Danmarks Nationalbank

Monetary Review 4th Quarter 2000

DANMARKS NATIONAL BANK 2000

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Recent Monetary Trends

This review covers the period from September until the middle of November 2000.

INTERNATIONAL ECONOMIC BACKGROUND

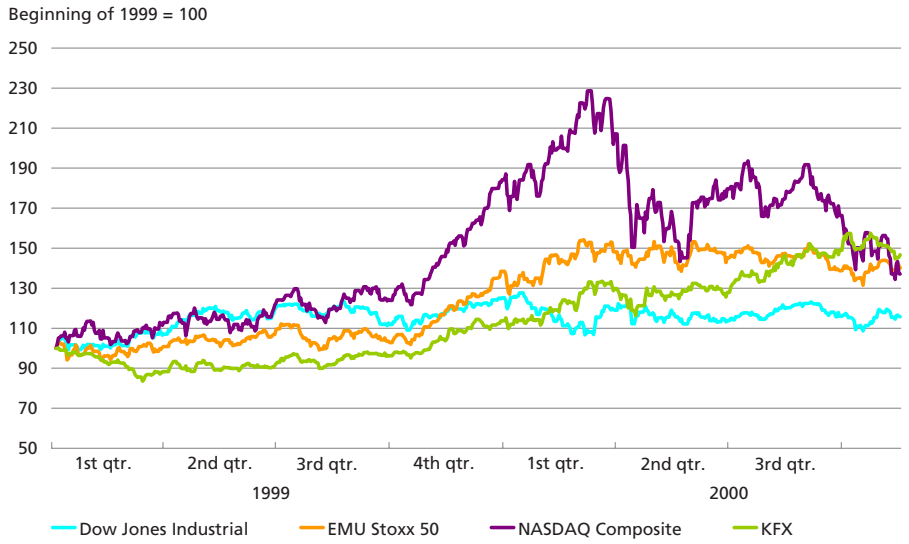
The robust growth in the global economy continued in the first half of 2000, and prospects are still favourable. In their autumn forecasts both the European Commission and the International Monetary Fund, IMF, have raised their estimates of global growth for 2000 and 2001. However, growth in 2001 is expected to be more moderate, in view of higher oil prices and a tighter monetary policy than at the turn of the year in both the USA and the euro area, as well as Japan.

After very strong expansion in 1999 and the 1st half of 2000 there are now more and clearer signs of a dampening of the US economy to a growth rate more in line with the output potential. The preliminary national accounts thus showed a slowdown in growth in the 3rd quarter. For investments in particular growth was more subdued. Although the growth in labour productivity is still high, it did fall in the 3rd quarter, in step with the economy's dampening. To date, the high productivity growth has made a strong contribution to the relatively moderate course of inflation, despite high growth and low unemployment.

US technology stocks have lately been highly volatile, cf. Chart 1. This especially applies to the NASDAQ Index, which has fallen since the start of the year. This reflects the announcement of downward revisions of earnings expectations by a number of major corporations in September and October. The traditional Dow Jones Index is at around its January level. Since stock prices are considered to be one of the forces driving private consumption, the greater volatility makes it more difficult to assess the trend for private consumption. Indeed, consumer confidence fell in October to the lowest level of the past year, but is still high.

The most recent key economic indicators for the euro area confirm the current economic upswing. GDP in the 2nd quarter was 3.7 per cent above the level in the previous year, which is the highest growth rate since the beginning of 1998. The growth is attributable to continued robust development in private consumption, and in particular to a significant improvement in exports, supported by stronger global growth

STOCK PRICES Chart 1

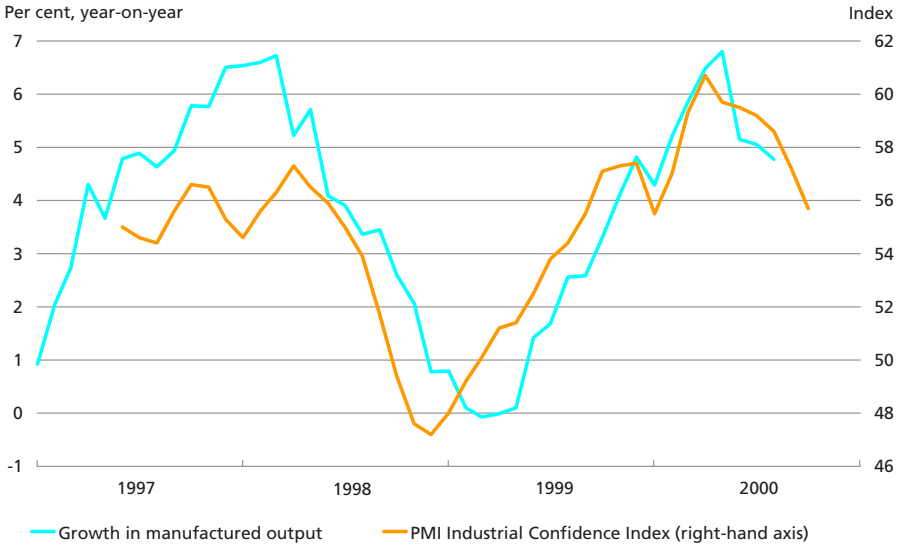


Source: Ecowin.

and the depreciation of the euro vis-à-vis especially the dollar and the yen. Unemployment in the euro area has declined steadily since the autumn of 1997, to a rate of approximately 9 per cent in late summer. However, industrial and consumer confidence indicators have generally fallen in recent months. Together with the more moderate growth in manufactured output, this indicates slightly lower growth in the 2nd half of 2000, cf. Chart 2. In October consumer prices (HICP) in the euro area were 2.7 per cent higher than one year before. The increase thus still exceeds the definition of price stability of the European Central Bank (ECB) as an annual rate of increase in HICP of below 2 per cent in the medium term. The higher rate of inflation is attributable particularly to rising energy prices. Inflation excluding energy and food is still well below 2 per cent, but with a tendency to rise. In September the monetary aggregate, M3, was 5.5 per cent higher than the level in 1999. The growth rate thus still exceeds the reference value for monetary growth of 4½ per cent.

In Japan the emerging upswing continued in the 2nd quarter with a rate of growth of 1.0 per cent against the 2nd quarter of 1999. The expansion is attributable primarily to strong growth in exports and the recent substantial increase in government investments as a consequence of the package of fiscal-policy measures of November 1999. However, a number of indicators suggest diverging economic trends, and therefore considerable uncertainty concerning the strength of the current up-

MANUFACTURED OUTPUT AND INDUSTRIAL CONFIDENCE IN THE EURO AREA Chart 2



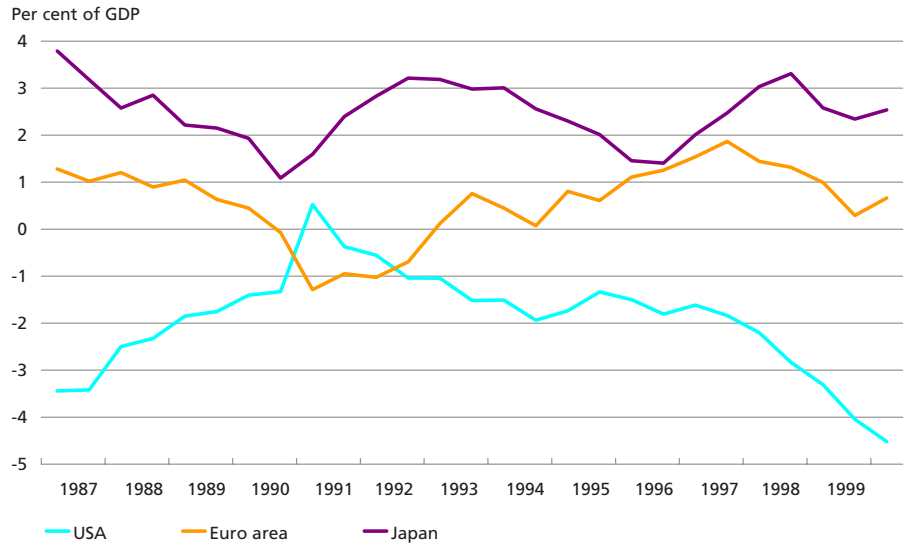
Note: PMI stands for Purchasing Managers Index.
Source: Ecowin.

swing. Although the industrial and consumer confidence indicators are both rising, the ongoing process of restructuring and renewal of the Japanese corporate sector entails a high degree of uncertainty and tends to dampen demand in the private sector. In Japanese terms unemployment is still high.

Together with the strong dollar the high level of domestic demand in the USA has led to an increase in the already very substantial US current-account deficit, cf. Chart 3. The growing US deficit has to a great extent been financed by direct investments and portfolio investments from abroad where investors are attracted by the rapid pace of technological innovation characterising the US economy. The tendency towards growing imbalances between the USA, Europe and Japan is not sustainable, and the central issue is how balance can be restored. There is a risk of a sudden, extensive correction of exchange rates, which would have major implications for the global economy.

Recent years have seen a net outflow of capital from the euro area to countries such as the USA, via direct and portfolio investments, cf. Chart 4. The development in portfolio investments reflects considerable net purchases of equity securities outside the euro area, whereas the euro area as a whole was a net seller of debt securities in 1999 and until August 2000. There appears to be a tendency of reduced total net outflow of capital from the euro area. It should be noted, however, that the

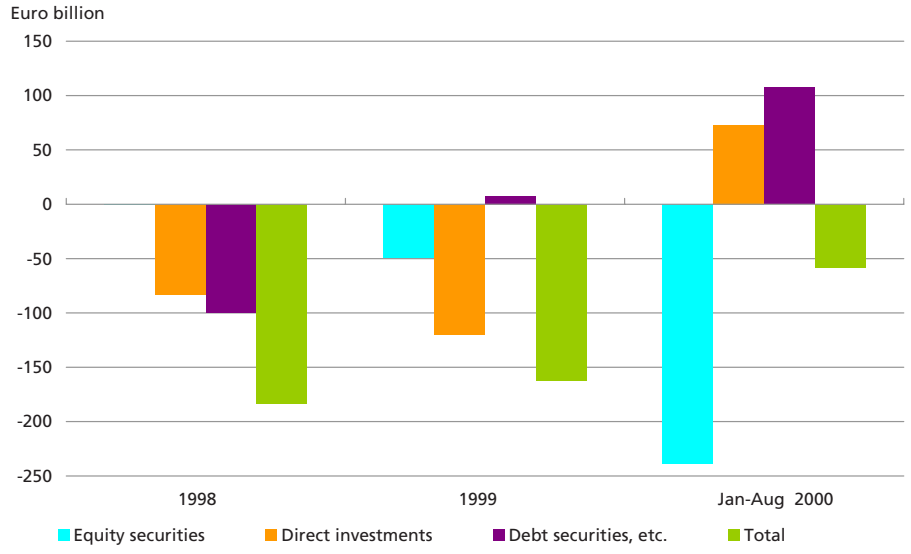
CURRENT ACCOUNT OF THE BALANCE OF PAYMENTS Chart 3



Note.: Estimates for 2000.
Source: OECD.

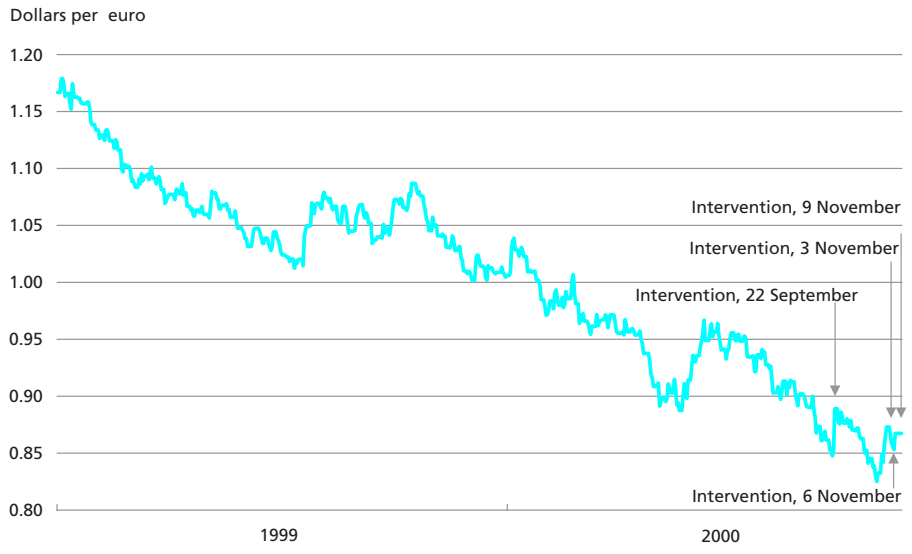
trends for direct investments and equity securities investments in 2000 are influenced strongly by substantial fluctuations in February, when the British telecommunications company Vodafone acquired Mannesmann of Germany via an exchange of shares.

NET INVESTMENTS IN THE EURO AREA Chart 4



Source: Ecowin.

EURO VIS-À-VIS US DOLLAR Chart 5



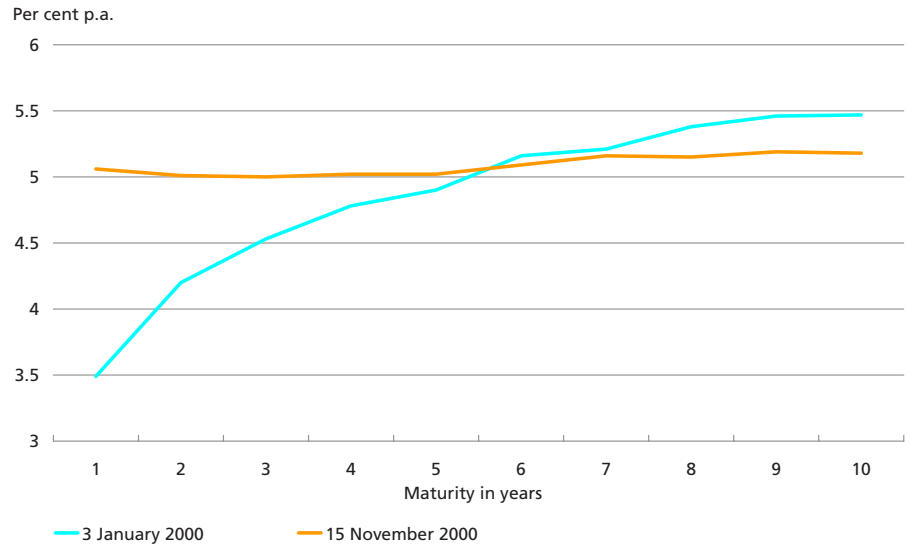
Source: Danmarks Nationalbank.

The euro weakened further in the 3rd quarter. Together with the central banks of the USA, Japan, Canada and the UK, on 22 September the ECB intervened in support of the euro. The background was their shared concern about the possible consequences for the world economy of the development in exchange rates. Thanks to this intervention, the euro strengthened immediately from approximately 0.85 dollar per euro to approximately 0.89 dollar per euro, or by just over 4 per cent, cf. Chart 5. The euro rallied forthwith by approximately 5.5 per cent against the yen. In conjunction with growing unrest in the Middle East the dollar strengthened again in October vis-à-vis the euro and the yen. The ECB intervened on a few occasions in the first part of November, in view of the concern about the global and domestic consequences of the euro exchange rate, including its significance to price stability. It was maintained that the external value of the euro did not reflect the favourable conditions in the euro area. In mid-November the euro stood at approximately 0.86 dollar per euro and approximately 93 yen per euro.

In mid-September the ECB announced its intention to sell foreign-exchange interest income derived from the foreign reserve assets against euro in order to maintain the structure and risk profile of the ECB's balance sheet.

