

Erling Røed Larsen

Escaping the Resource Curse and the Dutch Disease?

When and Why Norway Caught up with and Forged ahead of Its Neighbors

Abstract:

In the 1960s, Norway lagged behind its Scandinavian neighbors in the aggregate value of economic production per capita, as it had for decades. By the 1990s, Norway had caught up with and forged ahead of Denmark and Sweden. When and why did Norway catch up? The discovery and extraction of oil in the early 70s is usually suggested as the explanation. But oil alone cannot explain Norway's growth since Sachs and Warner (2001) show that resource-gifts often reverse growth, making oil a curse not a blessing. Moreover, there is the possibility of contracting the Dutch Disease, which involves a rapid and substantial contraction of the traded goods sector. This article explains how deliberate macroeconomic policy, the arrangement of political and economic institutions, a strong judicial system, and social norms contributed to let Norway escape the Resource Curse and the Dutch Disease for more than two decades. Intriguingly, it appears that Norway in the late 90s may show some symptoms. Norway experiences reversed relative growth compared to Denmark and Sweden and a contraction of industrial activity. This article explores the political economy behind this recent slow-down.

Keywords: booming sector, catch-up, comparative development, counterfactual path, Dutch Disease, economic parity, economic growth, factor movement, gross domestic product, industry, manufacturing, rent seeking, Resource Curse, oil discovery, political economy, spending effect, spillover-loss

JEL classification: C22, N10, O10, Q33

Acknowledgement: I am grateful to insightful conversations with and comments on an earlier version of the paper from Ådne Cappelen, valuable suggestions from Hilde C. Bjørnland, Clair Brown, Per Richard Johansen, Dag Kolsrud, Knut Einar Rosendahl, Thor-Olav Thoresen, and Wei-Kang Wong, ideas from Ian McLean, and grants from the Norwegian Research Council, project no. 149107/730. I also thank seminar participants at the Department of Economics, University of California, Berkeley; Department of Economics, the Norwegian Business School BI; and the Research Department, Statistics Norway. I share merits with all of the above. Errors remain, of course, my sole responsibility.

Address: Erling Røed Larsen, Statistics Norway, Research Department.
E-mail: erling.roed.larsen@ssb.no

Discussion Papers

comprise research papers intended for international journals or books. As a preprint a Discussion Paper can be longer and more elaborate than a standard journal article by including intermediate calculation and background material etc.

Abstracts with downloadable PDF files of
Discussion Papers are available on the Internet: <http://www.ssb.no>

For printed Discussion Papers contact:

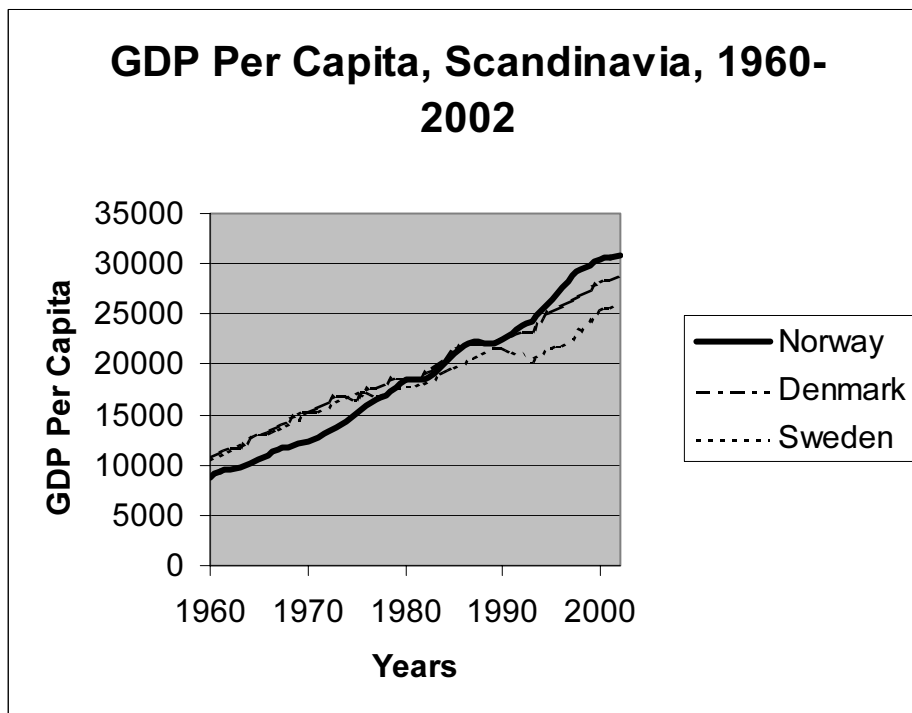
Statistics Norway
Sales- and subscription service
N-2225 Kongsvinger

Telephone: +47 62 88 55 00
Telefax: +47 62 88 55 95
E-mail: Salg-abonnement@ssb.no

1. Introduction

In the recent economic history of Scandinavia, one phenomenon is striking: The ascent of Norwegian gross domestic product (GDP) per capita compared to those of its neighbors Denmark and Sweden. Until the early 1970s, Norway had trailed its neighbors economically. For decades, or even centuries, Norway had been the poorest country of the three. However, by the turn of the millennium, Norway enjoyed the largest GDP per capita in Scandinavia, as is shown in Figure 1. This turn of events is conventionally and plausibly attributed to Norway's oil discovery in 1969 and subsequent extraction of oil from 1971. Today, Norway is one of the world's largest oil exporters. However, pointing to oil revenues is insufficient in explaining Norway's growth since Sachs and Warner (1999, 2001) and others have documented the detrimental effects of newfound riches on economic growth. This counterintuitive effect is called the Resource Curse. It involves a surprising, negative relationship between resource wealth and economic growth. Many resource-rich countries seem to suffer from it; only a few do not. Moreover, countries that are rich in resources may suffer from the Dutch Disease, an economic illness that involves factor movement, excess demand, and loss of positive externalities. The result of the disease is that the *traded goods sector*, which is exposed to foreign competition abroad or domestically, shrinks or disappears. In Norway, it did not. In other words, Norway's management of its oil wealth is no trivial feat. In fact, based on the evidence on how other resource-rich countries have fared, Norway's growth is surprisingly successful. Stevens (2003) offers a survey of the literature, and shows that there are only few exceptions to the curse and the disease, and none of them are fully understood. This article focuses attention on how Norway did it. Thus, this article attempts to explain why Norway (for so long) avoided the curse and the disease. Then I go on to examine a twist in the tale: Norway's a relative slow-down late in the 1990s. Possibly, Norway caught, presumably mild, strains of the illnesses. I examine why.

Figure 1. GDP Per Capita, Scandinavia, 1960-2002, 1999 U. S. Dollars, PPP



Note: Data from Bureau of Labor Statistics (2003), Table 1. Available online: <http://www.bls.gov/fls>.

In order to explain how Norway succeeded in its oil management, this article first establishes the fact. I do this by comparing Norway to its two neighbors Denmark and Sweden, and claim that these two neighbors illuminate the counterfactual rate of growth Norway would have followed had it not found oil. Simple first-order autoregressive regression models of GDP per capita time trends for each of the three countries show that Norway reached parity in the 80s, some ten years after oil extraction began. In addition, when we know that, as is shown in Røed Larsen (2003), that the relative acceleration started *after* oil extraction began, oil may be thought of as an important element in Norwegian growth. I then proceed to discuss the policies Norway implemented.

I am, and the reader should be, aware of the lack of readily applicable framework in which to understand growth in general and the curse and disease in particular. My attempted answers, or sketches of answers, must by necessity involve some element of guesswork. Moreover, I will have to rely on several angles of evidence and substantiation, and sometimes even challenge parts of conventional economics.

What are the curse and the disease? While both presumably arise from resource riches, they take on different forms. The Resource Curse can be thought of as the phenomenon that resource-rich countries

tend to grow slower -- using aggregate output per capita as measure -- than similar, not resource rich, countries do. The Dutch Disease, on the other hand, is a term most scholars use for the phenomenon that resource exports leads to a rapid contraction of the non-resource traded goods sector. Although research tends to concentrate effort on either the curse or the disease, I shall look at the two phenomena together. I do this because even though there is consensus that the two problems represent different aspects of resource wealth, they share the same origin: resource riches.

Many authors, e.g. Auty (2001a), Gylfason (2001a), Sachs and Warner, Stevens, and Torvik (2002) point toward rent seeking and corruption as core elements of what causes the curse. The Dutch Disease, on the other hand, goes together with other mechanisms and is thought caused by something else. The literature has not reached a consensus on the nature of causes and symptoms, and Stevens shows the different aspects on Dutch Disease as they are laid out in Corden and Neary (1982), Corden (1984), Gylfason et al. (1997), and Torvik (2001). Bjørnland (1998) and Brunstad and Dyrstad (1997) are recent Norwegian contributions on the Dutch Disease topic. There are other influential contributions; let me mention Chatterji and Price (1988), Hutchison (1994), van Wijnbergen (1984). Instead of focusing attention on the differences, let me identify the essence of this large and growing literature: the Dutch Disease is intricately linked to a factor movement effect, a spending effect, and a spillover-loss effect. The factor movement effect is the reallocation of factors of production such as capital and labor from other activities to resource extraction. The spending effect arises from the increased aggregate demand created by resource receipts, which if converted to domestic currency, may create periods of excess demand in the economy. The spillover-loss effect lies in the loss of positive externalities associated with the (crowded out) non-oil traded goods sector.

Thus, an observer who wants to explain how Norway escaped the curse and the disease must argue how Norway minimized rent seeking activities, limited the factor movement effect, curbed the spending effect, and dealt with the spillover-loss effect. However, the argument cannot be as clear-cut as we would like to. For example, Stevens points out that it is often not the question of what policies were followed, but why these policies were allowed implemented at all. In every resource-rich country there exist coalitions that will oppose these policies. That allowance points towards complex political economic interactions between institutions, special interest groups, and the electorate. In addition, it invokes social norms, the effect from which is notoriously hard to document.

