

POST-WAR GROWTH OF THE DANISH ECONOMY

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ABSTRACT

Post-War Growth of the Danish Economy*

Economic growth in Denmark in the post-war years has been close to the OECD average. The 'golden age' of very high growth was, however, of shorter duration in Denmark than in most other OECD countries. The main emphasis in this paper is on the description of productivity performance in the post-war years, and growth performance in a long-run international context. Growth perspectives originating in the 1930s and 1940s are included before the analysis of growth determinants in the post-war years is taken up. Sectoral shifts in production and shifts in relative prices contribute significantly to a reduction of growth some years before the OPEC oil price shocks. Finally, economic policy in the post-war years is discussed with special emphasis on the implications for growth.

JEL classification: N14, O47, O52

Keywords: productivity performance, growth determinants, economic policy

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NON-TECHNICAL SUMMARY

Three specific factors are central to Danish post-war growth. The first relates to the initial situation of traditional heavy dependence on agricultural exports. Since the post-war trade liberalization excluded agricultural products, this led to a precarious balance of payments position. While the share of agriculture in the labour force and in production was similar to a number of other European countries, agriculture had a higher share of exports. A second set of factors relate to the structure of the non-agricultural part of the economy. Partly due to protective measures in the 1930s and to circumstances during the war, manufacturing industry was – and is – dominated by small firms, which implies potential negative consequences for scale economies, R&D and export performance, which are all positively related to firm size. Next, shifts to non-agricultural sectors sheltered from foreign competition proceeded so swiftly in the high growth years that manufacturing industry never attained a relative share of the economy comparable with other OECD economies experiencing the same relative shift out of agriculture. A final factor is the existence, for most of the post-war period, of problems of macroeconomic imbalance, resulting in a number of cases in growth restraining policies.

In relation to the post-war growth profile (and also from a policy point of view) two questions are of major interest. First, the golden age of high growth began later in Denmark making it particularly interesting to study both the reasons for this delay and the factors that made the high growth rates possible. Second, what factors led to the end of the high growth period? An attempt is made here to distinguish between the OPEC oil price shocks, common to many countries, and domestic factors which were slowing down growth already by the time of the 1974/75 shock.

The emphasis in the second part of the paper is on post-war productivity performance. Aggregate productivity per employed person follows the profile of aggregate growth reaching a maximum growth rate in the mid-1960s followed by a decline to a new stable level of growth from the mid-1970s. Growth in hourly productivity in manufacturing shows a much stronger decline and even becomes negative in the mid-1980s. Finally, total factor productivity (TFP) growth is discussed. Data are available from the late 1960s showing a declining rate of growth until 1980 in both sheltered and competition exposed sectors. From 1980 an interesting – and for a small open economy somewhat disturbing – divergence appears between the sectors. In the sheltered sectors TFP growth increases from a low point around 1980. In the competition exposed sectors, on the other hand, the decline continues with TFP actually falling in the mid-1980s. By the end of the 1980s TFP growth is positive in both sectors, but significantly lower in the competitively exposed sectors. A partial explanation of this pattern can be

found in the allocation of investments and highly educated labour between the two sectors.

The third section of the paper summarizes that part of the legacy from the 1930s and 1940s which is of relevance for post-war growth. In the fourth section, the focus is on post-war growth determinants. Capital accumulation, measured by the aggregate gross investment ratio, fell to a maintained lower level from the beginning of the 1970s. In a growth perspective, machine capital may be more relevant than a concept encompassing all kinds of capital equipment. The growth rate of machine capital per employed worker fell from the late 1960s to nearly zero around 1980. In the 1980s the growth rate picked up again but never reached a level comparable with that of the 1960s. It is interesting to note that the relative price of machine capital declined until the late 1960s, becoming constant at the same time as the growth rate began to fall.

Foreign trade and scale economies are identified as important factors in modern growth theory. Danish foreign trade ratios reached a minimum in the golden age of high growth, indicating that domestic demand may have been more important than the effect of foreign trade on domestic growth. The relative price ratio between sheltered and competitively exposed sectors increased during the years of high growth at a rate which surpassed the differential in productivity growth between the sectors. An obvious interpretation is that the competitive sector was exposed to increasing pressure on its profitability during the golden age of high growth. Another factor indicating an end to the golden age in advance of the OPEC shocks was that the relative decline in the user cost of capital/wage ratio had already ended by the late 1960s, reducing the incentive for labour saving innovations.

The fifth part of the paper surveys economic policy in the post-war years. What factors created the period of high growth and which contributed to ending this period? The beginning of the high growth period was characterized by an unusual combination of factors including an international boom, an improvement of the terms of trade, better access to and lower costs on international capital markets, a fall in the rate of interest, the coming to power of a majority government, and the implementation of a growth promoting fiscal policy. Further, there was a growth potential in the economy with ample supply of labour and a favourable trend in relative prices.

Some of the factors contributing to the return to a lower rate of growth had their origins in the high growth period. International competitiveness deteriorated gradually, a structural savings deficit appeared in the private sector, and sectoral changes in the economy became gradually less favourable in relation to economic growth. Further, fundamental shifts in relative prices unfavourable to growth developed. The relative price of machinery investment, the relative prices between sheltered and exposed sectors and relative factor prices all developed

in a way during the high growth period that was unfavourable to continued high growth.

At the time of the 1974 supply shock, macroeconomic imbalances which had developed over a number of years along with a rather confused political situation led to a highly inappropriate adaptation to the external shock. Real wages rose fast and Danish terms of trade deteriorated. The subsequent increase in unemployment further illustrates an inadequate ability of the labour market to adapt to fundamental changes. The recovery in the 1980s from the second oil shock ended in 1986 due to policy reactions to an intolerable development in the foreign net debt position. Since 1986, Danish economic performance has had an impressive record with regard to inflation and the current account, while growth has remained low and unemployment has been on an increasing trend.



1 Introduction¹

The aggregate growth of the Danish economy since the second world war has followed the same broad pattern as experienced in most other European countries. The overall growth of the period has been close to the average of the European OECD countries, but the profile of growth has been somewhat different. The "golden age" of high growth and extremely low unemployment began later in Denmark than in the rest of Western Europe. During most of the 1950s growth remained below the OECD average. The golden period began in the late 1950s and ended in 1973 with the first round of oil price increases. Since then, the average growth rate of the Danish economy has once again been rather low. The postwar growth outside the golden period is more or less in line with the long run trend in economic growth based on prewar experience. Thus, looked on in a very long run perspective, the period from the late 1950s to the early 1970s stands out as historically exceptional years. This is the case both when we consider growth rates and when we consider the long run experience of unemployment.²

Around 1960 the Danish economy experienced a short spell of overall macroeconomic balance. The rates of unemployment and of inflation were both low, and the current account as well as the public budget were in balance. In contrast to this both the preceding and the subsequent years have been characterized by persistent problems of macroeconomic balance creating restraints on the actual growth of the economy.

A number of factors underlying the persistent problems in relation to the balance of payments, unemployment and inflation are discussed in more detail below. As an introduction, a few important structural characteristics of Danish postwar development should be emphasised. The first important factor is that Denmark was an industrial latecomer. Denmark entered the postwar period as a traditional major exporter of agricultural products with industrial exports playing a minor role. As agricultural exports were excluded from the liberalization of international trade following the Marshall Plan and administered by the OEEC, this created persistent problems in

¹ Comments are gratefully acknowledged from Nick Crafts, Ingrid Henriksen, Lars Muus, Niels H. Skou, Nina Smith and Gianni Toniolo.

² Rather few contributions on Danish postwar economic development are available in English. Different aspects of the postwar development are treated in Andersen & Risager (1990), Andersen & Åkerholm (1982), Denison (1967), Garganas (1991), de Haan et al. (1992), Johansen (1987), Kærgård (1991), Nannestad (1991), Nielsen & Søndergaard (1991), OECD country surveys, Paldam & Zeuthen (1988), Paldam (1991), Pedersen (1993), and Ølgaard (1966).

relation to the balance of payments as the transfer of resources to the urban sector and the subsequent expansion of existing and creation of new markets for Danish industrial exports necessarily took some time.

Another fundamental sectoral change was a major shift of resources into sheltered sectors of the economy. Around 1950, the share of public sector employment in the economy was lower in Denmark than in any other OECD country except Switzerland. Especially during the golden period and in the period between the two rounds of oil price increases in 1974 and 1980, public sector employment was expanded so rapidly that the public sector employment share by 1980 was second only to Sweden among the OECD countries. During the golden period rapid employment expansion took place also in another sheltered sector, building and construction.

The initial exclusion of a big sector in the Danish economy from the postwar boom in international trade combined later with a rapid expansion of the sheltered sectors in the economy are important facts in the postwar growth profile of the Danish economy. Another important factor is the existence of a structural savings deficit in the private sector. This may partly be related to the strong expansion of public sector income transfer programmes having a negative impact on the incentives for private savings. Partly, it may be related to the industrial structure which is characterized by a dominance of small firms, which in turn may explain the relatively low R&D intensity in the Danish economy. A final set of structural problems are related to the functioning of the labour market. In some respects the Danish labour market is characterized by inflexibility, i.e. the wage structure is very stable with a low variance, barriers against skill mobility are in some cases high and the sensitivity of real wages to unemployment is low by international comparison. On the other hand, industrial relations are very peaceful and firing and hiring rules are very flexible by international comparison.

Below, Section 2 presents an overview of the aggregate growth performance of the Danish economy. The emphasis in Section 2 is on the postwar productivity performance. The section also includes Danish growth performance in a long run international context.

Section 3 contains a discussion of the importance for postwar growth of the development in the years from 1930 to 1950 including the big depression, the war years and the reconstruction period. The emphasis in Section 3 is on the long run effects of sectoral shifts and of changes in attitudes with regard to economic policy.

Section 4 presents an overview of postwar growth determinants. The first part of Section 4 includes a survey of a number of factors behind the growth process, i.e. capital accumulation, labour, participation in international trade and aspects of the development of the industrial

structure. The emphasis in the second part of Section 4 is on sectoral shifts of relevance for the growth process. In the Danish context, the change from agricultural to industrial products with regard to exports, and the shifts between sheltered and exposed sectors are important factors.

In Section 5 the emphasis is on economic policy of special relevance for growth and productivity in a number of subperiods in the postwar years. Natural dividing years in this discussion are 1957, representing the beginning of the period of high growth in the Danish economy, and 1973 and 1979 representing the two oil price shocks. The Danish economy was hit especially hard as the dependency on imported oil at that time was nearly complete.³ The experience in the years after 1980 is the final topic in Section 5. Like other OECD economies, Denmark experienced both a recovery and a cyclical downturn in these years - but in reverse order in relation to the OECD trend, with recovery preceding the downturn. Finally, a number of concluding comments are found in Section 6.