On 5 October the ECB raised its official interest rates by 0.25 per cent. The minimum bid rate on the main refinancing operations was thus raised to 4.75 per cent, while the interest rates on the deposit facility

YIELD CURVE FOR GERMANY Chart 6



and the marginal lending facility were raised to 3.75 per cent and 5.75 per cent respectively. The background to the raising of interest rates was the upward pressure on consumer prices stemming from higher oil prices and a greater risk of imported inflation in view of the low euro rate. Despite rising official interest rates and a higher rate of price increases, 10-year bond yields in the euro area have been comparatively stable during the current year, causing the yield curve to level off, cf. Chart 6. The flatter yield curve can be taken to indicate stable interest and inflation expectations.

The 10-year US yield, on the other hand, has been more volatile throughout the year, even though in mid-November the 10-year government-bond yield was unchanged from September at approximately 5.8 per cent.

The 10-year government bond yield in Japan has also shown a high degree of stability in recent years. The yield on Japanese 10-year government bonds has dropped by approximately 0.2 percentage point since the start of September to approximately 1.8 per cent, despite the downward adjustment of the credit rating of Japan's domestic government debt from Aa1 to Aa2 by Moody's, the international credit rating agency.

Growth in the UK economy subsided slightly in the 3rd quarter to an annual rate of increase of 2.9 per cent. In October the unemployment rate was 3.6 per cent, which is the lowest level for 25 years. At the same time a record-high number of vacant jobs was reported to job centres. This combination indicates a very tight labour market in the UK, even though this

trend is not yet reflected in the annual rate of wage increases, which has been around 4 per cent since the spring. The increase in the consumer price index excluding housing (RPIX) was 2.0 per cent in October, and thus still below the Bank of England's inflation target of 2.5 per cent. The Bank of England's interest rates have remained unchanged since 10 February.

Sveriges Riksbank has kept its official interest rates at an unchanged level since February. In its most recent inflation report from October the Riksbank estimates growth for the year 2000 at 4.0 per cent, while the inflation rate up to the end of the projection period in September 2002 is not expected to exceed the target of 2 per cent. The Swedish krona has weakened since the summer, to some extent in step with the higher short-term interest rates in the euro area.

With effect from 21 September Norges Bank raised the official interest rates – the current account and lending rates – by 0.25 per cent to respectively 7.0 per cent and 9.0 per cent. The background to the raising of interest rates was the growing risk of higher price and cost increases in Norway than in the rest of Europe, and of a relatively weak Norwegian krone.

DEVELOPMENT IN INTEREST AND EXCHANGE RATES IN DENMARK

The result of the Danish referendum on 28 September was the rejection of the removal of Denmark's opt-out from the single currency. Immediately after the result of the referendum was published the Danish government and the Nationalbank issued a joint press release, cf. p. 77, stating that Denmark would continue its fixed-exchange-rate policy within the narrow band of the EU's exchange-rate mechanism, ERM II. The government and the Nationalbank will therefore implement the measures required to maintain and continue the fixed-exchange-rate policy. In his opening report to the Folketing (Parliament) on 3 October Prime Minister Poul Nyrup Rasmussen thus emphasised that the government would not hesitate to introduce measures to tighten fiscal policy if required, in order to maintain the fixed-exchange-rate policy.

To avoid uncertainty concerning the krone rate after the referendum the Nationalbank raised the lending rate and the rate of interest for certificates of deposit by 0.50 per cent to 5.60 per cent with effect from 29 September. The discount and current-account rates remained unchanged at 4.50 per cent.

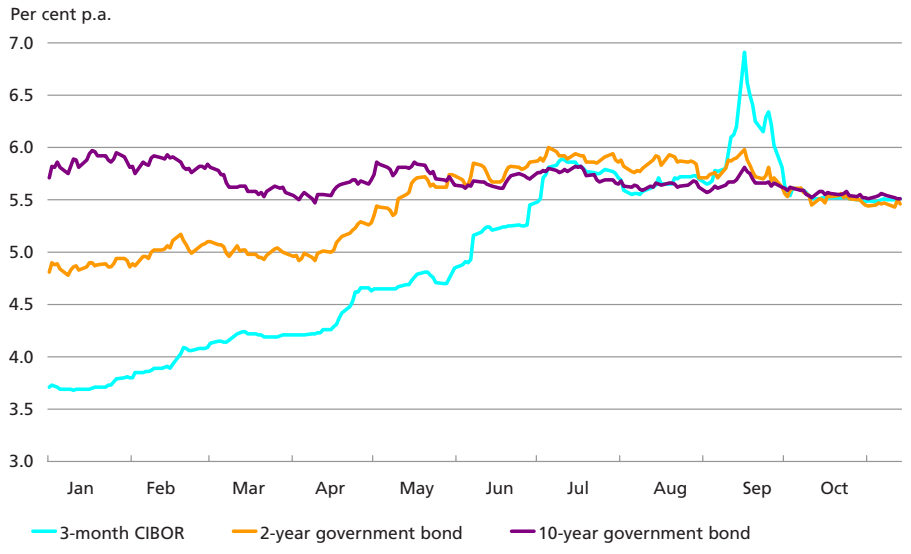
The krone rate had been under some pressure from the middle of September until the referendum. The krone weakened to kr. 7.4680 per euro, which is the lowest level ever in ERM II, but still well away

from the intervention limit of kr. 7.62824 per euro. The Nationalbank had sold foreign exchange for kr. 11.1 billion in September in order to dampen the fluctuations in the krone rate. At the beginning of September the short-term money-market interest rates in Denmark rose by more than 1 percentage point, as opinion polls indicated that a majority would reject the single currency. By far the greatest proportion of the opinion polls concerning EMU participation taken during the summer and up to the referendum had shown a majority in favour of remaining outside the single currency. The result was thus to a great extent already taken into account by the market participants before the referendum.

The 3-month money-market rate peaked at a level close to 7 per cent, with an interest-rate differential to the euro area of approximately 2 per cent. The differential narrowed considerably in the last two weeks before the referendum, and the money-market interest rate fell to a level of just over 0.5 per cent above its level at the beginning of September, cf. Chart 7.

After the referendum and the raising of interest rates the krone strengthened during October to the highest level since January, and the Nationalbank purchased foreign exchange for kr. 16.8 billion. Concurrently the interest-rate differential continued to narrow, and in mid-November the 3-month money-market interest rate was approxi-

MONEY-MARKET INTEREST RATES AND BOND YIELDS — Chart 7



Source: Danmarks Nationalbank.

COMMUNICATION OF INTEREST-RATE ADJUSTMENTS Box 1

After the ECB in June adjusted the tender procedure from fixed-rate tenders to variable-rate tenders, as an extraordinary interim measure the Nationalbank announced adjustments of the lending rate and the rate of interest for certificates of deposit by issuing press releases. The last press release was issued on 27 September when the lending rate was raised by 0.1 per cent to 5.10 per cent. The intention was to specify that these interest-rate adjustments were a consequence of the interest-rate variations in connection with the ECB's tenders and were not attributable to the development in the exchange rate or the foreign-exchange reserve.

Once this policy was established, the Nationalbank as from 3 October returned to its normal practice, which is to announce adjustments of the Nationalbank's lending rate and the rate of interest for certificates of deposit solely via its on-line information system, DN News, and on the Nationalbank's Web site.

mately 5.5 per cent, while the interest-rate differential to the euro area was around 0.4 percentage point. The development in the krone rate after the referendum reflects sustained confidence in the Danish economy and in the fixed-exchange-rate policy. Long-term interest rates remained by and large unchanged in the run-up to the referendum, and the yield differential to the euro area for 10-year government bonds fluctuated within the range of 0.35-0.55 per cent.

In view of the development in the ECB's marginal rate for allocation of liquidity in the weekly tenders the lending rate and the rate of interest for certificates of deposit were raised by 0.1 per cent to 5.10 per cent on 27 September, cf. Box 1 concerning the Nationalbank's communication of interest-rate adjustments.

Against the background of the ECB's raising of interest rates on 6 October the Nationalbank raised the discount rate and the current-account rate by 0.25 per cent to 4.75 per cent, cf. Box 2, which describes the relationship between interest-rate adjustments by respectively the Nationalbank and the ECB. In view of the krone's strengthening the lending rate and the rate of interest for certificates of deposit remained unchanged. As an element of the normalisation after interest rates were raised on 29 September the lending rate and the rate of interest for certificates of deposit were lowered by 0.1 per cent on 13 October, and by 0.1 per cent to 5.40 per cent on 27 October.

A number of Danish banks raised their published interest rates by 0.5 percentage point after the adjustment of the discount rate on 6 October, although not all banks raised their deposit rates. The interest rates generally remained unchanged when the discount rate was raised in August.

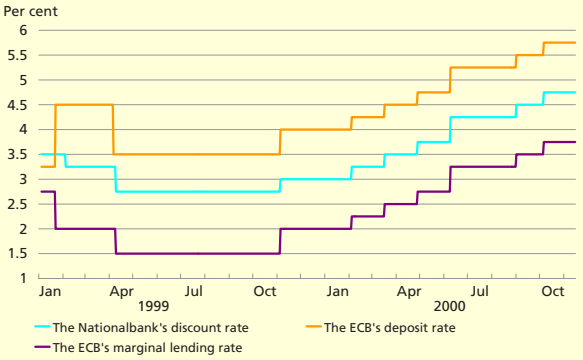
ADJUSTMENTS OF THE NATIONALBANK'S OFFICIAL INTEREST RATES — Box 2

Denmark's monetary-policy instruments fundamentally consist of two facilities: overnight deposits with the Nationalbank which accrue interest at the current-account interest rate corresponding to the discount rate, and the Nationalbank's weekly market operations, whereby monetary-policy counterparties may place funds and borrow at the 14-day rate. The 14-day interest rate is also called the Nationalbank's lending rate or the rate of interest for certificates of deposit.

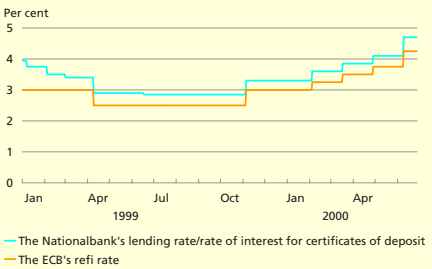
In practice, under the fixed-exchange-rate policy, these official interest rates closely follow the development in interest rates in the euro area. The discount rate will thus typically be adjusted when the ECB's interest-rate corridor is adjusted, cf. Chart A.

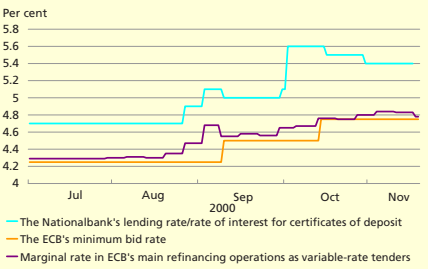
With effect from 28 June the ECB changed its tender procedure from fixed-rate tenders to variable-rate tenders for allocation of liquidity in the weekly main refinancing operations. Until this date, the Nationalbank would adjust the lending rate when the ECB changed the refi rate, cf. Chart B. The ECB now stipulates a minimum bid rate, while the counterparties submit combined bids for liquidity and interest. The bids at the highest interest rate are allocated first and the ECB then accepts successively lower interest rates until the allocated amount is exhausted. The marginal rate is the minimum bid rate at which liquidity is allocated. The Nationalbank's lending rate will normally follow the marginal rate. As a result of the ECB's adjustment of its tender procedure the Nationalbank's situation changed. Since then, several technical adjustments of the lending rate have been required in order to maintain a suitable interest-rate differential to the euro area, cf. Chart C.

THE NATIONALBANK'S DISCOUNT RATE AND THE ECB'S INTEREST-RATE CORRIDOR — Chart A



THE NATIONALBANK'S LENDING RATE AND RATES OF INTEREST IN THE ECB'S MAIN REFINANCING OPERATIONS — Chart B and C





DOMESTIC ACTIVITY AND THE BALANCE OF PAYMENTS

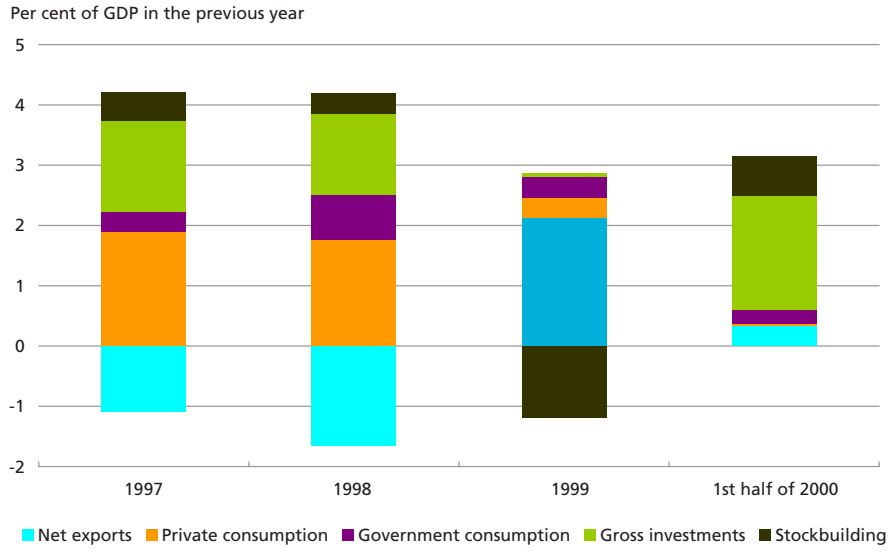
After a number of years of high growth driven by rising private consumption, leading to a deterioration of the balance of payments, economic activity shifted to a lower gear in 1999. The background was a significant dampening of domestic demand and thereby of imports. The result has been remarkable. Business enterprises were able to increase exports, while external factors such as the improved competitiveness attributable to exchange-rate developments, increased activity on Denmark's export markets and higher oil prices also contributed to a significant improvement in exports and in the balance of goods and services in 1999. The structure of growth in the Danish economy is now far closer to balance than it has been for a long time, cf. Chart 8. Growth was on the rise again in the 1st half of 2000. According to the preliminary national accounts GDP increased by 3.2 per cent against the first half of 1999. Investments and stockbuilding were the primary growth factors, rather than private consumption, which made no contribution. The latter is related primarily to a decrease in car purchases, in view of the replacement of the car fleet during preceding years. The strong growth in investments in the 2nd quarter is due mainly to higher investments in machinery and equipment, while residential investments decreased against the 1st quarter.

Residential investments are nonetheless still at a high level compared to the preceding year, and the confidence indicator for building and construction showed a positive trend in the 3rd quarter, compared to the 2nd quarter. House prices rose in the 2nd and 3rd quarters, but the rate of increase declined. The annual rate of increase in house prices is falling, but is still considerably higher than the rate of increase in consumer prices. The industrial confidence indicator has also risen strongly during 2000.

In the course of the spring and summer unemployment stabilised, and the unemployment rate was 5.5 per cent in September. Employment continued to rise in the 1st half of 2000, however, and has increased by approximately 35,000 people in total since the beginning of the year, according to the statistics from ATP (the Danish Labour Market Supplementary Pension Fund). During that period wage increases subsided, but there is still a considerable risk of bottlenecks, should the growth rate accelerate.

Most elements of Denmark's economic policy are now in place after the government's political agreement with a number of political parties represented in the Folketing (Parliament) on the Finance Act for the next year. The principal elements of the policy are as expected after the presentation of the Finance Bill in summer 2000. On the one hand, a

CONTRIBUTIONS TO GROWTH IN DENMARK, 1997-2000 Chart 8



considerable government finance surplus, equivalent to more than 2 per cent of GDP, is expected in 2001, while on the other hand the fiscal policy in 2001 will be more expansionary than in 2000.