I will make the case that the factor movement effect was dampened through income coordination. A highly centralized wage formation system made it possible to make the manufacturing sector the wage

leader. This made it possible to limit wage increases to all sectors from an expanding resource sector. The spending effect was curbed because the government shielded the economy by fiscal discipline and investing abroad. The spillover-loss effect was small because losses were substituted for by gains in the highly technological off shore oil extraction sector, which requires more capital than on-land oil extraction. In addition, industrial policy sought to stimulate learning-by-doing and maintain diverse industrial activities. Social norms, transparent democracy, proper monitoring, an effective judicial system, and the wage negotiation system reduced the frequency of rent seeking. This article examines four factors of rent seeking and distribution conflicts: large-scale conflicts, small-scale illegal rent-seeking, small-scale legal rent-seeking, and political purchase of power through election promises. I discuss Norway's record on each.

Let me describe the structure of the article. The next section discusses the curse, the disease, and the interactions between the two. It also explains why I use Denmark and Sweden to sketch the counterfactual path of Norwegian growth. The third section presents empirical findings on intra-Scandinavian growth. It establishes when Norway reached parity and estimates the counter-curser growth rates. The fourth section asks to what extent Norway suffered from the Dutch Disease, and the fifth section explains Norwegian policies to limit the Dutch Disease. The sixth section looks at the remedies to avoid the curse. The seventh section examines the political economy behind the recent slow-down. The final section concludes.

2. The Curse, the Disease, and Scandinavian Performance

Although both the curse and the disease originate from sudden resource wealth, they involve different propagation mechanisms of problems. Auty (2001a), Gylfason (2001a), Mikesell (1997) Sachs and Warner (1999, 2001), and Torvik (2001) say that the curse mechanism may be generalized to conflicts over distribution; manifested in rent seeking. On the other hand, 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 circumstance. Surely, if there occurs an exogenous shock to an economy, either in terms of a discovery of a valuable commodity or a discovery of a valuable technology, one would expect the economy to adjust to its new comparative advantage. It would be in-optimal not to utilize the new possibilities. Stevens (2003) discusses the controversy over the precise nature of the disease and the non-conclusive evidence for its universal applicability. Van Wijnbergen (1984), for example, asked early on whether the term was a misnomer.

But we may not have to choose between classifying a contraction of the non-resource traded goods sector as either a disease or a natural adjustment. What it is, or turns out to be, depends. If the contraction is rapid and deep, and if there are irreversible losses of knowledge, then such a contraction bodes future problems. If the contraction is small, smooth, and slow, then it may simply signify a highly welcome new position given new parameters. In summary, the curse and the disease take on different shapes, and it is not surprising that many contributions look at them separately.

However, both the literature on the curse and the literature on the disease seem to share common traits. Neither the curse nor the disease is thought of as inevitable outcomes. Both seem attributed to some unwelcome arrangement of institutions or inappropriate policies. In both strains of literature it seems as if proper management can contain the problems. Stevens sums it up by saying that the problems have something to do with governance.

This article's view is that the governance of curse problems is related to the governance of disease problems. For example, below I shall argue that Norway's highly centralized wage negotiation system and income coordination scheme helped limit factor movement, a cause of the disease, and helped prevent rent seeking, a pathogen of the curse. Moreover, much of the literature, e.g. Torvik and Sachs and Warner, argue that there are positive spillover effects from non-resource (export) manufacturing. The idea is that the activities of acquiring know-how and developing technology feed a virtuous circle that is beneficial to the whole economy. For example, Van Wijnbergen says that it is a stylized fact that technological progress is faster in the traded non-sheltered sectors of the economy. But if that is the case we would expect positive externalities to create an association between a sizeable non-resource traded goods sector and positive growth on the one hand and an association between a contraction of this sector and negative growth on the other. The latter entails a presence of *both* curse and disease. In other words, the stylized fact plays a role both for the Dutch Disease and the Resource Curse. Thus, they may be considered together because they share common roots. In Table 1, I tabulate the different combinations of the disease and the curse. Since I have argued that they may be linked, we would expect that resource countries are more likely to be positioned along the northwest-southeast diagonal than on the southwest-northeast diagonal. In the following I shall explain why Norway ended up in the favorable northwest corner while many other resource-rich countries ended up in the highly unfavorable southeast corner.

Table 1. Effects of a Resource Curse and a Dutch Disease

		Resource Curse	
		No	Yes
Dutch Disease	No	Overall growth and diverse export base	Stagnant growth, but diverse export base
	Yes	Overall growth, but strongly contracted manufacturing	Stagnant growth, and strongly contracted manufacturing

I investigate whether or not Norway escaped the curse by comparing Norway to Denmark and Sweden. The rationale for this comparison should be clear: Norway's neighbors are intended to function as a control group. The idea is that the aggregate growth in Denmark and Sweden represent annual growth numbers Norway would have followed had it not found oil. The strength of the idea of using Denmark's and Sweden's growth rates in this fashion depends on the soundness of premise that Norway would have grown at the same speed its neighbors did.

How sound is this premise? The Scandinavian countries are similar. They share a common history and an almost-identical political, linguistic, and cultural background. It seems as if the Scandinavian countries, historically, progressed in tandem. Sweden blazed the trail, Denmark followed, and then Norway finally emulated its neighbors. The careful observer would perhaps expect this equality in factors to lead to economic parity. Røed Larsen (2003) examines the possibility that Norway's catch-up was in fact simply a laggard's leap, a convergence unrelated to oil. Similar circumstances should bring similar levels of GDP per capita. But evidence is inconsistent with a catch-up *not* related to oil since there is nothing to support the proposition that Norway started the catch-up in the 60s. The catch-up started a few years *after* oil extraction started. Thus, it seems as if similar circumstances brought only similar growth rates -- until oil happened.

This article claims, then, that it may be reasonable to believe that the relative economic growth in Scandinavia would have continued to follow the historical pattern had oil *not* been discovered off the Norwegian coast in 1969 and only the enormous value of oil would change this order. In essence, the discovery of oil was one large natural experiment. Denmark and Sweden offer a glimpse into the counterfactual, the rate of growth that Norway would have followed had it not acquired oil receipts. It is Norway's acceleration, and the timing of it, that implies the escape from the curse.

3. Avoiding the Curse, Reaching Parity, and Moving Beyond

Before explaining why Norway could catch up with and surpass Denmark and Sweden, I shall document that it did. To do this, I use a straightforward strategy. I estimate the underlying trend in the observed gross domestic product per capita numbers depicted in Figure 1, and do it by using the standard regression technique. It is useful to think of such regressions as a way of simply compressing large data sets; i.e. reducing the dimensionality of observations. More specifically, the idea is that the observed numbers of gross domestic product per capita contain a trend component and a stochastic component. We aim to estimate the trend, or deterministic, component by regressing gross domestic product per capita for each country onto a time variable while allowing for an appropriate stochastic process in the non-deterministic part. Here, I use a first order autoregressive process. Norway's development is portioned into three periods, following Røed Larsen's (2003) finding that Norway accelerates relative to Denmark and Sweden in the 70s and decelerates in the 90s. Denmark's and Sweden's growth paths are modeled as following one period of smooth progression.

Table 2. Estimation of Time Trends^a for Norway, Denmark, and Sweden, 1960-2002

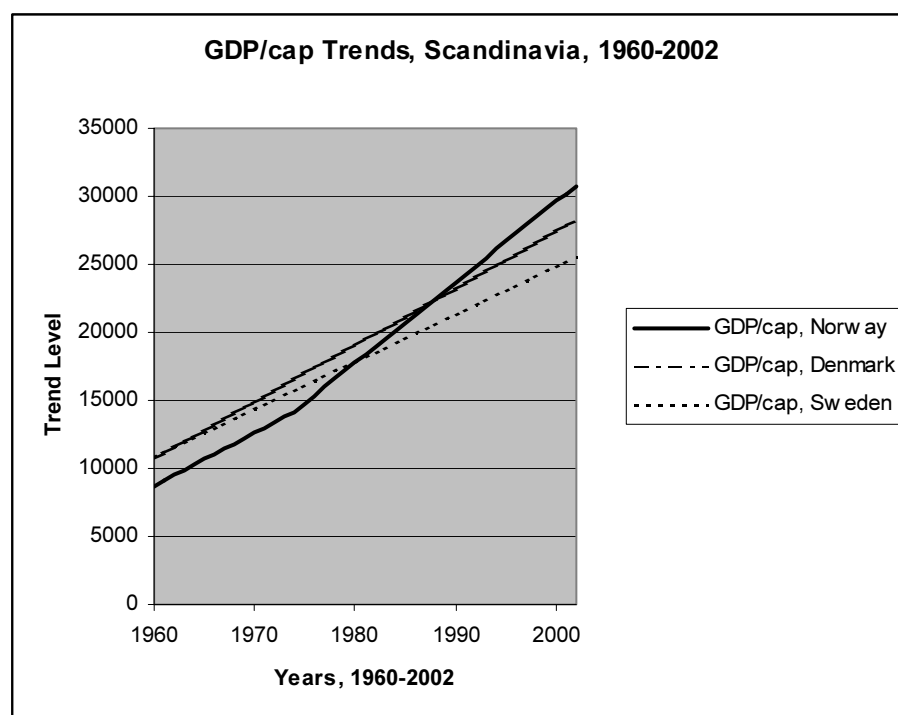
Parameter	Parameter Estimates, Norway (t-values)	Parameter Estimates, Denmark (t-values)	Parameter Estimates, Sweden (t-values)
Intercept, α	8722 (15.9)	10743 (29.68)	10847 (17.59)
Time Coefficient, β	388.97 (7.35)	417.82 (29.29)	349.81 (15.09)
Extra Time Coefficient, Norway, 1975-1996	207.91 (2.72)	--	--
Extra Time Coefficient, Norway, 1997-2002	-13.08 (-0.10)	--	--
Autoregressive Factor, ϕ	-0.8382 (-7.70)	-0.7619 (-7.30)	-0.8759 (-11.79)
Number of observations, N	43	43	43
Regression R-squared	0.9614	0.9554	0.8506
Total R-squared	0.9981	0.9959	0.9930

Notes: ^a First order autoregressive linear regression for Denmark and Sweden. First order autoregressive linear 3-step spline regression for Norway.