2 The Aggregate Growth Performance - An Overview

2.1 The Long Run Growth Performance of the Danish Economy

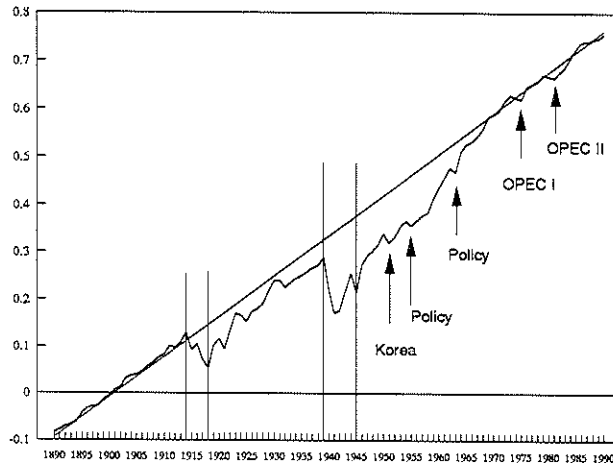
The period under study coincides with the years for which official national account data are available. To consider postwar growth performance in a long run setting it is necessary to use national account estimates for earlier periods developed by Hansen (1974). Using these unofficial estimates in combination with official national account data covering the years since 1948 produces the long run growth profile for the years from 1890 to 1990 shown in Figure 1.

One possible story producing the profile in Figure 1 is of an economy with a stable long run growth in GNP per capita at a level of 1.93 pct. per year experienced in the quarter of a century before the first world war to which the economy returns in the late 1960s following a number of major disturbances in the intervening period. The major setbacks are evidently the wars, especially the second world war. During the 1920s the economy nearly catches up with the long run trend level. Return to the trend is broken by declines in GNP per capita at the beginning of the 1930s. Growth in the remaining part of the 1930s is close to the trend rate, but the level of GNP per capita is persistently below the long run trend level. After the big decrease in real GNP during the war, the starting point of the postwar years is significantly below the trend level.

As mentioned, the economy catches up with the trend once again in the late 1960s. During the next quarter of a century, growth remains very close to the trend line. In this perspective, two questions seem to be of major interest in the interpretation of the postwar growth history. First,

³ In contrast to the situation at the time of the two OPEC shocks, Denmark was self sufficient in oil and gas from the end of the 1980s based on fields in the North Sea.

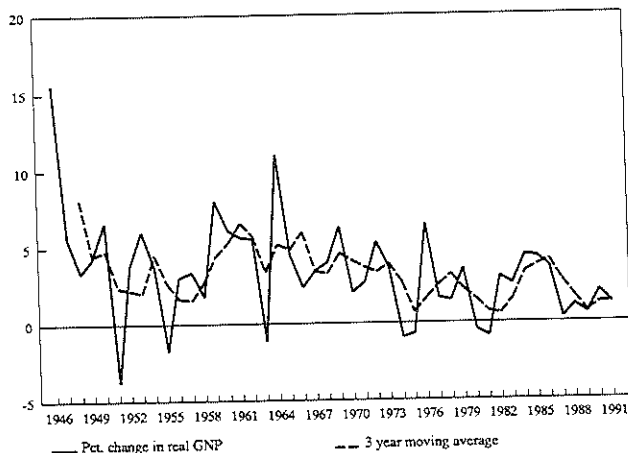
Figure 1. Log GNP per Capita, 1890 - 1990.



why did it take nearly 15 years before the catch up process began in the late 1950s? Secondly, which factors explain the beginning of the "golden age" of catch up growth from the late 1950s to the late 1960s/beginning of 1970s.

For the postwar years alone, Figure 2 shows the actual growth rate of real GNP along with a 3-years moving average. Looking at the moving average graph it is evident that growth performance is tapering off from the peak level around 5 pct. per year attained in the first half of the 1960s. The major postwar episodes of negative growth occur due to international disturbances, i.e. the raw materials price increases in 1951 due to the Korean war and the negative oil price shocks in 1974/75 and 1980/81, while the positive supply shock of 1986 is not at all reflected in the growth rate. The negative growth rates in 1955 and 1963 reflect domestic policy shocks due to balance of payments problems.

Figure 2. Growth in Real GNP, 1946 - 1991. (Calculations from ADAM databank).



2.2 Comparative Growth Performance

Following this summary description of the aggregate development, Danish growth performance will be considered in an international perspective. The very long perspective considered in Table 1 is calculated from Maddison's (1991, Tables A2 and B7) estimates of GDP in 1985 US relative prices and of the total population in 13 countries in 1820 and in 1989.

In this very long run perspective the relative position of Danish GDP per capita is nearly stationary going down from a position as number 7 among the 13 countries to be number 8. Average Danish growth per capita over the 169 years covered by Table 1 is 1.55 pct relative to an average growth for all 13 countries of 1.59. Measured by positions, the big "winners" from 1820 to 1989 are Japan, Finland, Norway and the USA. Except for the USA, the "winners" occupy the lowest positions in 1820. The big "losers" are the UK, the Netherlands, and Austria.

In order to view the postwar productivity performance in a long run perspective Table 2 presents the relative performance, measured by GDP per work-hour in constant US relative prices for Denmark and for an average of 16 countries for different subperiods since 1870.

Table 1. Long Run Growth Performance in International Perspective. (1820 and 1989 levels in 1985 US relative prices)

	Level in 1820	Relative position	Level in 1989	Relative position	Average growth per year
Austria	1041	5	12585	13	1.47
Belgium	1024	6	12876	11	1.5
Denmark	981	7	13514	8	1.55
Finland	639	12	13934	6	1.82
France	1052	3	13837	7	1.55
Germany	913	10	13989	5	1.61
Italy	956	8	12955	10	1.54
Japan	588	13	15101	3	1.92
The Netherlands	1307	2	12737	12	1.35
Norway	856	11	16500	2	1.75
Sweden	947	9	14912	4	1.63
UK	1456	1	13468	9	1.32
USA	1047	4	18317	1	1.69

Note: Calculated from Maddison, 1991, Tables A2 and B7.

Table 2. Annual Change in GDP per Work-Hour in Denmark and Average for 16 Countries, Decades 1870-1989. (1870-1979, measured in constant 1970 US relative prices. 1973-1989, measured in 1985 constant US relative prices)

	Average growth per year, 16 countries	Ratio between Danish and average growth rates	Relative growth position of Danish economy
1870-1880	1.64	0.90	11
1880-1890	1.43	1.36	4(3)
1890-1900	1.65	1.15	7
1900-1913	1.77	1.25	4
1913-1929	2.10	1.22	3
1929-1938	1.48	0.29	12
1938-1950	1.65	0.75	10
1950-1960	3.83	0.78	12
1960-1970	4.92	1.00	7
1970-1979	3.37	0.91	8
1973-1989	1.56	0.69	13

Notes: 1870-1979 calculated from Baumol et al., 1991, Table 5.1, p. 88 (primary source: Maddison, 1982), 1973-1979 calculated from Maddison, 1991.

It is evident from Table 2 that a "golden" period of Danish comparative labour productivity growth occurred in the half century from 1880 to 1929. The 1930s represents a low point, also in a comparative perspective. In the postwar years, productivity growth is lower than average in all subperiods except the 1960s when labour productivity grows at the average rate for the 16 countries included in Table 2.

Looking specifically at aggregate growth performance in the years from 1950, Table 3 shows the average growth rates for the Danish economy along with the average growth rates in two relevant groups of countries, i.e. the major trading partners in the EC and the other Nordic countries. Table 3 demonstrates clearly the two periods of relatively low Danish growth in the 1950s and in the years between the two OPEC shocks.

Table 3. Average Annual Rate of Growth of Real GNP, 1950-1992. Denmark, Average for France, Germany, Italy and the UK (EC4) and Average for the other Nordic Countries Finland, Norway and Sweden.

	Denmark	Average EC4	Average other Nordic countries
1950-1957	2.64	4.89	4.29
1958-1973	4.45	4.49	4.41
1974-1981	1.27	2.17	2.84
1982-1992	2.21	2.25	2.01

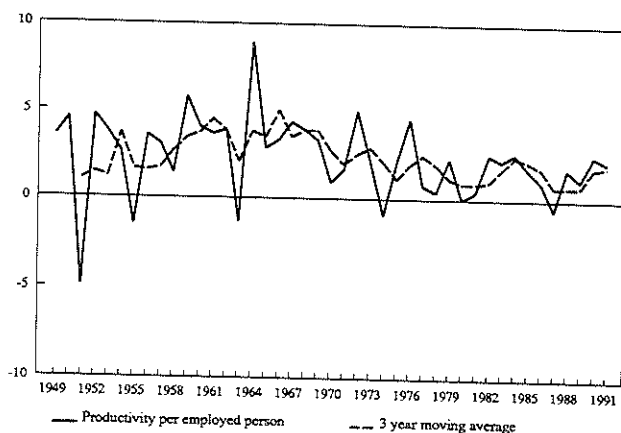
Note: Calculated from Madsen & Paldam, 1978 and OECD, 1993.

2.3 Postwar Productivity Growth

Postwar development of some crude measures of labour productivity is illustrated in Figures 3 and 4. Figure 3 shows annual change in labour productivity for the whole economy as the relative change in real GNP per employed person, i.e. without correcting for changes in annual hours and in part-time frequency, and à fortiori without any corrections for changes by education in the composition of the labour force. The profile is much in line with the profile for the aggregate growth rate shown in Figure 2, with growth in production per employed person falling from the mid-1960s and stabilizing at a new lower level from the mid-1970s.

Figure 4 shows a somewhat more satisfactory indicator of the development in labour productivity measured as the change in hourly productivity in manufacturing industry. The change in this measure is more pronounced. The very high growth registered in the mid-1970s was - mistakenly - at the time taken by some observers as indicating that the increasing unemployment was technological in nature. The subsequent development showed a steep decline continuing until the mid-1980s when labour productivity in industry was constant or falling from 1984 to 1987.

Figure 3. Change in Aggregate Real GNP per Employed Person, 1949-1991. (Calculated from ADAM databank)

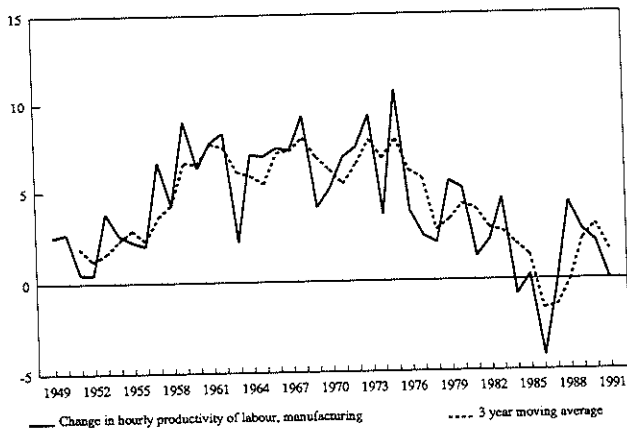


It is well known that productivity growth went down after the mid-1970s in most OECD countries. But the mid-1980s experience in the Danish economy was more troublesome due to the falling level of hourly productivity. Some possible explanation of the 1980s experience are taken up below.

