and even the use of some taxes.”

It should be clear from our discussion of the theory of both optimal taxation and optimal tax systems, that Alm has made important choices in compiling this list of recommendations. For example, while many contributions within optimal taxation theory recommend higher taxes on goods with high demand inelasticity, these are often necessity goods which

distributional concerns may preclude heavy taxation of. Understanding such judgements is essential to understanding why real world tax systems are constructed the way they are.

7.3.4 The Norwegian Tax System

Understanding a country's tax system requires you to lift your nose from text books and academic articles. Economic theories and empirical investigations do of course provide the foundation for the design and redesign of tax systems, but historical developments, national sentiments and political compromises are factors that among others have shaped a national tax system into what it is today. Therefore, the discussion of the Norwegian tax system starts with a brief sketch of the tax reforms of 1992 (TR92) and 2005 (TR05).

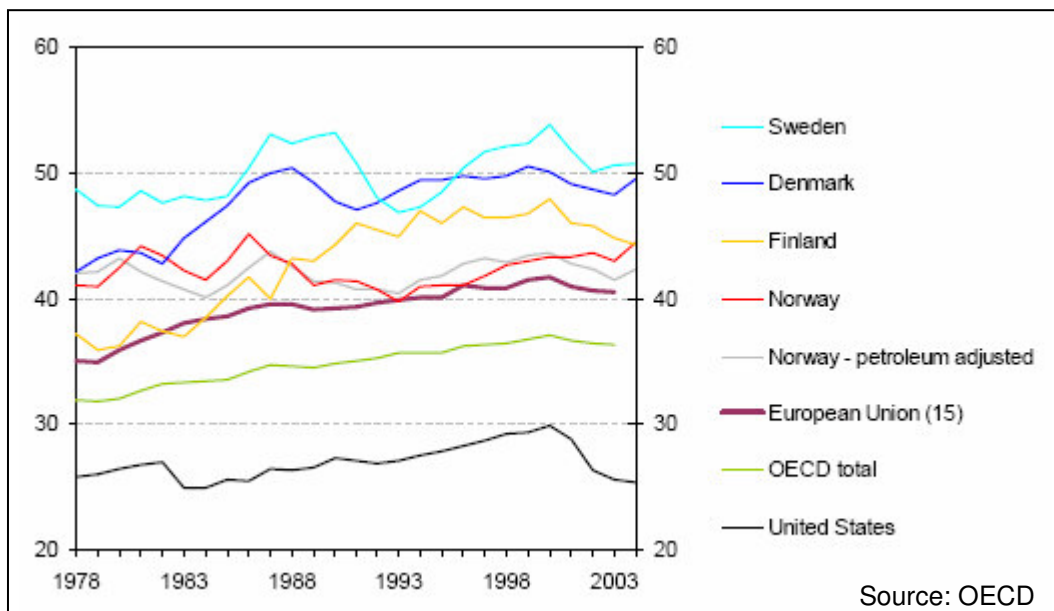


Figure 14: Total tax revenue in selected OECD countries 1978-2004, in per cent of GDP

The Tax Reform of 1992 – and its consequences¹⁵

¹⁵ This chapter and the next draw heavily on van den Noord (2000) and the report (No. 9, 2003) from the commission that prepared TR05.

The financial liberalisation of the 1980s and an increasing amount of tax planning during the same decade, contributed to an exposition of the shortcomings in the existing tax system. One of the world's highest marginal tax rates on labour income, many loopholes and quite a few exceptions from the tax base led to sub-optimal resource allocations. This also motivated economic agents to engage in tax planning and socially inefficient activities which incurred high expenditures both for taxpayers and the government. The many exemptions and possibilities for adjustment to the system were in addition counterproductive both with regard to horizontal and vertical equity.

The *Aarbakke Committee* proposed a tax reform built on important principles from modern taxation theory such as *neutrality* (the tax system should not treat different types of income, goods, industries and financing sources differently), *low rates* and a *broad tax base*. Their recommendations met little opposition in Parliament and were implemented in 1992. The reform introduced a dual income tax that levied a higher rate on labour than capital income. This can be justified on efficiency grounds and removed arbitrage gains from some types of tax planning. When it comes to company taxation, some of the most important changes were the introduction of neutrality between industries and abolition of the double taxation of dividends and capital gains.

The reform resulted in a strengthening of work incentives due to a decline in both average and marginal tax wedges, a more efficient use of the economy's resources and a simplification both for tax payers and authorities. Statistics Norway has concluded that the reform brought welfare gains for the society (Holmøy and Vennemo 1995) and the *Skauge committee* purports that it is not likely that the widening income distribution during the 1990s can be attributed to TR92. But the new tax system also brought some challenges, notably the so called split model and RISK method accompanying the dual income system, which are susceptible to tax planning and loopholes. TR92 did not manage to alter the unduly favourable tax treatment of property compared to other forms of wealth. This jeopardises both horizontal equity (discriminates individuals with different forms of net wealth) and vertical equity (44 per cent of the net wealth tax is paid by the upper income decile), and creates an efficiency loss. Holmøy and Vennemo (1995) suggest that welfare improvements from a more neutral tax treatment of property can be as large as those created by TR92.

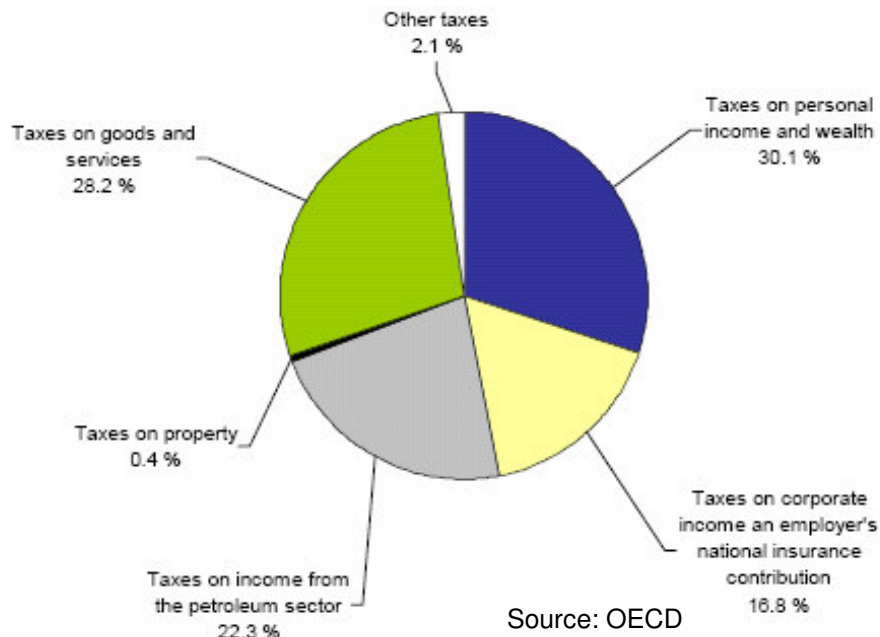


Figure 15: Taxes as percentage of total tax revenue for Norway in 2005

Taxation – Norwegian Style

Total accrued tax revenues in Norway accumulated to about NOK 830 billion in 2005. Of this, about 86 per cent were paid to the central government, while local government (municipalities and counties) received 14 per cent. The Norwegian tax system is characterised by a relatively high share of indirect taxes. The value-added tax (VAT) and excise duties represent about 28 per cent of the total tax revenue. The personal income tax and tax on net wealth levied on individuals represent about 30 per cent of the total tax revenue. The corporate tax, including employers' social security contributions, amounts to approximately 17 per cent. Taxes levied on the petroleum activity represent about 22 per cent of the total tax revenue.

Total taxes as a percentage of the gross domestic product (GDP) can give a rough impression of the general tax level. Total accrued taxes as a percentage of GDP is estimated to 44.9 for 2004. Adjusted for the petroleum activity, the tax level is estimated to 42.0 per cent.

Source: *The Norwegian Ministry of Finance*

(<http://www.odin.dep.no/fin/english/topics/p4500279/006041-990650/dok-bn.html>)

The Tax Reform of 2005

TR92 left some unfinished business and created new problems that became apparent during the next decade. In addition, amendments in the tax code after 1992 eroded the reform in some aspects. Special tax regimes for agriculture, forestry and – from 1996 – the shipping sector breaches with the neutrality principle, entice tax planning and lead to inefficient allocation of resources. The introduction of a new upper bracket in the national income surtax in 2000 weakened work incentives, and parts of the tax code was subject to constant revisions that created instability.

As a consequence of these shortcomings the *Skauge committee* was asked to come up with a plan for tax reform. Their proposals, submitted in 2003, built on many of the principles behind TR92. The optimal tax system, according to the group, is based on a hierarchy where taxes that correct the market are used first, primarily to promote a better use of the economy's resources. Then so called neutral taxes are levied, before one resort to distorting taxes to reach the required amount of government financing. Therefore the *Skauge committee's* report contained measures to broaden the tax base and remove exemptions, reduce marginal tax wedges and shift from a tax on wealth to a property tax. The jewel in the crown was the group's proposal to end the problems the dual income tax system had created. By both reducing the maximum marginal tax rate on wage income to 54.3 percent and introducing a 48.2 percent marginal tax rate on returns to individuals, it was possible to get rid of the split model. This simplification, and accompanying strengthening of work incentives, was the most important changes in TR05.