Table 2 tabulates the trend regression results. Details of estimation are included in the appendix. We observe that the trend estimates for both Denmark and Sweden have higher starting points of GDP per capita. They start out in 1960 with trend levels of 10743 and 10847 1999 U. S. dollars (USD), respectively. Norway starts at 8074 USD. In the period 1960-1974, Norway grows approximately as fast as its neighbors, as this article proposed. Oil had not yet been discovered. In fact, Norway's growth of 389 USD per capita per year is *between* the Swedish growth of 350 USD per capita per year

and the Danish growth of 418 USD per capita per year. However, in the period 1975-1996 Norwegian growth accelerates to 597 (389+208) USD per capita per year. Using the estimates in Table 2 and inspect Figure 2, we may compute that Norway was ahead of Sweden in 1981 and Denmark in 1988. After parity, Norway continued to expand GDP per capita at high speed until the mid-90s. For the remaining period, 1997-2002 growth estimates are statistically insignificant, but economically important. The negative sign in the estimate -13 USD per capita per year is evidence of the retardation found in Røed Larsen (2003).

Figure 2. Trends in GDP per capita, Norway, Denmark, Sweden, 1960-2002



Notes: First order autoregressive linear regression for Denmark and Sweden. First order autoregressive linear 3-step spline regression for Norway. Data from Bureau of Labor Statistics (2003).

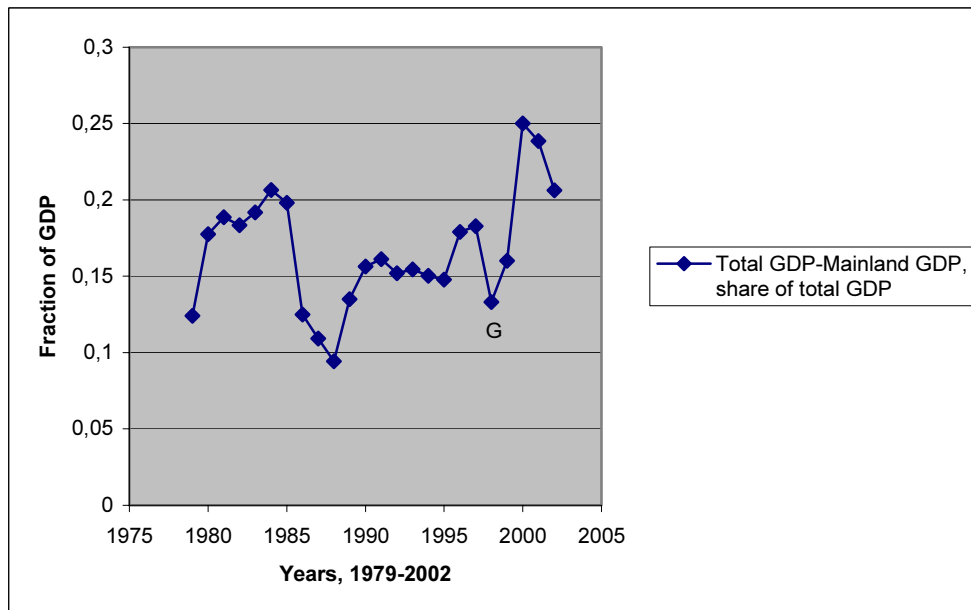
The change in the speed of growth is consistent with an oil-induced acceleration. It made Norway a candidate for the curse and the disease. However, the continued fast growth over two decades is evidence of an escape from the Resource Curse. Norway does not experience retardation. In the 25 years after oil extraction began, Norway grows faster than its neighbors Denmark and Sweden. Considering that Denmark and Sweden were ranked at number 4 and 6 in terms of GDP per capita in 2002, according to BLS (2003), the result is not a figment of poor performance in the control group. Thus, Norway's even faster growth implies that it did not suffer from the curse in the period from mid-70s to mid-90s.

4. Did Norway Actually Avoid the Dutch Disease?

There is a contrast between the scrutiny of the Norwegian record on the curse and the examination of how it fared with the disease. While few commentators, except recently in contributions by Cappelen, Eika, and Holm (2000), Gylfason (2001a), and Stevens (2003), comment upon the lack of curse symptoms in Norway many analysts have focused attention on how Norway dealt with the Dutch Disease. For example, Bjørnland (1998) finds that while there is weak evidence of Dutch Disease from North Sea oil in the UK, manufacturing output in Norway appeared to actually have benefited from the impact of higher oil revenues. Bye et al. (1994) find that Norway showed some symptoms in the 70s and 80s since the Norwegian economy restructured to extract large quantities of oil, but that the Norwegian economy thereafter was poised to maintain a well functioning non-oil traded goods sector. Cappelen, Eika, Holm find that the traded goods sector contracted due to oil, but that manufacturing did not. Hutchison (1994) uses cointegration techniques and detects that the impulse response functions indicate an adverse effect on the manufacturing sector from the oil boom. Brunstad and Dyrstad (1997) note that there is evidence that the Norwegian petroleum sector has caused weak manufacturing performance, and that there are costs-of-living increases in areas close to the oil sector, the latter a symptom of real appreciation.

In other words, there is some dispute on Norway's performance in relation to the Dutch Disease. However, it may be possible to reconcile the different views into a synthesis. When oil extraction began and expanded rapidly the oil sector demanded resources. Factors of production were moved to the North Sea. Thus, a build-up of real capital, labor, and expertise involved a reallocation of production capacities within the Norwegian economy. This resulted in a reduction of other production activities, a crowding-out. However, the essence of labeling the response a disease lies in whether the response signals future problems, for example in a gradual erosion of the overall economic capacity, the production capacity in the non-resource traded goods sector, or both. However, even if the responding restructuring of the Norwegian economy followed the usual path of a disease by letting the oil sector expand fast, the response appears not to become a disease. First, oil revenues' share of aggregate economic output became fairly constant in physical quantities quite early; see Figure 3. Thus, the *increasing* reliance on resource revenues, symptomatic of a disease, was not present. Second, labor movement into oil was modest, as shall be explained below.

Figure 3. The Importance of North Sea Oil and Gas, Fraction of GDP, Market Value, Norway, 1979-2002



Source: National Accounts, Statistics Norway, Table 13.

The fluctuations in oil's proportion of GDP are lately mainly results of oil price fluctuations. The *volume* of Norwegian oil production per year is now rather stable. Whether or not Norway is suffering from the Dutch Disease depends on the definition of it. One definition for suffering from the Dutch Disease may simply involve the *level* of oil's share of economic activity; for example the condition that oil revenues comprise a large share of gross domestic product. In Norway, that fraction is large. Another definition for suffering from the Dutch Disease includes scores on several facets of the economy such as both *levels* and *changes in levels* of output value shares, factor shares, and productivity increases in the oil sector, the non-oil traded goods sector, and the sheltered sector. Using all those indicators, the emerging picture of the last twenty years is much less conclusive in disease direction. In Norway, the oil sector commands a fairly small and constant share of total labor hours. The production volume is constant. The productivity in the manufacturing sector has been significant, see below. In fact, Bjørnland and Cappelen, Eika, Holm claim Norwegian manufacturing performed well in the 80s and 90s. Thus, while the oil sector obviously was and remains an important source for economic activity in the Norwegian economy, until recently Norway was not a typical Dutch Disease country.

5. How Did Norway Avoid a Full Blown Dutch Disease?

Norway escaped the curse for two decades and Norway avoided, at least the most detrimental effects of, the disease. How? I shall examine the disease first, then the curse. I do this because this way the presentation progresses in difficulty.

Norway managed to contain the factor movement effect, the spending effect, and the spillover-loss effect. This result may of course be part luck, part policy. However, we know from reports in Parliament in the 70s and early documentation that Norwegian policymakers contemplated the dangers of the disease before they knew what label to put on it. Consequently, they attempted preemptive action. Explicit, deliberate policy schemes were implemented. What was the nature of these schemes? Let me present a brief summary of the policies:

- i) *Factor Movement Policy*. Use the centralized wage formation system to limit general wage increases at the magnitude of productivity increases in the manufacturing sector. Use programs such as the "Solidarity Alternative" to coordinate income in order to moderate oil's effect on non-oil traded goods sector.
- ii) *Spending Effect Policy*. Exercise fiscal discipline. Pay back foreign debts when possible. Thereafter, establish a Petroleum Fund abroad. Shield the economy from excessive demand and real appreciation when at full capacity, thus reduce loss of competitiveness. When not at full capacity, allow some increases in aggregate demand, but beware of the stickiness of public spending.
- iii) *Spillover-loss Policy*. Encourage domestic accumulation of expertise in off shore oil extraction instead of using foreign specialists. Build up knowledge in technological centers. Educate oil experts. Invest in oil research. Attempt to maintain a diverse export base.
- iv) *Education, Research, and Development Policy*. Channel resources into education, research and development. Stimulate scholarships for visits abroad. Increase labor hours in teaching and research. Establish centers of excellence.
- v) *Active Counter-cyclical Policy*. Use enhanced political legitimacy of resource rents to counteract recessions. Exploit the feasibility of using returns to Petroleum Fund compared to other finance alternatives in active governmental capacity utilization.
- vi) *Labor Market Policies*. Maintain centralized wage negotiation system. Encourage the negotiating parties of employer and employee unions to keep in mind effects on the aggregate economy, not only special interests. Use a neutral agency to compute productivity increases in the manufacturing sector, and institutionalize these findings as ceilings of general wage

increases. Stimulate female participation in the labor market. Enhance information coordination in labor market through the establishment of vacancy and competence agencies.

vii) *Industrial Policy*. Maintain and accumulate know-how in industrial activities. Keep variegated exports. Seek successful inter-temporal paths for comparative advantage. Put emphasis on knowledge, technological progress, and human capital.