The Nationalbank finds that it is not its task to comment on the size of the budget for as long as the macroeconomic balance is ensured in accordance with the requirements of the fixed-exchange-rate policy. In contrast to previous years, however, the agreements do not contain significant structural improvement elements. As a consequence, real growth in government consumption in 2001 is now estimated to be somewhat higher than the government's medium-term objective of an increase in government expenditure on services of 1 per cent per annum.

The government has proposed a restructuring of the taxation of pension earnings. The impact on revenue will be neutral. The main element of the proposal is that the tax rates introduced in the Whitsun package of economic measures of 5 per cent of yields on equity securities and 26 per cent of yields on debt securities be amended to a uniform tax rate of 15 per cent on both types of securities. This measure will not only contribute to simplifying the taxation of pension yields, but also reduce the interest-guarantee problem. The latter relates to the fact that pension funds and life assurance companies have guaranteed their customers a minimum return which, at the time when the guarantee was given, appeared to be low, but nevertheless presented problems when interest rates and inflation fell because the companies

had no opportunity to hedge these very long-term nominal guarantees. The key implication for the market of the proposal is a drop in the price of index-linked bonds issued before the Whitsun package of economic measures, because the relative advantage of the tax exemption of these index-linked bonds declined when the tax on other bonds was eased. The price drop for index-linked bonds indicates that inflation expectations cannot be determined as the difference between a nominal yield and the yield on index-linked bonds, unless the taxation aspect is specifically taken into account.

Since the turn of the year the rate of growth in krone-denominated lending to residents from the banks' head offices in Denmark has been artificially high. This is due to several banks' transfer of lending to residents from units abroad (primarily in Dublin) to the head office in Denmark after the lapse of the stamp duty on loan agreements which are not entered to the title register. The growth in domestic lending, including lending by foreign units, has been declining in recent months, albeit from a high level. Throughout 2000 the annual rate of increase in the mortgage-credit institutes' lending has been around 4-5 per cent.

After September the reporting scheme for the Nationalbank's balance-sheet statistics for banks and mortgage-credit institutes was adjusted. Currently the statistics are being restructured, and will be published in a new format as from January 2001. Until then, the balance-sheet statistics will be published in an abbreviated form, after adjustment for the change in methodology. As part of the restructuring of the statistics historical time series are calculated according to the new method. The historical time series up to end-2000 and the new format of the balance-sheet statistics will be presented in a separate publication in January 2001.

On 2 October 2000 Danske Bank and RealDanmark presented their plans to merge the two groups. The merger has now been formally accepted by the owners of the two groups and approved by the competition authorities. The total balance sheet of the group which is the result of the merger, Danske Bank, will be kr. 1,314 billion. The new Group's balance sheet is equivalent to a market share of around 40 per cent of the Danish banking and mortgage-credit market. For comparison, the total balance sheet of the largest Nordic financial group, Nordea[1], is expected to be kr. 1,645 billion after the merger with Christiania of Norway.

Statistics Denmark has revised the current account of the balance of payments. This primarily concerns a change in the treatment of interna-

[1] Formerly Nordic Baltic Holding.

tional reinsurance, non-distributed dividend and the status of the Faroe Islands and Greenland. The preliminary current-account figures for the 12 months up to and including August 2000 show a surplus of kr. 25 billion.

To a certain extent the claims on Danish insurance companies arising from the hurricane on 3 December 1999 were covered by internationally written reinsurance. On the basis of international standards for national accounts Statistics Denmark has decided to carry damages paid from abroad as of the time of the event releasing the claim.

The final compilation of reinvested profits (non-distributed dividend) on direct investments showed higher net income in 1998 than previously estimated. The existing estimates for 1999 and the 1st half of 2000 have therefore been revised upwards.

As part of the adjustment to international standards, in future the Faroe Islands and Greenland will be treated as foreign countries in the balance-of-payments statistics. In the first instance this has led to a revision of the data as from 1997.

IMPACT OF OIL PRICES ON THE BALANCE OF TRADE

Oil and natural gas prices have more then trebled since the spring of 1999. Despite strong fluctuations the price of oil has generally stayed above 30 dollars per barrel since September, and in mid-November the oil price was a good 31 dollars per barrel.

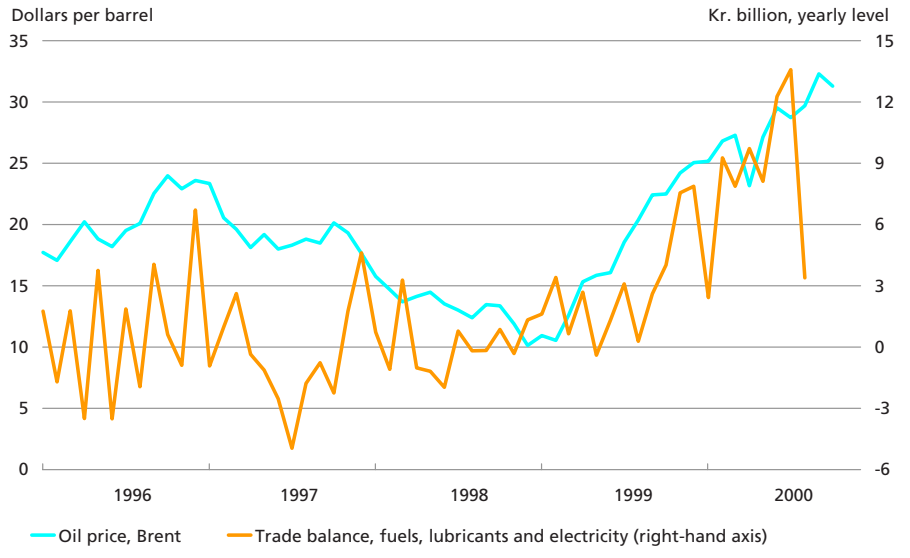
Denmark's oil and natural gas production has increased steadily for many years and the degree of self-sufficiency has risen. Taken as one, self-sufficiency in energy is estimated by the Danish Energy Agency at 118 per cent of consumption in 1999, compared to 102 per cent in 1998. Self-sufficiency in oil and natural gas is estimated to have been 159 per cent in 1999. A higher degree of self-sufficiency naturally implies a reduction of the requirement to import energy.

Since overall Denmark is a net exporter of energy, the rising energy prices since 1999 have contributed to improving the overall terms of Denmark's external trade. The terms of external trade of energy products have also improved, since the crude oil price has a stronger impact on energy exports than on energy imports. The higher energy prices and the increasing level of self-sufficiency have led to a rising, but still modest, trade surplus for fuels, lubricants and electricity, cf. Chart 9. Denmark's situation thus differs considerably from that of the other European countries which are either net importers or major net exporters of energy.

The impact on Denmark's trade balance of the rising oil and natural gas prices as a percentage of GDP is thus moderate compared to a large

OIL PRICE AND TRADE BALANCE FOR FUELS, LUBRICANTS AND ELECTRICITY

Chart 9



number of both energy-exporting and energy-importing countries. The impact on the current-account balance is even less since a large proportion of the production of raw materials from the North Sea is undertaken by companies which are partly in foreign ownership, so that increased profits will entail higher dividend payments to abroad. Should the oil price be significantly lower, and the dollar weaker, the current-account surplus is expected to be diminished, but not eliminated completely.

COMPILATION OF DENMARK'S EXTERNAL DEBT

The Nationalbank has compiled Denmark's external debt for 1999. These statistics are based on a comprehensive questionnaire survey with more than 2,100 respondents (primarily private companies, but also local governments and social security funds). There were also supplementary sources concerning the general government, the Nationalbank and the banks.

At end-1999 Denmark's external debt totalled kr. 174 billion, against kr. 306 billion at end-1998. The decrease by kr. 132 billion in 1999 can be attributed primarily to extraordinarily large value changes concerning securities portfolios. At year-end residents held net assets abroad as equity securities, and net liabilities as debt securities. Stock prices generally rose strongly, while bond prices fell, so that overall the external debt was strongly diminished by the value changes. The most recent

compilation of the current account is a surplus of kr. 27 billion in 1999. It thus accounts for only a minor proportion of the decrease in the external debt, which in individual years is increasingly influenced by the development in market and exchange rates.

DEVELOPMENT IN WAGES AND PRICES

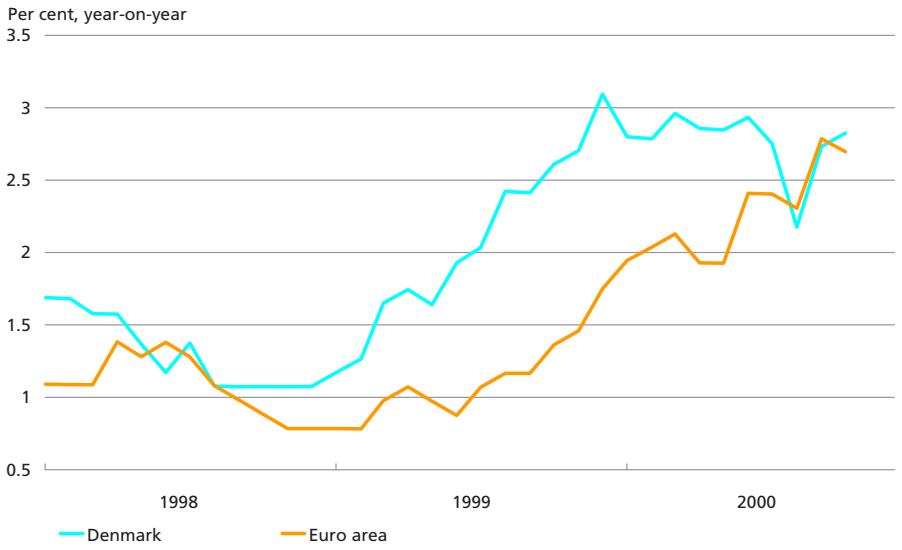
In October consumer prices, measured as the Harmonised Index of Consumer Prices (HICP), were 2.8 per cent higher than one year before. Measured in terms of "Other factors" underlying inflation continued to rise only very moderately in the 3rd quarter. The decrease in wage inflation has contributed to the reduction of underlying inflation, while profit margins may have been squeezed by the rising energy and import prices. The rates of increase for rent and foodstuffs also fell. The high inflation rate is therefore attributable primarily to external factors such as the direct impact of large price increases for energy and imported goods, cf. Table 1. In a future-oriented perspective it is vital that

DEVELOPMENT IN CONSUMER PRICES AND NET RETAIL PRICES — Table 1

	Consumer price index		Index of net retail prices	Energy	Imports	Domestic prices				
						Total	Food-stuffs	Rent	Public services	Other factors
			Weights							
	HICP	CPI	1,000	0,088	0,143	0,769	0,144	0,250	0,039	0,335
	Year-on-year growth, per cent									
1993.....	…	1.3	1.4	-0.9	0.0	1.9	-0.2	2.1	1.7	2.7
1994.....	…	2.0	1.6	-3.1	2.1	2.0	3.0	1.6	2.4	1.6
1995.....	2.0	2.1	1.9	-2.5	2.5	2.2	3.1	1.8	2.5	2.0
1996.....	2.1	2.1	2.0	6.6	0.1	1.9	1.7	1.6	1.1	2.4
1997.....	1.9	2.2	2.2	2.7	0.9	2.4	3.6	2.8	2.2	1.8
1998	1.3	1.8	1.5	-2.8	0.6	1.9	1.8	2.1	-0.9	2.3
1999	2.1	2.5	2.1	2.1	-0.3	2.5	0.6	2.7	3.5	3.0
1999 1st qtr.	1.4	2.0	1.5	-7.0	-0.7	2.4	0.3	2.8	2.1	3.1
1999 2nd qtr. ..	1.8	2.3	1.8	-1.4	-0.8	2.4	-0.2	2.5	4.5	3.1
1999 3rd qtr. ..	2.3	2.6	2.3	5.7	-0.2	2.5	0.7	2.8	3.8	2.8
1999 4th qtr. ..	2.8	3.0	2.8	11.5	0.4	2.6	1.7	2.7	3.6	2.7
2000 1st qtr.	2.8	3.1	3.4	24.1	2.1	2.1	2.6	3.1	3.6	1.0
2000 2nd qtr. ..	2.9	3.2	3.5	21.6	4.1	2.0	3.4	3.5	3.6	0.3
2000 3rd qtr. ..	2.6	2.7	3.0	18.3	5.1	1.4	2.3	3.0	4.3	-0,4

Note: Weighting basis as of December 1999.
The index of net retail prices is the consumer price index adjusted for indirect taxes, duties and subsidies for general price reductions.
"Other factors" is a measure of domestic market-determined inflation. "Other factors" normally increases faster than the index of net retail prices due to an overweight of services, for which the price development is typically stronger than for other commodities. At the same time the rise in demand for services is typically stronger in the longer term than demand for other products.
HICP is the Harmonised Index of Consumer Prices.

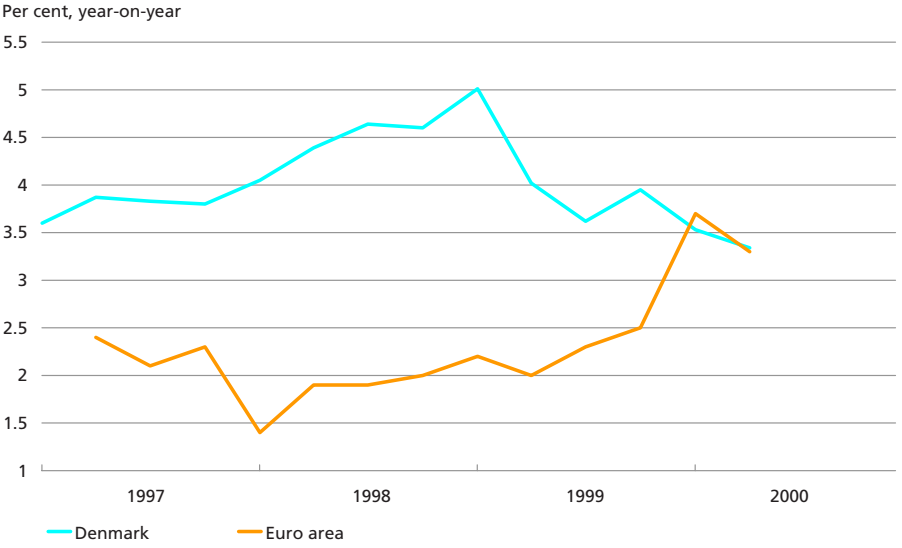
INFLATION IN DENMARK AND THE EURO AREA — Chart 10



Note.: Annual rate of increase in HICP.

increasing energy prices are not passed on to the labour market as wage increases which are out of sync with the development in productivity. The rate of increase in Denmark's HICP has for some time been higher than the rate of increase in HICP for the euro area. Most

HOURLY WAGE COSTS IN MANUFACTURING INDUSTRY IN DENMARK AND THE EURO AREA — Chart 11



Sources: Statistics Denmark (Denmark) and Eurostat (euro area).

recently, however, the inflation differential became almost non-existent, cf. Chart 10.

The rate of wage increases declined in 2000 compared to previous years. In the 1st and 2nd quarters hourly wage costs in the manufacturing industry rose by approximately 3.5 per cent against the same period of 1999. In the 3rd quarter the rate of increase accelerated a little. As the wage increases in the euro area have gained momentum since mid-1999 the wage-increase rates have converged, cf. Chart 11. One factor behind the higher rate of wage increases in the euro area is the reduction of working hours in France. In view of the considerable pressure on the labour market, there is still a risk that the rate of wage increases in Denmark will begin to rise again.