7.3.5 Policy Alternatives

“Tax laws have in vain been multiplied, new methods to enforce tax collection have been tried but the public expectations have been uniformly disappointed.”

- Alexander Hamilton

Flat Taxation

The practical recommendation by James Alm that “*income taxes should be imposed at constant marginal tax rates on broadly defined tax bases*” point to the introduction of a so called ‘flat tax’ as a possible reform. This is a natural conclusion from Mirrlees’ optimal income tax schedule and follows along the lines of TR05 in reducing the marginal tax on labour income and broadening the tax base. It would also make Norway the last of several countries (including Russia, Ukraine, Hong Kong and the Baltic countries) that have implemented flat tax reforms. It is important to remember that there is not a single flat tax reform, but really a wide range of different versions of it. A pure flat tax without some kind of deductions is deemed by most people to be highly inequitable. Hall and Rabushka’s famous proposal from 1995 is a flat consumption tax where all savings is deductible, while the late Nobel Laureate Milton Friedman and his wife (1962) suggested a negative income tax where very low incomes can claim a negative tax (payment) from the government.

A research group at Statistics Norway (Aaberge et. al. 2004) used the micro-macro CGE model MSG6 to estimate the economic effects of a pure flat tax reform. They used 1995 and the prevailing tax system as a starting point and compared how respectively this tax code and a flat tax reform affected economic growth towards 2050. Allowing for individual labour supply responses due to changes in taxation they find that such a reform will give an almost 10 percent higher GDP in 2050 than continuing with the 1995 system. The main channel through which a flat tax reform affects GDP is a large increase in employment under such a system. This raises the government’s revenue bases and hence it’s net revenues. The researchers behind these projections thus see a flattening of the tax system as one way of confronting the long-run fiscal challenges of the Norwegian welfare state.

	2050, 1995 tax system	2050, Flat tax system	1995, Pure effect of flat tax reform
Private consumption	4.2	14,3	12.4
Government consumption	-0.8	-2,9	-1.7
Gross fixed capital formation	3.6	10,7	6.3
Exports	3.8	14,3	8.7
Imports	2.3	8,5	9.4
GDP	4.0	13,7	7.8
Consumer real pre-tax wage rate	0.8	-10.3	-8.6
Consumer real after-tax wage rate	0.8	1.7	-1.1
Cash transfers per capita received by households, net of old-age pensions	1.3	-7.0	-5.6
Capital income per capita received by households	0.4	15.7	17.4
Employment, mill. man-hours	4.5	16.7	10.4
Payroll tax rate	-19.2	-	-
Flat tax rate	-	-28.4	-23.8

* Billions NOK in fixed 1995-prices, when nothing else is indicated.

Source: Aaberge et. al. (2004)

Figure 16: Macroeconomic changes caused by endogenous individual labour supply responses in 2050. Deviations in percent from base line

Although such calculations are fraught with problems of both value judgements and measurement, another study conducted at Statistics Norway (Bye et. al. 2004) has concluded that a flat tax reform will bring welfare improvements for Norwegian society. An Official Norwegian report prepared for the Norwegian government (No. 7 1999) took a more sceptical stance and pointed to the difficulties and large uncertainties in modelling labour supply responses to changes in taxation. They also purported that a flatter taxation will have negative consequences for the after-tax income distribution, since the largest tax cuts would apply to individuals with high wage income. Two members of the committee that prepared the paper disagreed with this conclusion and claimed that it was too much affected by a revenue neutrality restriction (any proposals from the group were supposed to not change tax revenues). The same members also claimed that the large difference between the taxation of respectively capital and labour incomes was a much bigger equality concern than a change to a flat tax.

On balance, both simulations on the Norwegian economy and international literature on taxation seem to point to a positive effect on labour supply from adjusting the Norwegian tax system towards constant marginal tax rates. Aaberge et. al (2004) show studies of labour supply elasticities that imply that the largest effects will appear if marginal tax rates for low

and medium incomes are reduced. We find such a conclusion plausible. Nevertheless, a development towards some kind of flat tax will boost long-run economic growth.

Property Taxation

Compared with most other countries, Norwegian taxation of property is exceptionally generous. Wealth invested in housing is for tax purposes on average valued at 25 percent of market price and the imputed rent income is computed at the very moderate rate of 2.5 percent. This obviously has both political and cultural reasons, but that doesn't free it from an economic scrutiny. In fact, most economists will agree that increasing property taxation will entice investors to invest more of their capital in productive objects. It is also consistent with prescriptions from the optimal taxation literature that taxation should not alter the allocation of resources unnecessary.

As noted earlier, Holmøy and Vennemo found that the welfare gains from more neutral capital taxation, especially housing, may be as large as those achieved by TRA92. In addition, authorities estimate the revenue loss from low taxation of housing to be in the order of 3 percent of GDP. From the perspective of optimal policy mix we see the possibility of using the revenue from increased taxation of housing in financing cuts in distortionary taxes. Such a reform would also have distributional effects compelling to several policy makers, since 44 percent of the net wealth tax is paid by individuals with the ten percent highest incomes.

Green Taxation¹⁶

In the world of perfect competition market forces work such that the economy reaches a state characterized by the so called Pareto optimality. This famous concept describes a situation where the marginal cost of production is the same for all producers, the marginal benefit is the same for all consumers, and marginal cost and marginal benefit is equal. One of the assumptions of Pareto optimality is the absence of externalities, which first Alfred Marshall and later Arthur C. Pigou showed is not a trivial omission. They purported that production and consumption externalities can distort the competitive mechanisms such that market

¹⁶ The discussion in this section owes much to an article by Sandmo (2003).

prices no longer equate marginal social costs and marginal social benefits. When we look at the mounting threat of environmental damages¹⁷ this is in fact the case. Pollution and other environmental damages creates cost which the market by itself in many cases is not capable to price.

The Holy Grail which many regulators and economists is thus searching for is a policy instrument that restores the mechanisms of the market, while maintaining both production and consumption efficiency. Most come to the conclusion that a tax on environmental damages or a system of transferable quotas¹⁸ is such an instrument. The most common way of setting the level of the tax or the quotas is to set a target for the amount of reduction in emissions.

A report prepared by economist Nicholas Stern to the British government in the autumn of 2006 show the importance of quite tough measures against climate change. Stern approximates in what he calls a modest estimate the costs of climate change to be around five percent of GDP. In the aftermath of the report there have been discussions about some of Stern's calculations, especially about his use of a very low discount rate, but most economists and climate scientists seem to agree on the main message of huge costs associated with climate change. His main proposal in tackling this challenge is an international market price on carbon, either through taxes, quotas or regulations. In addition he recommends increased funding for technology development, and regulations such as minimum standards for buildings and machines.

Most academics believe that taxes or quotas can be efficient measures in bringing about reductions in emissions, but Sandmo reviews in his article other possible gains from such 'green policies'. He presents what many scholars have labelled the 'double dividend', namely positive side effects of a tax on emissions:

¹⁷ It may be unscientific to hold the truth of man-made environmental problems as almost self-evident, but these authors are convinced by the overwhelming amount of evidence in support of such a claim. Doubters among our readers are referred to the United Nations Environment Network (web site) or the report from Sir Nicholas Stern (HM Treasury web site) for proof.

¹⁸ The main difference between the instruments is that a tax sets a price on the pollution, while the quota system regulates through the quantum. In practical terms, the tax may be fine-tuned to achieve the desired quanta, and vice versa. The choice between them depends more on the cost of administration and possibly political sentiments.

- a. Levying environmental taxes can help finance reductions in other, distortionary taxes.
- b. If a change to Pigouvian taxes reduces the efficiency costs of the tax system it may be optimal to increase taxation and thus public expenditures.
- c. If the change in taxation embodies a reduction in taxes on labour, this could increase the demand for labour and reduce unemployment.

Sandmo concludes that these effects are by no means certain, but that they are possible and specifically that they depend on the nature of the reform.

An important and widely debated question that we will touch upon briefly is whether reducing emissions and environmental damage is at all compatible with the prevalent doctrine of economic growth. Many economists have answered in the affirmative by referring to what they call the Environmental Kuznets Curve, that the pollution-GDP curve can in fact be bell-shaped. In the early stages of economic development the relationship between growth and environmental problems is positive due to a scale effect where increased economic activity leads to increased damages on environmental resources. Later two other effects will dominate the first; firstly, that the structure of the economy changes towards cleaner activities as the economy grows, and secondly, that technical progress associated with growth makes old and polluting technologies obsolete. Marzio Galeotti (2003) find that this decoupling of growth and environmental damage do not happen by itself, but rather that it has to be enticed by appropriate policies, such as regulations, quotas or taxes. This underlines the importance of policies that aim to reduce environmental damage from economic activity.

