Currency Gifts, Convergence and Divergence in two Neighbouring Economies

Draft

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Abstract

Currency gifts have proven to be a mixed blessing, as positive income shocks are often followed by financial problems and slow economic growth rates. Norway has twice been granted significant currency gifts: Firstly, through Britain's huge demand for merchant fleet services in the nineteenth century, secondly, by the exploration of petroleum reserves during the last decades. Sweden has never gained currency gifts at the same scale. This paper offers an examination of the effects of currency gifts on these neighbouring small open economies by mapping relative wealth and seeking to examine patterns of convergence and divergence.

Introduction

History has thought us that many countries rich on natural resources remain in poverty. This is for example reflected in third world countries rich on minerals. This may often be an effect of lack of institutions or processing industries in these countries, leaving them with exports of raw materials with high price elasticity of demand in markets with supply surpluses. Natural resources may also be utilised to generate cash, and thereby become sources of currency gifts. As for instance Sachs and Warner (2003) demonstrated, transforming natural resources into currency gifts does not necessarily imply success. In fact, it is often followed by poverty through Dutch disease or bad policy choices. This is reflected in the weakening economy of the oil exporting countries in the Middle East after the oil shocks in the 1970s and the high long-term petroleum prices thereafter. Such experiences may also have had an impact on growth accounting, assuming that natural resources do not play any significant, or in fact no role at all, in economic growth.

Sweden and Norway have perhaps never been poor countries in relative terms, at least not compared to other European countries at the time. However, during the last centuries they have both developed rapidly, and showed higher growth rates than most other countries rich on natural resources. The political and institutional frameworks in Sweden and Norway seem to have been very similar during the last two centuries. However, we find periods of significant structural differences between the two countries. We will argue that these are connected to special currency gifts given to Norway due to its unique closeness to the sea and its continental shelf rich on natural resources. Norway gained its first significant currency gift during the great expansion of foreign trade in the nineteenth century, when Norwegian shipping tonnage was demanded widely. This situation was fuelled by the British

abandonment of the Navigation Act in 1850. The second huge currency gift to Norway came after oil was discovered on her continental shelf at the dawn of the 1970s.

In the present paper we examine the economic consequences of these currency gifts. We ask if they can explain patterns of convergence and divergence between the two countries in the nineteenth and twentieth centuries. If this is the case, we firstly find an economy able to handle currency gifts in a profitable manner. Secondly, we then suggest this contributes to that natural resources should not necessarily be out-ruled by the assumption of zero-contribution to economic growth in growth accounting.

The paper is organised as follows: Firstly, we give a theoretical background of our choice of approach. Secondly, we provide a description of the basic data used in this article. Thirdly, we offer an outline of economic growth in Norway and Sweden on the basis of the results from an ongoing project on harmonisation and calculation of historical national accounts for the Nordic countries. The figures are made comparable by using same standards and definitions of historical national accounting and by establishing PPP-figures. We then go to the analytical part of the paper, where we provide a presentation of the structural time series techniques we use. The final part is a qualitative interpretation on the basis of the periodisations of growth. In this part we present counter-factual calculations of GDP figures for Norway adjusted for the main sectors providing currency gifts.

The two-country comparison approach

In contemporary growth studies, cross-country growth regressions have been very popular, following for instance Summers and Heston's (1991) seminal work. The empirical basis of comparative growth studies is often panel data sets comprising time series for several

countries. An advantage with the cross-country regression approach is the large amounts of data that facilitates econometric applications, when on the other hand drawbacks concerning the gap between theory and the models have been pointed out (OECD 2000). An alternative, or rather complementary route, which is more popular within quantitative sociology than in economics, is the two-country comparison, on the basis of the principle of the most similar case. Within economic-history the two-country comparison approach is also familiar, comprising comparisons between e.g. the United Kingdom and France and the United Kingdom and the United States. The studies are, however, usually justified by differences in the countries' economic history suggested by earlier scholarly work, often related to the "why-Britain-question". The pure most similar case principle is rarer.

When it comes to the 19th century European periphery very few two-country comparisons have been published in the international literature. We believe that studies of the most similar case principle could contribute to the understanding of e.g. catching-up growth. Norway and Sweden is from this perspective relevant for comparative growth studies due to their inherent structural similarities prior to the industrialisation process. Recent estimates of the Norwegian per capita income level for 1830 suggest income levels that are marginally higher than the Swedish; something places the countries neck by neck in per capita GDP at our starting point. The institutional structure is generally recognised as being similar as well. The two countries were between 1814 and 1905 joined in a royal union, and had to large extent comparable institutional structures in the fields of political system, economic policy, schooling, infrastructure, religion and public administration. Also both countries joined the gold standard through the Scandinavian Currency Union, which prevailed effectively for Denmark and Sweden between 1875 and 1914, and for Norway from 1877 onwards.

In this study we provide a comparison of long term-growth performance in Norway and Sweden. This has been possible by an ongoing project on harmonisation and construction of historical national accounts for the Nordic countries. Thus, we present estimates on new Norwegian GDP-figures from 1830 onwards (Grytten 2004) and new Swedish GDP series from 1800 onwards (Krantz 2001). We have estimated PPP-figures for the GDP per capita-series of the two countries with 2003 as reference year, i.e. the series are given in 2003 US-dollars. In order to decompose trends and be able to establish meaningful periodisations, labelled growth regimes, we apply Structural Time Series Decomposition. This allows us, in a statistical sense, to find more precise periodisation of such growth regimes, which in turn is important for qualitative analyses.

Growth theory, convergence and divergence

In the standard neoclassical growth model, also known as the Solow growth model, investments foremost in physical capital and exogenous technical change drive growth (Solow 1956). Capital is assumed to show declining marginal rates of return. Together with the assumption that capital depreciates with a fixed percentage this leads to a decreasing rate of growth of net investments and the capital stock. Eventually, the capital stock per worker stops growing and the economy reaches a steady state, or dynamic equilibrium in which growth is determined by the exogenously given rate of technical change.

The neoclassical growth model implies strong predictions for convergence between different countries. In the poorer countries, growth rates will be higher than in the rich countries in the short run. In the beginning, poor countries have the smallest capital stock per worker, which yields high rates of return on new investments and low depreciations. When the poor countries get richer, the growth rates will decline and in the end the growth rates in the

(former) poor countries and the rich countries will be the same. The neoclassical model, thus, predicts an unconditionally convergence in growth rates. Accordingly, a purely theoretical expectation is that the initially poorer of the two countries in our study at some subsequent point in time will experience catch-up growth until both economies grow at similar rates for a sustained period of time.

We also recognise that the convergence in growth rates predicted by the neoclassical model does not necessarily imply convergence in income levels. Economies saving and investing a higher proportion of their income will eventually have higher per capita income than those saving and investing less. Thus, convergence in income levels is conditional. Another important conclusion drawn from the neoclassical model is that it is possible by economic-political means to affect investment levels, which again affect growth in the short run, and, thus, income levels in the long run. Observations typically problematic to explain with in the neo-classical model concerns lack of convergence and patterns involving successive periods of sustained convergence, equal growth and divergence.