In assessing how these policies fared, we must relate them to the literature on the Dutch Disease. This literature proposes two main mechanisms of propagation, following the contributions from Corden and Neary (1982) onwards. They are the *factor movement* effect and the *spending* effect. Later, various authors, e.g. Torvik (2001), specialize a subgroup of the former into a *spillover-loss* effect. The factor movement effect is caused by attractive favorable returns in resource extraction. Capital and labor move from other sectors to resource extraction, and in the process factor prices, e.g. wages, are bid up. Such higher prices make other sectors lose competitiveness, and they shrink. When they shrink, the fear is that several disadvantageous effects set in. First, know-how, physical plants, and technology may be lost irreversibly. Or they are reversible only at substantial cost. Second, positive externalities from manufacturing are lost and not replaced by similar positive externalities from resource extraction. These positive externalities are learning-by-doing, technological progress, and innovative practices. This second effect may be specialized into the spillover-effect mentioned above. The spending effect results from converting resource revenue into domestic currency, and using the currency domestically and thereby increasing aggregate, domestic demand. This procedure has two sub-effects. First, the conversion entails increased demand for the domestic currency, which increases the nominal exchange rate. Second, the increased domestic demand for goods and services may create excess demand if the economy is at capacity. Both effects lead to real appreciation of the domestic currency, which leads to loss of competitiveness, which in turn leads to reducing the non-oil traded goods sector.

The following is the essence of whether adjustment to resource riches becomes a disease: Loss of competitiveness is not a problem in a highly flexible economy because factors will flow to the most efficient use and flow back when needed. But if there are path-dependencies, irreversible processes, lost spillover effects, and inflexibilities an economy will suffer low capacity utilization in the aftermath of resource depletion before it returns to general equilibrium. Thus, a resource boom is more likely to lead to the disease in an inflexible economy. Most, if not all, real-world economies are less flexible than the textbook case.

These three mechanisms can be moderated through policy. Also, the technology content in the expanding sector may moderate the effects. In Norway, factor movement was atypical since off shore oil under the North Sea is more difficult to extract than on-land oil in the Arabic desert. More capital moved and less labor. In the 70s, Norway invested heavily in real capital, technology, and human capital and built up large liabilities. To illustrate, Statistical Yearbook of 2003¹ (Table 352) shows that Norwegian net assets were 41.1 percent of GDP in 2001. In 1980, 9 years after extraction began, it was -32.6 while -11.4 in 1970. Thus, Norway had built up liabilities during the investments in the 70s in the process of developing oil extracting capacity. Thus, the labor movement effect was less acute in Norway. Moreover, wage increases were limited to the increases in manufacturing sector; see Cappelen, Eika, and Holm. This was feasible because the parties in the labor market were large coalitions of employers and employees that were able to consider aggregate interests, not only special interests. Norway's centralized wage negotiation system may thus have contributed to preventing too fast and too much real appreciation. The extent of this moderating effect is linked to the degree the negotiating parties managed to use the productivity increases in the manufacturing sector as a ceiling for general wage increases. Notice that a prerequisite of a sustainable and controlled real appreciation in this manner is centralized wage formation. It is an interesting association, then, that Wallerstein (1999) finds that Norway has one of the highest centralized wage formation systems in the world; see Table 3, row 6. Moreover, Bjørnstad and Johansen (2002) find, through simulations on a large-scale macro-model for Norway, that a de-centralization of the wage negotiation system could in fact increase the speed of the de-industrialization process, implicitly supporting the hypothesis put forward here. In essence, this article's argument is that Norway succeeded making manufacturing the wage leader, not the resource extraction sector, which may often be the case in resource-rich countries, and that this success limited the factor movement effect.

¹ Published by Statistics Norway. Available online at: <http://www.ssb.no>.

Table 3. Comparative Development, International Statistics, Selected Countries, 2001

	Norway	Denmark	Sweden	Germany	U. S.	Japan
Labor Force Participation rate¹	80.5	80.0	76.8	69.0	74.9	78.2
Corruption Index, Rank²	12	2	5	18	16	20
Human Development Index³	1	15	4	17	6	9
Wage Differences⁴	4.5	5.4	4.1	6.6	17.0	-
Index of Centralization in Wage Formation⁵	2.7	2.58	2.53	1	0.14	0.67

Source. ¹OECD. Online: <http://www.oecd.org/xls/M00037000/M00037562.xls>. Euro-area is used for Germany.

²Transparency International. Online: <http://www.transparency.org/cpi/202/cpi2002.en.html>. ³Human Development Index, United Nations. Online: <http://www.undp.org/hdr2001/>. ⁴Barth and Moene (2000), Table 3.1, quoted statistics show standard deviation of relative wage differences between branches of the private sector comparing employees with identical level of education, gender, and work experience. ⁵Source: Wallerstein (1999). The index ranges from 0 to 3, in which 3 represents centralized negotiations on national level and 0 represents local wage formation within individual firms.

The spending effect was limited because the resource rent in its entirety accrued to the government, and because the government exercised fiscal discipline, paid back debts, and built up the Petroleum Fund; see Bye et al. (1994), Cappelen, Eika, Holm (2000), Eika and Magnussen (2000). In comparison, if -- hypothetically -- individuals, coalitions, or an elite group had controlled the resource rent and brought it into the domestic economy, excess demand would likely have followed. In the 90s, Norwegian authorities established the Petroleum Fund, specially designed to and with the express purpose of shielding the domestic economy from the spending effect; see Table 4. Mikesell (1997) reports that Chile also managed to create such a fund, and that it helped stabilize revenue streams and Stevens (2003) reports cases of successful funds. This fund protected the economy from excessive demand and the ensuing increase in domestic wages and prices. It also prevented nominal appreciation since the fund is kept in foreign currencies.

Table 4. The Norwegian Petroleum Fund, 1996-2001

Year	Gross Domestic Product¹, Billion NOK	Petroleum Fund², Billion NOK
1996	1 027	47.6
1997	1 111	113.4
1998	1 132	171.8
1999	1 233	222.4
2000	1 469	386.4
2001	1 527	613.7
2002	1 521	609.0
2003	-	803.3 ³

Source: ¹National Accounts, Table 1, Statistics Norway, market value. Online: <http://www.ssb.no/emner/09/01/nr/>. ²Central Bank of Norway, Market value in NOK per 31st of December each year. Online: <http://www.norges-bank.no>, use: petroleum fund. ³Market value per September 30th 2003.

The spillover-loss effect may have been less acute in Norway than in other cases. Sachs and Warner (2001) and Stevens say that there is a stylized fact that economic progress is intimately linked to a diverse and entrepreneurial manufacturing sector. Van Wijnbergen (1984) also noted the stylized fact that technological progress is faster in the traded non-sheltered sectors than in the non-traded, and cites Balassa (1964) for an early reference. Torvik (2001) develops a model in which spillover effects play an important role. I suggest that it is plausible that the spillover-loss in Norway was much smaller than in other oil countries because of the immense real capital needed in the off shore oil industry and because of the inherent requirement of accumulation of know-how and expertise in off shore extraction. To illustrate, Cappelen, Eika, and Holm inform us that one labor hour in the Norwegian oil sector is combined with a capital stock 33 times that in manufacturing. This shows that Norwegian oil extraction is a high technology sector, which we may assume has much the same positive spillover effects manufacturing is assumed to have.

In my view, these three policies plausibly explain how Norway contained the factor movement effect, the spending effect, and the spillover-loss effect. They are also testable and documentable. More importantly, these policies are replicable. The other policies are increasingly more difficult to assess. In particular, I shall not present an assessment of the seventh policy type, industrial policy. As Stevens says, industry diversification is an obvious solution but an extremely elusive one to achieve. Trying to identify winning sectors and activities are next to impossible. It may be as likely that Norway's growth has happened in spite of, not because of, its industrial policy. It is noteworthy, though, to observe that many authors, e.g. Mikesell (1997) and Sachs and Warner (2001), point toward the importance of a

diverse non-oil traded goods sector. Rodrik (1995, 1997) demonstrates that some Asian countries may have succeeded because of governmental management and intervention.

As far as human capital policies go, Hægeland and Møen (2000) show that while Norway in the 1950s had a proportion of the population with university degrees of 8 percent, which was the OECD mean, this proportion in Norway today is 20 percent. At the same time, the OECD mean today is 15 percent. They further document that research and development at universities and research institutions in 1963 amounted to 4 500 man-labor years. In 1995, it was 14 500. This is, however, indicative of the effort to implement the policy, not its success. We can only speculate that the investments into human capital contribute to growth in a way alternative uses of investments could not.

How should we view the counter-cyclical and labor market policies? In Table 3, row 2, we observe that Norway has succeeded in utilizing a large share of the labor force. This is indicative of an economically sound policy. We can presume that the current large share was, and the similar large historical shares were, results of counter-cyclical policies and labor market policies. Labor market design is of much interest because it is important in determining the flexibility of an economy and its capability of handling the restructuring implied by a resource gift and the disappearance of it. There is a large literature on the topic, and I shall not attempt a review here. Let me say that Bjørnland (1998) discusses the labor market design (p. 558), and suggests that government consumption as a result of the oil-induced expansion of the public sector provided a stimulus for female participation in the labor market. That may prove to have been essential. Fifty percent of the talent in any economy is female. Engaging this talent into productive activity is likely to contribute to growth. The relevance to resource rents lies in the possibility of using, as Norway did, parts of the revenues to finance a growing public sector that increasingly employs female servants.

These policies, especially labor market policies, require no resource wealth, of course. However, resource wealth may make the policies easier to implement. In the daily practice of policy prescribing and implementing counter-cyclical policies may be difficult to because of intricacies of political economy nature. Changing tax receipts in excess of the built-in automatic cyclical changes in revenue are problematic. When the government commands revenues from resource rents they are in a position to follow counter-cyclical policies faster, with more vigilance, and with more flexibility. Measuring the success of such policies is a challenge since we do not have the counter-factual growth path of how the economy would have fared without the policies. However, Cappelen, Eika, and Holm (2000) have examined the case when the labor supply is not exogenous, but endogenous, which is a variation of the

counter-cyclical policy theme. In a multi-sectoral, large-scale macroeconomic model of the Norwegian economy (MODAG) they have simulated how Norway would have performed on key macroeconomic variables without oil, using endogenous labor supply as a model feature. The results are tabulated in Table 5. We observe that while unemployment was of magnitude 3.3 percent in 1998, they compute that it would have been 6.3 percent in the counterfactual path without oil. One centerpiece of this model is that it allows wage formation to mimic the Norwegian institutional set-up, where the productivity increases in the manufacturing sector determines the ceiling of general wage increases. As a result of the wage-limit and endogenous labor-supply, they find that the real GDP growth for a quarter of a century might have been as low as 1.8 percent per year in the counterfactual without oil compared to the actual 3.3 percent with oil.