Compilation of Seigniorage

Erik Haller Pedersen and Tom Wagener, Economics

INTRODUCTION

Historically, issuing money has been a royal prerogative, one of the reasons being that it generates considerable revenue, called seigniorage. From the sovereign's point of view this could be seen as equivalent to tax revenue. Today the Danmarks Nationalbank Act states that the Nationalbank is responsible for issuing banknotes, while minting is the prerogative of the Treasury under the Coinage Act. Since 1975, the Nationalbank has been in charge of the production and administrative aspects of minting. After allocations, the seigniorage falls to the Treasury via the Nationalbank's allocation of profits. This article discusses the problems related to compiling an exact measure of seigniorage.

SEIGNIORAGE IN A HISTORICAL PERSPECTIVE

From time immemorial gold, silver and copper have been used as means of payment of goods and services. In other cultures other means of payment have been used, typically articles with a certain rarity value. The oldest Danish coins date back to the 9th and 10th centuries, and since the 11th century minting has been a royal prerogative in Denmark.

Originally, the intrinsic value of a coin was equal to its face value, i.e. the purchasing power of the coin corresponded to its metal value. This did not necessarily mean that its value remained stable against other goods, since metal prices fluctuated. However, minters soon realised that if production costs could be lowered in relation to the face value of the coin, i.e. its purchasing power, a profit could be made. This profit, or seigniorage, accrued to the minter, in most cases the sovereign. The intrinsic value of the coin thus diminished and circulation increased in periods when much revenue was needed, typically in connection with wars. Debasing coins is equivalent to imposing an extra tax on the citizens of the country.

One way of debasing coins in circulation was to add e.g. copper to silver coins. If coins of the same face value, but different intrinsic values, are in circulation at the same time, the bad money will drive out the good money, as the latter will be melted down at a profit, exported or

hoarded. This phenomenon was described in the mid-16th century and is known as Gresham's law.

With the introduction of paper money – in Denmark in the 18th century – the seigniorage potential increased, as the gap between the face value and the production costs widened. Initially, the issue of paper money was in the hands of private individuals, but later it was taken over by the Treasury which then collected the seigniorage. Using paper instead of metal as a means of payment is profitable to society as the resources needed for mining and melting down metal are saved.

In the above historical context seigniorage can be defined as the change in the value of the banknotes and coins in circulation, i.e. the purchasing power at the time of issue, minus production costs. We could call this a flow definition of seigniorage (S^1).

Definition 1: $S^1 = \Delta Cu - P$
where Δ Cu = the change in value of the banknotes and coins in circulation, and
P = production costs.

This definition of seigniorage disregards the fact that for centuries issuers of paper money had to promise to exchange their banknotes for precious metal upon request. This guarantee was necessary to ensure that people would accept the banknotes and meant that the issuers had to have precious metal reserves to support the paper money in circulation. This security for the banknotes in circulation is an extra cost which reduces the seigniorage in definition 1.

AN ALTERNATIVE DEFINITION OF SEIGNIORAGE

A newer definition of seigniorage is found in Rovelli (1994)[1]. Here seigniorage is defined as the Treasury's revenue from issuing debt at no interest or a low rate of interest via the central bank. This definition is based on a broader monetary concept, base money. In a Danish context the latter can be defined as the banknotes and coins in circulation plus the banks' current-account deposits with Danmarks Nationalbank[2]. Both are highly liquid.

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[1] Rovelli, R., Reserve requirements, seigniorage and the financing of the government in an economic and monetary union, *European Economy*, Reports and Studies no. 1, 1994.

[2] If financial institutions are subject to statutory reserve requirements, these should be included in the base money. Reserve requirements are a monetary instrument imposing on financial institutions an obligation to deposit liquid funds with the central bank corresponding to a proportion of the deposits they have on their balance sheet. Interest may be paid on these deposits. This instrument is not used in Denmark.

BASE SEIGNIORAGE Box 1

An outline central-bank balance sheet can be set up as follows:

Assets	Liabilities
Foreign-exchange reserve	Circulation of banknotes and coins
Portfolio of domestic bonds	Current-account deposits
Lending	Reserve requirements
	Other liabilities, including equity capital

Assume that the central bank's assets can be divided into those which are counterparts of base money and those which are counterparts of other liabilities of the central bank, i.e. a separate balance sheet can be set out for the activities specifically related to the issue of base money. This is known as earmarking. The relation between base money and its counterparts can be written as:

$$V + B + L = F + R + Cu$$

Where V is part of the central bank's foreign-exchange assets, B is part of the central bank's portfolio of domestic bonds, L is part of the central bank's lending to the banks, F is current-account deposits with the central bank, R is statutory reserve requirements, and Cu is the circulation of banknotes and coins. Base seigniorage (S^2) can then be compiled analytically as follows:

Definition 2: $S^2 = i_V V + i_B B + i_L L - i_F F - i_R R - P$

where i_x is the interest on asset X, and P is the costs of issuing banknotes and coins. In Denmark's case R is zero.

Although the principle of earmarking sounds intriguing from a theoretical point of view, it is difficult to apply in practice. It is thus difficult to see how the counterparts of base money can be divided constructively into foreign-exchange assets, domestic bonds and lending.

Rovelli defines total or Treasury seigniorage as the sum of the base seigniorage and a concept called monetarisation. Base seigniorage is the profit to Danmarks Nationalbank from issuing base money. Banknotes and coins are not interest-bearing, but the Nationalbank can use the proceeds from issuing banknotes and coins to buy interest-yielding securities, i.e. in principle the Nationalbank borrows money at no interest and places it in assets yielding interest. In this case the proceeds from issuing banknotes and coins are not used to buy goods and services, but invested in securities which yield a return. From an analytical point of view, and using this stock approach, the base seigniorage can be com-

piled by assuming that the central bank's assets can be divided into counterparts of, i.e. assets financed by, base money, or counterparts of other liabilities. The base seigniorage is the yield on the relevant assets minus costs, cf. definition 2 in Box 1.

Unlike the historical definition 1, definition 2 reflects how banknotes and coins are actually put into circulation today. That is the case when the banks correspondingly reduce their deposits with or increase their loans from the Nationalbank. It is not a result of the purchase of goods and services by the Nationalbank. One could also say that the issue of banknotes and coins is not final in that the money can return to the Nationalbank at any time if demand falls. The issue of cash is determined purely by demand. Nonetheless, definition 1 is often used in both theoretical and empirical compilations of seigniorage, see Fischer (1982)[1], for example.

Breaking down the Nationalbank's balance sheet by business area may seem rather theoretical and is difficult in practice. Nevertheless, it has a certain historical relevance in view of the fact that the Bank of England was originally divided into an Issue Department (issuing banknotes and coins) and a Banking Department. In that case the compilation of seigniorage would be based on the Issue Department's balance sheet.

As stated above, Rovelli operates with two elements forming the total seigniorage: transfer of the entire base seigniorage or part of it to the Treasury via the allocation of the profits of the central bank; and monetarisation, which can be defined as the increase in base money resulting from the central bank's purchase of government securities or the government's drawing on its current account with the central bank. The central bank's purchase of government securities is regarded as "free" financing for the central government to the extent that the interest payment is ploughed back as part of the central bank's profit, which falls to the Treasury. According to this viewpoint, only government bonds placed outside the central bank are a net burden on the government's budget. The same argumentation can be used when the government draws on its current account with the Nationalbank. It is "free", for although interest is paid regularly, it reverts to the Treasury via the Nationalbank's allocation of profits.

Article 101 of the Amsterdam Treaty prohibits central banks in the EU from granting their governments overdrafts and from buying bonds direct from them. This limits the possibility of monetarisation as defined above, but does not completely prevent it. For instance, in relation to the compilation of total seigniorage it is irrelevant whether the central

[1] Fischer, S., Seigniorage and the case for a national money, *Journal of Political Economy*, no. 90, 1982.

SEIGNIORAGE Table 1

DKK million	Circulation (Cu)	Interest in per cent (i_{u})	$i_u C u$	Costs (P)[1]	S[4]
1993	27,571	9.67	2,666	97	2,569
1994	30,589	6.21	1,900	125	1,775
1995	32,582	6.36	2,072	167	1,905
1996	34,525	4.46	1,540	115	1,425
1997	36,608	4.31	1,578	102	1,476
1998	38,750	4.75	1,841	109	1,732
1999	40,928	3.94	1,613	115	1,498
Average	…	…	1,887	119	1,768

Note: Seigniorage compiled in accordance with definition 4.
[1] The total costs of issuing banknotes and coins are higher as a number of indirect costs are not included.

bank purchases government securities from the government directly or in the market.

The compilation of seigniorage as the sum of a base seigniorage and a monetarisation component is a hybrid between definitions 1 and 2, the base seigniorage being calculated according to definition 2, whereas the monetarisation element resembles definition 1.

If the Nationalbank purchases government bonds or the government draws on its current account, this will lead to expansion of liquidity and thus improve the net position of the banks vis-à-vis the Nationalbank. Under the narrow definition of base money used here this will have little influence on base money – in the form of larger interest-bearing current-account deposits. Therefore in the Danish case it is expedient to disregard the monetarisation component on compiling seigniorage.

EMPIRICAL COMPILATION OF SEIGNIORAGE

Empirical compilation of (base) seigniorage is often based on a consolidated balance sheet between the government and the Nationalbank. It is typically argued that what the government saves by receiving seigniorage is the interest on the government bonds which it no longer needs to issue. Base seigniorage is therefore calculated by multiplying the bond interest rate (i_B) either by banknotes and coins in circulation or by total base money and subtracting the financing and production costs, cf. definition 3.

Definition 3: $$S^3 = i_B[F + R + Cu] - i_F F - i_R R - P$$

The above argumentation does not take into account the actual institutional structure. Initially base seigniorage accrues to the Nationalbank and may be regarded as part of the bank's core revenue, cf. the discus-

sion in Hansen and Ølgaard (2000)[1]. The Nationalbank's assets and liabilities are managed jointly, and how far out on the yield curve the bank wishes to place itself is the result of an independent assessment of risk and yield. If the Nationalbank was not willing to run any material interest-rate risk, all accounts with the government would bear interest at a short-term Danish or foreign rate. Therefore it seems most expedient to compile seigniorage as the Nationalbank's lending rate (a 14-day rate) multiplied by the value of banknotes and coins in circulation minus production costs, definition 4. The lending rate is the rate of interest at which the banks finance their demand for banknotes and coins. The other elements of the base money make only an insignificant contribution to the seigniorage as they accrue interest at a rate close to the lending rate.

Definition 4: $S^4 = i_U Cu - P$

where i_U = the Nationalbank's lending rate.

In Table 1 seigniorage is compiled on the basis of definition 4. The average value of banknotes and coins in circulation is multiplied by the average lending rate in the respective years.

The costs of producing banknotes and coins are sourced from the Nationalbank's annual accounts. In the 1990s seigniorage averaged just over 0.2 per cent of annual GDP, reflecting falling interest rates and an increase in banknotes and coins in circulation. It is important to bear in mind that seigniorage is a theoretical concept which is not identical to the Nationalbank's accounting surplus, albeit constituting an important part of it.

SEIGNIORAGE IN THE EURO AREA

The compilation and allocation among the euro area member states of seigniorage or monetary income has been determined in principle. Under Article 32 of the Statute of the European System of Central Banks (ESCB) the sum of the participating national central banks' (NCB) monetary income shall be allocated to the individual NCBs in proportion to their paid-up shares in the capital of the European Central Bank (ECB).

Up to the introduction of physical banknotes and coins on 1 January 2002 a temporary scheme will be in operation, viz. calculation of monetary income by multiplying base money by a chosen rate of interest. This temporary method resembles definition 4. It is based on the cen-

[1] Hansen, I. and C. Ølgaard, Danmarks Nationalbank's Risk Management, Danmarks Nationalbank, *Monetary Review,* 2nd Quarter 2000.

tral-bank balance-sheet liabilities, in contrast to the previously described method, which is based on assets (counterparts of the base money). Furthermore, a very narrow definition of base money, which does not include banknotes and coins, has been chosen in the transition phase. The base money in the interim period consists mainly of the minimum reserves. It is multiplied by the rate of interest on main refinancing operations, i.e. a 14-day rate, and the rate of interest on the minimum reserves is deducted. As the rate of interest on the minimum reserves is equivalent to the 14-day rate, the monetary income during the transition period is close to zero. This will be changed on the introduction of physical euro banknotes and coins in 2002, as they will be included in the base money. At the same time, or perhaps after a transition period, the counterpart approach to the calculation of monetary income will be adopted. This will require explicit earmarking of the counterparts of base money, cf. definition 2. This will always involve a certain element of arbitrariness.

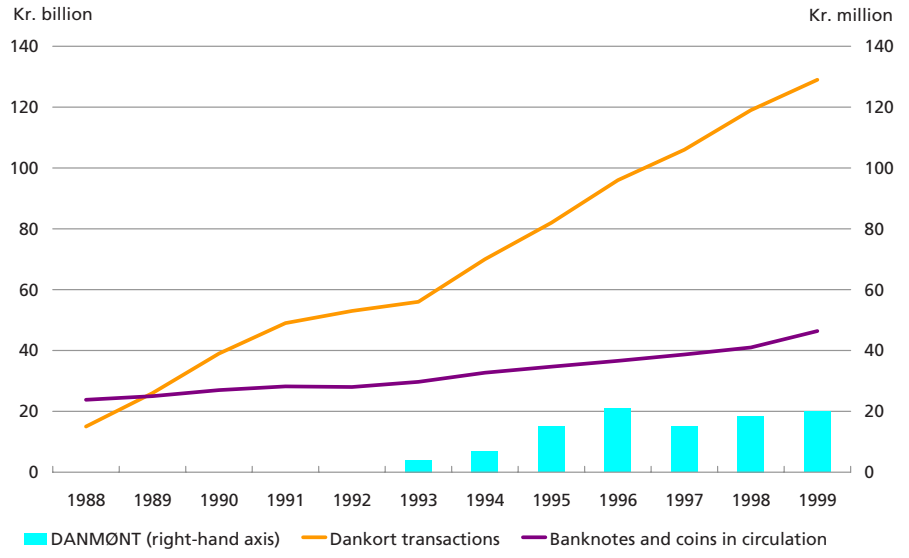
In addition to the pooled monetary income from the national central banks' issue of banknotes, the ECB will have independent revenue, mainly from the yield on its own portfolio (the counterpart of the NCBs' paid up capital shares). The ECB's surplus after allocation to the reserves – and in exceptional cases cover of losses – will be allotted to the participating NCBs. Collectively, the NCBs do not suffer specific losses or gain extra revenue by participating in the Eurosystem.

SEIGNIORAGE AND NEW PAYMENT TECHNOLOGIES

The seigniorage generated at the central bank is ultimately determined by the conditions affecting the private sector's demand for base money. One factor which – theoretically at any rate – affects this demand is new developments in electronic payment technology. The new electronic payment methods include a number of products (smart cards, chip cards or electronic purses) based on electronic storage of value. Examples in Denmark are the DANMØNT card or telephone cards, as well as various electronic transaction systems (Dankort and credit cards, home banking services, payments services or Internet payments) based on computer networks.

The influence of the new payment technologies on base money and thereby on the seigniorage generated at the central bank is expected mainly to be from the banknote and coin component, as the banks' accounts with the Nationalbank are determined mainly by the terms of the banks' payments and equalisation of liquidity variations. Card-based electronic money may be seen as an electronic alternative to minor cash

CIRCULATION OF BANKNOTES AND COINS AND ELECTRONIC PAYMENTS Chart 1



Note: Different scales are used on the left- and right-hand axes. Furthermore, the circulation of banknotes and coins and outstanding Danmønt cards are stock figures, whereas the value of Dankort transactions shows turnover.

transactions, so that greater use of these cards will have a very direct impact on circulation of banknotes and coins. The use of actual multi-purpose electronic money is not yet widespread in Denmark, however, and is limited to the DANMØNT card. In Denmark use of the Dankort debit card and of electronic payment systems in general is of far greater importance to households' settlement of their payments. For example, the number of Dankort transactions has multiplied many-fold over the last 10 years. Contrary to expectations it has, however, not been possible to demonstrate a statistical connection between the development in total banknotes and coins in circulation and the number of electronic payments, cf. Chart 1. Presumably this is partly because most of the large-value electronic transactions were not previously cash transactions, but e.g. cheque transactions. At the same time, the increase in the number of Dankort terminals has made cash more readily available. Finally, the low inflation during the last 10 years has, all else being equal, reduced the costs of holding cash[1].