In the new growth models introduced in the 1980s the simple neoclassical models were given more complex properties suited for explaining the absence of convergence (Lucas 1986). In these theories knowledge or human capital is introduced as a separate production factor, which gives fundamentally different predictions of factors generating growth in the long-run: neither has capital diminishing returns and nor is growth dependent on exogenous technical change.

The recognition of non-diminishing returns for capital has important implications for the predictions on convergence. The new growth model by Ray (1998) predicts that if countries have the same original relation between physical and human capital, they will have equal growth rates. If the relation is not equal in the beginning, or there are differences in the

propensities to invest in the two kinds of capital, then the growth rates do not converge. In the growth models by Romer (1986, 1990) the predictions of divergence of growth rates and income levels are clear. Due to economies of scale and the presence of technological externalities proportional to the physical capital stock, rich countries will grow faster than poor and the gap in income levels will increase. Similarly Lucas (1988) emphasised human capital as a factor that could hinder convergence.

Worth to notice is that new growth theory mainly seeks to explain lack of convergence. Again, patterns involving successive periods of various relative growth characteristics are difficult to explain within the theory.

Another approach for explaining differences in growth performance is new institutional theory (NIT), largely following North (1990). Arguably, institutional theory targets the Solow model assumption, i.e. resources of the economy is efficiently utilised. According to NIT, differences in the institutions and institutional lock-in effects known as path-dependency, explain persistent differences in economic performance. Despite some fifteen years of theoretical development new institutional theory has not yet been able to provide a consistent theory, which can explain differences in growth with a high degree of precision. For instance it has been pointed out that new institutional theory better explains lack of change than change, and that the theory has difficulties in showing how institutions are to be empirically incorporated into growth models. Rather, similar growth rates are often assumed to reflect similar institutional structures and consequently different growth rates are assumed to reflect different institutional structures. Thus, NIT suffers from an identification problem, in the sense that growth theoretically is seen as the result of institutions, while differences in institutional structures often are indicated through differences in growth rates. This problem, we believe is especially problematic when income differences are small and institutional differences not evident.

The data

A precondition for any subsequent investigation is to determine economic growth phases and differences in growth patterns between the two economies. To be able to do this, we have to examine the development of comparable GDP-figures for them.

Historically, both Norway and Sweden were in the forefront of establishing national accounts. During the 1930s both countries prepared for nation-wide accounts, reporting the economic activity in their respective national economies. The exercise in fact brought to publication national income figures for Sweden covering the period 1861-1930, led by Erik Lindahl (1937). After the war new and refined historical national account series were constructed for Sweden in the 1950s by Olof Lindahl (1956) and in the 1960s by Östen Johansson (1967). As for Norway, the central bureau of Statistics took up the challenge from the 1930s and published the first national account figures, containing historical series, in the early 1950s (Statistics Norway 1953). Finally, in the 1960s complete sets of historical national accounts for Norway covering the years 1865-1960 were calculated by Juul Bjerke and published by Statistics Norway (1965, 1968). Both the Norwegian and the Swedish series were at the time some of the best historical GDP estimates published internationally. However, empirical sources and calculation methods were not always well documented. And they are now in a process of being revised. These works have given us updated time series on GDP for both Norway (Grytten 2004) and Sweden Krantz (2001).

In addition, during the last decades both Sweden and Norway have been able to establish historical national account series further back in time. These are harmonised with current standards, both over time and cross-borders. For Sweden we now have annual GDP estimates stretching back to 1800 (Krantz 2001). As for Norway, recent estimates have been compiled back to 1830 (Grytten 2004). Both series are originally constructed from the product side and

they both reflect international standards (SNAs). However, admittedly, non of the series have been computed in detail, and revisions are necessary in respect of modernisation of the series covering the years from the 1860s to the first years after World War II. However, due to the work on harmonisation and standardisation of the Nordic historical national accounts, the Norwegian and the Swedish GDP-figures 1830 to present can be used as valid instruments for comparison of economic growth between the two countries.

Ideally, we should have been able to establish several base years in our computations of PPP figures of per capita GDP and splice relevant periods into one series with one reference year. However, we do not have sufficient information to carry out such an exercise for the time being. To be able to establish comparable figures we have started with the UN calculations of GDP per capita in US 2003 dollars in PPPs. By deflating the nominal series by the corresponding price indices with 2003 as reference year, we obtain historical measures of per capita GDP in PPPs.

Economic growth in Norway and Sweden

The data described above give us the opportunity to present graphs on comparable measures of economic growth and relative income for Norway and Sweden. These will serve as the departure of our analysis. Comparable series of GDP per capita in PPPs for Norway and Sweden are, thus, reported in chart 1.

CHART 1 ABOUT HERE

The chart reports significant and expanding rates of growth during the two centuries. In fact, with the exception of the last three decades for Sweden the graphs seem to report exponential trends of growth. Growth rates for different periods are reported in table 1, and show different periods of growth for the two economies during changing conditions. The first period is the years from 1830 and during the Great Victorian boom up to 1875. The second is the adoption of gold for the two countries along with the Great Depression of the nineteenth century and up to the split of the royal union in 1905. The third period consists of the growth years from the fourth period includes the post war years up to 1970, and finally our last period chosen stretches from 1970, when the Norwegian petroleum age started and till present.

TABLE 1 ABOUT HERE

The table clearly lines out periods of different growth rates between the two neighbouring economies. The relative differences between Norway and Sweden in PPP adjusted per capita GDP are illustrated in chart 2 below. A ten-year moving average line is also plotted into the chart, and gives a picture of the relative trends in income and growth between the two countries.

INSERT CHART 2 HERE

Model for defining patterns of structural growth

Growth studies are depending on proper measurements of growth rates. When addressing questions relating to the determinants of changes in growth trends it is important to avoid

biased growth estimates due to business cycle related phenomena. Associated with this issue is the need to arrive at proper periodisations. Effects on long-term growth rates due to institutional factors and exogenous shocks are usually difficult to quantify. Scholars often need to settle with evidence based on the chronology of the changes in growth rates and the events that may explain changing growth rates. Thus, we need a method, which enable us to separate long-term trends from shorter fluctuations. This is necessary in order to analyse the impact of important changes in the long-term growth rates caused by the effect of currency gifts' influence on economic structure.

To examine the effect of currency gifts on the real economy we use a structural time series model. This is done in order to map underlying structural trends in GDP to structural changes in consequence of currency gifts. By doing this we easier find relevant trends in GDP for our purpose.