Table 5. Economic Development in Norway, actual (with oil) and counterfactual (without oil), 1974-1999, Compared to EU

	EU	Norway, actual (w/oil)	Norway, counterfactual (w/o oil) ¹
Total growth, real hour wage, manufacturing, 1974-1998	7.4 ²	47.1	32.5
Unemployment, 1998	10.0	3.3	6.3
Governmental Net Financial Assets, Percentage of nominal GDP, 1999	-55.6 ³	48.5	-65.8
Growth, Real GDP, 1974-1999	2.2	3.3	1.8
Growth, Real Private Consumption, 1974-1999	2.4	2.7	1.4

Source: Cappelen, Eika, and Holm (2000) and OECD, reproduced with permission from the authors. Notes: ¹Simulations in MODAG, a large-scale macroeconomic multisectoral input-output model of the Norwegian economy. ²EU15. ³Except Greece, Ireland, Luxembourg, and Portugal.

6. How Did Norway Escape the Resource Curse?

While dealing with the Dutch Disease involves mostly macroeconomic policy instruments, avoiding the Resource Curse may include more fundamental elements of society. The literature focuses on the presence of conflicts over distribution. Avoiding the curse, the literature says, reduces to *preventing rent seeking*. Most authors point toward political and economic institutions. The rationale for identifying rent seeking as the problem is that resource revenues constitute vast wealth, and when individuals or coalitions of individuals attempt to take control over it, they become less entrepreneurial. Thus, rent-seeking activity involves several detrimental aspects. First, the attempts themselves are time consuming, and draw valuable labor hours away from productive, innovative activities. Talent is wasted in the pursuit of existing wealth instead of being employed at producing

new growth. Second, when the activities are successful, the wealth may be disposed of in ways that are not conducive to growth. If the wealth is used for personal consumption abroad for the successful rent seeker, and it is not invested in domestic technological progress and human capital, growth suffers. Probably, the wealth is acquired exactly for such purposes. Few agents acquire wealth to be able to act for the common good. The country's resource rent, then, is converted to luxury items, not research and development, so growth stagnates.

There exists a large literature on why conflicts over redistribution are so disruptive to economic performance. For example, Auty's (2001a) use of predatory behavior and factional fights in some political states to explain stagnation and Auty (2001b) who argues that rent seeking degenerates into corruption, which discourages investment and limits growth. Moreover, Gylfason (2001b) emphasizes the quality of management and efficacious institutions in handling resource gifts. Baland and Francois (2000) argue that the opportunity cost of rent seeking is foregone entrepreneurship. Paldam (1997) demonstrates how rent seeking has affected Greenland negatively through such effects.

What political and economic institutions in Norway prevented rent seeking? What parts of the political economy helped reduce conflicts of distribution? I cannot hope to prove beyond doubt the presence of the factors I shall mention, nor can I identify the relative strengths of each factor. In stead, this article presents a story with some key elements. Some elements are part of what constitute a democracy and a developed country, and are therefore shared with other rich countries. Consequently, rich countries may be immune to the (worst cases) of the resource curse. Other elements are unique to Norway, and may not easily be generalized or replicated. More specifically, this article examines four factors: large-scale conflicts, small-scale illegal rent-seeking, small-scale legal rent-seeking, and political purchase of power through election promises. I argue that a social contract and social norms prevented the first. A legal system and norms reduced the frequency of the second. Politico-economic institutions reduced the impact of the third. Policymakers and politicians restrained themselves from the fourth -- until erosion brought down some of the barrier in the late 90s.

Conflicts, in the shape of rent seeking, involve coalition formation and result in coalitions seeking to prey on victimized weaker groups in a non-transparent way, affecting the country's production, labor effort, trust, and investment in the process. Such groups may for example be a ruling class or an elite of powerful allies. But it could also be larger segments of society that come together in large coalitions, such as unions, and threaten major strikes, thereby initiating a rush to relatively higher compensation and conflicts of relative position. Norway was able to maintain low frequencies and

small amplitudes of labor conflicts, plausibly because of what Eichengreen (1996) would call a *social contract* and similar to Rodrik's (1995, 1997) concerted collective actions. Both employers and employees were satisfied with contract conditions and the eventual outcome. Table 3 shows why: Norway is now ranked number one on the U. N. Human Development Index. Thus, with such rewards, the incentives to defect were smaller given that norms helped agents feel obliged to participate in efforts toward the common good. Moreover, Norway has had no ruling elite that could funnel revenues into small, private ends. Instead, it is a highly egalitarian society that prides itself for it. This article's view is that Eichengreen's notion of a social contract therefore is particularly relevant to understanding Norway's success in avoiding conflicts over distribution. When the public sentiment is one of satisfaction with and acceptance of the way society is organized each individual feel less inclined to participate in conflicts such as strikes, sit-downs, or walk-slows. In Norway, laborers appeared content with the visible economic growth, knowing that profits would be plowed back into growth. The perception was that resource revenues were used to the benefit of all, in investments, technological advance, and education. Laborers found support for this perception in evidence: real capital accumulated, economic growth was reported, and levels of education grew.

Even if norms are hard to document, their impact on growth may be substantial. Norms may prevent individuals from seeking effortless reward and may reduce the frequency of conflicts. The early sociologist Max Weber pointed out the importance of the protestant work ethic. It is often thought to be very much in effect in Norway. Norms for effort and equal reward receive popular support and function as a behavior guideline in Norway. Claims of such norms are presented, examined, and discussed in Barth and Moene (2000). When the judicial system cannot capture individual defections from the social contract, norms may deter them. But how can we substantiate the presence of norms? This article does not attempt to, but let me instead indicate how norms may serve as building blocks in Norway. Norms ensure wide support for a public school system, which every pupil attends. They lead to a public health care system, in which every citizen is automatically entitled to state-of-the-art medical treatment with only very small co-payments. They allow a system in which tax payments and taxable income actually are public information, published by newspapers and accessible on the Internet. Consider that for a moment. Citizens may easily find out other's contribution to finance collective goals in media channels. This creates not only a sense of monitoring, but also a sense of common destiny and team spirit, from which few seem to desire to challenge or feel dissatisfaction with. In summary, norms constitute institutions that affect actions like laws do, even if the sanctions are different in nature and differently imposed.

In general, then, open large-scale conflicts of distribution and disruptions of economic performance were few in Norway. But what about small-scale individual attempts at confiscate parts of resource revenues, the typical rent seeking activity? Individual rent seeking may take two forms: illegal and legal. When norms fail, a strong and swift judicial system appears to detect and thus deter individual, fractional, and unlawful enrichment. The latter may then be seen to be one of the reasons why, possibly, developed countries are less prone to be affected by the curse. Illegal confiscation of collective wealth through corruption, theft, and misreporting is plausibly relatively infrequent in Norway due to the transparency of a small country, a well functioning legal system, intense media attention, and surveillance and monitoring by public agencies. Table 3 shows that studies find relatively low levels of corruption in Norway.

Transparency, media scrutiny, rule of law, and politico-economic institutions prevent easy access for small coalitions to the public funds of resource rents. The following two factors may help understanding why: First, oil revenues befall the government. Thus, any attempt at securing for oneself a larger share of the pie has to go through negotiations with the government. Second, the avenues that ensure illegitimate access to oil revenues for individuals from the government are in fact limited, quite transparent to all, and always under media scrutiny. To see how oil revenues are channeled through the government to special interests, recall the following structural relations: the government taxes profits of private oil companies, the government owns its own oil company, and the government owns the ground from which oil is extracted. The avenues to revenue access may take another form then, legal rent seeking. It may also be called negotiation or lobbying.

Legal acquisition of funds is possible for any Norwegian citizen through negotiation with the government. The negotiation may take the form of direct wage negotiation or through lobbying in parliament for subsidies and support to specific sectors; tariffs; and tax relief. There are some examples of powerful unions and coalitions securing favorable wage increases, and of evidence that pressure groups have been quite successful in lobbying for transfers, subsidies, and other benefits; see e.g. Brunstad (2003). Overall, however, this activity does not seem widespread. Moreover, since the public sector employs a large share of the Norwegian labor force, and since the government may finance this service stream by converting oil assets denominated in dollars into Norwegian kroner, it is at any time possible for individuals or fractions to seek an appropriation of larger parts of the oil wealth either by persuading the public sector to employ them favorably or by persuading the public sector to accept large wage raises. This would be especially acute in situations where individual employees negotiated with an individual public servant, and where the latter would not face the costs

of yielding to pressure, thus creating moral hazard possibilities. This principal-agent problem was and still is largely avoided, however, since most wage negotiations go through a collective and transparent forum, biannually in large-scale negotiations between employer unions and employee unions, results of which are reported in the media. Thus, the centralized wage formation system may not only have helped avoid the Dutch Disease, but also helped avoid the curse.

The fourth factor in avoiding rent-seeking is especially elusive to scrutiny and tests. It is related to the interplay between economics and politics and how the election system works. Explaining election results is an emerging branch of economic inquiry; see e.g. Persson and Tabellini (2000). Politicians seeking power may purchase this power and pay with promises. Thus, when resource rents accrue and the government controls a massive chest of resource rents it is possible for politicians to promise special interests that they be rewarded as long as they elect the politician. This may create a rush of promises, a massive race, which in turn may erode resistance to shielding the economy through a resource fund. Tapping into this fund to pay back election promises would first create excess demand and real appreciation; second rewards to special interests. The latter would make it tempting to position oneself as recipient, and thus encourage rent seeking. It appears that Norway through fiscal discipline, debt repayments, and through the establishment of a Petroleum Fund managed to avoid this phenomenon in the 80s and early 90s. However, the success has bred its own complications. The accumulation of reserves abroad is now highly visible, and daily reported in the media. This has created a perception of immense wealth, not unfounded, among citizens. Even if accurate, this wealth cannot without difficult repercussions immediately be brought into an economy at full capacity, and explaining this has proven difficult. Instead, recently politicians -- seeking popularity votes -- have been seen to demand utilization of this fund, ignoring advice from economists and prudent finance ministers. In short, the containability of resource wealth may be inversely related to the magnitude of accumulated reserves.