At an academic level it is discussed whether the increased use of electronic money will make central banks superfluous in the long run, or rather whether the central banks will lose their influence on short-term interest rates if base money diminishes[2]. There are not many indications

[1] See also Erik Haller Pedersen and Tom Wagener, Circulation of Notes and Coins in Denmark, Danmarks Nationalbank, *Monetary Review,* November 1996.

[2] See e.g. Benjamin Friedman, The Future of Monetary Policy, *International Finance*, November 1999.

that this will be the case in the immediate future. Firstly, as stated above, the impact of electronic money and payments on base money has been surprisingly small. In the long run, however, a certain degree of undermining of base money and thereby a decline in the earnings potential of the Nationalbank cannot be ruled out. Secondly, even if base money were to disappear entirely it could be argued that by borrowing and lending electronic money the Nationalbank will retain its influence on short-term interest rates[1]. Strictly speaking, the opportunities to pursue monetary policy are not related to the issue of banknotes and coins, but to the fact that the banks wish to hold accounts with the Nationalbank. These accounts are risk-free and of practical use in connection with settlement of payments and equalisation of liquidity in the money market.

[1] See Charles Goodhart, *International Finance* (forthcoming).

IMF Quotas

Thomas Enevoldsen, International Relations

INTRODUCTION

Since the establishment of the International Monetary Fund, IMF, in 1944 the capital subscriptions, or quotas, paid by the member countries have been determined and reviewed on the basis of almost unchanged calculation methods. Since then, the international economic and financial environment has undergone considerable changes characterised by greater economic integration, improved access to financial markets and increasing capital flows, while emerging markets have come to play a more important role. The individual countries' relative positions in the world economy have hereby changed significantly, without corresponding changes in the quotas. A case in point is that in 2000 Korea's quota is smaller than Denmark's, even though Korea's GDP is three times higher. These changes in the countries' relative economic significance have prompted the consideration of a new calculation method which better reflects these shifts. In 1999 the IMF commissioned an external working group to review the quota formulas. This article comments on the report of the Quota Formula Review Group which was published in September 2000[1].

OBJECTIVE OF THE QUOTAS

According to the IMF's Articles of Agreement each member country must pay a capital subscription to the IMF which is equal to its quota. The quota of a member country serves the following purposes.

Capital subscription (financing). Firstly, the quota determines a country's contribution to the IMF's resources. A member country subscribes to capital equivalent to its quota. The capital subscription typically consists of up to 25 per cent as international reserve assets and the remainder in the country's national currency. International reserve assets are held in currencies of countries with a sufficiently strong balance-of-payments position to finance the IMF's lending (US dollar, euro, yen, etc.) and

[1] Richard N. Cooper et al., *Report to the IMF Executive Board of the Quota Formula Review Group*, IMF, Washington, September 2000.

SDR[1]. The international reserve asset contributions are the primary source of finance for lending by the IMF. The industrialised countries contribute by far the greatest part of the IMF's financing.

Access to purchases. Secondly, the quota determines the limits for a country's access to draw on the IMF. Normally, the annual limit is 100 per cent of a country's quota up to a total ceiling of 300 per cent. However, this has posed certain problems in recent years, namely that in a number of cases the access limits had to be exceeded by a significant amount partly because a number of countries' quotas were considerably lower than the requirement for IMF lending indicated. Lending by the IMF to Mexico in 1995 and to Thailand and Korea in 1997-98 are examples of how the IMF deviated from the general rules on access limits and lent more than these rules provide for[2].

Influence. Thirdly, the quota determines a country's voting power in the IMF's decision-making bodies and thereby the country's influence in the IMF. IMF decisions are subject to either a simple majority or a qualified majority of 70 or 85 per cent, depending on the tabled motion. A minority of only 15 per cent of the votes can thus block the vote. (The USA's voting power is approximately 18 per cent so that it can veto decisions such as changes in quotas, sale of the IMF's gold and issue of SDR assets.)

The determination of a country's quota thus depends on a number of relative factors such as the country's ability to make resources available to the IMF, its potential borrowing requirement and its relative position in the world economy. Although they are motivated by various considerations, the countries will typically be interested in maximising their quotas. The developing countries' interest in gaining large quotas is based primarily on their wish to enhance their opportunity to borrow, while the industrialised countries are motivated by a wish for greater influence.

Finally, it must be stated that the determination of the IMF quotas is of significance to the countries' quotas in the World Bank, whereby the IMF quota also determines a country's contribution to the World Bank.

QUOTA HISTORY SINCE THE ESTABLISHMENT OF THE IMF

The IMF's Articles of Agreement do not stipulate how the quotas are to be determined. In practice, the quotas are set after political negotia-

[1] The SDR (special drawing right) is a reserve asset created by the IMF as a supplement to existing reserve assets. It was originally valued in terms of gold (equal to one US dollar) but since 1974, the value of the SDR has been determined by that of a basket of major currencies. The average value of the SDR was USD 1.37 in 1999.

[2] This development led to the establishment of two new financing instruments which are not covered by the quota-based drawing access: in 1997 and 1999 the IMF established the Supplementary Reserve Facility (SRF) and the Contingent Credit Line (CCL).

tions. For example, since 1992 the quotas of the UK and France have been exactly equal. This also applied to Japan and Germany for a long period, even though this was not founded on objective economic criteria.

Although quota setting, especially for the large countries, is primarily the result of political negotiations, the quota discussions have been based on economic criteria. This is particularly the case for the small countries. The formula applied in the 1940s by the original members as the basis for negotiations of the size of the quotas was known as the Bretton Woods formula. When new countries join the IMF, their quotas are negotiated by the IMF's Executive Board on the basis of the result of the quota formula and the typical quota size for comparable countries.

The Bretton Woods formula is a simple equation to calculate a country's quota on the basis of its gross domestic product (GDP), foreign-exchange reserves, imports, exports and the fluctuation of exports, cf. Box 1. The choice of these economic variables must be seen as a compromise between the various purposes served by the quotas. A country's GDP and foreign-exchange reserves were regarded as good indicators of a country's ability to make funds available to the IMF, and of its position in the international financial system. The scale and the fluctuations of the member country's external trade – the openness of its economy – were taken to express its potential requirement for borrowing from the IMF.

In the 1960s the simple formula was expanded to a multi-formula approach with various weightings of the same economic variables, in order to adapt the formula to the development in the world economy and the influx of new member countries. The basic structure of the formulas has remained unchanged since the 1960s, although they were modified slightly in 1982-83.

At 5-year intervals the IMF quotas are reviewed to see if they are still adequate. It is then decided whether quota adjustments are needed, typically increases. In connection with these general quota increases most of the allocation of increased quotas normally constitutes a proportional write-up of the existing quotas. Only a minor proportion is allocated on the basis of actual political negotiations based on the quota formulas. This proportion is often called the selective element of the quota increase. Historically, the selective element has averaged around 30 per cent of the revisions. The fact that only a minor proportion of the quota increases is allocated on the basis of the formulas means that the countries' actual quotas may deviate considerably from the results of the formulas. In view of the ongoing development of the economic variables used in the formulas, the changes in the world eco-

HISTORY OF THE IMF'S QUOTA FORMULAS Box 1

The original Bretton Woods formula

The original Bretton Woods formula calculated a member country's quota on the basis of its GDP, foreign-exchange reserves, balance-of-payments statistics and export fluctuations.

$Q = (0.02Y + 0.05R + 0.010M + 0.10V)(1 + X/Y)$,

where

Q = Calculated quota
Y = National income
R = Gold and foreign-exchange reserves
X = Average annual exports (5-year average)
M = Average annual imports (5-year average)
V = Maximum fluctuation in exports over a 5-year period

The revised Bretton Woods formula

In 1962-63 a multi-formula approach was adopted using almost the same variables, but with different weightings compared to the original Bretton Woods formula. In practice, this entailed that the quotas of the major countries were still calculated using the original Bretton Woods formula, while the quotas of particularly the developing countries were calculated using revised formulas.

The revised Bretton Woods formula 1983

The quota formulas were simplified in 1983, when particularly the significance of fluctuations in current receipts was reduced. The quota is calculated on the basis of five different formulas, of which the first is the original Bretton Woods formula. The result using the Bretton Woods formula is compared with the average of the two smallest results from the other equations and the quota is then given as the largest of the two values. Typically, the quotas of the industrialised countries are thus calculated using the original Bretton Woods formula, while the quotas of the developing countries are calculated using the revised formulas. The 1983 revised formulas still apply.

$Q^1 = (0.01Y + 0.025R + 0.05P + 0.2276VC)(1+ C/Y)$,
$Q^2 = (0.0065Y + 0.0205125R + 0,078P + 0.4052VC)(1 + C/Y)$,
$Q^3 = (0.0045Y + 0.03896768R + 0,07P + 0.76976VC)(1 + C/Y)$,
$Q^4 = 0.005Y + 0.042280464R + 0,044(P + C) + 0.8352VC$,
$Q^5 = 0.0045Y + 0.05281008R + 0.039(P+C) + 1.0432VC$,
$Q = \max(Q^1, \text{mean of lowest 2 of } Q^2, \ldots, Q^5)$,

where

C, P = Mean currency receipts and expenditure, most recent 5-year period.
V, VC = Variability of annual exports and current receipts defined as a standard deviation from a centred 5-year moving average for the most recent 13-year period.

nomy have tended not to be sufficiently reflected in the countries' actual quotas.

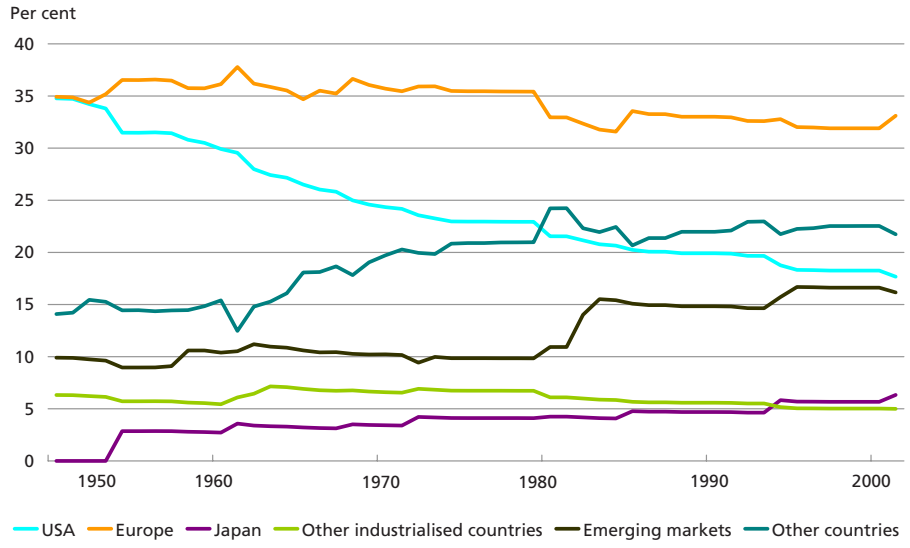
There are several factors behind the limited significance of the quota formulas and the resulting discrepancy between the member countries' relative quotas and the quotas calculated using the formulas.

- Although the discussions of all quota reviews are based on the quota formulas, to a wide extent they have been determined by political considerations. The reason is that the adoption of a general quota review requires 85 per cent of the votes, and thereby broadbased approval.
- The member countries will typically seek to prevent a decrease in their quotas, since the quota determines the country's voting power in the IMF's decision-making bodies.
- The quotas of the developing countries typically exceed the quotas calculated using the formulas, while the opposite applies to industrialised countries. Giving higher priority to the selective element in the quota reviews will therefore be resisted by the developing countries.
- It is not possible for a country to have its *absolute* quota reduced unless the country itself accepts the reduction.

Apart from the general reviews the IMF's Articles of Agreement make it possible under certain conditions to adjust a country's quota. China has requested an extraordinary quota adjustment due to such factors as the inclusion of Hong Kong in China.

The IMF had 45 member countries when it became operational in 1946. Since then, almost all countries have become members and the

SELECTED COUNTRY GROUPINGS' SHARE OF THE IMF'S OVERALL QUOTA SINCE 1948 Chart 1



Note: Other industrialised countries are Canada, Australia and New Zealand. Emerging markets comprise Argentina, Brazil, China, India, Mexico, Russia, Saudi Arabia, South Africa, South Korea and Turkey. Countries which were not among the original IMF members are included at zero weighting until the date of membership. This applies to e.g. Switzerland which did not become a member until 1992.
Source: IMF, *International Financial Statistics*.

IMF's current membership is 182 countries. All industrialised countries had become members by 1960, except Switzerland which joined the IMF in 1992. Since the beginning of the 1960s new members were primarily recently independent countries, and since the 1980s they have mostly been former planned economies.

On the establishment of the IMF the USA's dominant quota of 35 per cent reflected the country's economic weight, as well as its unique position at that time as the only issuer of a broadly accepted international reserve asset. The influx of new member countries and the growing significance of emerging markets have led to a reduction by half of the USA's quota to the current level of 18 per cent, cf. Chart 1. Europe's quota of around 35 per cent has been generally unchanged throughout the IMF's lifetime. The main factor behind the stability of the European quota is that several of the new member countries were European countries. The quota of the 12 original European member countries is now reduced to 22 per cent.

INTERNATIONAL ECONOMIC AND FINANCIAL DEVELOPMENT

Since the establishment of the IMF the world economy and the international financial system have undergone major changes in a number of respects of significance to the IMF's role as an international lender.

The collapse of the Bretton Woods fixed-exchange-rate system at the beginning of the 1970s and the transition to floating exchange rates created expectations of a reduced requirement for borrowing from the IMF to the extent that untenable balance-of-payments deficits would tend to be adjusted via the realignment of exchange rates. However, in practice the transition to floating exchange rates was no panacea against untenable balance-of-payments deficits and the IMF's resources remained available to member countries that were unable to finance their deficits in other ways.

The countries' economic integration via greater openness to both trade and capital flows has contributed to increased prosperity in many countries, but also to increasing vulnerability to changes in the economic and financial environment. This has led to new demands for IMF lending. Emerging markets have gained importance not only as recipients of IMF loans, but also as contributors. A number of emerging markets have joined the IMF as creditors and have thus contributed to improving the IMF's liquidity.

In view of these trends it has been discussed whether the previous system for determining the member countries' quotas should be subject to an exhaustive review.

THE PRINCIPAL RECOMMENDATION OF THE COOPER GROUP Box 2

The quota is calculated using the following formula:

$Q = \alpha Y + \beta V$,

Q = calculated quota,
Y = 3-year average of GDP,
V = external vulnerability[1],
α and β are relative weights, $\alpha = 2\beta$.

[1] Data for long-term capital flows for all member countries are not yet available, but the intention is to establish a suitable database for fluctuations in capital flows. The fluctuations are measured as standard deviations from the trend.

THE COOPER REPORT

The increase in the relative importance of emerging markets in the world economy and the equivalently diminishing position of the western economies have caused particularly the USA and Asian countries to press for a quota redistribution. A new quota formula was seen as the instrument to achieve this redistribution in the longer term.