Estimates of more satisfactory measures of total factor productivity (TFP) are available for part of the postwar years from a number of different sources. For the years 1950-1962 Denison (1967) found TFP growth to be 1.37 pct. per year on average. Groes & Bjerregaard (1978) report estimates for 1950-1960 of 1.01 pct. per year and for 1960-1972 of 1.70 pct. per year, i.e. at the same level as Denison's estimate and showing an increasing trend like the growth rates. More recent estimates have been produced by Statistics Denmark covering the period 1966 to 1991.⁴ The average annual change in TFP in some major production sectors is shown in Table 4 for the whole period 1966-91 and separately for four subperiods divided by cyclical peak years. For the private sector as a whole TFP growth is decreasing between each subperiod. The profiles in individual sectors differ from this pattern. In agriculture TFP is accelerating. Manufacturing industry shows the same profile as the aggregate private sector, while TFP growth accelerates in private service industries in the last period from 1986-91. In building and construction no

⁴ The most recent estimates are found in Statistics Denmark (1993). 1990-91 estimates are preliminary. The methods are documented in Dalgaard (1989). Due to lack of data on income shares for different types of labour no weighting of different labour inputs is undertaken.

Figure 4. Change in Hourly Productivity of Labour. Manufacturing Industry, 1949-1991.
(Calculated from ADAM databank)



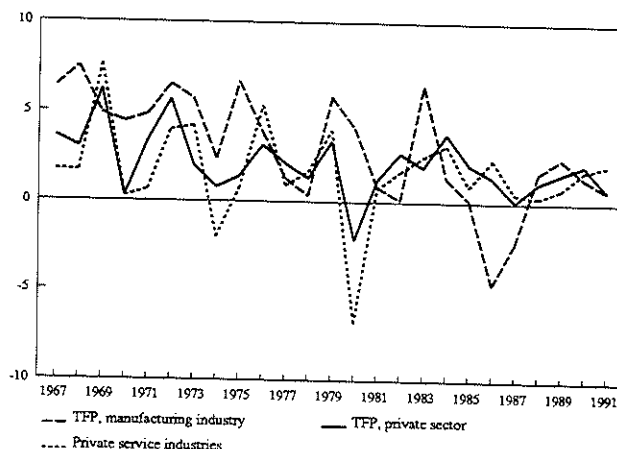
clear time pattern appears. A regression of TFP growth in building and construction on real growth in the sector shows a rather strong covariation considering the big cyclical swings in construction.⁵ The sector non-market services - practically identical with the public sector - follows the same pattern as the private sector service industries. The annual change in TFP is shown in more detail in Figure 5 for the whole private sector and for the two major sectors manufacturing industry and private service industries. The decline in TFP growth for the whole private sector and for private service industries seems to stop around 1980. In manufacturing industry on the other hand the profile shifts from TFP growth above the private sector average to a steep decline with falling TFP in the mid-1980s. The profile for manufacturing industry is much in line with the profile shown for hourly productivity of labour found in Figure 4.

⁵ The regression tracks TFP growth especially close in the very volatile 1980s. A possible interpretation is that new investments dominate in periods with positive growth in building while maintenance and repairs dominate in periods with declining activity. The quite different technologies in these two areas could explain the narrow relationship between TFP growth and growth of production in the sector.

Table 4. Annual Change in Total Factor Productivity, 1966-1991. (Source: Statistics Denmark, 1993)

	1966-73	1973-79	1979-86	1986-91	1966-91
Agriculture	3.33	3.98	5.79	5.92	4.69
Manufacturing industry	5.77	3.40	1.19	0.80	2.90
Public Utilities	3.84	5.97	7.32	-1.33	4.24
Building and construction	1.15	-2.14	3.71	-2.30	0.36
Private service industries	2.87	1.76	0.63	1.12	1.62
Private sector	3.45	2.04	1.58	1.15	2.12
Non-market service industries	1.81	1.11	0.20	1.15	1.06

Figure 5. Annual Change in Total Factor Productivity, 1967-1991. (Source: Statistics Denmark, 1993)



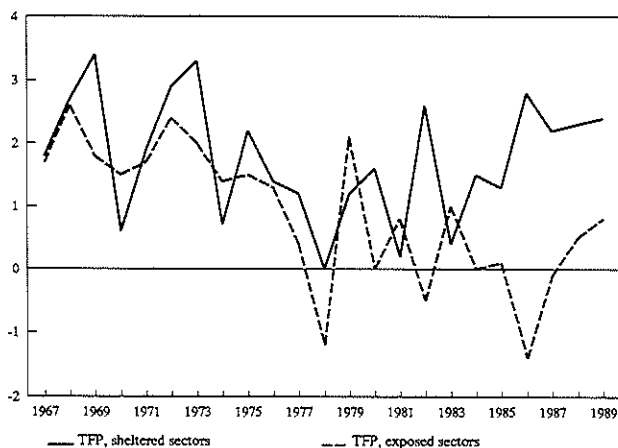
TFP growth in the 1980s is very much influenced by a big shift in capital productivity in the second half of the decade shown in Table 5. TFP and labour productivity show the same profile until 1986 but while the fall in TFP continues until the second half of the 1980s, the change in labour productivity increases after the low point between 1979 and 1986. The continued decline in TFP growth is due to the fall in capital productivity estimated to decline with about 2 per cent annually between 1986 and 1991.

Table 5. Average Change per Year in Total Factor Productivity, Labour Productivity and Capital Productivity in the Private Sector, 1966-1991. (Source: Statistics Denmark, 1993)

	1966-73	1973-79	1979-86	1986-91	1966-91
Total factor productivity	3.45	2.04	1.58	1.15	2.12
Labour productivity	5.33	3.21	2.24	3.16	3.52
Capital productivity	-0.57	-0.29	0.12	-2.08	-0.62

The Economic Council (1991) has made a more detailed study of the development in TFP between 1967 and 1989 with the purpose of analyzing separately the development in sheltered and competition exposed sectors of the economy. In contrast to the official estimates from Statistics Denmark discussed above, labour inputs in the study by the Economic Council are disaggregated and weighted together by income shares drawing on wage data for different educational groups. In the same way capital inputs are decomposed into a quantity and a quality part. The resulting estimates of TFP growth in sheltered and exposed sectors are shown in Figure 6.

Figure 6. Factor Quality Corrected Estimates of TFP Change in Sheltered and Exposed Sectors, 1967-1989. (Source: Economic Council, 1991)



Foreign trade intensity is used as the criterion to assign sectors into the sheltered or the exposed part of the economy. This division is roughly comparable to the division between manufacturing industry and private service industries in Figure 5. With the reservation following the imperfect

comparability the relative sector profiles differ in two respects. In Figure 5, TFP growth in manufacturing industry is higher than in private service industries until the beginning of the 1980s, while Figure 6 with adjustments for differences in factor qualities shows quite another development. In Figure 6 sheltered sector TFP growth is typically higher than TFP growth in the exposed sector through the whole period. Another difference is seen for the 1980s when the sheltered sector increase in TFP growth is more pronounced than found for the counterpart in Figure 5.

For a small open economy it is clearly a problem if TFP consistently grows slower in the exposed than in the sheltered sector. A full explanation of the pattern shown in Figure 6 is not available. A number of possible contributions to an explanation include that the sectors have faced different relative factor prices, that investment patterns have differed and that the long term allocation of labour have differed with respect to the composition of educational qualifications, cf. Economic Council, 1991.

3 The Legacy from the 1930s and the War and Reconstruction Years

3.1 The 1930s

In this and the following two subsections no attempt is made to present a comprehensive picture of growth determinants in the two decades before 1950. The purpose is an attempt to identify a number of fundamental characteristics of these decades that were of importance for the postwar growth process.

Like in most other countries, the 1930s were years of crisis and high unemployment in Denmark. But at the same time it was a decade of structural change in the economy and of employment expansion. In the political history the 1930s mark the beginning of a long period of social democratic dominance in the Danish parliament.⁶ In economic policy this fact along with the big external shocks from the world depression implied a change from a very liberal attitude both in domestic and in foreign trade policy towards a very comprehensive regulation both of external trade and of the domestic economy.

Two facts made the impact from the world depression especially serious for the Danish economy. Denmark was predominantly an agricultural exporter and the shock of the depression was most severe in raw materials and in agricultural products. The other fact was that the country's foreign trade was not bilaterally balanced. Trade was very concentrated with 75 pct. of exports being sold to the UK and Germany and with 50 pct. of the import coming from these two countries.

⁶ The social democratic party was the leading party in coalition governments until the general election in 1973 when a rather stable pattern in Danish political life broke down. The party has never had a majority of the votes.

Trade with the two dominant partners was unbalanced with a big surplus in the UK trade and a deficit in the trade with Germany. This presented no problem in a state of free trade and convertible foreign exchange, but became a very grave problem when restrictions came up on trade in combination with demands for bilateral trade equilibrium.

The full impact of the world depression came in 1933. The terms of trade declined with more than 20 pct. from 1931 to 1932 and insured unemployment reached an all time record level of 32 pct. in 1932. Unemployment declined from the 1932-level but did not move below 18 pct. reached in 1939⁷. The terms of trade improved after the big initial decline and by the end of the decade the 1930-level was reestablished⁸. Average aggregate per capita growth in real GNP was 1.66 pct. from 1930 to 1939. The structural change taking place during the decade is illustrated by a parallel increase of 60 pct. in both industrial production and employment from 1932 to 1939. Part of this was due to the trade restrictions behind which many new, small and labour intensive firms came up.⁹

The overall gross investment to GDP ratio does not decline much in the 1930s where it was 16.6 pct. compared to 17.2 pct. on average for the 1920s. On the other hand, the sectoral composition of investments changes very much. Looking at the ratio between gross investments in agriculture and the non-agricultural sectors there is a big decline from an average ratio of 28.4 pct. for the 1920s to 14.5 pct. in the 1930s. The share of employment in agriculture is falling both before and after the 1930s. Except for the steep decline from 1929 to 1932, the overall decline throughout the 1930s is not faster than in the preceding and the subsequent decade. Concerning the sectoral terms of trade between agriculture and non-agriculture, the GDP deflator for agriculture declined on average by 0.57 pct. per year in the 1930s while the GDP deflator for non-agricultural sectors increased by 1.26 pct. annually. Overall, this resulted in a 20 pct. deterioration of agricultural terms of trade in the domestic economy. Finally, the shifting weight between agriculture and the rest of the economy is illustrated by a fall in the export share of agriculture from 73 pct. in 1930 to 63 pct. in 1939 (Hansen, 1974, Table XIII.6, p. 62) and a decline of the GDP share of agriculture of 2.5 percentage points in constant prices.