7. But All Is Not Well: When Political Resistance Erodes

As late as the mid-90s, Norway seems to have avoided both the curse and the disease. But Røed Larsen (2003) detects a negative structural break around 1997. Concomitantly, in Table 2 we observe that the period-specific additional growth coefficient for Norway 1997-2002 is negative. Norway's faster growth relative to Denmark and Sweden weakens. Close scrutiny of Figure 1 shows that Norway reaches maximum lead over Denmark in 1998, in which the difference in GDP per capita was of magnitude 2 506 U.S. 1999 dollars, and maximum lead over Sweden in 1997, in which the difference was 6 431 U.S. 1999 dollars. After that, the lead diminishes, and is reduced to 2 007 and 4

837 USD per head, respectively, in 2002. Table 6 summarizes the growth numbers of the relative slow-down. It is still too early to conclude, but it seems as if Norway experiences some curse symptoms.

Table 6. Recent Growth in 1993-1998 and 1999-2002, Scandinavian Countries, Gross Domestic Product per Capita, U.S. 1999 Dollars at PPP

	Norway	Denmark	Sweden
GDP per capita, 1993-98	21.5%	15.8%	14.8%
GDP per capita, 1999-2002	3.1%	4.6%	6.7%

Source: BLS (2003). U.S. 1999 Dollars, PPP. Online: <http://www.bls.gov>.

Table 7. Changes in Total Labor Hours in Key Sectors, 1993-1998 and 1999-2002

Period	Oil and Natural Gas ²	Industry	Public Sector
1993-1998	11.1%	11.4%	4.8%
1999-2002	-5.4%	-7.3%	-1.9%

Sources and Notes: Statistics Norway, National Accounts. Online: <http://www.ssb.no/emner/09/01/nr>. Table 21.

Moreover, Table 7 uncovers that as Norway grew relative to its neighbors into the 90s, it looks as if Norway initially avoided the labor hours displacement from industry that the Dutch Disease involves. In fact, in the period 1993-1998 the labor effort exerted in the industrial sector increased *more* than it did in the oil sector, by 11.4 per cent compared to 11.1 per cent. The second row, however, in Table 7 reveals two other phenomena in the period 1999-2002. First, there is a contraction of exerted labor hours in all three key sectors. This accompanies the structural break retardation Røed Larsen (2003), and may again be indicative of a mild curse. Second, the relative magnitude of contraction is a symptom of the disease. Industry sheds most labor hours, and the public sector sheds the least. This may still only be indicative of a natural progression of development, but nevertheless breaks the earlier trend from 1993-1998.

Observers of Norwegian economy and society have noted that the pressure from oil revenues intensified during the 90s. By the turn of the millennium, the pressure from the public on policymakers was so intense that the government felt forced to institutionalize the so-called "action rule", an oil management strategy that specified that only *returns* to the Petroleum Fund could be used domestically, not the Fund itself. This was a political attempt at binding oneself to the mast, after the advice of prominent economists, in order to insulate oneself against popular calls from sirens. It was institutionalized to buttress the effort of shielding the economy from the excess demand in the

spending effect so that real appreciation and loss of competitiveness could be avoided. However, the rope was not bound tight. Norway has spent much more than the action rule prescribes each year, and in 2003 public spending is about fifty percent larger than the prescribed dosage. We may interpret this as an erosion of the forward-looking policies discussed above.

The erosion of proper management is driven by popular demand, and challenges analysts to understand the sociology and political economy of resource wealth. The perception is that Norway is extremely wealthy. The attitude is that it is inadmissible that certain tasks are left unattended-to when the nation is fabulously rich. The riches are visible for all through the accumulation of the Petroleum Fund, now exceeding 50 percent of GDP; see Table 4. The political mechanism amounts to this: politicians promise to use oil receipts as remedies. There is thus a pulverization of responsibility due to moral hazard. Politicians who are elected on a platform of spending receive much support, but face a small risk. Disadvantages of real appreciation and Dutch Disease lie in the future, are shared by many, and the links to promises are obscure. Thus, the political mechanisms offer little incentive to restraint.

In return for promises, generous politicians are elected to parliament. Sociologically, this creates an atmosphere of spending. The resulting economic mechanism is that the government channels oil fund money to public finance. This allows public bids in competition with private enterprise. Labor flows to the higher bidder, which is publicly controlled, prices and wages increase, the interest rate rises, and the nominal exchange rate appreciates. We observe real appreciation and reallocation of labor into domestic production of non-tradable goods and services. Private, industrial activities are crowded out. Possibly then, Norway's successful track record may largely be understood by saying that oil revenues are more manageable when they need go directly to debt repayment than when they go directly into a Fund. Since the latter is quite recent, it was too early in the 80s and 90s to say that Norway escaped the temptation of resource riches. However, it is also still too early to assess the magnitudes of the political spiral of resource rent utilization. Norway may still escape from the curse and disease with only moderate effects depending of the efficacy of the institutions discussed above.

8. Concluding Remarks and Policy Implications

Many countries experience slow or negative growth after discovery of a valuable resource. This phenomenon has been named the Resource Curse. Factors of production move to extraction activities, and this factor movement effect is part of the mechanism in the Dutch Disease. The disease also includes a spending effect since resource revenues allow increases in aggregate demand, in turn

creating excess demand domestically, which puts additional pressure on manufacturing through real appreciation and loss of competitiveness. Moreover, if there are positive externalities connected to having a large non-resource traded goods sector, resource countries also face a spillover-loss effect since resource extraction may imply slower technological progress. Thus, moving factors from the traded goods sector to the resource-extraction sector leads to loss of positive externalities. Both the curse and the disease are resource extraction phenomena. Some economists believe that only poor countries are afflicted by the curse, and that rich countries are immune to it. Even if true, it begs the question of why. Some economists believe that the disease is not a disease, but merely structural adjustment that easily and quickly may be reversed. This article has examined both positions, and suggests that they may be mistaken. I do this by using a Norway's management of its oil wealth as a case study.

First, I show that Norway caught up with and passed its highly similar neighbors in the 80s. This involved an escape of the resource curse. Second, during this growth Norway does not seem to reallocate factors from industry to resource-extraction and public service at an alarming rate or lose competitiveness at an exceedingly large rate due to real appreciation from the spending effect. It does not seem as if Norway lost important spillover effects. In stead, it appears as if Norway avoided both the Resource Curse and the Dutch Disease. Moreover, since growth accelerated only after oil discovery it seems clear that oil was the engine of growth. Then, when so many resource-rich countries have experienced growth problems after resource discovery, Norway's management of its oil riches deserves scrutiny. The question is what Norway did right.

This article argues that rent seeking is the pathogen of the curse, and agrees with other authors that labor displacement, spending, and spillover-loss effects lead to the disease. Social norms, a social contract, transparency, and rule of law may contribute to limiting rent seeking. Thus, explanations involve sociology. This article examines four such political and sociological factors of rent seeking: large-scale conflicts, small-scale illegal rent-seeking, small-scale legal rent-seeking, and political purchase of power through election promises.

I sort Norway's macroeconomic policies implemented to handle the Dutch Disease into seven categories, not all of them immediately consistent with the conventional economic recipe. Most notably, since spending of oil money may involve deterioration of future comparative advantage, there may exist a negative externality in such spending. Concerted public and governmental effort may shield the economy from this effect in a way individual behavior in a laissez-faire economy cannot.

For example, the government may invest the revenues outside the economy. This shields the economy from the spending effect, and limits real appreciation and labor displacement. Moreover, the erosion of the traded goods sector or manufacturing may be prevented through income coordination. Income coordination may improve upon laissez-faire since wage increases in the public sector may be limited to the productivity increase in the internationally competing industrial sector. In essence, income coordination internalizes the externality resulting from inter-temporal adjustment problems. Since Norway has one of the world's most centralized wage negotiating systems it managed to make manufacturing the wage leader; in contrast to other resource economies where resource extraction is the wage leader. In addition, this article discusses to what extent spillover losses from a contraction in manufacturing may be compensated for by spillover gains in the establishment of a capital-intense, technologically advanced off shore oil sector. This would make the Norwegian oil sector different from the oil sectors in countries that build up on-land oil-extracting expertise.

Intriguingly, it appears as if Norway did not continue its relative growth compared to Denmark and Sweden. A diagnostic test shows that it went through a structural break in the 90s. Growth slowed down. Domestically, industry rapidly decreased in 1999-2002 compared to 1993-1998. The stagnation may be the result of a late onset of a curse and a disease. I inspect the political economy of the political and popular pressure that resulted from building up vast financial wealth abroad. In short, even if rent seeking is avoided, another form of in-optimal rent utilization may arise. Politicians may purchase political power in elections by extending generous promises of using oil revenues to special interests. When they keep such promises, excess demand may arise, which creates real appreciation, loss of competitiveness, de-industrialization and both the curse and the disease.