Structural time series models (STRM) contain a stochastic trend and cyclical components (Koopman et al 2000, Harvey, 1989).[1] One advantage of these models is that the components are possible to interpret. For instance, the stochastic trend may represent a slowly changing but comparatively stable economic structure, while the cyclical component may represent wave phenomena in the economy. Thus, it is compatible with often-used assumptions concerning economic historical processes. Structural time series models have therefore been used in several economic historical studies (see for instance Mills and Crafts 1996). The basic formulation of the model departures from the familiar:

$$Y = T + C + I \qquad\qquad\qquad (1)$$

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[1] This part of the text is partly based on Lindmark (2002), Lindmark and Vikström (2003) and Vikström (2004).

where Y is the observed time series, T is the trend and C is the cyclical component. The irregular component I can be considered to be the residual or unexplained component of the time series. The general shape of a structural model with stochastic components is written as:

$$Y_t = m_t + y_t + e_t \qquad (2)$$

where Y is the observed time series at time t, and μ is the stochastic trend, $?$ is the stochastic cyclical component, and e is a white noise element. This is the most commonly used decomposition, which also is used in this article. The possibility to give the components stochastic properties is especially attractive when the analysis covers such along time period as in this case. It would be erroneous to assume that the trend, for instance, would have a deterministic behaviour over extended periods of time. Moreover, the formulation of the trend that is used here also allows the estimation of not only the trend itself, but also the slope component or the rate of change of the trend. The slope component is an important tool for describing the changes in the trend and makes it easier to compare the behaviour of two or more trend components. Slope components are the growth of the slow-moving trend, which differs from annual growth rates of the original series, due to business cycles and other short-term effects. Thus, it will be the slope component that will be the main component of interest when the pattern of growth is examined. One example on the usefulness of isolating slope components is Peláez (2004) who shows that U.S. long-term productivity slow-down started well before the 1973 OPEC crises, an event which accordingly was not responsible for the slow-down.

The trend component is defined as:

$$m_t = m_{t-1} + b_{t-1} + h_t \tag{3}$$

$$b_t = b_{t-1} + x_t \tag{4}$$

where *β* is a stochastic component, more specifically the *stochastic slope* which describes the change of the trend. The elements *?* and *?* are independent stochastic elements or *white-noise* elements. Thus, the trend is determined by its value in the previous year, the change of the trend, and a random change. The change of the trend is determined by the change during the previous year, and a random element (known as a random-walk with drift).

A stochastic cyclical component is also used in the models.

The cyclical component is defined as a combination of sine/cosine components, where ω_t is a stochastic disturbance, similar to those discussed previously:

$$
\begin{aligned}
y_t &= r\left(y_{t-1}\cos \lambda_c + y^*_{t-1}\sin \lambda_c\right) + w_t \\
y^*_t &= r\left(-y_{t-1}\sin \lambda_c + y^*_{t-1}\cos \lambda_c\right) + w^*_t
\end{aligned}
\tag{5}
$$

Since the cyclical components are not used for analytical purposes in this study, we do not elaborate further in the technical aspects of the method.

A reason why structural time series models are appropriate in economic historical studies is that it is often assumed that events during one year are determined by events during previous years and various unique factors. The thought of deterministic or mechanical causality is widely rejected in modern historical research. At the same time, it is often assumed that considerable structural stability is present. These properties are well captured in structural

time series models, through the random walk with drift procedure. The fit of the model is expressed in a measure called Rd2, which express (on a 0 to 1 scale) the improvement of the model in comparison to a random walk. Thus, the Rd2 measure cannot be interpreted as an equivalent to R^2.

Turning to the structural time-series models chart 3 reveals the slope component, in other words the growth of the trend of both economies. From the chart we can conclude that Norway experienced higher economic growth already in the 1830s. From the late 1830s there is, however, evidence for accelerating Swedish growth rates. In fact, these two graphs suggest that Norwegian GDP per capita was significantly higher then the Swedish in most of the 1830s and 40s. This is in fact earlier than most writers on Scandinavian economic history seem to have believed. The remarkable success for Norway in the 1850s and 60s, is that she not only maintained the lead, but also strengthened it despite a significantly higher rate of manufacturing growth in Sweden. We notice that the development of the Swedish financial sector, including banks and insurance companies, also was strong in this period. Jonung and Hansson (1997) show that banking had a causal effect on growth in this period.

CHART 3 ABOUT HERE

Anyway, Norwegian growth rates stayed at higher levels until the late 1860s. Then, due to a significant fall in Norwegian economic growth, Sweden narrowed the gap in the 1870s and 80s. She maintained the highest growth rates of the two until World War I, and we map an evident and rapid catching up process between 1890 and 1905. Thus, we find conditional convergence in this period. Thereafter, Sweden had somewhat higher growth in the interwar

period, followed by a close race in the post World War II period, with Sweden marginally in front. However, from the 1960s economic growth has been higher in Norway, which means that she can record four succeeding decades with higher growth than her neighbour. During the last decade the differences have been significant.

In short, according to our charts the two economies were on quite similar GDP levels at the beginning of the period in question, with Norway a horse head in front. Shortly, thereafter Norway managed to establish and a significant gap until the middle of the 1870s. This was maintained, but admittedly significantly reduced until 1890. Then, Sweden was able to close this gap under just few years until the turn of the century. From that period both countries experienced almost identical income levels and growth rates for roughly 70 years.

Four evident questions can be raised on basis of the relative growth performance. In the first place, how can we explain the diverging process from the early 1830s to the middle of the 1870s? Secondly, how can we explain the converging process from the middle of the 1870s to the first years of the twentieth century. Thirdly, why did the two economies have such similar growth rates from the early 1900s to the 1970s? Finally, why did the two economies diverge again from around 1980 to the present days?

Exploring institutional explanations

If we look at fundamental institutional differences at the level typically found in cross-country studies such as in terms of private property rights, absence of totalitarism and economic freedom, it is difficult to trace any institutional differences between the two countries in the first phase of divergence up to the 1860s or 70s. The two countries were united into a loose union with a common king. They both monitored their own independent economic policy and

monetary system, but the systems were very similar. However, there were some minor differences. Norway was slightly more liberal than Sweden, when Sweden had a larger public sector, due to a larger military force and a more costly state church. However, the public sector was still very limited in the two economies, representing only a fraction of their total GDP (Bjørsvik 2004). Norway also ran a longer deflationary monetary policy in the 1830s in order to reach at par silver value of the *speciedaler*. Apart from this, which is a case of difference in economic policy and not in institutions *per se*, the institutions and the framework for the economy seemed very similar in the two countries, and we find it very difficult to understand that institutions can explain the differences in growth rates between the two countries in this first phase up to the 1870s.

Turning to the Swedish catch-up growth phase from the 1870s it is evident that the gap was closed by a decline in Norwegian growth rates in combination with a burst of Swedish take-off growth. According to chart 3 the Norwegian slowdown in growth rates started in 1863, more than a decade earlier than most writers on Norwegian economic history seem to have believed (Hodne 1975, Bergh 1981). It lasted until 1882, despite some downturns in the Norwegian GDP towards the end of the decade. Sweden also faced slowdown within this period. However it started six years later and caused a lower decline in growth rates. In Sweden they dropped from 1.6 to 1.3 per cent. As for Norway, they dropped from 1.6 to 0.8 per cent. Accordingly, this part of the story begs the question why the slow-down lasted longer in Norway and why it was more severe than in Sweden. Could Norway have strayed from a common growth path through institutional shortcomings?

It is hard to find evidence for this view. Both countries adopted the international gold standard and they even set up the Scandinavian Monetary Union together with Denmark in the 1870s. There were large differences neither in foreign trade policies nor in domestic economic policies. They were both two small open economies in a liberal international order. When

liberalism was somewhat reversed towards the last part of the century, the two countries followed the same path, both in direction and strength. The dismissal of the union in 1905 had virtually no other impact than a new royal family in Norway and independent Norwegian diplomacy.