With a view to recommending a new quota formula, in June 1999 an external working group under Professor Richard N. Cooper, USA, was authorised by the Executive Board of the IMF to review the quota formulas[1]. The Cooper Report was completed in September 2000. The principal recommendation, cf. Box 2, is a new and simpler formula with only two economic variables, one of which (GDP) indicates a country's ability to contribute to the IMF's resources, while the other indicates the country's potential need for financial assistance (measured in terms of variability of current receipts).

Indicators of member countries' ability to contribute

There is widespread support in QFRG for applying GDP as the central economic variable to determine a country's ability to contribute to the IMF's resources. However, there is some disagreement as to the method of conversion from national currency to SDR, the unit of account of the IMF. A number of developing countries call for purchasing power conversion on the grounds that the value of e.g. the output of developing countries is systematically undervalued in market rates. This is rejected by the majority of QFRG, since high GDP in terms of purchasing power parity does not reflect a corresponding ability to contribute to the IMF's

[1] The Quota Formula Review Group (QFRG) consisted of Richard N. Cooper (USA), Joseph L. S. Abbey (Ghana), Montek Singh Ahluwalia (India), Muhammad S. Al-Jasser (Saudia Arabia), Horst Siebert (Germany), György Suranyi (Hungary), Makoto Utsumi (Japan) og Roberto Zahler (Chile).

resources. In this context market exchange rates are the relevant measure.

The recommendations of QFRG emphasise that the IMF's creditors, typically the industrialised countries, should retain a majority of the votes in the IMF's Executive Board in order to allow the creditor countries to remain in control of the resources they make available to the IMF. The proposal is therefore that the weighting of a country's ability to contribute to the IMF's resources (GDP) should be twice as high as the weighting of the country's potential need for financial assistance (measured in terms of the variability of current receipts). Naturally, it is not possible to apply objective criteria to the specific weighting, but the basic approach of the Cooper Group was to achieve a suitable balance between the creditor and debtor countries in the IMF.

In conjunction with the old formulas QFRG rejected the foreign-exchange reserve as a measure of a country's ability to contribute. The argument is that the size of the foreign-exchange reserve has lost significance as an indicator of a country's ability to make hard currency available to the IMF, since access to financial markets has improved. According to this argument the central issue is a country's potential access to raise foreign exchange in the financial markets. The countries' access to borrow foreign exchange may have improved, but this source of financing has often dried up when the need for foreign exchange was most pronounced.

Indicators of a member country's borrowing requirement

The Quota Formula Review Group recommends the inclusion of a need-related variable in the quota formula, i.e. the variability of current receipts. Countries with volatile current receipts would hereby gain a higher quota and thereby improved access to borrow from the IMF, since access limits are determined by the country's quota. In order to take the capital flows' growing significance to the countries' external financing into account, it is proposed that long-term net capital flows be included in current receipts.

The inclusion of a need-related variable in the quota formula is no innovation in itself. The existing Bretton Woods formulas include such a variable, i.e. fluctuation in exports. The proposal to include fluctuations in the countries' capital flows in the quota formula nevertheless has the unfortunate side effect of "rewarding" countries which have pursued ever-changing policies with substantial outward and then substantial inward capital flows. According to the proposal, such countries would gain more voting power and greater access to borrow. The Danish position has been that the IMF's quota formulas should not reward countries

ESTIMATED QUOTA ADJUSTMENT AS PROPOSED IN THE COOPER REPORT Table 1

Per cent	Cooper Report (1)	Current quota (2)	Current calculated quota (3)	1 less 2	1 less 3
Country grouping					
USA	22.5	17.5	17.3	4.9	5.2
Europe[1]	31.3	32.8	39.7	-1.6	-8.4
Japan	13.2	6.3	10.2	6.9	3.0
Other industrialised countries[2]	4.3	5.0	4.7	-0.6	-0.4
Emerging markets[3]	12.6	16.0	11.6	-3.4	1.0
Other	16.1	22.4	16.5	-6.3	-0.4
IMF	100	100	100	0	0

Note.: The calculations were made using data for the 11th quota review, not the data for the upcoming 12th quota review. In addition, the calculations do not include the proposals in the Cooper Report to include the variability of the countries' net capital flows, so the calculations should be regarded as illustrative.

Source: IMF, *Staff commentary on the external review of the quota formula*, 6 June 2000.

[1] EU15, Norway, Switzerland, Iceland and San Marino.

[2] Canada, Australia and New Zealand.

[3] Argentina, Brazil, China, India, Mexico, Russia, Saudi Arabia, South Africa, South Korea and Turkey.

which have pursued unstable policies, which again have led to greater fluctuation in those countries' international payment patterns.

It has been proposed that population size be included in the factors applied to determine the quotas, but this variable was rejected by a majority in the Cooper Group.

An alternative to the Cooper Group's proposal is that countries with extraordinary borrowing requirements be accommodated by an extension of the general rules concerning access limits. The wishes of the developing countries to retain influence in the IMF, and perhaps even increase it, can be accommodated by raising the number of "basic votes" (the number of votes allocated to each country irrespective of its quota. This requires a difficult amendment of the IMF's Articles of Agreement, which is not the case for any adjustment of the quota formulas).

Illustration of the potential significance of the Cooper Report to the quotas

Preliminary calculations carried out by IMF staff, cf. Table 1, show that the application of the new formula would benefit major industrialised countries such as the USA and Japan, as well as major emerging markets such as Mexico and Brazil. The losers would in particular be the small industrialised countries in Europe (including Denmark) and small developing countries.

CONCLUDING REMARKS

The quota negotiations have only just begun and will probably invoke discussion of a number of related issues such as the structure and composition of the decision-making bodies of the IMF. The IMF's Executive Board consists of 24 members whereby each of the five largest countries appoints one member, while the other 177 member countries are allocated to constituencies which elect the other 19 members.

The issue of the representation of the western European countries on the Executive Board of the IMF has been raised in connection with the discussion of quota formulas. Currently, eight of the 24 members of the Executive Board are from western Europe[1]. It is argued that western Europe should be represented jointly by one member. This will not in itself affect the voting power of the individual countries. In the longer term, however, the euro may lead to pressure to exclude intra-euro area trade in the calculation of the quotas. This would reduce the calculated quota and thereby also the quota share and voting power of the euro area member states. If the western European countries were represented jointly in the IMF's Executive Board, the representation of other continents could obviously increase.

The Cooper Report was met with some reserve when presented to the IMF. The recommendations of the report were not strongly supported, but were rather viewed as one of many options. The quota discussion has thus only just begun and it can be expected that quite some time will elapse before concrete changes are implemented.

One reason is that in practice the redistribution of the relative quotas can only be achieved via a general increase of all quotas. At present, the IMF has ample liquidity due to a significant decrease in new lending and large repayments on previous loans. Against this background it appears that a general quota increase will not be needed in the next few years. Moreover, quota adjustments require an 85-per-cent majority. A quota increase could be resisted by the US Congress which in recent years has been very reluctant to increase the USA's financial contribution to the IMF's resources.

[1] Including the member for the Spanish/Latin-American constituency who is appointed by Spain and Mexico alternately.

Stock Prices, Property Prices and Monetary Policy

Steen Ejerskov, Economics

INTRODUCTION AND MAIN CONCLUSIONS

During the 1990s the USA and several European countries, including Denmark, saw periods of strongly rising prices for stocks and owner-occupied homes, two important assets in private individuals' portfolios. The development in asset prices is closely monitored by central banks since substantial fluctuations in asset prices significantly influence financial and economic stability, including price stability. Economic and financial crises have more often been related to strong fluctuation in asset prices than to fluctuation in prices for goods and services. A sharp fall in asset prices following substantial increases has often had severe economic implications.

The price of an asset depends on the expectations of the future course of the economy. Minor changes in the prevailing economic situation can entail considerable shifts in expectations of future trends. Asset prices therefore naturally fluctuate more than other economic variables. In certain periods expectations can be too optimistic, or too pessimistic, causing asset-price fluctuations which deviate considerably from movements consistent with the economic fundamentals (speculative bubbles). A speculative bubble in an asset is typically followed and nourished by an increase in borrowing, e.g. borrowing against the free mortgageable value of a property, or gearing of the rising market value of a stock portfolio. The financial sector is therefore vulnerable when the bubble bursts.

During the last two decades inflation has been reduced successfully in Europe and the USA. Nevertheless, this period has seen more financial crises than previously in the last century[1]. Significant increases in prices for stocks and housing in Denmark during the economic expansion in the mid-1980s were followed by strongly falling housing prices and a prolonged recession. The other Nordic countries saw even stronger in-

[1] Michael Bordo and Barry Eichengreen, Is the Crisis Problem Growing More Severe?, presented at the conference *Asset Markets and Monetary Policy*, Sveriges Riksbank, Stockholm, 16-17 June 2000.

creases in asset prices at the end of the 1980s, and the subsequent price drops had a severe impact on the financial sector, leading to a recession at the beginning of the 1990s. Beyond the Nordic region, a similar scenario prevailed in the UK at the beginning of the 1990s. In Japan, the financial sector is still suffering the consequences of a substantial portfolio of non-performing loans after a speculative bubble in property and stock prices burst at the end of the 1980s. Japan's inflation was low in 1986-87, and the authorities were therefore able to lower interest rates to curb the strengthening of the yen[1]. The lower interest rates led to further increases in prices for stocks and housing. In this case focusing solely on the primary objective proved to be inadequate[2].

The disruptive effects are most severe if asset prices deviate far from their fundamental level before the bubble bursts. The problems can be reduced if the bubble can be deflated before the deviation becomes large. However, in practice bubbles are difficult to identify before they have burst, and their effect on the overall economy is subject to great uncertainty. If many indicators point to the same, however, this could signal that the development is not sustainable. Under such circumstances an economic-policy response may be needed to ensure fiscal and economic stability in the longer term.

Stock prices in a number of countries, including Denmark, are historically high, even after the fall in prices in recent months. This may reflect that the current estimates of the potential real growth rates of the economies are too low, for example because the effects of the development of networks and information technology are not taken sufficiently into account. It may also reflect that investors in stocks are willing to accept a reduction of the risk premium, e.g. due to the liberalisation and integration of financial markets and the improved macroeconomic environment in the 1980s and the 1990s. It is still unclear, however, whether these effects are of such magnitude that they justify the current level of stock prices.

Property prices have risen considerably in Denmark since 1993. These increases followed a period of price lags in the housing area compared to the general price development. As a ratio of construction costs, the cash price index is close to the relatively high level in the mid-1980s.

This article considers three issues: firstly, what determines the prices of stocks and housing? Secondly, how do substantial fluctuations in asset

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[1] Inter alia to comply with the international foreign-exchange agreements (the Plaza and Louvre Accords).

[2] The major fluctuations in asset prices in a number of countries, including Denmark, during this period are described in C. Borio, N. Kennedy and S. Prows, Exploring Aggregate Asset Price Fluctuations Across Countries – measurement, determinants and monetary policy implications, *BIS Economic Papers*, 1994.

prices affect financial activity? And thirdly, what role should monetary policy play in countering threats to economic and financial stability?

STOCK PRICES

Like other assets, stocks are a means to postpone consumption from today to a later date. This allows the investor to determine the most suitable consumption pattern over time. The yield on the asset is the compensation for postponing consumption. To obtain the optimal consumption pattern, a person must, at the expected yield by postponing consumption, be indifferent as to whether consumption takes place now or is postponed. If the investor is not indifferent, the consumption pattern can be changed, and overall affluence improved. The price which the investor is willing to pay for the asset thus depends on the expected yield on the asset, as well as the investor's time preference regarding the consumption pattern (discount factor).

Over a company's lifetime a stock's yield is the sum of the dividend in the individual periods. The stock price therefore depends on the sum of the expected future dividend payments, discounted to present value by the discount factor. A mathematical expression of this price is[1]:

$$P_t = \sum_{i=1}^{\infty} \beta^i E(D_{t+i})$$

P_t is the asset price at time t, $E(D_{t+i})$ is the expected future dividend payments in current prices, and β is the discount factor of the investor.

Since neither the future dividend payments nor the discount factor can be observed, pricing entails certain problems. It is often assumed as an approximation that the actual dividend payments are subject to a constant growth rate and that the discount factor is closely associated with the interest rate. Application of these assumptions gives the following expression of the stock price[2]:

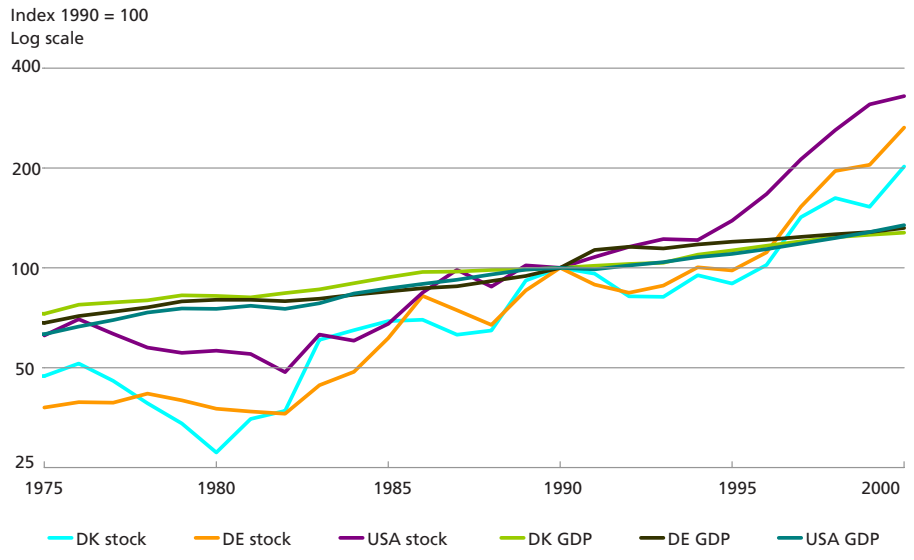
$$P_t = \frac{D_t(1+g)}{r+\rho-g}$$

g is the nominal growth rate for dividend payments, r is the nominal interest rate and ρ is the risk premium on holding the stock rather than government bonds. The discount factor is approximated in terms of 1/r.

[1] When the time horizon is infinite, capital gains are zero (the transversality condition). If a company has a policy of retaining dividend, e.g. if distributed dividend is subject to higher taxation than retained dividend, a price based solely on dividend will be undervalued. In that case, the profit for the individual periods will be a more correct variable than dividend. A dividend policy leaning towards retained dividend is often pursued by newly-established companies.

[2] From Myron J. Gordon, *The Investment, Financing and Valuation of the Corporation*, Irwin, 1962.

REAL STOCK PRICES AND GDP IN DENMARK, GERMANY AND THE USA Chart 1



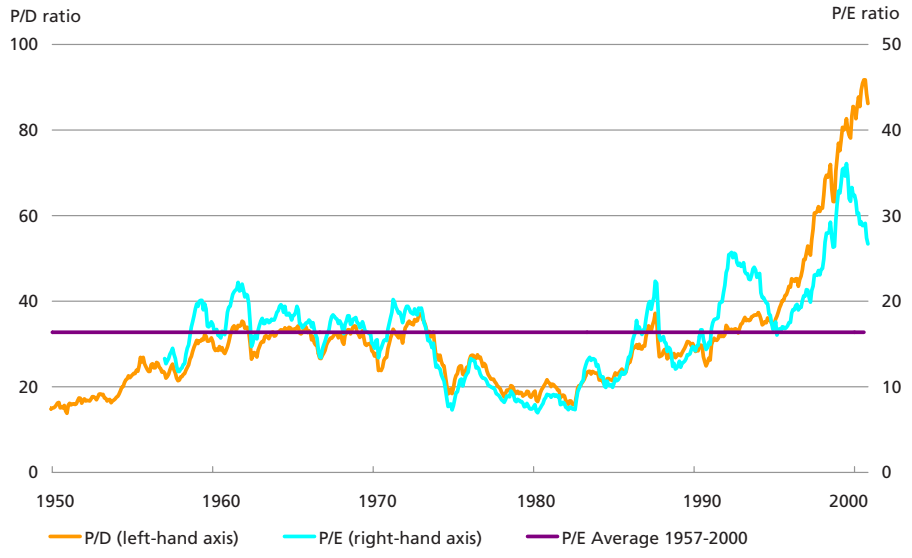
Note: Annual averages of the total index in Denmark, CDAX in Germany and S&P 500 in USA are deflated by the consumer-price index. Most recent observation is 10 November 2000.
Sources: Bloomberg, OECD.