References

- Auty, R. M. (2001a): The Political Economy of Resource-Driven Growth, *European Economic Review*, **45** (4-6): 839-846.
- Auty, R. M. (2001b): Transition Reform in the Mineral-Rich Caspian Region Countries, *Resources Policy*, **27**, pp.25-32.
- Baland, J.-M. and P. Francois (2000): Rent-seeking and Resource Booms, *Journal of Development Economics*, **61**, pp. 527-542.
- Balassa, B. (1964): The Purchasing Power Doctrine: A Reappraisal, *Journal of Political Economy*, **72**, pp. 584-596.
- Barth, E. and K.O. Moene (2000): Er lønnsforskjelle for små? [Are Wage Differences Too Small?], in NOU 21: *En strategi for sysselsetting og verdiskaping*, Vedlegg 3, Oslo: Norges Offentlige Utredninger.
- Bjørnland, H. C. (1998): The Economic Effects of North Sea Oil on the Manufacturing Sector, *Scottish Journal of Political Economy*, **45**: 5, pp. 553-585.
- Bjørnstad, R. and P. R. Johansen (2002): Desentralisert lønnsdannelse: avindustrialisering og økt ledighet selv med et tøffere arbeidsliv [Decentralized Wage Negotiation: De-industrialization and Increased Unemployment Even in a More Competitive Labor Market], *Norsk Økonomisk Tidsskrift*, **116**: 1, pp. 69-98.
- Brunstad, R. J. and J. M. Dyrstad (1997): Booming Sector and Wage Effects: An Empirical Analysis on Norwegian Data, *Oxford Economic Papers*, **49**: 1, pp. 89-103.
- Brunstad, R. J. (2003): Hvorfor følger ikke politikerne økonomenes råd i jordbrukspolitikken? (Why don't politicians follow advice from economists in agricultural policy?), *Økonomisk Forum*, **57**: 1, pp. 30-34.
- Bureau of Labor Statistics (2003): Comparative Real Gross Domestic Product Per Capita and Per Employed Person. Fourteen Countries, 1960-2002, U.S. Department of Labor. <http://www.bls.gov/fls>
- Bye, T., Å. Cappelen, T. Eika, E. Gjelsvik, and Ø. Olsen (1994): Noen konsekvenser av petroleumsvirksomheten for norsk økonomi (Some Consequences of the Petroleum Activities on the Norwegian Economy), *Report 94/1*, Oslo: Statistics Norway.
- Cappelen, Å., T. Eika, and I. Holm (2000): Resource Booms: Curse or Blessing? article presented at the Annual Meeting of American Economic Association 2000, forthcoming in the *Discussion Paper-series* (2004), Oslo: Statistics Norway.
- Chatterji, M. and S. Price (1988): Unions, Dutch Disease and Unemployment, *Oxford Economic Papers*, **40**, pp. 302-321.
- Corden, W. M. and J. P. Neary (1982): Booming Sector and De-industrialization in a Small Open Economy, *Economic Journal*, **92**, pp. 825-848.
- Corden, W. M. (1984): Booming Sector and Dutch Disease Economics: Survey and Consolidation, *Oxford Economic Papers*, **36**, pp. 359-380.

- Eichengreen, B. (1996): Institutions and Economic Growth: Europe after World War II, in N. Crafts and G. Toniolo (eds.): *Economic Growth in Europe Since 1945*. Cambridge: Cambridge University Press, pp. 38-72.
- Eika, T. and K. A. Magnussen (2000): Did Norway gain from the 1979-1985 oil price shock? *Economic Modelling*, **17**, pp. 107-137.
- Gylfason, T., T. T. Herbertson, and G. Zoega (1997): A Mixed Blessing: Natural Resource and Economic Growth, Discussion Paper No. 1668, London: CEPR.
- Gylfason, T. (2001a): Natural Resources, Education, and Economic Development, *European Economic Review*, **45**, pp. 847-859.
- Gylfason, T. (2001b): Nature, Power, and Growth, *Scottish Journal of Political Economy*, **48:5**, pp. 558-588.
- Hægeland, T. and J. Møen (2000): Kunnskapsinvesteringer og økonomisk vekst (Investments in Knowledge and Economic Growth), in NOU 2000: 14 *Frihet med ansvar*, Vedlegg 15, Oslo: Norges Offentlige Utredninger.
- Hutchison, M. M. (1994): Manufacturing Sector Resiliency to Energy Booms: Empirical Evidence from Norway, the Netherlands, and the United Kingdom, *Oxford Economic Papers*, **46: 2**, pp. 311-329.
- Mikesell, R. F. (1997): Explaining the Resource Curse, with Special Reference to Mineral-Exporting Countries, *Resources Policy*, **23: 4**, pp. 191-199.
- Paldam, M. (1997): Dutch Disease and Rent Seeking: The Greenland Model, *European Journal of Political Economy*, **13**, pp. 591-614.
- Persson, T. and G. Tabellini (2000): *Political Economics. Explaining Economic Policy*. Cambridge, MA: MIT Press.
- Rodrik, D. (1995): Getting Interventions Right: How South Korea and Taiwan Grew Rich, *Economic Policy*, **20**, pp. 53-97.
- Rodrik, D. (1997): The 'Paradoxes' of the Successful State, *European Economic Review*, **41**, pp. 411-442.
- Røed Larsen, E. (2003): Are Rich Countries Immune to the Resource Curse? Evidence from Norway's Management of Its Oil Riches, Discussion Paper 362, Oslo: Statistics Norway
- Sachs, J. D. and A. M. Warner (1999): The Big Push, Natural Resource Booms and Growth, *Journal of Development Economics*, **59**, pp. 43-76.
- Sachs, J. D. and A. M. Warner (2001): The Curse of Natural Resources, *European Economic Review*, **45**, s 827-838.
- Stevens, P. (2003): Resource Impact: Curse or Blessing? A Literature Survey, *Journal of Energy Literature*, **9 (1)**, pp. 3-42.

Torvik, R. (2001): Learning by Doing and the Dutch Disease, *European Economic Review*, **45**, pp. 285-306.

Torvik, R. (2002): Natural Resources, Rent Seeking, and Welfare, *Journal of Development Economics*, **67**, pp. 455-470.

Usui, N. (1997): Dutch Disease and Policy Adjustments to the Oil Boom: A Comparative Study of Indonesia and Mexico, *Resources Policy*, **23**: 4, pp. 151-162.

van Wijnbergen, S. (1984): The "Dutch Disease": A Disease After All? *Economic Journal*, **94**, pp. 41-55.

Wallerstein, M. (1999): Wage-Setting Institutions and Pay Inequality in Advanced Industrial Societies, *American Journal of Political Science*, **43**: 3, pp. 649-680.

Data and Estimation Method

Real GDP per capita converted to U.S. 1999 Dollars using a technique involving purchasing power parity can be found in Table 1 at page 9 in "Comparative Real Gross Domestic product Per Capita and Per Employed Person. Fourteen Countries. 1960-2002", U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, July 2003. Online access is possible through the web page: <http://www.bls.gov/fls/>.

Gross domestic products measured in national currencies are converted to comparable entities using purchasing power parity (PPP). For a given country, a ratio is computed that consists in the numerator of the monetary units needed to purchase a common basket of goods and in the denominator the monetary units needed to purchase the basket in the United States. This ratio is then used to compute an international equivalent of a country's gross domestic product.

Details of Trend Estimation

Equations (1)-(3) describe a first-order autoregressive process, and it is estimated through feasible general least squares:

$$(1) \quad GDP_i^t / cap_i^t = \alpha_i + \beta_i t + e_i^t, i \in \{Denmark, Sweden\}, t \in \{0, 1, 2, \dots, 42\},$$

$$(2) \quad e_i^t = \phi e_i^{t-1} + \varepsilon_i^t,$$

$$(3) \quad \varepsilon_i^t = IN(0, \sigma_i^2),$$

in which the variable t is a time counter, the stochastic term e follows a first-order autoregressive process governed by the autoregressive factor ϕ , and the deterministic trend component is governed by the intercept α and the slope β . The stochastic term ε represents white noise and is identically, independently, and normally distributed with mean zero and constant variance. Subscripts i and t refer to country and time. I use maximum likelihood estimation in the *SAS* statistical analysis and programming package.

In this package, the reported total R-squared in Table 2 is unity minus the ratio of the sum of squared differences between model predictions and original observations to the sum of squared differences between the original observations and their mean. The regression R-squared is unity minus the ratio of the sum of squared differences between model predictions and the AR-1 transformed response variables to the sum of squared differences between the transformed response variables and their mean. The large difference between the two R-squared measures indicates presence of an AR-1 process that has been accounted for.

Since Røed Larsen (2003) documents an acceleration and deceleration in Norway's relative development, Norway's growth is estimated through a slightly different model, a 3-step linear spline. It is similar to the one presented in equations (1)-(3) for Denmark and Sweden, except that I have modeled an additional coefficient for the growth speed in the period 1975-2002, and a third growth speed component in the period 1997-2002. Thus, equation (1) is changed to (1') for Norway:

$$(1') \quad GDP_n^t / cap_n^t = \alpha_n + \beta_{1,n}t + \beta_{2,n}t_2 + \beta_{3,n}t_3 + e_n^t, \begin{cases} t_2 = t - 14 & \text{if } t > 14 \\ t_3 = t - 36 & \text{if } t > 36 \\ t_2, t_3 = 0 & \text{otherwise.} \end{cases}$$