7 In Denmark unemployment insurance was (and still is) voluntary. As a consequence of this it is difficult to compare unemployment before the war with the level in other countries as only 50 pct. of blue collar workers and 20 pct. of white collar workers were insured in the 1930s. And the insurance incentive was highest for individuals with a high risk of unemployment (Pedersen, 1982).

8 The only exception was the decline in 1937 caused by the American fiscal policy generated boom in this year which raised dollar-nominated prices on Danish imports of raw materials.

9 Nearly half of this increase in industrial production and employment is estimated to be due to import substitution by Boserup, 1947.

Summing up, the most important legacy from the 1930s for postwar growth seems to be three factors. The first is the sectoral shift from agriculture which is permanent and reinforced after the war. The second is the fundamental change in attitude towards economic policy from *laissez faire* liberalism to a very comprehensive regulation. Foreign trade and part of agricultural production remained regulated throughout the decade. Fiscal policy was mildly expansive - although not due to an early acceptance of Keynesian ideas, cf. Topp, 1987 - and was supplemented through most of the decade by a low interest rate policy. Finally, the change in the relative size and structure of industry had repercussions on postwar growth and trade. Protected by the restrictions on import, most of the expansion of industry after 1932 occurred in small, labour intensive firms¹⁰.

3.2 The War Years

The outbreak of war implied a drastic deterioration of the Danish terms of trade with 20 pct. from 1939 to 1940. In April 1940 Denmark was occupied and the regulated trade pattern broke down. Exports to the dominating UK market for agricultural products fell away as did the normal pattern of imports of raw materials. Exports were - partly forced, partly voluntarily - going to Germany as payments for delivery of raw materials from Germany to keep industry going.

The cutting-off from normal supply channels implied a decline both in the quantity and quality of available raw materials and a necessity to devote resources to develop and produce a multitude of low quality substitutes. Reinvestments fell to a low level and the capital stock became worn down, while the direct destruction through acts of war was rather limited. The consequence was negative growth during the occupation with real GDP 11 pct. below the prewar level in 1945.

The sectoral shift from agriculture to industry slowed down during the war as agricultural products were in high demand from Germany and as major parts of industry were rationed in relation to energy and raw materials. Growth perspectives at the end of the war were both negative and positive. On the negative side was a break down - for obvious reasons - of raw materials supplies from Germany in combination with a lack of foreign reserves. On the positive side counted that real capital and infrastructure were worn down but basically undamaged by war

¹⁰ The high labour intensity was also partly a result of the restrictions on foreign trade. In relation to the analysis by De Long & Summers (1991, 1992) of the importance for growth of investment in machinery, it is interesting to note that the authorities allocating scarce foreign exchange in the 1930s gave low priority to import of machinery. If a firm got a license to import machinery it was conditional on old machinery not being resold, but taken completely out of use. The rationale behind this policy was to restrict the creation - based on the old machinery - of firms that would be completely dependent on protection (Boserup, 1947). The growth and productivity consequences of the first part of the policy was seemingly not considered.

destructions. Another positive factor was the creation of nearly full employment as people with long term unemployment back in the 1930s and at the beginning of the war had been absorbed into jobs.

3.3 The Reconstruction Years, 1945-50

As mentioned, the term reconstruction is less relevant in the Danish case to describe the half decade after the war. The capital stock was largely intact, although reinvestments and maintenance had been at a low level. The main problems in this period were found in the area of foreign trade. On the import side the main problems were the supplies of energy and raw materials in a situation where trade connections with the West had been cut off for five years and where foreign exchange was extremely scarce. On the export side, the two traditional markets, Germany and the UK, were both hit hard. Germany had very little import capacity, and the UK entered the postwar period with big economic problems. As a consequence, a major restructuring of exports occurred with the share of exports going to the other Scandinavian countries and the USA going up with 11 percentage points and with the share of exports going to the rest of world tripling from 15 to 45 pct. (Henriksen & Ølgaard, 1960, p. 42-45). The traditional structure with a surplus earned in Pound sterling used to finance the import of raw materials from outside the sterling area broke down as a sterling surplus no longer was convertible.

Things improved in the area of foreign trade in 1948 and 1949 as the terms of trade increased very much, with a total of 37 pct., over the two years. At the same time the Marshall Plan assistance reached its maximum in 1949 when Denmark received an amount corresponding to 2.6 pct. of GDP. The more comfortable situation in relation to the terms of trade came to an end with the currency realignment in September 1949. Denmark followed the devaluation of sterling due to the importance of the UK market for Danish agricultural exports. Problems came up because agricultural prices were nominated in sterling in an earlier long-term trade agreement and a significant share of Danish imports was bought from the dollar area. As a consequence, the terms of trade deteriorated with 18 pct. from 1949 to 1950 and, due to the Korean war, with a further 17 pct. in 1951.

Despite these big problems related to the restructuring of foreign trade, growth was very high in the first five years after the war with real GDP rising on average nearly 7 pct. per year. Employment rose on average with 1 pct. annually and the capital stock with more than 4 pct. The normalization of the supply situation and the increasing capital intensity resulted in productivity growing between 5 and 6 pct. annually.

Table 6. Indicators of Sectoral Shifts, 1945-50.

	Agriculture			Industry		
	Real GDP	Number of workers	Labour productivity	Production index	Employment index	Labour productivity
1945	100	100	100	100	100	100
1946	105	97	109	141	123	114
1947	97	91	106	158	137	115
1948	97	90	107	176	139	126
1949	110	89	123	188	145	129
1950	124	88	140	208	158	132

Notes: Calculated from Hansen, 1974.

Indicators of the development in agriculture and industry are found in Table 6. Production increased much faster in industry where the prewar level was passed in 1946. Employment also increased very fast in industry in contrast to a fall of 12 pct. in agriculture. The increase in labour productivity was slightly higher in agriculture than in industry from 1945 to 1950. But compared to the prewar level of productivity an important difference appears. In agriculture, the 1945 level of productivity was the same as the prewar level of 1938, so the 40 percent increase from 1945 is a genuine postwar growth. On the other hand, in industry the 1938 level of productivity was not reached again until 1949, so the impressive 1945-50 growth is really no more than a return to the level of 1938. The profile of productivity growth in agriculture is probably due to a shift in the composition of agricultural investments towards a greater share consisting of machinery and equipment. The long time needed to restore the productivity level in manufacturing industry was a topic of debate at the time. The main factors that entered this discussion were problems related to the supply with raw materials and the worn down capital stock mentioned above. Furthermore, part of the explanation could be labour substitution both due to the problems in relation to raw materials and capital stock and due to substitution in consumption towards more labour intensive products. Finally, some - implicit - human capital arguments were made, i.e. training had been sub-standard during the war and the long-term unemployed who re-entered production had lost to some extent both general and specific skills (Stevenius-Nielsen, 1952).

Overall, growth was high during the reconstruction period, in contrast to the first years of the so-called golden period, cf. below. In the long run perspective, the main heritage from the 1940s was a new commitment to high employment modified by a balance of payments restriction. The

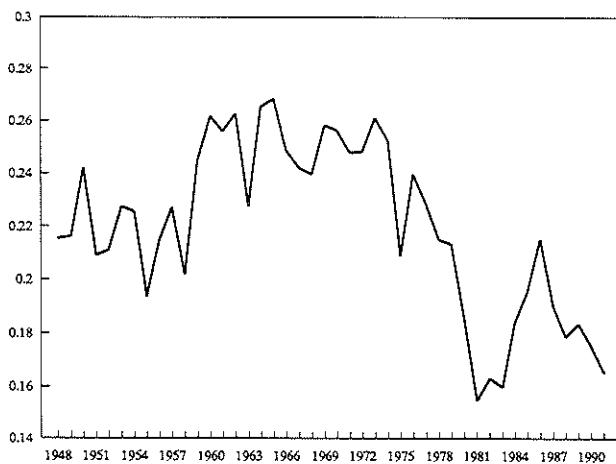
counterpart to this in economic policy was a change in attitudes away from direct regulations and rationing to rely instead on demand management with fiscal policy being the main instrument.

4 Growth Factors and Sectoral Shifts in the Postwar Years

4.1 Growth Factors

After the overview in Section 2 of the aggregate postwar growth and productivity performance we go on to a short presentation of some of the factors behind the growth process using a traditional production function framework. Beginning with additions to the capital stock in the postwar period, Figure 7 shows the gross investment ratio for the aggregate economy. Relative to investment activity, the postwar years clearly fall in three phases: the low growth years of the 1950s with the investment ratio moving around a level of .22; the years of high growth from the late 1950s to the early 1970s with cyclical movements around a higher level of .25; and finally the most recent twenty years with a volatile investment ratio on a downward trend towards a level somewhat below that of the 1950s.

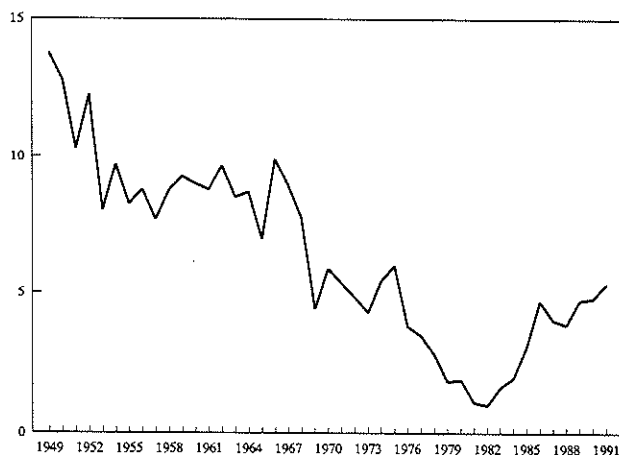
Figure 7. Gross Investments to Output Ratio, Aggregate Economy, 1948-1991. (Source: ADAM databank)



The investment variable used in Figure 7 is a comprehensive measure, including public sector investments and dwellings. In a growth setting De Long & Summers (1991, 1992) have pointed to the specific importance of investments in machinery and equipment. In Figure 8 we show the

annual change in the stock of machinery capital per person in employment for the postwar years since 1949. In the very first years growth in machinery intensity declines from a very high level undoubtedly influenced by reconstruction needs. Next, machinery intensity grows at a fairly constant and relatively high rate from the beginning of the 1950s to the end of the 1960s. It is interesting to note that a big decline in the growth rate occurs before the OPEC supply shocks. In the years with negative supply shocks and stagflation from 1974 to 1980 growth in machinery intensity nearly stops. Growth accelerates in the 1980s, but only to a level significantly below that of the high growth years. Comparing Figures 7 and 8 the gross investment ratio stays at a high level some five years longer than the growth rate of machinery intensity. This reflects the growing importance of investments in dwellings and public sector activities towards the end of the high growth period.¹¹

Figure 8. Relative Change in Machine Capital per Employed Person, 1949-1991. (Calculated from ADAM databank)



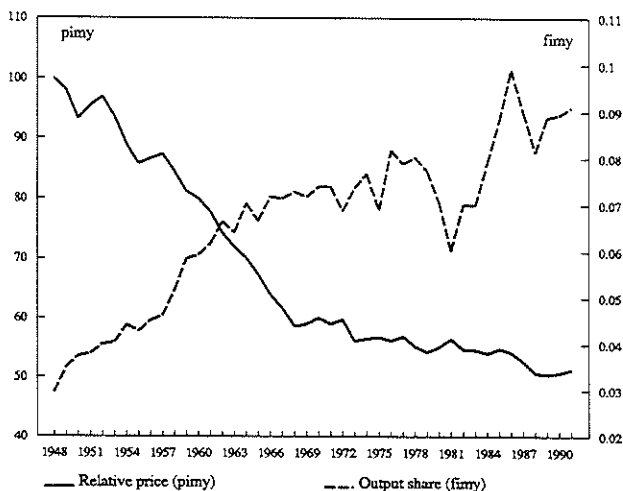
The problems related to machinery investments are illustrated further in Figure 9 showing the output share of machinery investments in constant prices along with the relative price of machinery investments.¹² The visual impression of a narrow relationship between the two curves

¹¹ Looking at the share of machinery investments in gross investments a maximum is reached already by 1960. The trend in the machinery share is falling throughout the years of high growth.