In the next period up to the 1960s or 70s, depending on when the differences were easily seen at the time, the two countries showed close growth rates and income levels. However, with a minor advantage to Sweden.

Given an institutional theoretical approach, the similarity in growth performance implies institutional resemblance. An overview into the formation of the welfare state and other aspects of regulation, suggests that this may be the case. It is easy to argue that similar growth rates in two neighbouring economies with similar income levels, is quite reasonable. However, Sweden still stayed in front for the entire period, and even reported marginally higher growth rates. A plausible explanation for Sweden's better performance during the interwar period is the long and persistent deflationary monetary policy aimed at reaching the par gold value of the Norwegain krone in the 1920s (Hanisch 1999). Sweden also pursued a deflationary policy, but the way to go was significantly shorter both in time and level. We also recognise that Sweden was pioneering price level targeting in the 1930s, which may have had a positive effect on investments (Berg and Jonung 1999). Thereafter, the centralised planning in both Sweden and Norway after World War II may have set the market forces out of order to obtain full convergence between the two countries. However, the differences are small in this period why we dare to generalise the period as a period of more or less the same growth rates.

However, if we assume that institutional similarity explains the similar growth rates from the early 1900s to the 1960s, and if we stick to the institutional explanation also for the post 1970

divergence period, Sweden somehow must have strayed away from a common Scandinavian model thereafter. This view has in particular been used to explain Sweden's performance since the 1970s, characterised by reports suggesting that Swedish per capita income had been lagging behind the OECD average since the 1970s (Ståhl and Wickman, 1993, Lindbeck, 2005). One possibility is that Sweden overstretched its ambitions with the welfare state. This view gains some plausibility by Midtbø (1999) who identifies public spending and growth as reciprocally in small economies. Lindert (2004) is on the contrary highly sceptical to the overstretched welfare state hypothesis. Institutional impact on growth is, however, not only about levels of public expenditure. Olson (1971, 1983) formulates a theory concerning relationships between institutions and growth rates. Here, institutions are seen as collective groups promoting common interest. On the one side institutions may promote growth. On the other side, when they may cause major disruptions without carrying their own costs, they may also hamper economic growth.

The government's attempt to "rescue" the Swedish ship building industry between 1977 and 1985 could be seen in this perspective, and it has indeed frequently been used as a symbol for misguided industry politics in the period. It has therefore been suggested that this exponent of the "democratic corporate model" contributed to slower growth (Mokyr, 2003, vol 4, p 105). Considering that the state-owned *Svenska Varv AB*, that took over bankrupted private wharves, reduced the number of workers from roughly 25 000 to 2 500 persons while subsidies amounted to 34 billion SEK over a ten-year period, on average less than 0.5 % of annual GDP, makes it less convincing that this type of industrial politics contributed to significantly lower growth rates. In addition the Norwegian government followed the same kind of subsidy policies towards shipyards (Espeli 1992). Other examples of Swedish industrial policy during the 1970s, most prominently the rescue of LKAB and northern Swedish iron ore industry has proved to be very successful.

We also notice that the view that Sweden lagged behind other countries has been questioned. Korpi (1996, 2004, 2005) argued that the lagging-behind was a statistical effect due to the comparison with the OECD, including countries with comparatively low income levels in the 1970s, which accordingly experienced catch-up growth during the period. Instead he made a comparison with a group of countries of comparable income levels in 1970, which suggested similar growth patterns. Korpi's conclusion was simply that the lagging-behind problem did not exist. Thus, according to him there were no unique macroeconomic reasons for institutional reforms in Sweden. If he is right, then the present income-gap to Norway must due to extraordinary Norwegian economic performance.

It is often claimed that Norwegian regulatory reforms and the shaping of the welfare state was inspired by Swedish examples during the 1950s and 1960s, when Norway was a major capitalist pioneer in centralised economic planning (Søilen 1998). Again, reasoning from an institutional perspective, keeping in mind the similar growth performance and income levels in the early 1960s, it then appears as a mystery why sclerosis occurred in Sweden, but not in Norway. It is equally clear that the sclerosis explanation must be flawed since more of the assumed problem, i.e. centralised economic planning, cannot have produced different effects on growth in Sweden and Norway. Already this short overview throws some doubt on a general institutional explanation. In an attempt to refine Olson's approach Booth et al (1997) are arguing that intuitional structures are formed in specific economic and political environments, "the historical context". These make straightforward theoretical analyses of their evolution difficult. Furthermore, they emphasises that long-run productivity outcomes cannot be predicted from given institutional structures. In practice they warn against exaggerated expectations on institutions as holding the key to understanding economic performance with any precision.

Although we argue that the general institutional characteristics are similar in the two countries, there are some differences. Interestingly enough, these differences generally do not favour Norway, in the sense that they are easily compatible with theoretical predictions of efficient markets. One such difference is the very high degree of state ownership in Norwegian industry. In the 1990s it peaked with 40 per cent, measured as the stock value at the Oslo exchange owned by the state, in Norway against less than ten per cent in Sweden (Hanisch, Søilen and Ecklund 1999). This was to an extent due to state ownership of the dominating Norwegian oil companies *Statoil* and *Norsk Hydro* and to temporary state control over the Norwegian bank system after the huge financial crises 1988-1993. However, despite privatisation during the last years, Norway still runs and traditionally ran an economy with very high degree of state ownership, which we believe many economists would consider not being beneficial to growth. It is possible to make the list longer. Sweden abolished most of its agricultural protection in the 1980s, while Norwegian food industry and agriculture is still protected by high tariffs. Sweden de-monopolised railways in the 1980s, while the state monopoly remains in Norway. Wages –fully or partly- are often individually negotiated in Sweden, while this is seldom the case in Norway.

Thus, it is difficult to see how the differences in institutional factors that we have discussed here could explain why Norwegian economic growth has been so much higher as compared to Sweden. We believe that the key is rather the industries in which Norwegian state ownership is strong, i.e. the petroleum sector. This, we will argue, is the best candidate to explain the huge divergence during the last decades. This explanation will not come as a surprise. However, one should bear in mind that during the Norwegian petroleum adventure from the 1970s till present most oil exporting countries have had severe problems in their economy, many with stagnant GDP developments. In fact, most Arab oil producing countries have experienced contraction in their per capita GDP since the significant increase in oil prices in

the 1970s. In this picture, significant Norwegian growth due to exploitation of oil and gas reserves makes up an exception from a common pattern during the last decades.

Currency gifts

Since divergence and convergence between the to economies can hardly been explained by institutional differences, we would rather suggest that currency gifts seem to have played a crucial role.

In 1830 Norway initially had a somewhat higher GDP per capita than Sweden due to utilisation of its rich fish resources. Thereafter, Norway gained foreign currencies and economic growth through the rapid increase in world trade, and thereby an outward shift in demand for Norwegian shipping tonnage. This growth reached its peak after the British abandonment of the Navigation Act in 1850. Norwegian export volume showed an annual growth rate of 3.7 per cent 1830-1865, when the corresponding growth rate for GDP was 2.4 per cent (Brautaset 2002). Not being an equal maritime power to Norway made Swedish growth rates lag behind the Norwegian despite its earlier industrialisation and supreme financial strength.