Sandmo also addresses the claim that green taxes have poor distributional effects because the tax system relies less on direct taxes and green consumption taxes weigh more heavily in low-income budgets. On the other hand, he points to the possibility of compensating this with changes in other taxes or through for example government transfers.

Green taxes are levied under the principle of targeting and their *raison d'être* is that they help internalising environmental to the market mechanism. It is clear that a greening of the tax system may have other positive side effects, prominently that it can help reduce distortionary

taxes and thus eliminate some of the deadweight losses incurred by taxation. To the extent that green taxes bring about a decoupling of economic growth and environmental damage it contributes towards removing one of the main obstacles for sufficient measures in tackling environmental problems: that voters fear green policies will threaten their material well-being.

7.4 Education policies

“[Education] is both the seed and the flower of economic development.”

– F. Harbison and C. Myers, quoted in Krueger and Lindahl (2000), p. 44

Education is just a part, although an important one, of the human capital accumulation. As mentioned in section 6.1.3, the health of the population is just as crucial to the ability to be economically productive. The education system is not the only form of knowledge enhancing; tacit knowledge and more formal courses all add to the human capital, implying a lifelong learning process for each individual. Still, a central part of the education system is to learn the ability to learn, so an effective school system enhances human capital indirectly too. In fact, improvements in the formal education system may have an impact on all the parts that add up to the human capital, including health maintenance.

The education policies have implications for other causes of economic growth as well. The social capital is positively correlated with the education level of the society. Although the national wealth of a nation to a large degree consists of human and social capital, these sizes are only measured as an intangible capital residual (The World Bank, 2006). The role of education in the economic growth literature may be interpreted in the same way; it is acknowledged that education is important, but to measure this significance is very tricky and may lead to different conclusions.

7.4.1 The efficiency of an education system

Education policies could boost economic growth in three broad ways:

- i. Higher intensity in the schooling system would, all other things being equal, reduce the required number of years the students need to learn a particular curriculum. In a world where productive resources are scarce, especially the higher educated kind of labour¹⁹, the years saved in schooling could be used in productive work instead.
- ii. Better quality of the education system would in turn increase the productivity of the labour force and thereby accelerate the economic growth.
- iii. In addition, achieving a more optimal mix of graduates would improve the utilization of the total resources, and probably also promote economic growth

The results of studies trying to measure the relationships between resource inputs in schools and student learning are inconclusive. Because of the complexity of the schooling process and factors outside the school determining the ability to learn, it is hard to find statistically significant results. Socioeconomic background of the students may influence the performance more than various school and teacher characteristics. Henry Levin (1997) identifies five dimensions that productive schools have in common: a clear, objective function with measurable outcomes; adaptability; efficient access to information; incentives linked to success; and use of the most productive, cost-effective technologies.

An optimal mix of graduates would in theory lead to no structural unemployment. In a real world where the flow of human capital between countries is to some degree restricted, the structural unemployment may persist and hamper economic growth. Determining why students choose their line of studies would in an economic model focus on the mix of economic incentives and other considerations like interests, traditions and status (non-economic incentives) with a shadow price attached to them. Policies would have an influence on the choices made by the students through the tax system, wage policies and financing system of studies.

¹⁹ In all developed countries but Greece the higher educated individuals have less years of unemployment than the average.

7.4.2 The private and social return of education

The average private profitability of investment in education is positive for all countries studied (Psacharopoulos 1993). But this positive premium may not be the case for the society as whole, as private returns are considerably higher than social returns (Wolf 2004). People may invest in more education for mere positioning, but an overall growth in education level does not necessarily alter the social distribution within the country. Investing in education comes at a cost for the society, even regarding the positive externalities; the state usually subsidizes the education system because of these externalities, as well as it obtains opportunity costs like lost tax income. In a race to educate and increase the productivity, surely the general public gained? Not necessarily, since the society must share in on the cost to equip the contestants, the economic growth may trail behind the field. And in pursuing the quantity of education, the quality may be lost in hindsight.

When comparing countries, a positive relationship between both the change and initial level of education and GDP growth has been established (Krueger and Lindahl 2000). Hanushek and Kimko (2000) find strong relationship between economic growth and labour-force quality, and that these qualities are related to schooling. The concern of a negative social return of education is not that high on primary and secondary levels, as people with low levels of literacy and mathematical skills easily becomes a burden on society (as well as themselves). The social return is also considerably higher where the level of education starts off at a low level. Therefore, it is not surprising that investing in primary education in developing countries give the highest boost to economic growth (Psacharopoulos and Patrinos 2002). But the usefulness of the rate of return on education in such studies is widely challenged, as it is sensitive to assumptions made about the length of working life or the retirement decision (Björklund and Kjellström 2002).

7.4.3 The education system in Norway

“Compulsory schooling in Norway is ten years and children start school at the age of six. Primary and lower secondary education in Norway is founded on the principle of a unified school system that provides equal and adapted education for all on the basis of a single

national curriculum. [...] Since autumn 1994, everyone between the ages of 16 and 19 has had a statutory right to three years' upper secondary education leading either to higher education or to vocational qualifications or partial qualifications", as stated on the web site of the Ministry of Education and Research.

The latest reform by the Ministry of Education and Research is the Knowledge Promotion, at primary and secondary level, whose purpose is *"to help all pupils to develop fundamental skills that will enable them to actively participate in our society of knowledge"*. The latest systematic reform of tertiary education, the Quality Reform, has introduced a performance based financing system. The students have a portion of their government scholar grant depending on their accomplishments, and they are not receiving more grant or loan if they are delayed more than one year in their studies. The students' academic performance will be assessed both by final examinations as well as various term assignments throughout the semester. The new degree structure follows the international model of Bachelor (3 years), Master (2 years) and Ph.D. (3 years). The Quality Reform also gives the individual colleges/universities the freedom to decide their organisational structure, as well as greater autonomy in managing and organising their activities.

The PISA studies (OECD PISA web site) shows that the performance of Norwegian students in primary and secondary education has been disappointing; especially compared with the high amount of spending per student. The lack of results is hard to explain; using the five dimensions of Levin's productive schools, Norway's schools seem overall to score high on all these, maybe except on 'incentives linked to success'. Without speculating too much, maybe the lack of performance in the school system may be an early sign of the resource curse (which will be covered in more detail in the next chapter). Unnecessary to say, as the quality of the education is hard to measure, international studies like PISA faces a lot of criticism for their choice of methods.

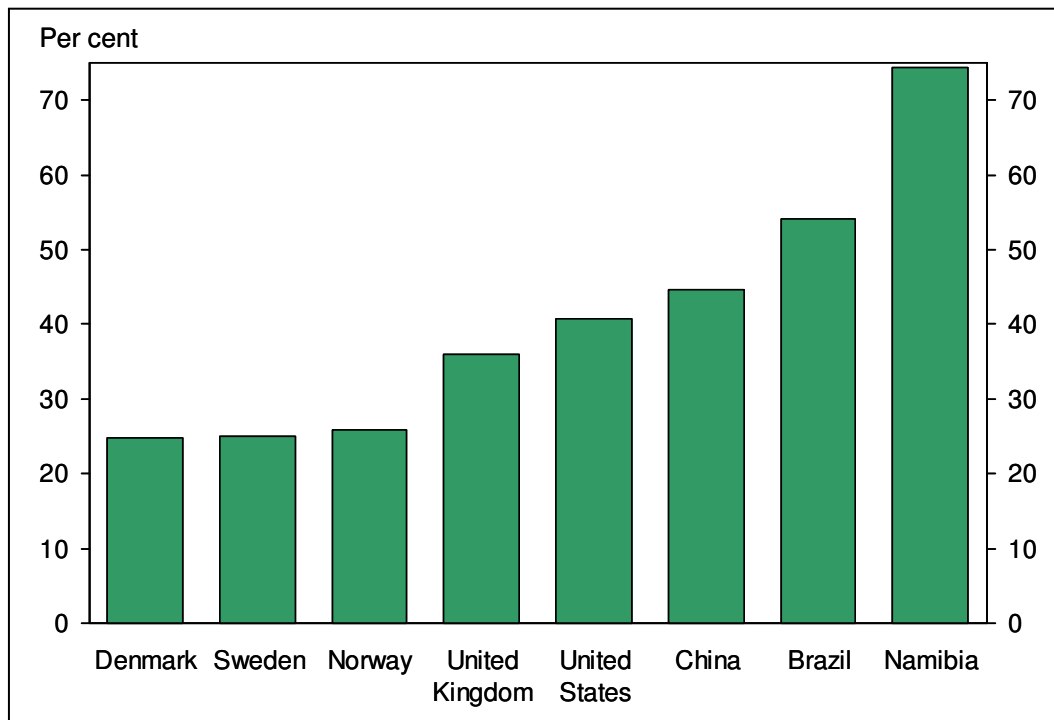


Figure 17: Gini index²⁰ of a selected group of countries, 2000-2003

A more certain lack of incentive than a general theory about a resource curse, is the fact that Norway is one of the countries with the lowest education premiums, even though it is still positive (Barth and Røed 1999). Aaberge et. al (2000) show that Norway and the other Nordic countries have a moderate and stable earning dispersion, as measured through the Gini index in Figure 17. This compression of earnings may be explained by a range of socio-political factors and decisions over a long period, where centralized wage bargaining is emphasized by Moene and Wallerstein (1997). But while the earning dispersion has increased in, among others, Anglo-Saxon countries over the last decades, Hægeland et. al. (1999) argues that the education system explains why the earning dispersion remains relatively constant in Norway. The supply of higher educated workers has in a large degree followed the increased demand, resulting in less need for a price signal to attain higher student enrolment. Controlling for self-selection, the development in the earning dispersion

²⁰ The Gini coefficient is a measure of inequality of a distribution of income. It is defined as a ratio with values between 0 and 1, where the numerator is the area between the Lorenz curve of the distribution and the uniform (perfect) distribution line while the denominator is the area under the uniform distribution line. A high number (close to 1) implies large income inequality. The Gini index is the Gini coefficient expressed as a percentage.

does not indicate any evidence for a declining educational quality, contrary to popular beliefs.