Recent publications in the series Discussion Papers

- 286 F.R. Aune, T. Bye and T.A. Johnsen (2000): Gas power generation in Norway: Good or bad for the climate? Revised version
- 287 A. Benedictow (2000): An Econometric Analysis of Exports of Metals: Product Differentiation and Limited Output Capacity
- 288 A. Langørgen (2000): Revealed Standards for Distributing Public Home-Care on Clients
- 289 T. Skjerpen and A.R. Swensen (2000): Testing for long-run homogeneity in the Linear Almost Ideal Demand System. An application on Norwegian quarterly data for non-durables
- 290 K.A. Brekke, S. Kverndokk and K. Nyborg (2000): An Economic Model of Moral Motivation
- 291 A. Raknerud and R. Golombek: Exit Dynamics with Rational Expectations
- 292 E. Biørn, K-G. Lindquist and T. Skjerpen (2000): Heterogeneity in Returns to Scale: A Random Coefficient Analysis with Unbalanced Panel Data
- 293 K-G. Lindquist and T. Skjerpen (2000): Explaining the change in skill structure of labour demand in Norwegian manufacturing
- 294 K. R. Wangen and E. Biørn (2001): Individual Heterogeneity and Price Responses in Tobacco Consumption: A Two-Commodity Analysis of Unbalanced Panel Data
- 295 A. Raknerud (2001): A State Space Approach for Estimating VAR Models for Panel Data with Latent Dynamic Components
- 296 J.T. Lind (2001): Tout est au mieux dans ce meilleur des ménages possibles. The Pangloss critique of equivalence scales
- 297 J.F. Bjørnstad and D.E. Sommervoll (2001): Modeling Binary Panel Data with Nonresponse
- 298 Taran Fæhn and Erling Holmøy (2001): Trade Liberalisation and Effects on Pollutive Emissions and Waste. A General Equilibrium Assessment for Norway
- 299 J.K. Dagsvik (2001): Compensated Variation in Random Utility Models
- 300 K. Nyborg and M. Rege (2001): Does Public Policy Crowd Out Private Contributions to Public Goods?
- 301 T. Hægeland (2001): Experience and Schooling: Substitutes or Complements
- 302 T. Hægeland (2001): Changing Returns to Education Across Cohorts. Selection, School System or Skills Obsolescence?
- 303 R. Bjørnstad: (2001): Learned Helplessness, Discouraged Workers, and Multiple Unemployment Equilibria in a Search Model
- 304 K. G. Salvanes and S. E. Førre (2001): Job Creation, Heterogeneous Workers and Technical Change: Matched Worker/Plant Data Evidence from Norway
- 305 E. R. Larsen (2001): Revealing Demand for Nature Experience Using Purchase Data of Equipment and Lodging
- 306 B. Bye and T. Åvitsland (2001): The welfare effects of housing taxation in a distorted economy: A general equilibrium analysis
- 307 R. Aaberge, U. Colombino and J.E. Roemer (2001): Equality of Opportunity versus Equality of Outcome in Analysing Optimal Income Taxation: Empirical Evidence based on Italian Data
- 308 T. Kornstad (2001): Are Predicted Lifetime Consumption Profiles Robust with respect to Model Specifications?
- 309 H. Hungnes (2001): Estimating and Restricting Growth Rates and Cointegration Means. With Applications to Consumption and Money Demand
- 310 M. Rege and K. Telle (2001): An Experimental Investigation of Social Norms
- 311 L.C. Zhang (2001): A method of weighting adjustment for survey data subject to nonignorable nonresponse
- 312 K. R. Wangen and E. Biørn (2001): Prevalence and substitution effects in tobacco consumption. A discrete choice analysis of panel data
- 313 G.H. Bjertnær (2001): Optimal Combinations of Income Tax and Subsidies for Education
- 314 K. E. Rosendahl (2002): Cost-effective environmental policy: Implications of induced technological change
- 315 T. Kornstad and T.O. Thoresen (2002): A Discrete Choice Model for Labor Supply and Child Care
- 316 A. Bruvoll and K. Nyborg (2002): On the value of households' recycling efforts
- 317 E. Biørn and T. Skjerpen (2002): Aggregation and Aggregation Biases in Production Functions: A Panel Data Analysis of Translog Models
- 318 Ø. Døhl (2002): Energy Flexibility and Technological Progress with Multioutput Production. Application on Norwegian Pulp and Paper Industries
- 319 R. Aaberge (2002): Characterization and Measurement of Duration Dependence in Hazard Rate Models
- 320 T. J. Klette and A. Raknerud (2002): How and why do Firms differ?
- 321 J. Aasness and E. Røed Larsen (2002): Distributional and Environmental Effects of Taxes on Transportation
- 322 E. Røed Larsen (2002): The Political Economy of Global Warming: From Data to Decisions
- 323 E. Røed Larsen (2002): Searching for Basic Consumption Patterns: Is the Engel Elasticity of Housing Unity?
- 324 E. Røed Larsen (2002): Estimating Latent Total Consumption in a Household.
- 325 E. Røed Larsen (2002): Consumption Inequality in Norway in the 80s and 90s.
- 326 H.C. Bjørnland and H. Hungnes (2002): Fundamental determinants of the long run real exchange rate: The case of Norway.
- 327 M. Søberg (2002): A laboratory stress-test of bid, double and offer auctions.
- 328 M. Søberg (2002): Voting rules and endogenous trading institutions: An experimental study.
- 329 M. Søberg (2002): The Duhem-Quine thesis and experimental economics: A reinterpretation.
- 330 A. Raknerud (2002): Identification, Estimation and Testing in Panel Data Models with Attrition: The Role of the Missing at Random Assumption
- 331 M.W. Arneberg, J.K. Dagsvik and Z. Jia (2002): Labor Market Modeling Recognizing Latent Job Attributes and Opportunity Constraints. An Empirical Analysis of Labor Market Behavior of Eritrean Women

- 332 M. Greaker (2002): Eco-labels, Production Related Externalities and Trade
- 333 J. T. Lind (2002): Small continuous surveys and the Kalman filter
- 334 B. Halvorsen and T. Willumsen (2002): Willingness to Pay for Dental Fear Treatment. Is Supplying Fear Treatment Social Beneficial?
- 335 T. O. Thoresen (2002): Reduced Tax Progressivity in Norway in the Nineties. The Effect from Tax Changes
- 336 M. Søberg (2002): Price formation in monopolistic markets with endogenous diffusion of trading information: An experimental approach
- 337 A. Bruvold og B.M. Larsen (2002): Greenhouse gas emissions in Norway. Do carbon taxes work?
- 338 B. Halvorsen and R. Nesbakken (2002): A conflict of interests in electricity taxation? A micro econometric analysis of household behaviour
- 339 R. Aaberge and A. Langørgen (2003): Measuring the Benefits from Public Services: The Effects of Local Government Spending on the Distribution of Income in Norway
- 340 H. C. Bjørnland and H. Hungnes (2003): The importance of interest rates for forecasting the exchange rate
- 341 A. Bruvold, T.Fæhn and Birger Strøm (2003): Quantifying Central Hypotheses on Environmental Kuznets Curves for a Rich Economy: A Computable General Equilibrium Study
- 342 E. Biørn, T. Skjerpen and K.R. Wangen (2003): Parametric Aggregation of Random Coefficient Cobb-Douglas Production Functions: Evidence from Manufacturing Industries
- 343 B. Bye, B. Strøm and T. Åvitsland (2003): Welfare effects of VAT reforms: A general equilibrium analysis
- 344 J.K. Dagsvik and S. Strøm (2003): Analyzing Labor Supply Behavior with Latent Job Opportunity Sets and Institutional Choice Constraints
- 345 A. Raknerud, T. Skjerpen and A. Rygh Swensen (2003): A linear demand system within a Seemingly Unrelated Time Series Equation framework
- 346 B.M. Larsen and R.Nesbakken (2003): How to quantify household electricity end-use consumption
- 347 B. Halvorsen, B. M. Larsen and R. Nesbakken (2003): Possibility for hedging from price increases in residential energy demand
- 348 S. Johansen and A. R. Swensen (2003): More on Testing Exact Rational Expectations in Cointegrated Vector Autoregressive Models: Restricted Drift Terms
- 349 B. Holtmark (2003): The Kyoto Protocol without USA and Australia - with the Russian Federation as a strategic permit seller
- 350 J. Larsson (2003): Testing the Multiproduct Hypothesis on Norwegian Aluminium Industry Plants
- 351 T. Bye (2003): On the Price and Volume Effects from Green Certificates in the Energy Market
- 352 E. Holmøy (2003): Aggregate Industry Behaviour in a Monopolistic Competition Model with Heterogeneous Firms
- 353 A. O. Ervik, E.Holmøy and T. Hægeland (2003): A Theory-Based Measure of the Output of the Education Sector
- 354 E. Halvorsen (2003): A Cohort Analysis of Household Saving in Norway
- 355 I. Aslaksen and T. Synnøstvedt (2003): Corporate environmental protection under uncertainty
- 356 S. Glomsrød and W. Taoyuan (2003): Coal cleaning: A viable strategy for reduced carbon emissions and improved environment in China?
- 357 A. Bruvold T. Bye, J. Larsson og K. Telle (2003): Technological changes in the pulp and paper industry and the role of uniform versus selective environmental policy.
- 358 J.K. Dagsvik, S. Strøm and Z. Jia (2003): A Stochastic Model for the Utility of Income.
- 359 M. Rege and K. Telle (2003): Indirect Social Sanctions from Monetarily Unaffected Strangers in a Public Good Game.
- 360 R. Aaberge (2003): Mean-Spread-Preserving Transformation.
- 361 E. Halvorsen (2003): Financial Deregulation and Household Saving. The Norwegian Experience Revisited
- 362 E. Røed Larsen (2003): Are Rich Countries Immune to the Resource Curse? Evidence from Norway's Management of Its Oil Riches
- 363 E. Røed Larsen and Dag Einar Sommervoll (2003): Rising Inequality of Housing? Evidence from Segmented Housing Price Indices
- 364 R. Bjørnstad and T. Skjerpen (2003): Technology, Trade and Inequality
- 365 A. Raknerud, D. Rønningen and T. Skjerpen (2003): A method for improved capital measurement by combining accounts and firm investment data
- 366 B.J. Holtmark and K.H. Alfßen (2004): PPP-correction of the IPCC emission scenarios - does it matter?
- 367 R. Aaberge, U. Colombino, E. Holmøy, B. Strøm and T. Wennemo (2004): Population ageing and fiscal sustainability: An integrated micro-macro analysis of required tax changes
- 368 E. Røed Larsen (2004): Does the CPI Mirror Costs.of.Living? Engel's Law Suggests Not in Norway
- 369 T. Skjerpen (2004): The dynamic factor model revisited: the identification problem remains
- 370 J.K. Dagsvik and A.L. Mathiassen (2004): Agricultural Production with Uncertain Water Supply
- 371 M. Greaker (2004): Industrial Competitiveness and Diffusion of New Pollution Abatement Technology – a new look at the Porter-hypothesis
- 372 G. Børnes Ringlund, K.E. Rosendahl and T. Skjerpen (2004): Does oilrig activity react to oil price changes? An empirical investigation
- 373 G. Liu (2004) Estimating Energy Demand Elasticities for OECD Countries. A Dynamic Panel Data Approach
- 374 K. Telle and J. Larsson (2004): Do environmental regulations hamper productivity growth? How accounting for improvements of firms' environmental performance can change the conclusion
- 375 K.R. Wangen (2004): Some Fundamental Problems in Becker, Grossman and Murphy's Implementation of Rational Addiction Theory
- 376 B.J. Holtmark and K.H. Alfßen (2004): Implementation of the Kyoto Protocol without Russian participation
- 377 E. Røed Larsen (2004): Escaping the Resource Curse and the Dutch Disease? When and Why Norway Caught up with and Forged ahead of Its Neighbors