Then, from the 1870s onwards the merchant fleet of Norway saw a significant relative decline due to lack of capital in order to manage a rapid transformation from sail to steam (Fischer and Nordvik 1986). Thereafter, Sweden recorded higher growth rates than Norway since the 1860/1870s. In this period Sweden were simply favoured by favourable natural resources in terms of forests, iron and rivers for power and timber floatation which formed a basis for rapid industrialisation. The Norwegian relative decline in the merchant fleet could not be compensated for by the two other main export industries. The fish stocks on the Norwegian

continental shelf showed signs on over fishing in some areas. Thus, the growth in fisheries slowed down. In addition Norwegian timber resources were exhausted in the late nineteenth century. Since Norwegian timber did not have the same quality as in Sweden, why Norway could not a Swedish type of industrial development based on timber (Hodne and Grytten 2000). Instead, Norwegian entrepreneurs initially played an important role in the diffusion of sawmill industry in Sweden (Björklund et al 1991).

During the 1880s both countries again experienced increasing growth rates, but with the difference that the Swedish growth record was better up to 1905. After a Swedish slow-down until approximately 1915 more or less common growth-rates were reached. From this period, similar growth rates prevailed until the 1960s. During these years neither Norway nor Sweden received any significant currency gifts through exploitation of latent resources.

Then, from the 1970s the oil and gas adventure started for Norway. Parliament soon gained control over the resources discovered in December 1969 by establishing the 100 per cent state owned company *Statoil*. Through corporation with foreign oil companies *Statoil* soon learned the business and took over responsibilities from their partners. In this way the state gained almost entirely control over the Norwegian oil and gas production, until the system was liberalised in the 1990s. Along with the start of the Norwegian oil industry, prices stepped up dramatically in the 1970s. The value of the Norwegian oil and gas production increased form zero per cent of GDP in 1971 to 14 per cent in 1980, and reached a peak of 18.5 per cent in 1984. Towards the end of the 1990s it normally fluctuated around 15 per cent, depending on the very volatile petroleum prices. Due to high prices in the first years of the 21st century the share has come closer to 20 per cent. At present, petroleum accounts for about 50 per cent of Norwegian exports and 20 per cent of gross investments (Hodne and Grytten 2002).

Evidence for positive effects from North Sea oil are for instance provided by Mork and Olsen (1994) who investigate correlations between oil-price movements and GDP fluctuations for the United States, Canada, Japan, Germany (West), France, the United Kingdom, and Norway. From our perspective the relevant results are that the Norwegian economy benefits significantly from oil price increases, while the effect was the opposite in oil importing economies. Simply put: what is good for Norway is bad for Sweden.

Our assumption that Norway had a net benefit from North Sea oil is also supported by Bjørnland (1998) who concludes that while Dutch disease effects could be seen in the UK, the Norwegian manufacturing industry benefited from oil discoveries and oil price increases in the period 1973-1991. This, she argues, may be explained by state subsidies during the transitional period of North Sea oil, which kept unemployment at low levels. Accordingly, the management of oil revenues seems to be crucial for whether a country is struck by natural resource curse, or as in the Norwegian case, actually benefits from large oil discoveries. Eifert et al (2001) points out that oil revenue management concerns the achievement of economic stability in the face of fluctuating oil revenues and how to ensure high quality spending, whether in the form of large investment projects, public consumption, or subsidies.

While Davis et al (2001) argues that oil funds have been problematic in many countries, they point out that Norway is an exception since sound and transparent fiscal and macroeconomic policies were implemented before setting up the State Petroleum Fund. Their argument is very much the same as Eifert et al (2001) who states that successful oil revenue management is depending on the general political stability and institutional accountability of a country, while observing that Norway "has been successful in using its highly consensus-oriented and parliamentary institutions, as well as the involvement of interest groups representing business and labour, to reconcile competing claims for oil revenues with long-term objectives and stabilization goals" which contrast to most other oil-exporting countries.

However, as we previously argued concerning the institutional similarities between Norway and Sweden, the general characterisation of the political system that created the successful oil revenue management, would hold true also for Sweden. The imperative diverging factor between Swedish and Norwegian growth performance during the past decades is therefore not primarily institutional differences, but North Sea oil.

Adjusting GDP for currency gift sectors

Due to reasons of economic planning and accounting, Statistics Norway has calculated GDP figures excluding the offshore oil industry. Needless to say this adjusted GDP is affected by the oil industry incomes, and the arithmetic approach of deducting the oil industry incomes of course ignores the both positive and negative dynamic effects on the inland economy. A positive effect could be absence of public borrowing, more funds available for investments, and a negative effect appreciation of the currency resulting in the "dutch disease syndrome". Despite these shortcomings, the adjusted GDP provides a rough counterfactual of what the Norwegian economic performance would have been without oil.

Our challenge is to do the same with the other sector providing Norway a huge currency gift, i.e. the 19th century merchant fleet. This is of course also a counter factual analysis. By subtracting value added to the economy from the merchant fleet from GDP we arrive at GDP figures less the merchant fleet contribution. However, this is not a relevant measure, since the capital used on ships would have been invested elsewhere. It is reasonable to believe that this capital then would have given about the same level of return as the average. Thus, we suggest that the Norwegian GDP growth rates would have been the same as in the non-merchant fleet sectors. We find 1845, which also serves as a benchmark year in the historical national accounts, as a representative year for the merchant fleet's share of GDP before the giant boom

in shipping services. Thus we calculate the counter-factual merchant fleet adjusted GDP figures with 1845 as base year. This implies that GDP for 1845 is equal for the two GDP measures, when the extended growth rates, and thus levels of GDP are different.

Chart 4 shows the development of GDP per capita and the corresponding adjusted figures for Norway along with the Swedish figures. As the graphs reveal Norwegian GDP adjusted for the currency gift sectors is more similar to the Swedish GDP. The figures reveal that in the nineteenth century Norway maintained the gap down to Sweden due to the currency gift earned by the merchant fleet.

CHART 4 ABOUT HERE

During the relative decline of this sector Norway lost ground and was caught up by the dawn of the twentieth century. Then, from the late 1970s the currency gift from the Norwegian petroleum sector made a new phase of divergence in favour of Norway.

Clearly, Norway have profited from its currency gifts during their duration. However, when the income from the merchant fleet fell from the 1870s Norway's growth fell significantly. Nothing had been planned to accumulate capital from this currency gift. This is in contrast to the present situation, where Norway successfully has accumulated capital in its Petroleum Fond. Charts 5 and 6 reveal the corresponding estimated trends. Both during the 19th and 20th centuries it is clear that the currency gifts produced differences in long-term growth.

INSERT CHART 5 HERE

INSERT CHART 6 HERE

According to this chart the growth rates, peaks and turns were quite similar in the two economies when the huge currency gift sectors are omitted. The Norwegian periods of positive divergence in the real GDP slope component series happened to be in times of huge currency gifts. Thus, we can conclude with two examples when currency gifts have given sustainable economic growth for several decades. Chart 7 clearly shows how the slope components are influenced by the sectors providing huge currency gifts into the Norwegian economy. In particular, for the last decades of the twentieth century our counter factual slope component analysis suggests Norwegian and Swedish GDP would have followed the same pattern if the income from the petroleum sector had been omitted.