¹² The relative price is measured as the ratio between the GDP deflator of machinery investments and the aggregate GDP deflator.

is confirmed by a coefficient of correlation of .94. No obvious explanation is at hand of the distinct kink in the relative price curve in the late 1960s. But it may be a promising area for future search for the factors responsible for ending the period of high growth.¹³

Figure 9. Relative Price and Output Share of Machinery Investments, 1948-1991. (Calculated from ADAM databank)

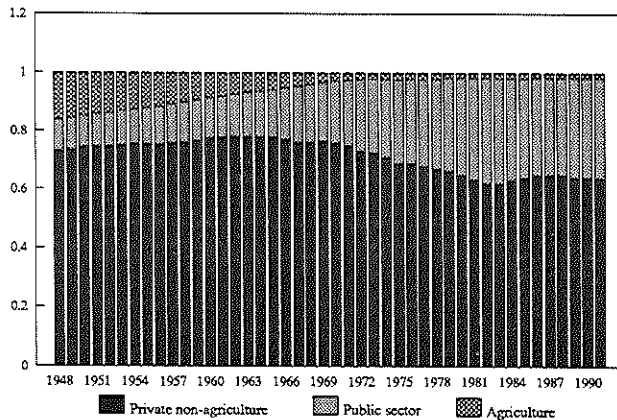


In the postwar years the total number of employed persons including self employed has increased on average by 0.65 pct. per year. The total number of employed wage and salary earners has increased on average by 1.16 pct. per year. The total labour force has increased somewhat faster with unemployment increasing strongly in the last 15-20 years. The strongest increase in the participation rate occurred during the low growth years from the mid-1970s to the mid-1980s. Average annual hours have gone down and the net outcome has been a roughly constant number of working hours supplied in the Danish economy since the mid-1960s. As a consequence, the most interesting aspects in a growth context are shifts in the sectoral composition of employment and changes in the educational qualifications of the labour force or more broadly in the stock of human capital including specific skills acquired through work experience.

¹³ The development in machinery intensity and investment share is not narrowly correlated with year to year changes in growth and productivity. Regressions of the machinery investment share on growth or on growth in productivity shows no relationship between annual observations. Regressions of the annual change in machinery intensity on productivity growth and on growth results in positive coefficients. But they are not quite significant at conventional levels.

Figure 10 shows the major sectoral shifts in the composition of the labour force. The shift from agriculture is completed by the end of the high growth years. It seems to occur so smoothly that it hardly contributes to explain the growth difference between the 1950s and the 1960s. The share of the public sector is growing until 1983. As mentioned above, the employment share of the public sector was extremely low in international comparison at the beginning of the postwar years. The very fast growth from the beginning of the 1960s to the beginning of the 1980s implies that Sweden is the only OECD country with a higher public sector employment share at the end of the period.

*Figure 10. Sectoral Distribution of Employment. Wage and Salary Earners, 1948-1991.
(Calculated from ADAM databank)*



The share of employment in private non-agricultural sectors reaches a maximum a few years into the high growth years and is declining during the subsequent two decades. The composition of employment in the private non-agricultural sectors shows a maximum for the share of employment in manufacturing industry in 1960 and a maximum value for the share of employment in building and construction in 1970. Private service industries is the major employer in the private non-agricultural part of the economy throughout the postwar years. In other words, manufacturing industry never became for a period the dominant non-agricultural private sector as has been the case in most other OECD countries. As a consequence, manufacturing industry employs about 100,000 persons less than in a situation with the same share of employment in industry as in neighbouring OECD-countries (Economic Council, 1987, p. 164).

Data on the development of the stock of human capital - measured by the amount of formal education - are not available on an annual basis for the whole of the postwar period. From 1980 annual register data are available on education and labour market status on an individual basis. Before 1980, less reliable indicators of the level of education are available in census years. For these years, Groes & Bjerregaard (1978) report indicators displaying a slow decline in the share of the adult population without any formal vocational education from 69.5 pct. in 1950 to 66.7 pct in 1970. For the mid-1980s, Hansen (1992) reports the share without vocational education to be about 50 pct. for people between 15 and 59, excluding persons undergoing education. Of the other 50 pct., 9 pct. have long or intermediate theoretical educations and 41 pct. have vocational training. Defined by the type of education 12 pct. had a theoretical or vocational training in technical professions.

In relation to growth performance it is interesting to note that the big increase in the number of people with theoretical educations - a trebling since the end of the 1960s - for the major part has been employed in the public sector and in sheltered parts of the private sector (Economic Council, 1991). In 1988, only 9 pct. of people with long or intermediate theoretical educations were employed in the exposed sectors, while 30 pct. were employed by sheltered private sectors and about 60 pct. were in the public sector.¹⁴ This allocation is partly explained by the supply of trained labour in the new cohorts in the labour market having had for many years a predominance of educations directed towards the sheltered sectors, including the public sector. Partly, it may be explained by a wage structure containing too weak signals to affect a reallocation.¹⁵ Compared with Germany, Hansen (1992) shows that the share of people with university training employed by industry is about three times higher than in Denmark, with 25-30 pct. against 10 pct. This may partly reflect differences in the industrial structure by firm size to which we return below.

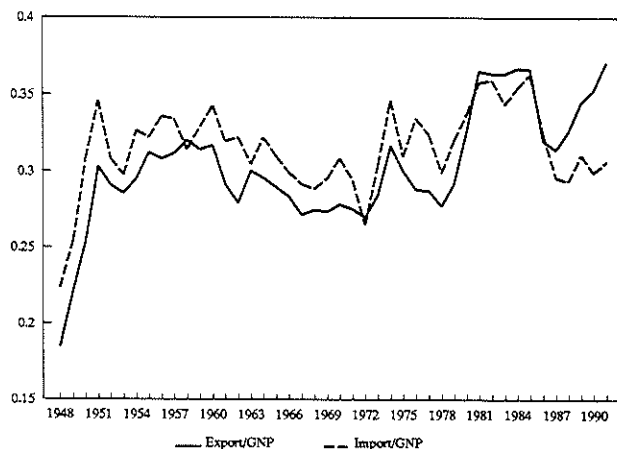
For a small open economy foreign trade is especially relevant in a growth perspective for several reasons. Exports are necessary in cases where economies of scale is an important factor in growth. In the same way, firm size above a certain critical level necessary for systematic R&D activities is also tied to exports for firms operating in a small national economy. Finally, imports of capital equipment for a small open economy is an obvious way to acquire best practice techniques in production processes.

¹⁴ As mentioned in Section 2, this allocational pattern may contribute in the explanation of higher TFP growth in sheltered compared to exposed sectors as depicted in Figure 6.

¹⁵ Typically, human capital estimations on Danish data result in rather low returns to schooling. A specific study in this area is Pedersen et al., 1990.

Aggregate exports and imports ratios for the Danish economy in the postwar years are shown in Figure 11. Obviously there is no simple positive correlation between growth and aggregate participation in foreign trade in the postwar years. On the contrary, trade ratios reach their minimum in the years of high growth, stressing the importance of domestic growth generators in these years, i.e. the expansion of the public sector and of building and construction mentioned earlier.

Figure 11. Aggregate Export and Import Ratios, 1948-1991. (Calculated from ADAM databank)



The importance of agricultural exports initially should be emphasized once again. By the end of the 1950s industrial exports surpass the net agricultural exports. During the 1960s until Danish entry into the EC, agricultural exports were restrained, as the Danish EFTA membership implied free trade only in industrial products. This structural problem should be kept in mind when interpreting the foreign trade profiles shown in Figure 11.¹⁶

The factor contents of Danish foreign trade have been analyzed for the years 1966-80 by the Economic Council, 1984. The analysis was based on input-output tables to obtain estimates of

¹⁶ In a very long run perspective Paldam (1991, p.82) shows that the exports share has been moving around a stationary level since the 1920s. The strongest increase in the exports ratio occurs from around 1870 to around 1930. It is interesting to compare this with the above average Danish growth in the decades from 1880 to 1929 found in Table 2 above.

the factor intensities in exports and in competitive imports.¹⁷ The result is that Denmark was a net-exporter of capital and labour and a net-importer of R&D. Less surprisingly, the country was found to be a net-importer of energy.¹⁸ Disaggregating the net trade flows on different educational groups of labour, it was found that Denmark was a net-exporter of unskilled labour, and a net-importer of skilled and theoretically trained labour. The same pattern is confirmed by Hansen (1992) using more reliable data on education for the years 1980-86.

This factor-composition paradox in a high-wage economy is no doubt to some extent related to the still important export of processed and semi-processed agricultural products. Many people working in agriculture and related industries have no formal training - and are therefore classified in the educational registers as unskilled - which of course in many cases, especially for farmers, is a measurement error in relation to the "true" human capital variable that should be used in the analysis. Bearing this reservation in mind, one could still claim that the production of value-added in foreign trade is more relevant in a growth perspective than the factor intensities of net trade. Factor intensities could however in a long run perspective be useful as signaling structural imbalances or weaknesses in the industrial structure. It should finally be mentioned that the factor-composition paradox based on available evidence seems to be declining, Economic Council, 1984, p. 68 ff.

Scale economies and R&D are two important factors stressed by the new growth theory. In both areas the relative position of the Danish economy is weak judged by available indicators. The average firm size in Danish industry is small compared to most other OECD countries.¹⁹ No industrial firm is big by international comparison. The biggest industrial firm - Danfoss, producing electrical equipment to industrial and household uses - employs less than 10,000 people. About 90 pct. of industrial firms employ less than 100 people. In relation to growth, this lack of big industrial firms creates potential problems both regarding scale economies, R&D and export performance. The Economic Council (1987, p. 172 ff) finds indications of scale economies in a number of industrial branches in the Danish economy. It is thus clearly a problem in relation

¹⁷ Imports that could not be produced domestically and imports for which no domestic counterpart exists (e.g. engines for aeroplanes) are excluded from the calculations.