The low income dispersion would be better suited to explain a lack of incentive to take (higher) education in the first place, not necessarily why the quality of the education trails below a desired level. The resource curse theory could explain lack of incentives to work or study in general, even though education level in itself (personally and in the society as a whole) may influence the degree of the curse. Krokstad et. al. (2002) finds the risk of disability pension being influenced by low educational level, in addition to low perceived health, occupational related factors, and any long-standing health problems.

The best explanation for the high supply of applicants to college/grad school may be sociological, which surely has an economic translation as well: the value of working with something you value, or the value of a social position that you achieve. These considerations, combined with government grants making it easy to continue studying, make the case of over-investing in education possible.

7.4.4 A comparison of quality and efficiency in the education system

A back of the envelope calculation may illustrate the relative importance on economic growth between the quality and the efficiency of the education system. The comparison can be made between a one per cent increase in productivity of a random worker because of a better education system (as all workers in Norway have some kind of education) contrary to an education system where this person is finished one year earlier. If the worker increases his working years from 43 to 44 years, the more efficient schooling system raises the life-long production by more than two times compared to the increase in quality. If each worker is paid according to their productivity, a fully rational student (excluding all factors beyond monetary gains) will study one more year if:

$$\text{avg. (productivity gains per year)} > (\text{production loss} - \text{government grants}) / \text{no. of working years}$$

where production loss is 100 per cent related to an average productivity/wage before the additional studies²¹, and government grants are in per cent of this average wage. If government grants are 20 per cent and the number of working years is 40, a productivity gain above two per cent is needed to study more. If the retirement age is unaffected by the decision to study more, each additional year of study will implicate a need for higher productivity gains as the number of remaining years in the work force will fall.

What can these results tell us? Firstly, if the education system is crucial in teaching people to do their work, the government should be careful to force students through their studies as this may affect their productivity, if not their ability to do their work at all. But if education system mainly has the function of a classification mechanism, the focus should be on sorting the students according to their capability to absorb the knowledge, and to do this at the earliest stage possible.

Secondly, the equation may tell us a thing or two about the difference between private and social return of education as well. A year more of education is only positive to economic growth for the society as whole if the productivity increase follows the related equation (which excludes positive externalities from education beyond the productivity gain):

$$t \times [\text{avg. (productivity gains per year)}] > t \times [(\text{production loss} + \text{government grants}) / \text{no. of working years}]$$

Using the same numbers as above, and assuming the same marginal tax on all income, the increase in productivity must be three per cent if the extra year of studying fulfils a requirement of positive social return. The size of the government grants must correlate to the positive externalities that education inflicts on society.

The empirics show that the return to investments in education is negatively correlated with the level of education and the prosperity of the country. At some point, believing that

²¹ The production loss of one more year of education is in reality the final year of working, when holding the retirement age constant. The production in this year may be less or more compared to an average throughout the career, depending on how much the productivity falls at older age. The assumption of the wage relating directly to productivity further complicates these calculations. To keep it simple, the production loss of one more year of education is set equal to the pre-education average throughout the life span.

Norway has not reached it already, the social return of education will turn negative as both education level and prosperity continues to increase.

7.4.5 Policy Alternatives

“Perhaps the most valuable result of all education is the ability to make yourself do the thing you have to do, when it ought to be done, whether you like it or not.”

– Walter Bagehot, *Physics and Politics* (1872), p. 44

Develop the international model of the Quality Reform

As a principle for an optimal education policy, the funds should be invested in parts of the education system that generates the highest social returns, and to a level where the investments, at the margin, give a social return of a preferred size. The discussion in chapter 7.4.2 highlights that the return of investing in different educational levels diverge across countries. Universal answers on how to prioritize are not likely to find, so the policies must take the national setting into consideration.

A practical question relevant for the policy makers would be: is it possible to prioritize within the education system? For example, should the politicians pick which level of education it should focus on? Maybe, if the results on this level are especially meagre compared to other countries, and considering that the lack of achievements probably would spread to higher levels of education. But should the same politicians prioritize between different lines of studies, to get the optimal mix of graduates? The discussion follows the line of picking national winners; does the state have information advantages leading to a better result compared to the combined decision of the students in the education market? Believing this is not necessarily the case; the government must first and foremost lay framework conditions of the education system and not make meticulous priorities within the system.

However, there is a time lag between:

- i) the decision of which education to undertake, which at least partly is based on the information available about the job market, and

- ii) the start of the work career and the situation in the job market at this point of time.

This time lag will of course be the length of the studies, and may have huge impacts within professions where the job possibilities vary a lot over the business cycles. If the government really has better information about the variations in demand for certain professions, then strict regulations for admissions to these studies should be implemented. But another possibility is to take advantage of the new system of Bachelor degrees, and decrease the time lag of information for some professions.

The Anglo-Saxon model of working some years before taking the Master degree could be more exploited within Norway's system, since it has some advantages. First, as the time lag of information decreases, more students make the decision of which education to follow on better information, presuming that the changes in the job market are smaller in three than in five years. And students separating their Bachelor and Master degrees may alter their career plans by studying other subjects in their Master, giving a greater flexibility to adapt to a changing job market. Best of all, some students are moving faster into the job market, and those pleased with their career after the Bachelor degree save two years of studying.

But if there are several upsides of splitting the higher education, why are not more Norwegian students doing that compared to USA and Great Britain. The answer could be explained by cultural differences, but the truly underlying reason is the difference in incentives. While Anglo-Saxon students must pay for their studies on their own, except for granted scholarships, Norwegian students receive one of the most generous student loan and scholarship regime in the world. The incentive of participating in the position game, as earlier explained, may be too strong. The hiring procedures of the companies reflect this, as the supply of highly educated workers is bustling.

If the flexibility of the Bachelor/Master system should be more utilised, incentives working in the other direction of the generous government program of student loans should be elaborated upon. A possibility is to make the student loans at the Master more generous when taking the degree after some years working. This makes sense at another level too, since the standard of living achieved after some years of work is higher, and the income drop would not be so big. Incentives directed to the companies for investing in their employees' education could also be implemented, e.g. as a tax break for the grants given.

7.5 The resource curse

7.5.1 Norway's oil-wealth – doomed rich?

What do sudden riches do with us? How does a country tackle to 'win in the lottery' and receive generous amounts of windfall wealth? In what ways does it affect a tiny country to be in possession of a petroleum fund larger than its GDP? These are questions policy pundits, economic scholars and in fact most people worried about Norway's long-term growth prospects should ask themselves. These are also questions that go beyond what economic theory can answer. That is not to say that economists haven't tried. An abundance of articles have been written about the paradox of plenty, that states rich on natural resources perform economically less well than their resource-poor counterparts. In the next section we present the main findings of this literature.

7.5.2 Anatomy of the resource curse

It is important to make clear that generous amounts of natural resources have not always led nations into dismal growth rates. Resource booms in Latin America during the nineteenth century enhanced economic prosperity and the industrial revolution can in many countries at least partly be explained by the existence of vast endowments from nature. Diamond rich Botswana has boasted the world's largest growth rates since 1960. Norway is indeed – as we explained in chapter 5.2.9 – another nation rich on natural resources that in fact have prospered from its windfall gains.

So why not declare our patient healthy and in good shape, and stop this enquiry into petroleum's impact on Norway here? From the perspective of analysing future growth-enhancing policies this would be both arrogant and naïve. Probably, the full effects of Norway's oil richness have not yet appeared. Changes in industry structure, political culture and institutions, and such intangibles as attitudes and work mentality, take a long time to materialise. And it is not until recently that the large monetary wealth has become visible through the Pension fund. We assert that a responsible policy for long-term economic growth must acknowledge that Norway also may find itself in a position where its resource richness

has been detrimental to growth. It is in such an analysis of the possible pitfalls Norway can encounter that economists, development experts and political scientists can help us.