INSER CHART 7 HERE

CONCLUSIONS

In the present paper we have investigated phases of convergence and divergence between two small open neighbouring economies, i.e. Norway and Sweden, in the nineteenth and twentieth century. By estimating comparable per capita GDP figures in PPPs we have concluded on relative income and growth rates between the two countries. By using structural time series analysis we have mapped phases of convergence and divergence during periods of structural variance between the two countries, We conclude that Sweden lagged increasingly behind

Norway from the 1830s towards the 1870s and from around 1980 to present. When Sweden showed a remarkable catching-up growth 1870-1905. As for the period 1905-1970, the two economies very much stayed at the same per capita income level and growth rates with a minor advantage Sweden.

Given the similar institutional structures in the two economies, we do not find institutions as a plausible explanation for the differences, perhaps with an exception for the minor differences in the first 25 post World War II years, when a similar, but very rigid institutional framework may have hindered the market forces to converge the economies.

The two significant divergence phases can better be explained by the efficient utilisation of currency gifts provided to Norway. This is clearly illustrated in our counter-factual use of structural time series analysis on GDP for Norway exclusive the merchant marine 1830-1910 and the offshore petroleum industry from the 1970s onwards. The trend analysis also shows that currency gifts have created long periods of diverging growth, and not only short boom phases. This analysis suggests that Norway would not have done significantly better than Sweden without these sectors. Our analysis points at similar, however, more preliminary, suggestion: natural resources should not necessarily be assumed as zero in growth accounting.

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Chart 1. GDP per capita 1830-2003 for Norway and Sweden in PPPs (2003 US dollars).
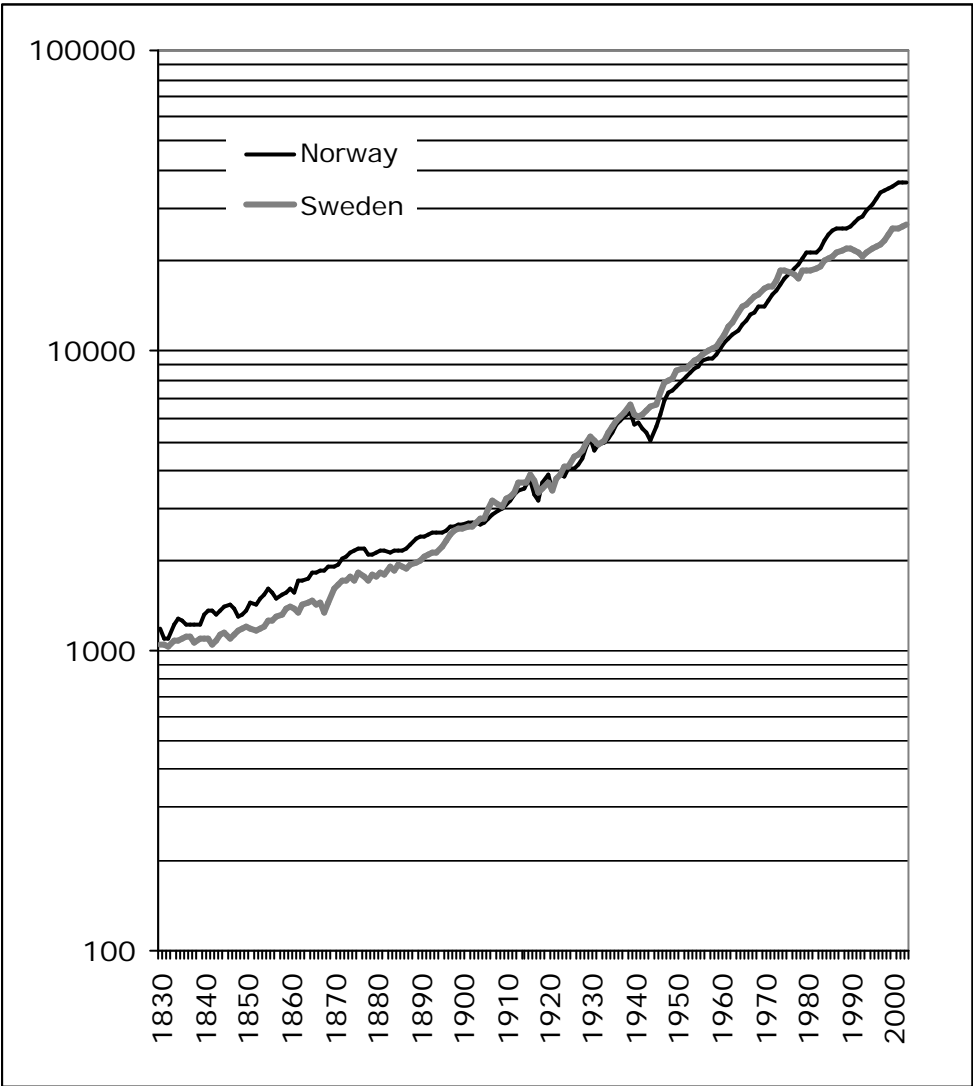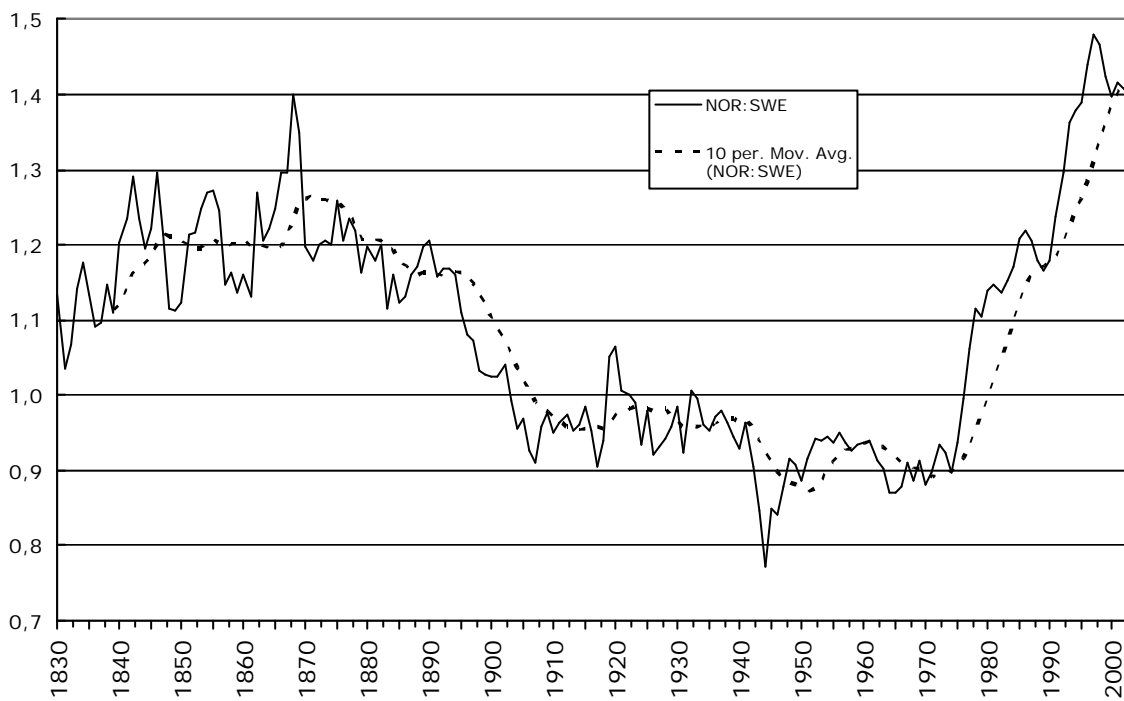

Sources: Krantz (2001) and Grytten (2004).