In the financial literature r is also known as the risk-free interest rate, and often the government-bond yield is used. The bond yield can also be interpreted as an opportunity cost of the stock investment. An alternative to buying the stock is to invest, almost without risk, in a government bond. If this yield rises, buying the stock becomes less attractive compared to buying the government bond. The equation, also referred to as the Gordon-Shapiro equation, is very simple, but also widely used.

The central element of pricing stocks is that the price depends on the expectations of the company's earnings and the interest rate. The expectations can be excessively pessimistic or optimistic, and can lead to considerable fluctuations in stock prices, with substantial deviation from the fundamental value in certain periods. One of the explanations for non-fundamental fluctuations is that some investors do not act rationally. Examples are herd behaviour, myopic behaviour (e.g. the investor knows that the increases in the market are not sustainable, but he believes that he can buy and sell again before the market turns around) or the application of an incorrect model (e.g. that a high return in the preceding period will be achieved again in this period). However, it can be very difficult to determine the fundamental value.

One approach to assessing stock prices is to compare them with the real rate of growth in the economy, cf. Chart 1. In the long run, real stock prices will normally follow the real growth rate in the economy,

PRICE/EARNINGS RATIO (P/E) AND PRICE/DIVIDEND RATIO (P/D) IN THE USA Chart 2



Note: Monthly observations for S&P 500. Stock prices as a ratio of dividend disbursements and earnings per share in the preceding year. Most recent observation is 10 November 2000.
Source: BIS.

and thereby also the rate of growth in real income[1]. Since the mid-1990s the rate of increase in real stock prices in Denmark, Germany and the USA has been considerably higher than the rate of growth in real output.

Development in the USA

The discussion of the stock-price increases in recent years has focused particularly on the USA. The US stock market accounts for around 60 per cent of the value of global stock markets, and the development in the USA significantly affects trends in other countries.

Chart 2 shows the development in stock prices as a ratio of business enterprises' earnings per share (price earnings or P/E) and stock prices as a ratio of dividend (P/D). The price earnings ratio is the price an investor has to pay for a share of one unit of the company's profit[2].

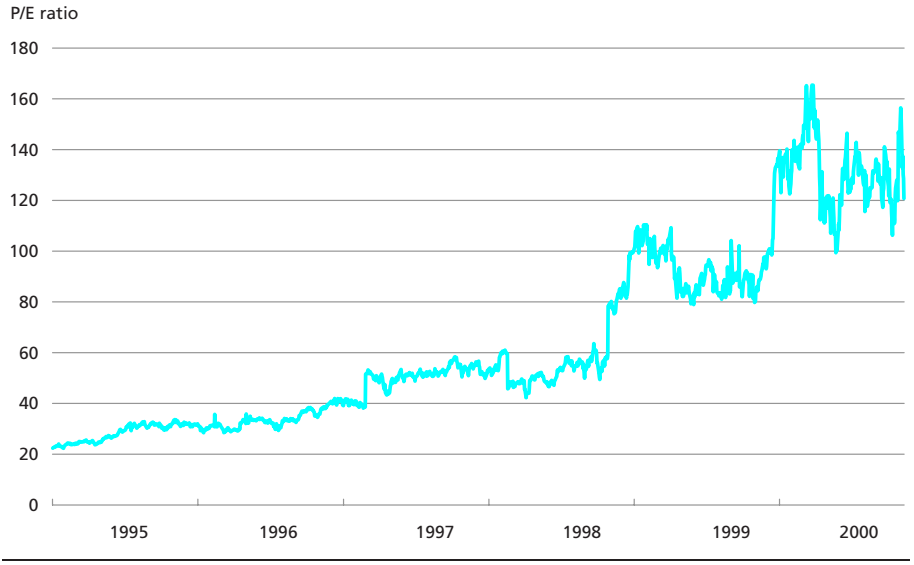
The average P/E ratio in the USA for the broad S&P 500 index in the period 1957-2000 is around 16. This entails an E/P (earnings yield) of

[1] If the earnings and dividend payments of the companies included in the stock index are a stable proportion of GDP.

[2] The P/E ratio can be shown theoretically by a simple adjustment of the Gordon-Shapiro equation where it is assumed that dividend disbursements constitute a stable proportion, δ, of earnings E ($D=\delta E$):

$$\frac{P_t}{E_t} = \frac{\delta(1+g)}{r+\rho-g}$$

PRICE/EARNINGS RATIO (P/E) FOR NASDAQ Chart 3



Note: Daily observations. Most recent observation is 10 November 2000.
Source: Bloomberg.

approximately 6 per cent, which is relatively close to the average real yield for S&P 500 of 6.5 per cent p.a. throughout this period. In practice, the development in the earnings yield for broad stock indices has been relatively close to the average real yield on stocks, and this real yield has been stable for long periods of time. Estimates from the USA show that the real yield on stocks has been around 6.5-7.5 per cent p.a. in various sub-periods for the last 200 years[1].

The price earnings ratio has risen considerably from the level at the end of the 1980s. This should be viewed against the background of an unusually long period of high growth in private consumption and investments, falling unemployment and a relatively low inflation rate in the USA. For the last 2 years the P/E ratio for S&P 500 has fluctuated at around 30 (27 in mid-November 2000), which corresponds to an earnings yield of 3.5 per cent, i.e. only half the historical average real stock yield. The P/E ratio for S&P 500 covers a wide range of values for the individual companies, where the P/E ratio of certain of them is higher than 50. The stock price of certain companies in the information technology sector (computer technology and communications) is very high. The NASDAQ index, which primarily comprises technology enterprises, has shown a P/E ratio of more than 100 in 2000, cf. Chart 3. The ratio has fluctuated considerably in the last two years. This average value also conceals large

[1] Jeremy Siegel, *Stocks for the Long-Run*, McGraw-Hill, 1998.

IMPLICIT RISK PREMIUM IN THE USA AND GERMANY Table 1

	P/E ratio[1]	Dividend yield	Real GDP growth	Real-interest rate	Inflation	Implicit risk premium
Average 1987-99						
USA	14	3.6	3.1	4.3	2.8	2.6
Germany	17	2.0	2.9	4.4	2.2	0.6
2000						
USA	27	1.1	3.7[2]	3.5	2.5[3]	1.4
Germany	60	1.9	1.9[2]	3.8	1.5[3]	0.1

Note.: S&P 500 and CDAX. Data for 2000 are the most recent data available (beginning of November 2000). The risk premium is calculated as $\rho = (1+g)(1+\pi)D/P - (r+\pi) + (g+\pi)$, where π is inflation, r is the real-interest rate and g is growth in real GDP.

Sources: ECB and Bloomberg.

[1] A direct comparison of P/E ratios in various countries is difficult due to variations in legislation, taxation and financial market structure. The high current P/E ratio in Germany reflects that the five largest corporations had values of between 45 and 110.

[2] Potential GDP growth, OECD estimate, spring 2000.

[3] OECD estimate, spring 2000.

differences between the individual enterprises. Certain companies have a P/E ratio of more than 300. Unless there has been a significant change in the discount factor, a P/E ratio of 300 implies that the company's earnings must increase very strongly in order to fulfil expectations. An example of how expectations are met is that the company's earnings increase by approximately 40 per cent p.a. for 10 years, and then level out to approximately 6 per cent p.a. in all subsequent years, i.e. close to the nominal growth rate for the rest of the economy.

Viewed in a historical perspective, these values appear to be extreme. However, it is difficult to apply traditional valuation methods to companies of this type, which often have a low capital stock. A large proportion of their value is associated with their organisational structure and human capital, which are difficult to value.

On the basis of the Gordon-Shapiro equation an implicit risk premium can be derived, cf. Table 1. The Table shows historical averages and current levels for key economic indicators in the USA and Germany. The yields on 10-year government bonds (deflated by the consumer-price index) are used as the risk-free interest rate of the Gordon-Shapiro equation. An investment horizon of 10 years for investors in stocks is often applied in the financial literature. The real growth in the economy is a fair approximation of the growth in real corporate earnings and dividend payments, assuming that profits and dividends are stable percentages of GDP. The potential rate of growth in the economy is an approximation of investors' expectations of the future rate of growth in corporate earnings. The historical average is limited to the period

1987-99. This relatively short period is chosen primarily on the grounds of data availability. Furthermore, the period chosen was characterised by relatively stable macroeconomic conditions, in contrast to the 1970s and the beginning of the 1980s. Calculating the average over a longer period results in higher risk premiums[1].

The current stock market levels are historically high. There are at least four interpretations of the results.

Firstly, if the current values in the stock markets are sustainable, this could imply that investors accept a considerable permanent reduction in the risk premium. The current implicit risk premium in the USA and Germany is respectively 1.2 and 0.5 percentage points lower than the average for 1987-99, according to the above calculation. The current risk premium is also considerably below the previous averages, viewed over a longer period.

It is difficult to say whether a decrease in the risk premium is sustainable in the longer term. Liberalisation and integration of the financial markets, as well as the financial innovation during the last two decades, may have contributed to a lower risk premium. Investors now have greater opportunity to diversify and hedge risk, as well as easier and cheaper access to the financial markets via e.g. mutual funds and the Internet. The risk premium can also be influenced by demographic trends. Higher pension savings in the 1990s by large year-groups can increase demand for stocks, and lead to a reduction of the risk premium. This mechanism will be reinforced if pension funds in the long term increase the proportion of stocks in their portfolios. An improvement in the macroeconomic conditions may also affect the risk premium. The return to low inflation, balance in government budgets and a reduction of public debt may also have contributed to a lower risk premium. However, these factors can only lead to a permanently lower risk premium to the extent that investors expect permanent improvements.

It is not yet clear, however, whether these effects are sufficient to justify the current level of stock prices. The risk premium has tended to fluctuate with the business cycle, so that increasing risk premiums can be expected in the event of a downturn in the economy.

Another interpretation is to assume that the risk premium has not been reduced, but that the current values reflect expectations of future higher earnings growth rates and dividend payments. If this is the case,

[1] See e.g. Olivier Blanchard, Movements in the Equity Premium, *Brookings Papers on Economic Activity: 2*, 1993 and Sushil B. Wadhwani, The US Stock Market and The Global Economic Crisis, *Special Paper No. 110*, Financial Markets Group, London School of Economics, 1999.

the rate of growth in dividend payments must be respectively 1.2 and 0.5 percentage points higher than the potential real growth in the USA and Germany, according to the calculations in the table.

The ratio of corporate earnings and dividend payments to the overall economy has been seen to rise in the short term, but has been remarkably stable in the long term. The stability of this ratio is normally regarded as a well-established element of economic growth theories[1]. If this applies, the potential growth rate in the economy must rise to the level corresponding to the expectations of growth in earnings, or the growth in earnings will be below current expectations.

This indicates a third interpretation. The current estimates of the potential real growth rate in the economies may be too low. Large-scale investments in networks and information technology in recent years can improve production processes, stock management and distribution, and enhance competition and productivity. If new technologies increase productivity, the potential real growth rates are currently undervalued. Productivity rose by 2.6 per cent p.a. on average in 1995-99 in the USA after a prolonged period of relatively low productivity growth at 1.7 per cent p.a. in 1972-95. However, it appears from an estimate of the contributions to the increase in productivity growth that half of the increase can be attributed to adjustments to the statistical methodology and normal cyclical effects, while the other half relates solely to the computer sector, which accounts for only 1.2 per cent of the US economy[2]. However, the introduction of new technology may require changes in production processes and supplementary training, so that the effect is apparent from the data after a certain time lag. The increase in the productivity growth rate in the USA has occurred at a relatively late stage of the expansion, which is unusual.

Previous periods have shown that there is no natural connection between technological progress and strong increases in stock prices. The advance of electricity-based industries in the 1920s resulted in considerable productivity increases, but did not entail the strong rises in stock prices seen for IT stocks in recent years[3].

A fourth interpretation of the results is that the current values in the stock market are excessively high and that the stock markets will see a negative correction. A correction of the broad stock indices does not

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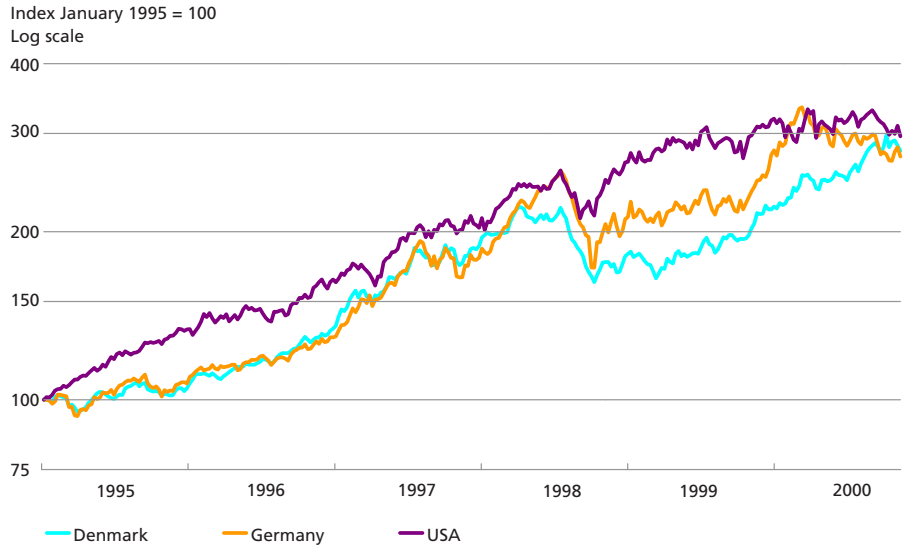
1 See e.g. Olivier Blanchard, The Medium Run, *Brookings Papers on Economic Activity: 2*, 1997 and Robert Barro and Xavier Sala-i-Martin, *Economic Growth*, McGraw-Hill, 1995.

2 Robert Gordon, Has the 'New Economy' Rendered the Productivity Slowdown Obsolete?, *Northwestern University Working Paper*, 1999.

3 Nicholas Crafts, Globalization and Growth in the Twentieth Century, *IMF Working Paper 00/44*, 2000.

STOCK PRICES IN DENMARK, GERMANY AND THE USA, 1995-2000 Chart 4



Note.: Weekly observations. Total index in Denmark, CDAX in Germany and S&P 500 in USA. Most recent observation is 10 November 2000.
Source: Bloomberg.

rule out the possibility that some business enterprises will be able to fulfil the current high expectations.

The development in Denmark

In the late 1990s Denmark saw an increase in stock prices of around the same magnitude as in the USA and Germany, cf. Chart 4. Unlike these countries the price increases in Denmark took place over the past year in particular, which may reflect a lag vis-à-vis abroad. The increases cannot be explained by the development in bond yields and corporate earnings, which are two key factors determining the discount factor and the expectations of future corporate earnings[1]. The bond yield has been relatively stable for the last two years, and the growth in corporate enterprises' earnings is generally subdued.