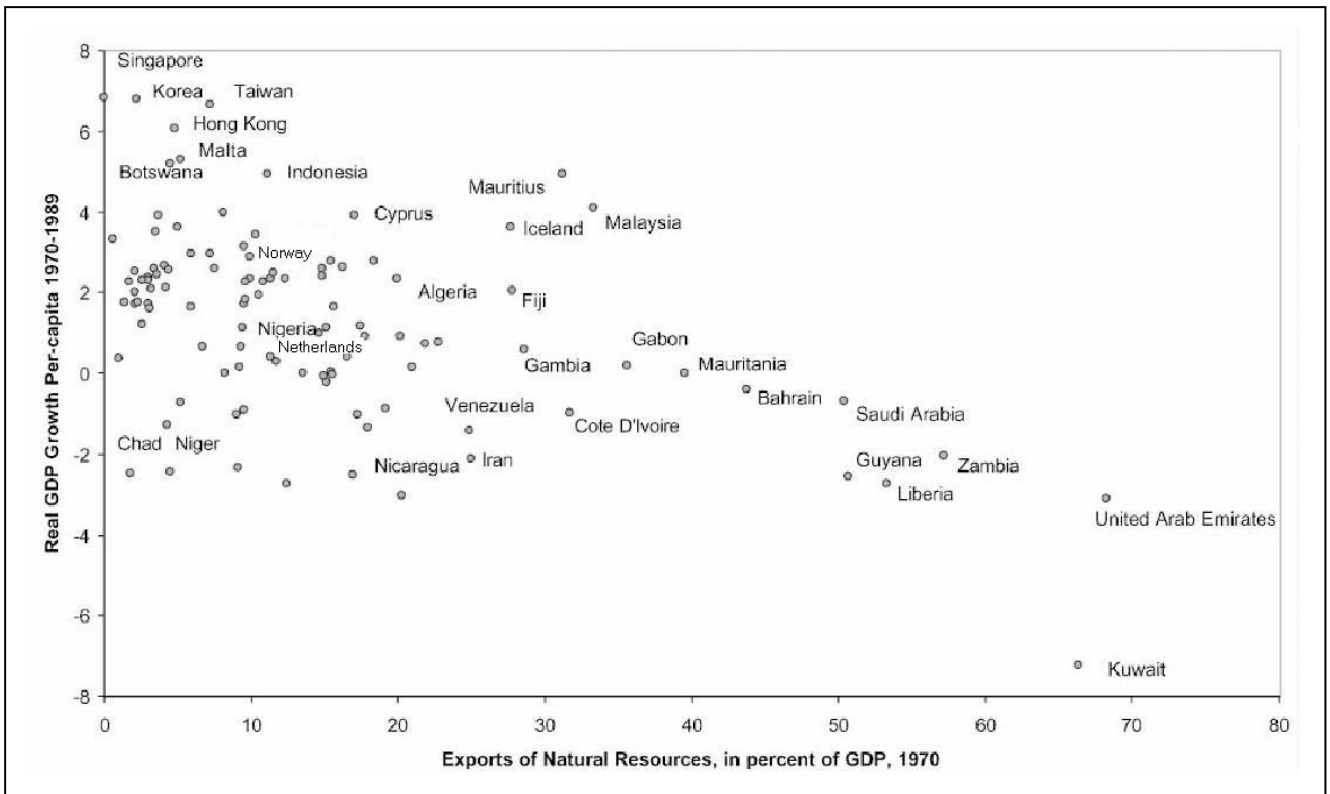


Figure 18: Exports of natural resources seen in comparison to GDP growth

Economists often talk about the resource curse and something called the Dutch disease, although it can be hard to figure out the distinction between the two. Erling Røed Larsen (2004) argues that “*rent seeking is the pathogen of the curse*” and that “*labor displacement, spending, and spillover-loss effects lead to the disease*”. Sachs and Warner (1999) purport that natural resource abundance can instil in a nation a false sense of security which lead to bad economic policies. Drawing on insights from political science and development studies, three Norwegian economists (Mehlum et. al. 2005) also point to the role of institutions in explaining the paradox of plenty.

Dutch disease

In policy debates the infamous Dutch disease²² is often used as a generic term describing all the possible problems resource rich countries can stumble upon. A more precise use of the

²² Corden (1984) claims that the term was coined by *The Economist* in an article 26 November 1977.

word is offered by among others Michael L. Ross (1999): he explains Dutch disease as firstly “*the appreciation of a state’s real exchange rate caused by the sharp rise in exports*” and secondly “*the tendency of a booming resource sector to draw capital and labor away from a country’s manufacturing and agricultural sectors, raising their production costs*”. This can lead to “*a decline in the export of agricultural and manufactured goods and can inflate the cost of goods and services that cannot be imported*”.

Although this ailment is often used as an explanation of lagging growth in developing countries, it may be more appropriately applied to highly developed countries where capital and labour supplies are fully employed. It is important to stress that, in the words of Røed Larsen (2004), “*the disease may not be a disease at all, but part of a natural development path and actually an expected economic adjustment to new economic circumstances*”. It is only if the transition accompanying a resource discovery leads to unfortunate economic effects we really can speak about a disease. Corden and Neary (1982) name these economic consequences the factor movement effect and the spending effect. The first being an irreversible loss of know-how, technology, physical investments and positive externalities associated with the industries being replaced by the new natural resource based industries; the second is the loss of competitiveness caused by a real appreciation of the domestic currency.

Rent-seeking

Rent-seeking appears both in a private version, e.g. theft and other forms of transfers between private parties, and a public one taking the form of lobbying, corruption and so on. When members of a society engage in such activities it drives resources away from more productive uses and it can result in a wealth transfer that is detrimental to growth. Røed Larsen categorises rent-seeking into four sub-groups: firstly, large-scale conflicts between coalitions of powerful groups seeking to affect in a non-transparent way the distribution of resources to their own benefit. The second being small-scale illegal rent-seeking, such as individual activity to enrich oneself in an unlawful way. The third version is the legal small-scale rent-seeking which has to be conducted through negotiations with and lobbying aimed at the government. Lastly, Røed Larsen point to political purchase of electoral success through election promises paid by resource riches.

Overconfidence, feeling of security and bad economic policies

The argument made by scholars who claim to find causality between resource abundance and suboptimal economic policies is as follows: Wealth provides economic security that can give rise to a complacency which consequently makes policy makers lose sight of the need for prudent economic management. An anecdotal – but elegantly formulated! – argument for this view is made by sixteenth century philosopher Jean Bodin, quoted in Ross (1999): “*men of a fat and fertile soil, are most commonly effeminate and cowards; whereas contrariwise a barren country makes men temperate by necessity, and by consequence careful, vigilant, and industrious*”.

This line of reasoning appeals to common sense and most will agree that it makes sense on an individual level, but attempts on developing a testable theory linking natural resources, the cognitive skills of government officials and the quality of economic policy have not been successful. Case studies point to national and international institutions and political pressures as constraints on the myopic disorders of policy makers, so the problem may not be fully understood without taking such factors into consideration. Still, the complacency argument has some merit. Even though government officials and politicians is led towards (the not unbiased and wholly objective term) ‘sound economic policies’ by education, professional and academic networks, and economic research, a political pressure from voters and powerful groups can make them diverge from what they originally view as an optimal policy. That one would expect these political forces to be stronger in a resource-rich economy also corresponds to Røed Larsen’s fourth form of rent-seeking.

Loss of work ethic and erosion of human capital

Several academics have found that in many resource rich countries the sudden inflow of natural capital seem to crowd out human capital. Gylfason (2000) find that of the total detrimental effect of natural capital on growth, half of it is transmitted through natural capital’s negative effect on education. This seem to be due to less skilled workers, lower innovation and fewer external benefits in resource-extracting industries, but for reasons we shall return to this makes this explanation less relevant for Norway. Another problem is that most studies measure input to human capital (enrolment rates, years of schooling etc.) and not the quality of human capital itself. This is of course because of the inherent difficulties in measuring the return on human capital investments. The possible threat for Norway is if the oil wealth creates an atmosphere of complacency detrimental to hard work and educational

quality. There is little serious research into these problems, but we will later in this chapter consider some indicators of such trends.

The effect on – and of – political institutions

It should be clear by now that the role of government and political institutions is essential in determining what effects sudden windfall gains might have. Mehlum et al. (2005) find that whether large windfall gains increase or decrease economic growth to a large extent can be explained by a nation's institutions, such as political system, rules, laws, norms etc. They find that "*when institutions are bad, resource abundance is a growth curse; when institutions are good resource abundance is a blessing*". This may be an important explanation of why Norway seems to have escaped the resource curse.

7.5.3 The criteria of success: Norway's case

Economists have been more preoccupied with the curse of natural resources, rather than the blessings. Since Norway seems to have experienced more of the latter, some scholars have tried to come up with plausible explanations for it. Røed Larsen asserts that Norway has managed to address Cordon and Neary's two elements of the Dutch disease with appropriate policies. Centralization of wage formation has contained the factor movement effect by letting productivity increases in the manufacturing sector set the level of general wage increases. And much of the resource rent is collected and then invested into foreign securities to shelter the domestic economy, thus limiting the impact of the spending effect. Investment in research and development in oil extraction industries, and a policy to stimulate the creation of a Norwegian supply industry, has limited the loss due to spill-over effects.