Table 1. Growth rates in GDP per capita for Norway and Sweden 1830-2003.

Period	Norway		Sweden	
	$y = (y_T/y_t)^{-(T-t)}$	$y = b_0 e^{b_1 t}$	$y = (y_T/y_t)^{-(T-t)}$	$y = b_0 e^{b_1 t}$
1830-1875	1.38%	1.37%	1.15%	1.12%
1875-1905	0.67%	0.94%	1.55%	1.66%
1905-1970	2.60%	2.48%	2.75%	2.62%
1970-2003	2.91%	2.84%	1.51%	1.32%
1830-2003	2.00%	2.01%	1.89%	2.07%

Sources: Krantz (2001) and Grytten (2004).

Chart 2. GDP per capita in PPPs (2003 US dollars) for Norway relative to Sweden (NOR:SWE).
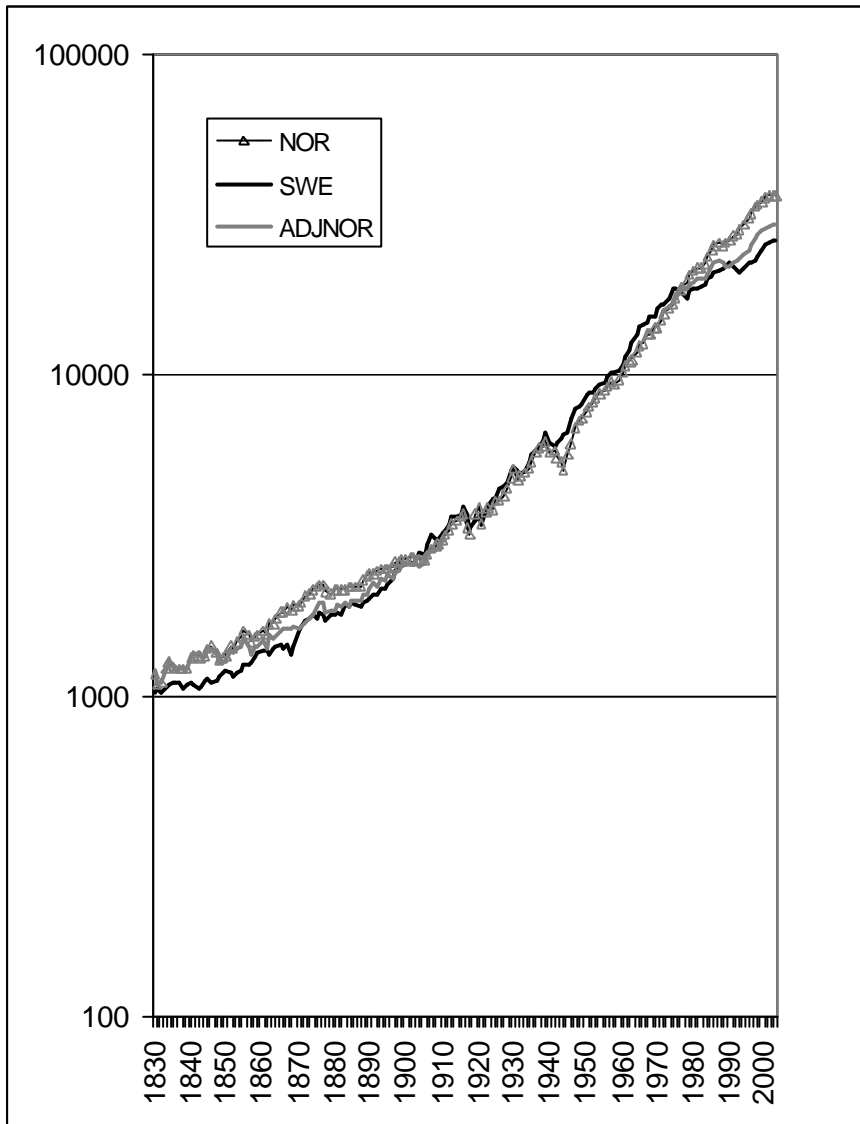

Sources: Krantz (2001) and Grytten (2004).