¹⁸ This has changed in recent years due to a big increase in domestic oil and gas production in the North Sea.

¹⁹ The exceptions are the Netherlands and Norway having size distributions close to what is found in Denmark.

to growth, that so few big firms were generated during the industrialization wave in the 1950s and the 1960s. A deterioration of Danish wage competitiveness throughout the 1960s and 1970s is possibly part of an explanation of this lacking ability to generate big firms.²⁰

R&D intensity in Denmark is low by international comparison. In 1983 the R&D share of GNP was estimated to be 1.17 pct. compared with an unweighted average of 2.26 pct for 6 other OECD-countries.²¹ Growth in Danish R&D expenditures was on the other hand higher in the beginning of the 1980s than in the reference group of countries. Møller (1985) found that firms with more than 1,000 employees (12.5 pct. of the firms in the sample) were responsible for nearly half (46.5 pct) of the amount of R&D. On the other hand, the study showed that size is decisive for whether R&D is undertaken at all. For the firms who do engage in R&D the intensity of R&D does not increase with firm size.

Firm size is also important in relation to export performance and thus indirectly for growth performance. Indicators for this can be found in the Economic Council, 1987, p. 187 ff. Calculations of the direct export ratio for a great number of industrial branches result in a narrow relationship between firm size and export ratio in all branches. Taking the four most R&D intensive branches, cf. above, the average export ratio for big firms in these branches is 6 times higher than the average for all firms in these industries.²² For all branches the unweighted average relative export ratio for big firms is 3.2. Based on these indicators, scale economies seems to be present in both R&D and export performance. The tentative conclusion is that the industrial structure has been a growth restraining factor in the postwar Danish economy.

4.2 Sectoral Shifts

In the domestic economy major sectoral changes have occurred during the postwar period. The most important shifts are the decreasing importance of agriculture and the increasing share of the public sector in the economy. These trends are as well known common to all OECD countries. The special feature in the Danish case is the magnitude of the shifts. In contrast to most other European countries, agriculture was still the dominant exporting sector at the beginning of the postwar period. As regards the public sector, only Sweden has experienced a stronger relative growth than Denmark in this area among the OECD-countries.

²⁰ Whether a wave of mergers and acquisitions in Danish industry in the late 1980s can compensate for this is another question. In a study of mergers and acquisitions in 1989, Rasmussen (1990) concludes from stock market reactions that the merger activity was net value creating.

²¹ The UK, the USA, West Germany, France, Sweden and Norway (Economic Council 1987, p. 177).

²² Big firms are defined as the 8 biggest firms in each industrial branch.

Thus, while a big shift has occurred between the public and the private sector, major shifts have also occurred within the private sector of the economy. Indicators for this are found in Table 7 showing for each of the four postwar decades the average annual growth rate, the standard deviation and the coefficient of variation for the four major private sectors of the economy.

Table 7. Sectoral GNP Growth Indicators, 1950-1989.

		Agriculture	Building and construction	Manufacturing Industry	Private Service industries
1950s	Av. annual growth	2.22	4.99	4.50	3.45
	St.dev.	8.04	6.39	4.78	1.75
	Coeff. of var.	3.62	1.28	1.06	0.51
1960s	Av. annual growth	2.17	6.97	6.73	3.81
	St. dev.	5.09	5.65	3.70	2.67
	Coeff. of var.	2.35	0.81	0.55	0.70
1970s	Av. annual growth	1.26	-1.60	3.06	1.97
	St. dev.	12.34	6.15	2.83	3.42
	Coeff. of var.	9.80	-3.84	0.93	1.74
1980s	Av. annual growth	4.42	0.37	1.72	2.29
	St. dev.	8.37	9.74	3.12	2.33
	Coeff. of var.	1.89	26.32	1.81	1.02

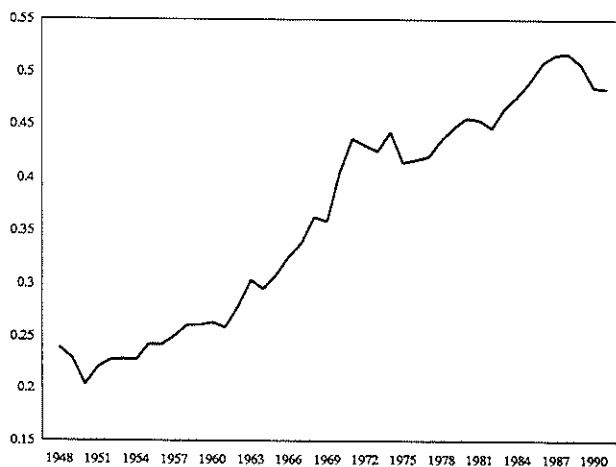
Note: Calculations from ADAM databank.

Agriculture has the lowest average growth from 1950 to 1970. This low average growth is highly volatile. Growth is still low and volatile in the 1970s, but in this decade the lowest average growth is found in building and construction. Finally, in the 1980s agriculture has an average growth that is higher than in preceding decades, higher than what is found in the other three major private sectors and furthermore, growth is more stable than earlier. This presumably reflects the impact from operating under the EC agricultural programme. Over the whole period 1950-90 the GDP share of agriculture in current prices goes down from 17.2 to 3.7 pct. For building and construction the last two decades represent a complete end to growth. From 1950 to 1990 the GDP share of building and construction, measured in current prices, goes down from 6.7 to 5.1 pct. For manufacturing industry, the GDP share decreased with nearly five percentage points from 1950 to 1990, from 22.9 to 18.2 pct. in current prices. For the period 1950 to 1979, service industries follow the general pattern with the difference between decade averages being, as expected, somewhat smaller than in the goods producing sectors. An exception

to the general pattern is the accelerating growth in service industries from the 1970s to the 1980s. The GDP share of private service industries goes up slightly from 29.8 pct. in 1950 to 30.4 pct. in 1990²³.

A summary illustration of the rapid postwar increase in the public sector is found in Figure 12 showing the tax/GDP ratio from 1948 to 1991. The initial level is clearly below the OECD average at the time while the level in 1991 is surpassed marginally only by Sweden. The major part of the increase occurs within only 10 years from the beginning of the 1960s to the beginning of the 1970s. A renewed increase in the first part of the 1980s is partly redressed in the most recent years.

Figure 12. Total Taxes Relative to GNP, 1948-1991. (Calculated from ADAM databank)

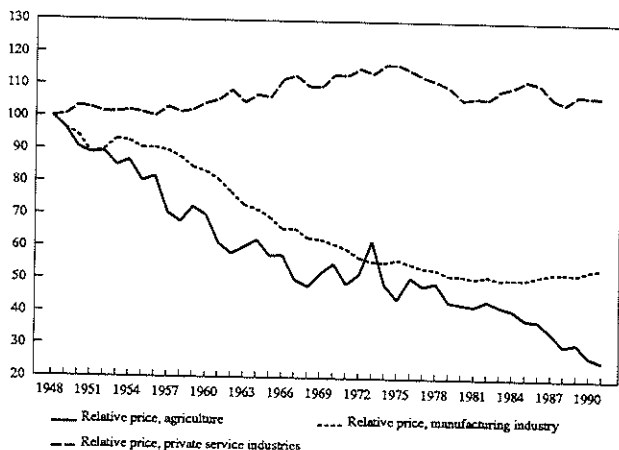


The quantitative shifts in the relative importance of different sectors in the postwar economy have been accompanied by equally big changes in relative sector price levels. In Figure 13 this is shown for agriculture, manufacturing industry and private service industries. The relative sector prices are calculated as the ratio between implicit sector GDP deflators and the aggregate GDP deflator. For the two goods producing sectors, the relative price levels fall to between 30

²³ The GDP shares of the four sectors are heavily influenced by the increasing public sector share from 1950 to 1990. Looking at the relative distribution of GDP between the four sectors alone produces a somewhat different picture. From 1950 to 1990 the shares change as follows: agriculture from 22.4 to 6.4 pct., building and construction from 8.7 to 9.1 pct., manufacturing industry from 29.9 to 31.6 pct. and finally service industries from 38.9 to 52.9 pct.

pct. and 60 pct. of the initial level for respectively agriculture and manufacturing industry. Until the mid-1970s the fall is approximately parallel for agriculture and industry. Since then, the decline continues for relative agricultural prices while the relative level stabilizes for industry.

Figure 13. Sector GDP Deflators Relative to Aggregate GDP Deflator. Agriculture, Manufacturing Industry and Private Service Industries, 1948-1991. (Calculated from ADAM databank)

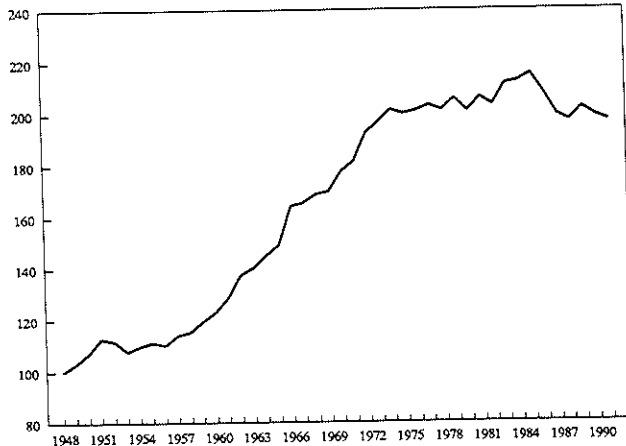


In a small open economy an important factor is the terms of trade or the relative price levels between exposed and sheltered sectors. This is illustrated in a crude way in Figure 14. A relative, sheltered sector price level is calculated as a weighted average between the relative price levels for building and construction and for private service industries. Figure 14 shows the ratio between this and the relative price level in manufacturing industry taken as representative for the exposed sector of the economy. Over the whole postwar period the sheltered sector price level doubles relative to the level in the exposed sector²⁴. The shift in the price ratio is concentrated in time to the years of high growth from the late 1950s to the early 1970s. The annual change in the price ratio is about 5 per cent which is clearly higher than the productivity growth differential between the sectors. Consequently, the development shown in Figure 14 indicates the possibility of crowding out of the competitive sector due to a pressure on labour and other costs from a

²⁴ The same phenomenon is found for Belgium, but for the post 1973 years, cf. Cassiers et al., 1993.

very strong expansion of the sheltered sectors in the high growth years. Note that Figure 14 includes only the private sector part of the sheltered sectors and as illustrated in Figure 12, public sector expansion was also very fast in this period.