Røed Larsen claim that none of the four forms of rent-seeking have been widespread in Norway because of respectively a social contract, legal system and norms, political and economic institutions, and restraint among politicians and government officials. Mehlum et al., as mentioned above, sum these explanations up in the good quality of Norway's producer-friendly institutions.

One of Mehlum's co-authors, Ragnar Torvik, expands the range of explanations in a paper prepared for the so called Kydland group. Torvik (2007) acknowledge the importance of saving the major part of resource rents and the quality of institutions, but adds type of natural

resource, form of government and stage of industrialisation as explaining factors. Minerals and oil seem to have a very high variance among countries when it comes to the effects windfall gains have on economic growth; while Torvik in his analysis find that such resources is very detrimental to growth in countries with institutions of low quality, countries with good institutions on the other hand get a very strong growth impulse from oil and minerals. Torvik also cites work by Andersen and Aslaksen (2006) that show that the resource curse only holds for democracies with a presidential system, not for parliamentary ones. Whether the correlation is spurious or not, and why it possible is the case, is up to future research to determine. A last explanation provided by Torvik is that countries that already had industrialised when they discovered their natural resource, like Norway, is more likely to benefit from it.

7.5.4 Is all really that well?

Norway's forty years of resource richness has been a blessing. But disciples of the dismal science of economics may still claim that gloomier times could lie ahead. Why might the curse set in now, when it has not been present earlier? One of the reasons is that it is only in the last years that Norway's wealth has become visible in the form of a gigantic fund, and the impact of this unprecedented build-up of a large public fortune will have effects on Norwegian industry structure and incentives to entrepreneurs, politicians and voters. Accompanying this is the fact that some effects of wealth upon institutions, politics and culture may take a long time to materialise. Unfortunately, worrying signs may already have started to show up both in the realms of politics and, in the wealth creator above all, the willingness to work.

Political pitfalls

Politics is important. Especially so, it seems, for countries endowed with large amounts of natural resources. Whether windfall gains turn into a blessing or a curse depend to a large extent upon policy, quality of institutions and history. What effects may Norway's wealth have on these factors? Røed Larsen investigates the more sluggish growth in Norway relative to Sweden and Denmark in the late nineties and proposes that his fourth form of rent-seeking, purchase of political power, may have led to real appreciation and loss of competitiveness. The extent to which Røed Larsen uses this as an explanation of economic

growth over a fairly short time period is disputable²³, but not his view that large financial wealth create political pressures that we are only beginning to see the consequences of. For example, since Norway started to inject money into the Petroleum fund (officially labelled 'the Government Pension Fund - Global' since 2006) no Norwegian government has been re-elected. There are several reasons for this of course, but increasing popular pressure to use more of the oil wealth domestically obviously is a big challenge for governments (of both the centre-left and the centre-right) that so far have defended the policy of shielding Norway's mainland economy from some of the oil revenues.

As a result of a political compromise in 2001 a large majority of Norway's political parties agreed to limit use of money from the oil fund with a decision rule²⁴. So far, no government have adhered to the rule, mainly because of an economic downturn just after the rule was implemented, but preliminary accounts point to 2006 being the first year the rule will be adhered to (not taking the adjustment for business cycles into consideration). The closing-in on the gap is of course because of buoyant economic growth in Norway, high oil prices and a strong return on the Pension fund. Many observers criticises the Government for not limiting spending to the decision rule far earlier and that the use of 'oil money' should have been far less in a good year as 2007. Already, one of twelve Norwegian kroner channelled trough the state budget is taken from the Pension fund, but this does not seem to stop the calls for using more of the oil wealth now. How long will Norwegian governments withstand the pressure?

Spending of the global part of the Pension fund is restricted in yet another way, namely that investments should be done outside of Norway to shelter the domestic economy. This second decision rule is increasingly attacked by politicians that want to use more of the funds on various political ends. This can increase the problems associated with politically motivated investments and so called white elephants. Norway has a large public ownership of businesses compared to many other western countries and about half of the nation's money runs through the state budget. Norway's oil wealth may reduce the pressure from budget constraints and make politicians prone to undertake investments motivated not by economic

²³ Norway has after some economic hardships following the international downturn in the early 2000s boasted strong economic growth, both relatively and absolutely.

²⁴ The Norwegian government can only use an amount equal to the expected real return on the money invested in the Pension fund, estimated at 4 per cent, adjusted for business cycles.

arguments, but political. There are some examples of such investments the last ten years²⁵, although it is not very widespread.

Røed-Larsen's third form of rent-seeking, legal small-scale rent-seeking which has to be conducted through negotiations with and lobbying aimed at the government, has a long tradition in Norway. In fact, it is institutionalised through routinely negotiations between the government and powerful lobby groups especially within trade and industry. Political scientist has long since described the outcome of this phenomenon to be the 'segmented state' (Egeberg et. al. 1978). They describe how elites with common educational and industry background, and to a large extent common interests, occupy positions in the bureaucracy, political committees, educational institutions, trade organisations and other positions that form the policy agenda within a sector or field. Although this way of governing was at its peak during the years of majority rule by the Labour government after the last war²⁶, remnants of the system are still in place. The most obvious example is how important decisions governing Norway's agricultural policy is formed by the Ministry of Agriculture, the farmer's organisations and powerful actors such as the country's food-processing monopolies.

During the nineties many of the old privileges given to some industries was dismantled, for example in the fisheries, even though some still remain (subsidised energy prices for heavy industries and high agricultural subsidies being prominent examples). This development finds support in classical economic theory that questions the government's ability to 'pick the winners' and warns against efficiency losses from policies that distort the decisions of economic players. The last years there have been signs that this view is losing support in the public debate. The so called 'industry neutrality' have come under attack for being passive and calls for subsidies, special tax treatments and industry-specific regulations have again appeared on the political scene.

²⁵ Witness for example the grandiose, but unsuccessful project IT Fornebu, the sale of formerly state-owned BaneTele and the politically prestigious project for carbon capture and storage (CCS).

²⁶ This came as a response to the parliamentary channel of influencing the government losing attractiveness, since the Parliament was more of a processing organ for what the majority government already had decided. On the positive side this strengthened public and organisational participation in the government's decision making, on the negative side it could lead to important decisions being made in a non-transparent way through the government's dealing with powerful actors.

An atmosphere of complacency²⁷

We remember from chapter 5 that a Moroccan ambassador in the seventeenth century described how “*the love of luxury and the comforts of civilization have overcome [the Spanish nation]*”. That wealth can create complacency appeals to common sense, but it has been more difficult to develop a testable theory about the possible causality. We will not attempt to develop such a theory, but rather point to some empirical evidence that there are changes underway in Norwegian society that can support this view.

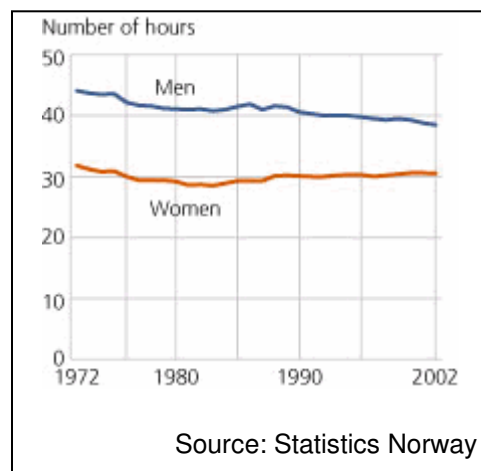


Figure 19: Working hours per week, 1972-2002

Norwegians work less than they did before. Figure 15 show that Norwegian men have reduced number of working hours per week by more than 10 percent. There is nothing unnatural in this, insofar as this is a trend found in most other developed countries. It can also be explained by economic theory as a way of splitting increases in wealth between increased consumption and increased leisure.

Not only do workers put in fewer hours than they did in the past, a larger share of Norwegians does not go to work at all. Figure 16 show that with the exception of Poland no OECD country had in 1999 a higher share of its working population that was non-employed or receiving disability benefits. The diagram also shows that this share had increased during the nineties and this is a development that continued into the first years of the 21st century (as figure 17 documents when it comes to disability benefits). The growth in people not

²⁷ This section draws heavily upon two OECD reports: *OECD Economic Surveys: Norway, Volume 2005/17, October 2005* and *Sickness, Disability and Work: Breaking the Barriers – Norway, Poland and Switzerland, Vol. 1, 2006*

working translates into more resources being spent on disability benefits than in almost all other countries and hence reduces the amount that (within the same budget constraints) can be spent on other welfare goods. It also means that fewer people take part in the economy's wealth and welfare creation. The same trend towards less work is also found in the reduction in the effective retirement age and in the increased average age for leaving formal education. Fortunately, these trends are balanced by Norway's very high share of women in the job market, so in total Norway still enjoys a relatively high work participation rate.