Chart 3. Slope component of Swedish (LSverige) and Norwegian (LNorge) log GDP per capita 1830-2003 in 2003 US PPP- dollars
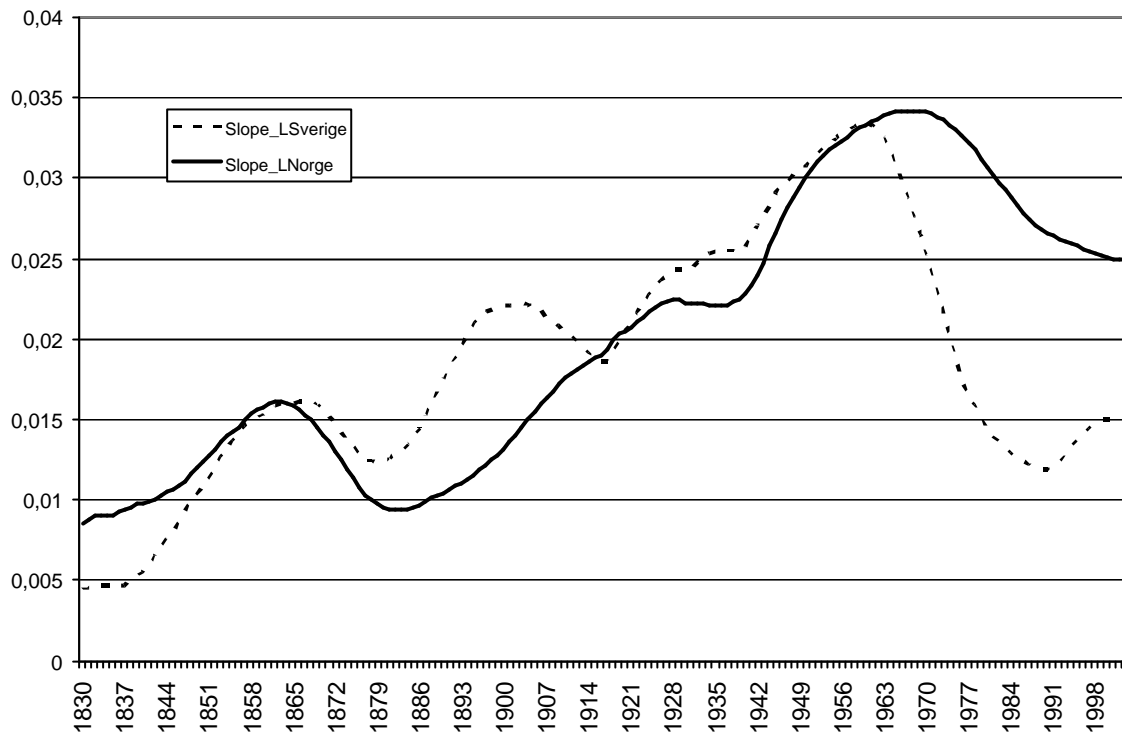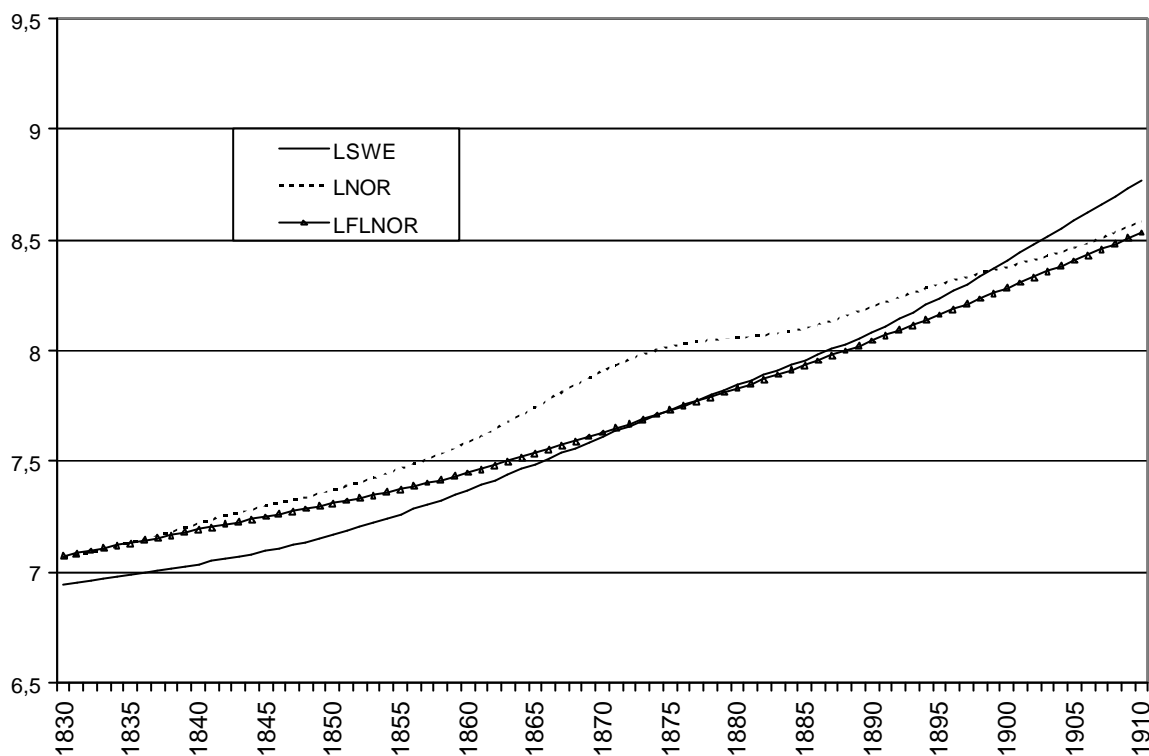

Sources: Krantz (2001) and Grytten (2004).

Chart 4. *GDP per capita in Norway, Sweden and Norway adjusted for the shipping industry (19th century) and off-shore industry (20th and 21st centuries) (ADJNOR) 1830-1910. 2003 US PPP dollars. Log scale.*
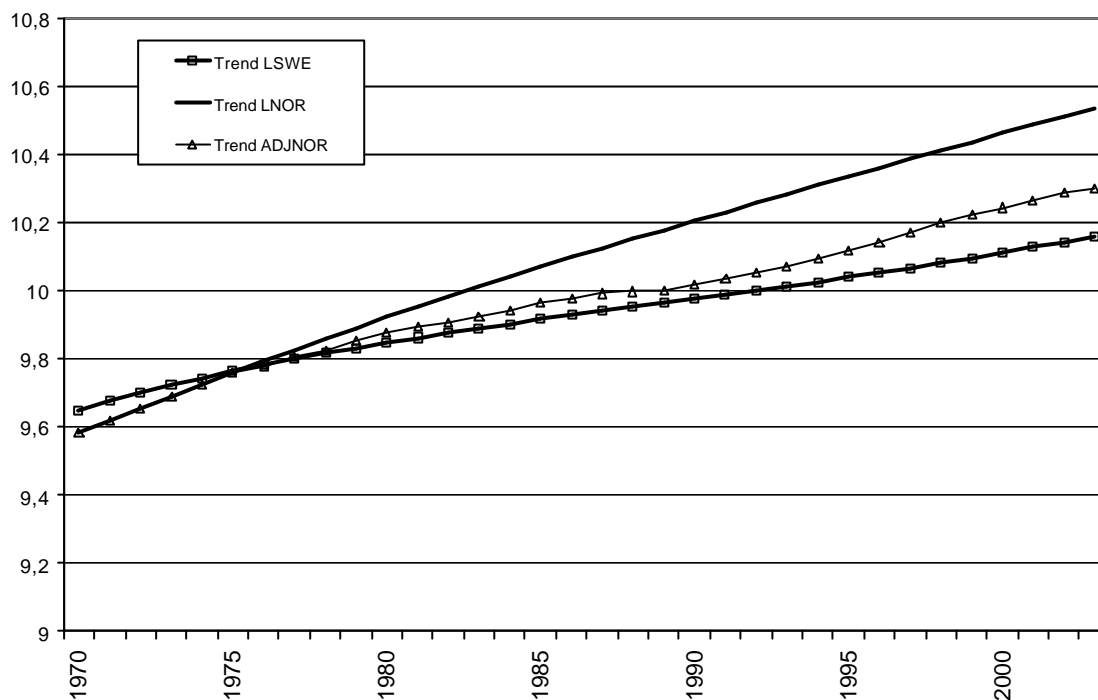

Sources: Krantz (2001) and Grytten (2004).

Chart 5. *Trend component of Swedish (LN_SWE) and Norwegian (LN_NOR) log GDP per capita and Norwegian log GDP per capita excluding the shipping industry (lnFLNOR). 1830-1910 in 2003 US PPP dollars.*

Sources: Krantz (2001) and Grytten (2004).

Chart 6. *Trend component of Swedish (LSWE) and Norwegian (LNOR) log GDP per capita and Norwegian log GDP per capita excluding the oil industry (ADJNOR). 1970-2003 in 2003 US PPP dollars.*

Sources: Krantz (2001) and Grytten (2004), Statistics Norway (2005).

Chart 7*. Slope component of Swedish and Norwegian log GDP per capita and Norwegian GDP excluding shipping and off-shore industry, 1830-2003 in 2003 US dollars.*