Figure 14. Relative Price between Sheltered and Exposed Sectors, 1948-1991. (Calculated from ADAM databank)



5 Growth and Economic Policy since 1950

5.1 The Slow Start, 1950-1957

Economic growth was lower in Denmark in these years than in most other OECD countries with Belgium and the UK as exceptions. It is difficult to point to any decisive factor to explain this fact. A standard explanation in Danish economic history is that the slow growth was due to a perceived balance of payments restriction, i.e. there existed both for liberal and socialdemocratic governments a shared conviction that it would be impossible or difficult to finance any major deficit on the international capital markets. In retrospect this conviction was hardly well founded. Anyway, governments at the time acted upon it and the result was that foreign net debt was nearly non-existent at the end of the 1950s.

A negative development on the balance of payments induced on a number of occasions a contraction of economic policy restraining growth. International price movements had a negative effect during the Korean war and during the Suez crisis. On both occasions the effects were quickly felt in an economy which depended to a very high degree on imported raw materials and energy. A long run factor influencing the balance of payments situation was the ongoing shift from agriculture to industry. It created problems that trade in agricultural products for a great part remained regulated.²⁵ At the same time, other types of problems were created by the liberalization of trade in industrial products, as major parts of Danish industry had grown up during the time of strict trade restrictions in the 1930s. Nevertheless, the export share of industrial production doubled from 10 to 20 pct. until 1957. Employment in industry surpassed agricultural employment in 1957. This, however, was due most of all to a decline in agricultural employment. Industrial employment was nearly constant and the growth in industrial production nearly exclusively went to exports.

As mentioned, in economic policy the main heritage from the preceding decade was a new commitment to high employment, and a commitment to low inflation and balance of payments equilibrium. The first of these targets is illustrated in Figure 15 showing the postwar profile of unemployment. Unemployment was higher between 1950 and 1957 than in most other OECD countries and higher than in the subsequent 15 years. Compared to the 1930s, however, the level was extremely low. Growth per se was on the other hand not a specific target in economic policy. Inflation, measured in Figure 17 by the rate of increase of nominal wages was volatile but overall rather low in the period. It is interesting to note in Figure 17 the real wage flexibility at the outbreak of the Korean war and the very modest and temporary increase in unemployment. This is very much in contrast to the reactions of the first OPEC shock 20 years later, cf. below.

²⁵ Kindleberger (1967, p. 70) is critical towards the agriculture based explanation of slow Danish growth in the 1950s. He points out that neither the employment share nor the migration out of agriculture was especially high in Denmark compared to a number of other European countries. This misses, however, the point that the export share of agriculture was very high in Denmark.

Figure 15. The rate of Unemployment, 1948-1991.

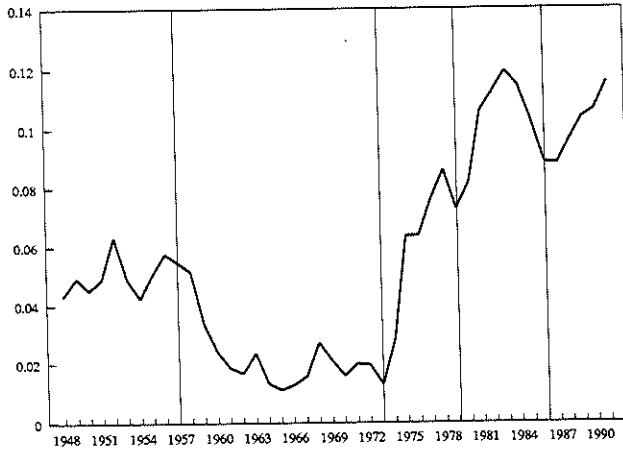
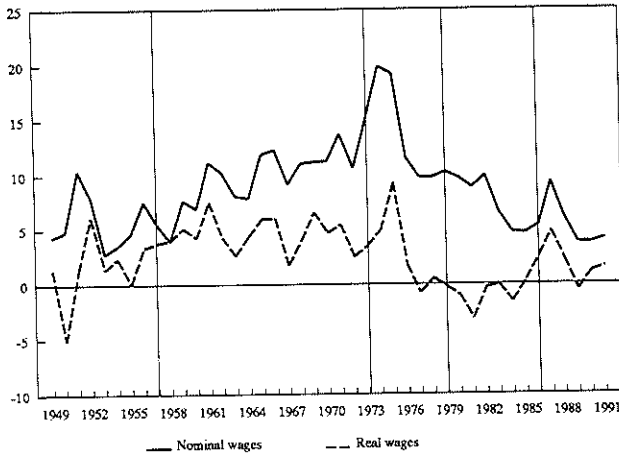


Figure 16. Rate of Increase in Nominal and Real Wages, 1949-1991. (Calculated from ADAM databank)



In economic policy the late 1940s saw a certain interest in national budgets and indicative planning. Neither planning nor incomes policy became dominant in actual policy making in the 1950s (Kindleberger, 1967, p. 70). Instead, the main principle became a policy mix with rather restrictive fiscal policy to keep the external balance and a more expansionary monetary policy to encourage investments and growth. Even though there was a surplus each year from 1950 to 1957 on the state budget, the policy mix was not realized with success. The rate of interest drifted upwards for most of the period as fiscal policy was not sufficiently restrictive to meet the external constraint.

5.2 Years of High Growth, 1958-1973

It is difficult to point out any single factor as being responsible for the slow growth of the 1950s until 1957. In the same way, no single factor explains the sudden shift in growth performance beginning from 1958.

The external constraint became less binding as an international boom coincided with an improvement of the Danish terms of trade. Rather weak minority governments were succeeded in 1957 by a majority government. The possibility to finance an external deficit improved very much and the attitude towards running a balance of payments deficit changed too. In the beginning this was rationalized by the need to accelerate the ongoing structural change from agriculture to industry. In the end it turned out to be a very difficult and painful process to end the running of external deficits. The government of the late 1950s further introduced a more expansionary fiscal policy. It turned out to be especially important that the tax treatment of investments were improved along with a declining rate of interest.

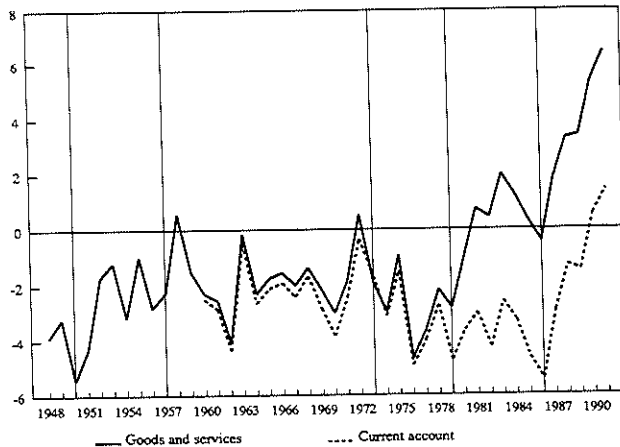
The combined effect of this set of factors along with an ample supply of labour both coming from unemployment and from migration out of agriculture laid the foundation for an investment boom, from the late 1950s to the mid-1960s, especially in the form of investments in machinery and equipment, cf. Figure 8. A few years into the high growth period, expansion began in the public sector and in building and construction. From the mid-1960s these factors became dominant in the continuation of high, but decreasing growth rates.

It was not all aspects of the external development that were favourable to growth of the Danish economy, however. A main problem for Denmark in the 1960s was that major trading partners joined the EC and others joined EFTA. As a member of EFTA, Denmark enjoyed free trade in industrial products while agricultural exports both to EC countries and to most EFTA countries were restrained by direct regulation.

As mentioned in the introduction, Denmark enjoyed only a short spell of macroeconomic balance and high growth around 1960. Soon, imbalances turned up and became increasingly important as we approach the end of the high growth period. Unemployment in Denmark was lower than the European OECD average and inflation was higher, cf. Figure 16 showing cyclical movements around an increasing trend in nominal wage increases while real wage increases are at a stationary level. A consequence of this was a steady deterioration since 1960 of international competitiveness as measured by an increase of about 30 pct. in the real effective exchange rate of Danish kroner from 1960 to 1973 (Hoffmeyer, 1993, Figure III.6, p. 69).²⁶

The current account was in deficit throughout the high growth period with 1963 and 1972 as the only exceptions, cf. Figure 17. During the 1960s this reflected a savings deficit in the private sector, as the public sector had a savings-investment surplus throughout the period (Pedersen et al., 1987, Figure 10, p. 27). This marked the beginning of a long period of mounting foreign indebtedness with the foreign debt to GNP ratio increasing from 1 pct. in 1960 to 10.8 pct. in 1973. As a consequence, the interest rate gap vis-à-vis Germany increased from 0 in 1960 to a level around 2-3 percentage points at the end of the high growth period (Hoffmeyer, 1993, Figure III.4, p. 55).

Figure 17. Balance of Payments Relative to GNP, 1948-1991.



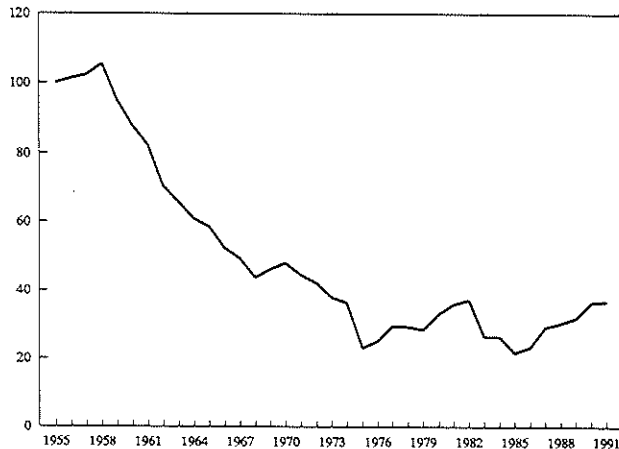
²⁶ The real effective exchange rate is weighted by Danish industrial trade weights and corrected for differences in the development of wage costs.

Public sector expansion was very fast in the high growth years. From 1960 to 1970 the ratio between public and private consumption doubled from .2 to .4 and income transfers rose in the same proportion as public consumption. Whether this development created further imbalances is another question. As illustrated in Figure 12 total taxes relative to GNP also rose very fast. The public sector was in surplus throughout the period 1960 to 1973 with an average surplus of 2.6 pct. of GNP. Looking instead at the change in the public sector surplus corrected for automatic fiscal reactions a different picture emerges (Christensen, 1993, Table A.2.1, p. 125). In the 1960s fiscal policy appears to have been on average neutral/slightly expansionary. In a setting with a private sector boom during most of the period this indicates that the extremely strong expansion of the public sector was not accompanied by a sufficiently strong crowding out of private sector activities.

A crowding out could have been effected by an accompanying monetary policy. Nominally, the long term rate of interest doubled from 1960 to 1973. The real rate was stationary, moving around 3 pct. But, reflecting unlimited tax deductibility for interest expenditures and the strong increase in taxation, the real rate net of taxes declined from 3 pct. in 1960 to -3 pct. in 1973. (Nielsen & Søndergaard, 1991, Figure 11.8, p. 360). No crowding out, creating room for public sector expansion could come from this development. On the contrary, the building boom during the latter part of the high growth period was partly a crowding *in* reaction to this profile in net real interest rates.