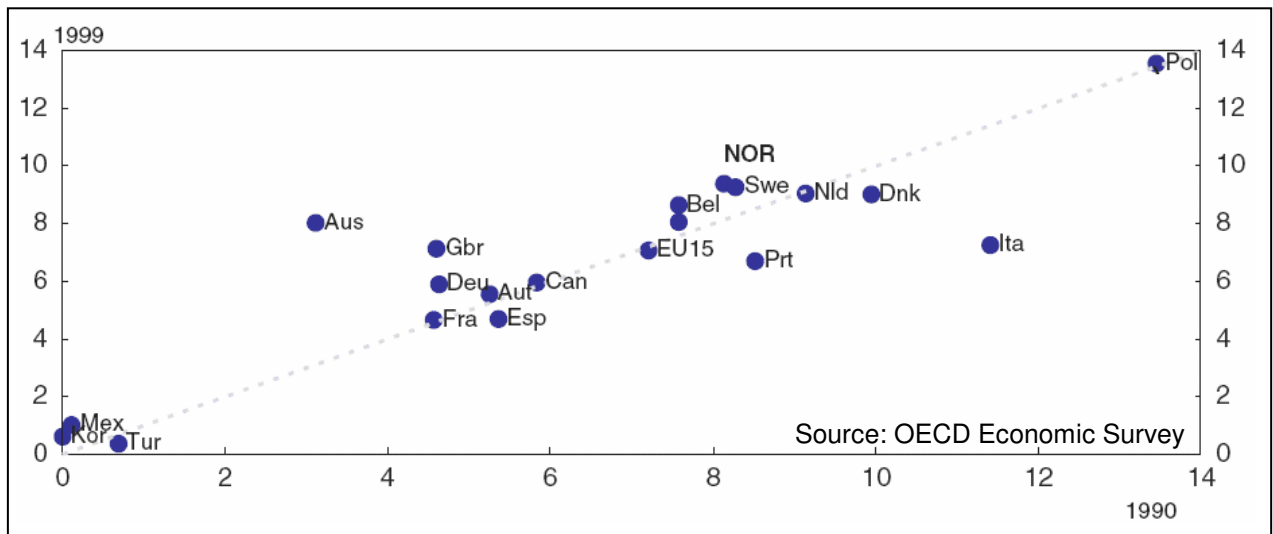
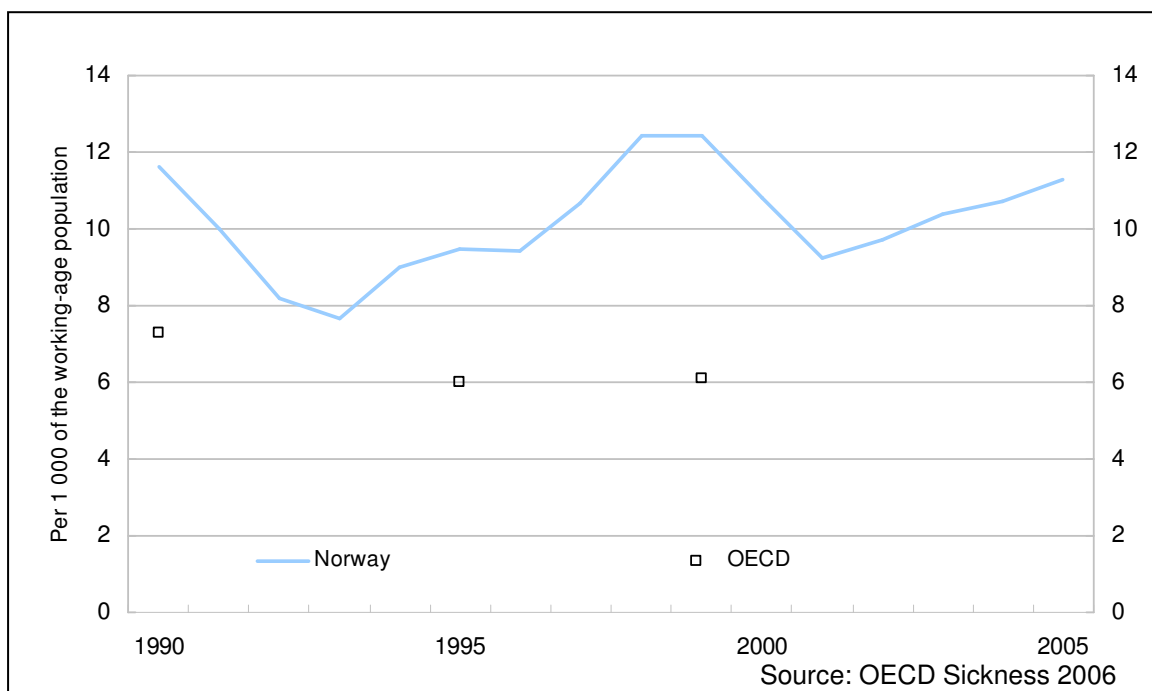


Figure 20: Share of working age population non-employed and receiving disability benefits, OECD countries 1990 and 1999



Source: OECD Sickness 2006

Figure 21: Annual inflow into disability benefit, per thousand of the working-age population 1990-2005

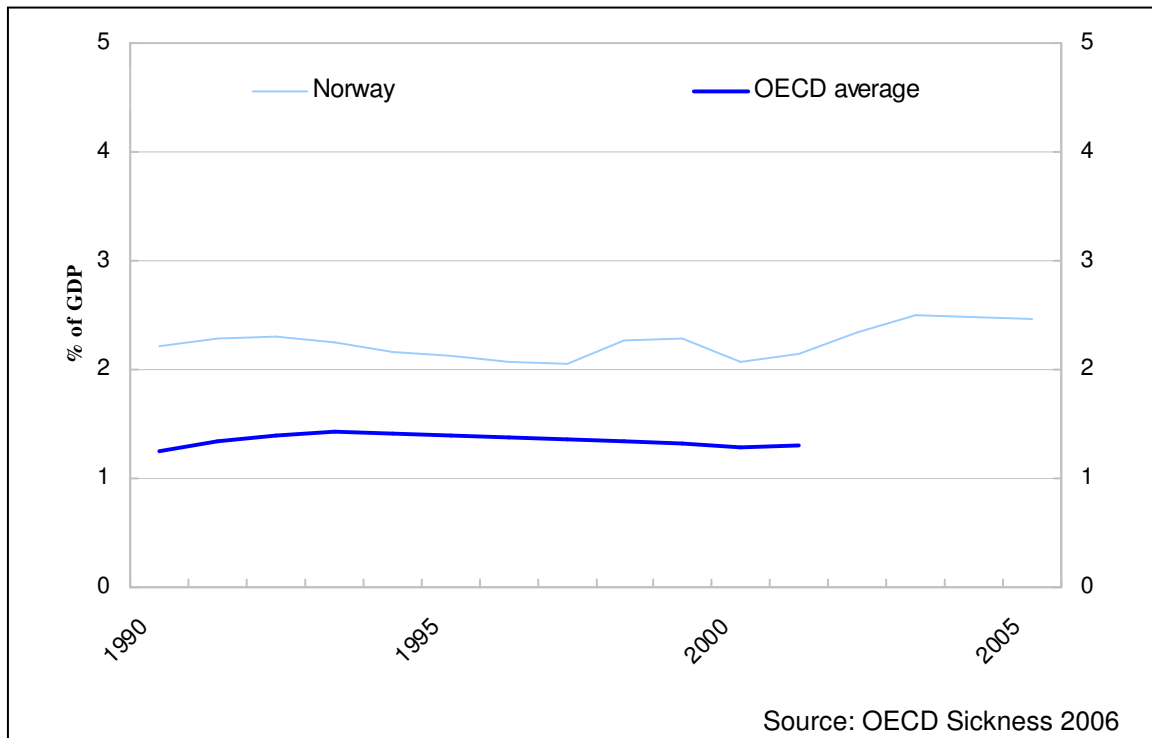


Figure 22: Annual spending on public and mandatory private disability benefits, per cent of GDP 1990-2004

The growth in disability benefits could be explained by a more stressful and demanding labour market, but it is hard to find evidence of this. Even though there are some psychological studies reporting that during the nineties workers increasingly experienced their workplace as stressful, more objective measures point in the other direction. Norwegians have never worked as little and had so much vacation as now. The explanations for the surge in people on disability benefits are more likely found in the generosity of the Norwegian welfare system and in changes in the work ethic. The first explanation is plausible since Norway has among the highest, if not the highest, payments to disabled and unemployed. The second is more difficult to measure, but is most certainly an interesting field of study for scholars of economics, psychology and sociology.