Income policy was introduced in the 1960s and used with great vigour in 1963, and later on a number of occasions between 1967 and 1973. Apparently, this new instrument was unable to end the mounting imbalances in the economy. These imbalances, along with the sectoral changes and shifting trends in relative factor prices signalled a fading out of the high growth period before the actual occurrence of the first OPEC shock. Some of these shifts are illustrated in Figures 8 and 9 showing the drop in the rate of increase in machinery capital per person employed along with the end of the relative decline in the price of machinery investments. These shifts occurred simultaneously, 4-5 years ahead of the first OPEC shock. Looking at the broad pattern in the capital user cost to wage ratio, data - available from 1955 - shows a more dramatic development than the one depicted in Figure 9, confirming the break in the ratio from the late 1960s, cf. Figure 18.

Figure 18. Ratio between User Cost of Capital and Industrial Wages, 1955-1991. (Calculated from ADAM databank, 1955=100)



5.3 Shocks and Stagflation, 1973-1979

The international recession following the first OPEC shock had very serious repercussions on the growth of the Danish economy. The mounting macroeconomic imbalances had created a situation where economic policy options were restricted. Options became further restricted as the political situation was in turmoil after a general election in December of 1973 resulting in a major break up of established party patterns in the Danish Parliament.

The immediate impact of the price shock was reinforced in the labour market by an automatic indexation of wages, where indexation occurred with a short lag and high coverage. At the same time wages were affected by a lagged impact from excess demand in 1973. Nominal hourly wages rose by nearly 40 pct. between 1973 and 1975, cf. Figure 16. The consequence was a huge increase in real wage costs. The competitive situation was at the same time affected by the tying of Danish kroner to the German Mark during the "Currency Snake" period. The outcome was that Danish kroner appreciated with 8 pct. between 1972 and 1976. The combined effect of these domestic and external events were not surprisingly a huge increase in unemployment and two consecutive years with negative growth. Unemployment in those years was affected also by an unprecedented increase in labour force participation.

Economic policy during the decisive years 1974-75 had a stop-go character emitting unclear signals.²⁷ Priorities shifted between the balance of payments problem and unemployment, until expansionary measures were given up in 1976, when the strategy of joint expansion failed internationally. In the following years a so-called "Twist-strategy" was applied consisting of shifting demand from private to public sector activities. The purpose was to stabilize or increase total employment and at the same time improve the current account by shifting demand away from import-intensive private sector demand.

From 1974 to 1979, major income policy measures were applied at 9 occasions. But neither the twist-strategy nor income policies were able to redress the initial decrease in employment from 1973 to 1976. Between 1979 and 1982 the strategy shifted towards devaluations of the currency supported by restrictions on wage indexation ending with a complete abolition of indexation in 1982. As a consequence of this, real disposable wages for industrial workers decreased from the late 1970s to the early 1980s with no less than 20 pct. (Hoffmeyer, 1993, Figure IV, p. 91). This was a foundation for the strong recovery going on until 1987, cf. below.

Overall, the shocks of the 1970s were handled by inappropriate economic policy reactions and institutional changes came too slowly. The consequence was a permanent shift to high unemployment and a sequence of years with low or no growth. Beyond the field of short run economic policy, slower growth was also related to the fundamental changes in relative prices discussed above that began well before the external shocks.

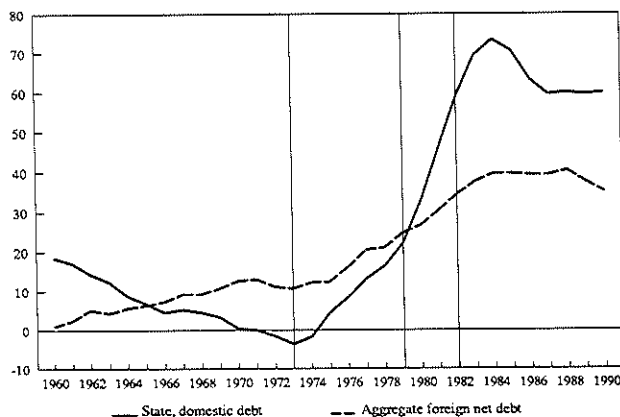
5.4 Recovery and Stagnation - The Years after 1980

In the first years of the 1980s, the Danish economy felt once again the impact from an external shock. This time endogeneous reactions were much more appropriate than during the 1974 shock. The initial position, however, was weaker and the size of the shock was bigger. The impact both on the domestic debt position of the state and on the overall foreign net debt position was alarming, cf. Figure 19. In a rather despairing mood a socialdemocratic minority government resigned in 1982 and was relieved by a conservative-centre coalition announcing a change of regime to a fixed exchange rate, private sector strategy.

The initial reactions were impressive. The nominal rate of interest and inflation came down very quickly like in most other OECD countries, but at the same time employment, investment, private consumption, and growth all went up equally quickly. The Danish 1980s recovery thus preceded the OECD recovery. It turned out, however, that credibility in relation to the change of regime

²⁷ A very comprehensive analysis of Danish economic policy in the years 1974-1979 with a comparative approach can be found in Nannestad, 1991.

Figure 19. Net Foreign Debt and State Sector Domestic Debt Relative to GNP, 1960-1990.
 (Source: Mikkelsen, 1993, Tables II.2 and II.3)



was more difficult to establish than expected. In the capital market a sizeable interest gap remained vis-à-vis Germany, and in the labour market too, credibility of the fixed exchange rate regime was hardly established until the end of the 1980s.²⁸

The recovery came to an end in 1986 after a big deterioration of the current account, cf. Figure 17, making the foreign debt position critical. The Danish recovery thus came to an end at the same time as the general OECD recovery was under way. Fiscal policy was tightened in 1986 and reinforced by a tax reform in 1987. In the following years the only expansionary element in the Danish economy was exports helped first by the general OECD recovery and next by the effects from the German unification.

In a growth perspective three important phenomena turned up, all in the mid-1980s. The first was a very big decline in the private sector savings rate. The second was the years with negative growth, both in conventional labour productivity and in TFP. Finally, labour market reactions to the recovery showed a lack of flexibility as wage increases accelerated and reached 10 pct. in 1987 with unemployment at 8 pct. of the labour force. The net rate of saving in the private sector declined from 15 to 5 pct. of net disposable income during the recovery. This could be explained as a cyclical reaction reinforced by capital gains due to the big decline in interest rates. In the long run, however, the private sector has had a structural savings deficit in the sense

²⁸ See the analysis in Andersen & Risager (1990).

that savings fell short of investments as soon as capacity utilization reached a normal level. This fact may be related to the expansion of income transfer programs having a negative impact on private savings motives and to the full deductibility of interest expenditures until 1987. A sufficiently high level of public sector saving could in principle counteract negative long run effects from the private sector savings deficit on capital formation. Public sector savings have moved counter to private savings but, as evidenced by the persistent deficit on the current account, not in an extent to neutralize periods with a low private savings rate.²⁹

Finally, the productivity problem of the 1980s. As shown in Section 2, productivity growth had been on a declining trend since the end of the 1960s in Denmark as in most other OECD countries. The specific Danish problem was the occurrence of negative productivity growth in 1986. In the Danish debate Gjerding et al. (1990) have claimed that the 1986 occurrence marks a technological break where installation of fundamentally new technologies created problems of adaptation for firms and their employees. Others, Clemmesen et al. (1993), argue that the 1986 occurrence is explainable as a reaction to adjustment lags in a highly volatile cyclical situation and an extremely high utilization of existing capital equipment in 1986. In relation to the profiles in relative prices presented earlier, the last interpretation seems convincing. The interpretation of 1986 data is further complicated due to the dramatic decline in this year in both raw material prices and the exchange rate of US dollars. Due to this, specific deflation problems may exist for 1986. In conclusion, it seems that productivity growth in the 1980s returns to the level prevailing before the period of high growth. In this interpretation, it is productivity growth from 1957 to 1973 that is exceptional, and not the decline to a more normal level once again in the 1980s.

6 Concluding comments

Danish postwar growth has been more uneven than in many other OECD-countries. Overall, growth has not differed much from the OECD average, but the time profile has been different. Growth was below average in most of the 1950s and after 1973, but above average in the rather short period of high growth from 1958 to 1973. Growth has been restrained by two sets of factors. An unfavourable initial sectoral allocation with great importance attached to export intensive agriculture created external constraints in a postwar situation with liberalized trade in industrial

²⁹ It could be argued that this problem is less important in a global environment with perfectly free capital mobility. But, as the savings deficit is a reflection of an insufficient level of international competitiveness, a country in this situation becomes less attractive for international investors. Anyway, in spite of perfect capital mobility, national savings and investment rates are still highly correlated. Sectoral savings-investments balances are discussed further in Pedersen et al., 1987.

products, but heavily regulated trade in agricultural products. Another set of factors have been macroeconomic imbalances growing in some periods to an extent that restrained growth and restricted choices in economic policy.

It was argued in Section 2 that the lower post 1973 growth represents a return to the long run rate of growth of the economy. Accepting that argument, it is of major interest to identify the factors that created the period of high growth as well as the factors contributing to end this period. The beginning of the high growth period was characterized by an unusual combination of factors including an international boom, an improvement of the terms of trade, better access to and lower costs on international capital markets, a fall in the rate of interest, the coming to office of a majority government, and the implementation of a growth promoting fiscal policy. Further, there was a growth potential in the economy with ample supply of labour and a favourable trend in relative prices.

Some of the factors contributing to the return to a lower rate of growth began evolving in the high growth period. International competitiveness deteriorated gradually, a structural savings deficit appeared in the private sector, and sectoral changes in the economy became gradually less favourable in relation to economic growth. Further, fundamental shifts in relative prices unfavourable to growth developed. The relative price of machinery investment, the relative prices between sheltered and exposed sectors and relative factor prices all developed in a way during the high growth period that was unfavourable to continued high growth.

At the time of the 1974 supply shock, macroeconomic imbalances growing over a number of years along with a rather confused political situation created a highly inappropriate adaptation to the external shock. Real wages rose fast in a situation where Danish terms of trade deteriorated. The subsequent increase in unemployment further illustrates an inadequate ability in the labour market to adapt to fundamental changes. The only longer post-1973 recovery in the 1980s ended in 1986 due to policy reactions to an intolerable development in the foreign net debt position. Since 1986, Danish economic performance has had an impressive record with regard to inflation and the current account, while growth has remained low and unemployment has been on an increasing trend.

A number of problems were identified in the Danish postwar growth history. Industrialisation proceeded rapidly in the late 1950s and the 1960s, but very few big firms were generated during this process. In relation to size-dependent barriers to export, R&D, and scale economics this aspect of the industry structure may have restrained growth.

A final concluding comment concerns the eventual role of institutional characteristics. Minority coalition governments for most of the postwar period could be part of the explanation of the fact that imbalances were allowed to reach an extent that seriously restrained growth and created narrow options in economic policy at several occasions during the postwar years.

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