Oil wealth and expectations regarding the public sector

The large petroleum fund may have raised people's expectations regarding the ability of the public sector to supply additional services, for example in health services, improvements in the educational system, reductions in the age of retirement, and tax reductions. Indeed, public

sector spending and employment have grown rapidly since the discovery of oil in the early 1970s. Survey data shows that a large share of the population believes that reductions in the age of retirement can be afforded on the basis of large oil wealth, and statistics bear out that the effective age of labour market exit has fallen by about 5 years between 1980 and 2004, at a time when life expectancy has increased. A growing petroleum fund could also lead to a neglect of efficiency improvements in the public sector. Empirical work suggests that local level public employees are more likely to resist efficiency improvements and modernisation, while demanding higher wages, in response to the increased oil wealth, compared with those at the central government level and in the private sector (Haugsten, 2004). A key question is whether these attitudes will be reinforced by the recent jump in the oil price, following a period of relative calm since 2002, when employment growth in the public sector has for the first time slackened and wage demands have been mild, in part reflecting a new macro policy regime.

Source: OECD Economic Survey: Norway, 2005

7.5.5 Policy Alternatives – The Cure for the Curse

A restricted industrial policy

The end goal of industrial policy is to increase the wealth of a nation through measures that correct where markets malfunction. Even though well-known welfare theorems tell us that the market solution will generally provide the most efficient use of resources, it is equally true that externalities and distributional concerns provide reasons for politics to play a role. That is not to say that it does not matter how these public regulations and other policies are implemented. Economists agree that the choice of such measures should be conducted with an eye to the effects on production efficiency. That is, as most famously formulated in the Diamond-Mirlees theorem, regulators should implement policies that have the least detrimental effects on efficiency.

The question is whether the existing Norwegian economic policy meets a test against these criteria? Several Norwegian economists writing about economic policy and the principle of ‘industry neutrality’ in 2005 conclude that many of the tax exemptions and subsidies currently in place can not be justified on production efficiency grounds (Økonomisk Forum

No. 9 2005). The reply from politicians and industry representatives will probably be – so what? Many of these policies are not put in place due to reasons of production efficiency, but because regulators want to accomplish other political goals. We acknowledge that this argument can have some merit, especially in the case of positive externalities like the ones Norwegian agriculture is purported to create, e.g. beautiful scenery. More worryingly is the wide support for policies that claim to enhance competitiveness and stimulate economic growth, while they by the standards of both theory and empiric research most certainly do not.

In 2005 Norway spent approximately NOK 30 billion on targeted measures within industrial policy; NOK 17 billion in direct subsidies, a large share to Norwegian farmers, and NOK 13 billion in tax exemptions. This is in addition to import tariffs that aim to support certain industries (and thereby raise the prices consumers pay) and the indirect support through for example the not very industry neutral public spending on R&D.

It is debatable how much of this spending is justified on production efficiency grounds and some studies show that policy goals such as correcting market failure and internalising externalities can be achieved at a considerably smaller cost. One example is the level of Norwegian subsidies to the agricultural sector, which is one of the highest in the world. Brunstad and Gaasland (2006) argue in an article that public goods associated with Norwegian agriculture can be provided for less than half of today's spending on subsidies to farmers. Another example is the Norwegian shipping industry which, as is also the case in many other European countries, is given a special tax regime compared to other sectors. Few economists will claim that this special treatment in form of tax exemptions can be justified according to welfare theory or other economic research. A committee led by Norwegian economist Guttorm Schjelderup concluded that the shipping tax regime should end, but this was uniformly denounced by all political parties.

The subsidies, tax regimes and other measures labelled industrial policy may have sufficient justification in other political goals, but the main point here is that some of the policies are counter-productive to economic growth. The full cost of this is extremely hard to measure, especially in that they distort the allocation of resources such that human capital, physical capital and technology are not directed to its most productive use. A more measurable cost is the alternative budget cost for politicians: Subsidies and tax exemptions have alternative uses

both in public spending (health care, education, roads etc.) and in reducing the general tax level.

Securing the Decision Rule – Both of Them!

The prudent management of Norway's oil riches has received much praise. The spending effect associated with the Dutch Disease seems to have been countered by restricting the use of money from the petroleum fund to the expected real return on the assets. But the second decision rule, the sheltering of Norway's domestic economy by exclusively investing the fund in foreign securities, may have been just as important.

2006 may be the first year that Norway managed to adhere to the 4 percent spending rule, mainly due to higher than expected tax revenues in a booming economy. As the favourable economic conditions extend into 2007, it is likely that this also will be the case in this year. The problem is that today's rule probably is too loose. A strict adherence to the current 4 per cent limit will give effects that were not foreseen when the rule was established. In the years ahead it will give a stronger growth impulse than earlier predictions, with an adjoining strengthening of the NOK and an increased interest rate level, of course if the good times continue to roll. In a long-term perspective a negative unbalance between the state's income and its expenses will build up. In the National Budget for 2007 this gap is estimated to 4.5 per cent of GDP in 2050 (National budget 2007). If Norwegians continue to work less and demand more from their public services the projected deficit in 2050 will be even larger.

Given the shortcomings associated with the current spending rule, it is necessary to consider alternatives to it. One obvious solution is to implement a policy that fiscal policy should be conducted with the aim of eliminating the long-run negative gap in public finances. On the other hand, this is probably not reliable enough as a basis for political decisions due to methodical problems in generational accounting. Another alternative is to limit spending such that the petroleum fund's share of GDP grows at the same rate as pension liabilities share of GDP. Here the hitch is that it implicitly assumes that petroleum revenues primarily is to finance pensions and does not take into account the development in other public expenses.

The problem with policy rules is that political decisions can be overturned and policies changed. This time-inconsistency in public finance policies makes all alternatives vulnerable

to popular pressure. From a democratically point of view is this of course mostly good, but it reduces the effect of such rules. Political pressure makes it also difficult to change the current rule; even if alternative models are more appealing seen from the point of view of economists. So maybe the most realistic approach is to improve how the current rule functions? In fact, much of the long-term unbalance in public finances would disappear if politicians managed to follow the current spending rule countercyclical and spend equivalently less more than 4 per cent in good economic times as they do spend more than 4 per cent in bad times.

The second rule for the petroleum fund, to invest in foreign securities, is from time to time challenged by various proposals for investing some of the petroleum fund in mainland Norway²⁸. The report prepared by the Sandmo committee for the Norwegian Ministry of Finance (2004) concluded that there are no overall capital shortages, quite the contrary. Investing some of the fund's assets in Norway will thus most likely lead to an overflow of capital chasing too few good ideas and consequently an even lower rate of return on investments. In addition may large public investment funds raise the probability that investments are undertaken to satisfy political ends, rather than economic.

²⁸ The latest was a proposal by a lobbyist group to use part of Norway's oil wealth to build a "Norwegian Wall Street".

8. Conclusions

This thesis has tried to explore whether and how the welfare of Norwegians can be improved in the long-run. The emphasis has been put on evaluating different policy alternatives' effect on an economic welfare target, while also discussing implications for non-economic welfare indicators. Inspiringly enough the conclusion is that policy makers have several options for improvements, both from the view of economic welfare and likely also in terms of wider perspectives on human well-being.

Continuing along the lines of the recent pension reform, but going some steps further, there are possibilities for boosting the labour supply. Redefining the pension system, by establishing an even clearer relationship between pension entitlements and wages for middle-income earners, makes it possible to strengthen work incentives for a group that micro-economic research suggests responds most strongly to changed incentives. Lifting the pension premium for older workers should also increase labour supply because a person nearing his pension age will most likely value an increase in pensions relatively more.

Changes in tax policy can also strengthen work incentives, but also stimulate productivity and capital formation. Due to much the same work incentive effects as associated with a pension reform, a development towards flatter wage income taxation would increase labour supply. This reduction in distortionary income taxation may possibly be financed by increases in taxes on property and environmental damages. The first reform could stimulate productivity and give a more efficient capital allocation because the current over-investment in property is reduced. The latter may have several economic advantages due to possible 'double dividend' effects, but the main argument for it is as a powerful tool in environmental policy – or, in the words of economists, by equating marginal social costs and marginal social benefits.

Improving the efficiency of the education system can both bring students earlier into working life and also entice young people to undertake the right education because of reduced information lags.

It is hard to estimate the costs of policies aimed to support specific industries and economic activities, but they are most certainly large. Suboptimal resource allocations and reduced

return on investments lowers society's welfare level, and direct subsidies and tax exemptions have a significant alternative cost because they could have been used for other purposes, like investments in roads, education, health care or research.

Equally, a too loose fiscal policy can give long-term problems for Norway. If a lavish use of Norway's petroleum wealth today produces a negative gap in public finances in the future, this will lead to reduced welfare either through lowered quality on public services or through tax increases.

Some of the policy alternatives are complementary, as in the case of increasing taxes on property and pollution to finance a reduction in other distortionary taxes. Such 'bundles' of policy reforms can help smooth the political process and make it easier to implement necessary changes. Still, how economic policy reforms can be put into reality is maybe the most important question left unanswered by this thesis. These 'disturbances from the real world' challenge economic theory to develop towards even better explanations of how economic policy operates. This thesis has tried to provide some answers to the question of how to increase human welfare based on the current theory and empirics of modern economics.

But certainly, the theory of the subject is still not complete.

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