As in the USA, the P/E ratio for the broad stock index in Denmark is relatively high at present. The average P/E ratio was approximately 18 in the period 1987-99, while it was around 30 in mid-November. This corresponds to an earnings yield of approximately 3.5 per cent and implies an annual real yield on stocks of the same magnitude. This would be a considerable reduction from the historical averages. Since 1980 the av-

[1] In empirical research corporate earnings and bond yields are robust fundamental variables to explain the development in stock prices, see e.g. Jan Overgaard Olesen, A Simple Explanation of Stock Price Behaviour in the Long Run: Evidence for Denmark, *EPRU Working Paper Series*, 09, University of Copenhagen, 2000.

P/E AND D/P FOR THE DANISH STOCK MARKET, OCTOBER 2000 Table 2

	P/E	D/P
Banking and insurance	14	3.3
Brewing and foodstuffs	21	1.7
Construction products and properties	12	2.2
Consumer goods	26	1.1
Services	66	0.2
Capital goods	97	0.6
Medical	40	0.6
Shipping	27	0.3
Telecommunications and technology	34	2.1
Total	34	1.3

Note.: Estimates for 2000 as of 13 October 2000. Cover around 80 per cent of the market capitalisation in the total index. D/P is dividend payments as a ratio of the stock price.
Source: BG Bank.

erage annual real yield, including dividend, from the total index has been around 13 per cent. Including the 1970s, the average is approximately 9 per cent p.a.

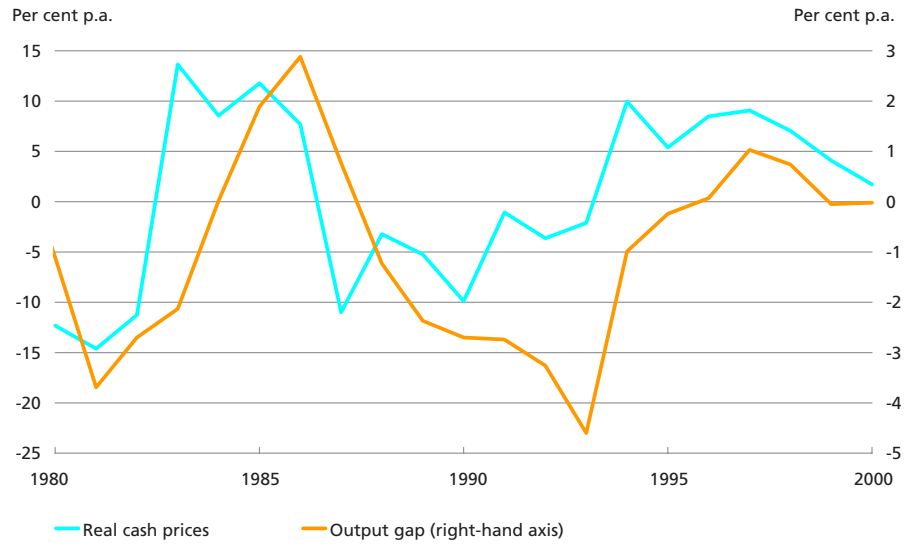
Table 2 illustrates that the pricing can vary considerably among the individual sectors. Furthermore, the overall figures reflect a relatively wide spread between individual shares, of which few have a P/E ratio that exceeds 200.

Calculation of the risk premium for Denmark by means of the Gordon-Shapiro equation, as in Table 1 for the USA and Germany, gives a negative risk premium for the period 1987-99. This result appears implausible. One reason may be that the equation is a simplified approximation to "true" values. For example, the equation does not take the taxation factor into account. The pension fund tax which was adopted in Denmark in 1983 did not include yields on stocks, and thus favoured investments in stocks rather than bonds. This may have reduced the pre-tax risk premium for stock investments. The average dividend yield in this period was approximately 1.5 per cent p.a. in Denmark, which is somewhat lower than in the USA and Germany. This can be attributable to a greater tendency for Danish companies to retain dividends during this period. Variations in corporate dividend policies among various countries can be affected by such factors as how disbursed dividends are taxed compared to retained dividends. No value is given to retained dividends in the Gordon-Shapiro equation.

Surveys over a longer period have estimated a positive risk premium in Denmark[1].

[1] Tom Engsted and Carsten Tanggaard, The Risk Premium on Danish Stocks, (in Danish) *Nationaløkonomisk Tidsskrift*, 1999, estimates the risk premium at 3.7 per cent on average in the period 1922-96.

REAL CASH PRICE AND OUTPUT GAP IN DENMARK Chart 5



Note: Cash prices for one-family houses deflated by the consumer-price index.
Sources: OECD and Statistics Denmark.

PROPERTY PRICES

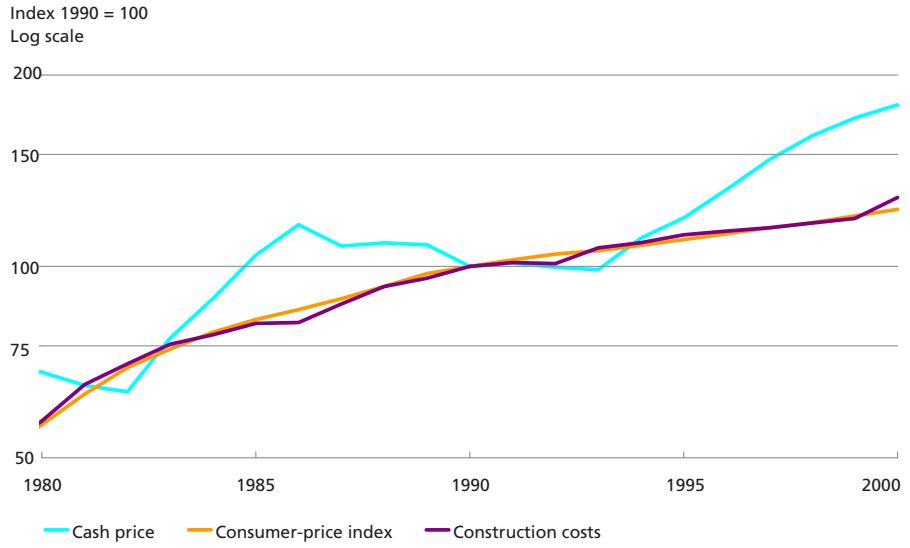
In the short to medium term property prices are to a large extent determined by demand, which follows the business cycle, especially interest-rate levels (financing conditions) and the households' real incomes[1]. Chart 5 presents annual rates of increase in real cash prices and a measure of the cyclical situation – the output gap. This measure is calculated as the deviation of actual real output from an estimate of potential real output.

Property prices also depend on the general price level, the property stock and tax regulations (e.g. the tax value of the deductibility of interest payments).

In the short term at least the supply of properties is relatively inelastic. An increase in the demand for housing compared to the housing stock exerts upward pressure on cash prices. New construction thus becomes more attractive, and housing investments will increase, so that the housing stock will gradually expand. In the long run housing prices are determined by construction costs.

[1] A cash price relation is estimated in e.g. Lone Schøtt Jensen and Dan Knudsen, Housing Investments and Cash Prices (in Danish), *Nationaløkonomisk Tidsskrift*, 1990. The effect on cash prices of fluctuation in bond yields is described in The Monetary Policy Transmission Mechanism, Chapter 4 in *Monetary Policy in Denmark* (in Danish), Danmarks Nationalbank, 1999.

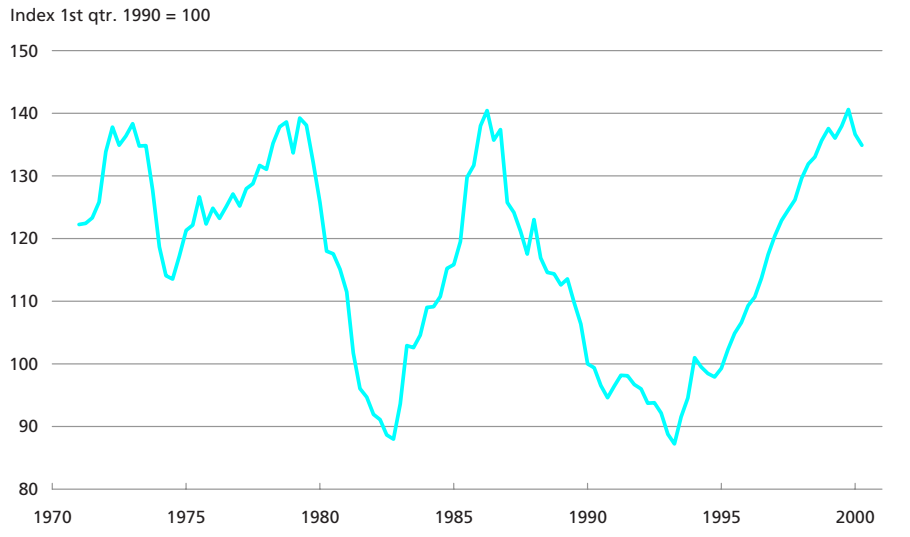
CASH PRICES, CONSUMER PRICES AND CONSTRUCTION COSTS IN DENMARK Chart 6



Note: The housing investment deflator is used as an indicator of the development in construction costs.
Source: Statistics Denmark.

In certain periods housing prices may deviate significantly from the general development in prices, cf. Chart 6. Since 1993 increases in housing prices have been considerably greater than increases in construction costs. However, this acceleration occurred after a period of sluggish

CASH PRICE AS A RATIO OF CONSTRUCTION COSTS Chart 7



Note: Quarterly observations. Cash prices and construction costs are both indexed using 1st quarter 1990 as the basis.
Source: Statistics Denmark.

housing prices at the end of the 1980s and the beginning of the 1990s. Compared to construction costs, the cash price index is close to the relatively high level seen in the mid-1980s, cf. Chart 7.

The correlation between property prices in various countries is considerably lower than the correlation between stock prices. The interest-rate parity and the effects of the international business cycle have an intensified impact on the stock market due to such factors as the opportunities for international arbitrage and the very liquid nature of the stock market. The property market is influenced first and foremost by domestic conditions. Hence, the capability of economic policy to affect the property market is greater than its capability to affect the stock market.

Households have a fundamental need for housing, but not for a portfolio of stocks. Prices for housing thus tend to be less forward-looking than stock prices. An investor in stocks may choose other liquid investment alternatives, such as bank deposits, in certain periods if a lower return on stocks is expected in the immediate future. For a home owner, the alternative is to rent a home. However, moving in and out of the market for owner-occupied homes is cost-intensive, and furthermore the market for rented housing in Denmark is inefficient.

ASSET PRICES AND FINANCIAL ACTIVITY

Strong fluctuations in asset prices have a significant impact on the solvency of the financial sector and the course of the economy. The most frequently cited effect of asset price fluctuations on the business cycle is the effect from the private sector's wealth to shifts in consumption and investments (wealth effect)[1]. For the corporate sector rising asset prices will reduce the cost of acquiring new capital compared to existing capital, which can increase the level of investment (the Tobin's q effect). Asset prices are generally forward-looking and rising asset prices may reflect expectations of a higher level of future economic activity. Expectations of higher future income will increase consumption and investments (expectations channel)[2]. Finally, effects related to the functioning of the credit markets (credit channels) also play an important role. A case in point is that it is easier for financially sound households or business enterprises to borrow, and at a lower interest rate (lower external financing premium), than would have been the

[1] The transmission channels from changes in asset prices to the real economy are described in Erik Haller Pedersen, Capital Gains on Stocks and Owner-Occupied Homes, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 1998.

[2] An interesting correlation between the development in stock prices and consumer confidence in the USA is examined in Maria Ward Otoo, Consumer Sentiment and the Stock Market, *Working Paper, Finance and Economics Discussion Series, no. 60*, Board of Governors of the Federal Reserve System, 1999.

case if their financial position were less sound (balance-sheet effect). Assets are used as collateral to enhance access to borrowing and to reduce the premium on external financing, and thereby cushion the effects of adverse selection[1]. Strong fluctuations in asset prices will thus affect the private sector's access to credit. For example, if the market value of the assets of the private sector declines, while payments on liabilities remain unchanged, creditworthiness is reduced, and thereby also opportunities to achieve the desired level of credit financing. The external financing premium will also tend to increase. The banks are subject to capital adequacy requirements, i.e. they have an incentive to reduce the scope of lending if the value of the collateral declines. This type of credit rationing will affect small business enterprises and households in particular, since their dependence on bank loans is relatively high. The mechanism, called a financial accelerator, amplifies the fluctuations in credit extension and thereby also reinforces business cycles[2].

The financial sector is exposed both directly and indirectly to fluctuations in asset prices. The direct exposure is via capital gains and losses on its own asset portfolios, while the indirect exposure is via the portfolio of lending to the business sector and households. Falling asset prices undermine the solvency of the private sector and may cause the number of defaulted loans to rise. This diminishes the financial soundness of the banks and reduces opportunities to offer new loans (lending channel). The effect may be amplified if the banks have to realise the assets provided as collateral for the loans, such as stocks, at a time when the asset price is falling sharply. This may again adversely affect stock prices and the banks' solvency, resulting in a vicious circle which can lead to a credit crunch. The opposite effect can be seen when asset prices are rising strongly, leading to a credit boom.

The principal asset of households is owner-occupied homes[3]. A very large proportion of Danish households own their own home, and this proportion is rising. In 1999 approximately 61 per cent of all households owned their own home, an increase from approximately 47 per cent in 1970. In most OECD countries the proportion of owner-occupied homes is more than 50 per cent. There is a relatively close correlation between

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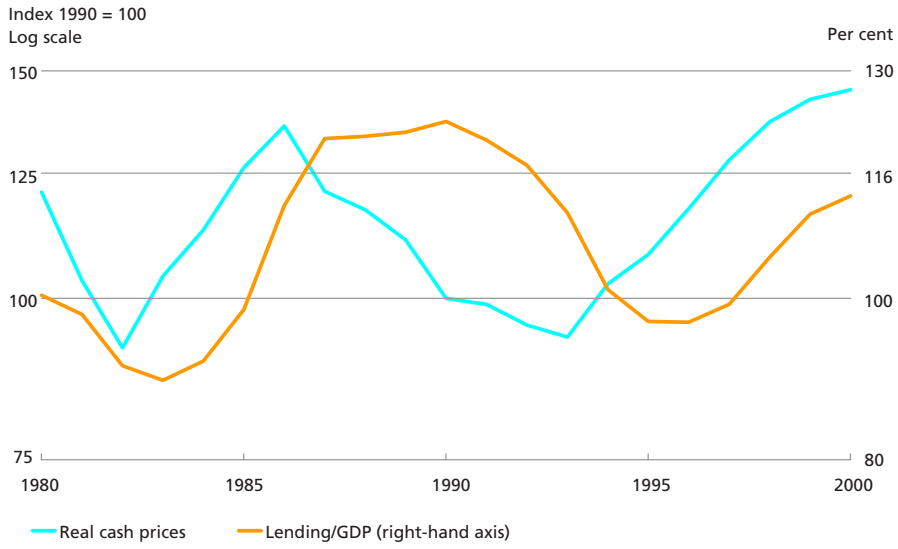
1 Adverse selection applies when the lender is unable to gain a full insight on the borrower's ability to repay a loan. In view of the risk of an excessively large proportion of defaulting customers the lender may choose to reduce the volume of lending.

2 The accelerating effect is described in e.g. Ben Bernanke, Mark Gertler and Simon Gilchrist, The Financial Accelerator and the Flight to Quality, *The Review of Economics and Statistics*, February 1996.

3 Gross housing assets were approximately 290 per cent of disposable income in Denmark in 1999, while the portfolio of listed shares and mutual fund certificates was approximately 22 per cent. Housing makes up approximately 60 per cent of the households' total wealth, cf. *Economic Survey*, (in Danish) Ministry of Economic Affairs, May 2000.

REAL HOUSING PRICES AND LENDING BY BANKS AND MORTGAGE-CREDIT INSTITUTES

Chart 8



Note: Annual average. Total lending by banks and mortgage-credit institutes as a ratio of GDP.
Source: Statistics Denmark.

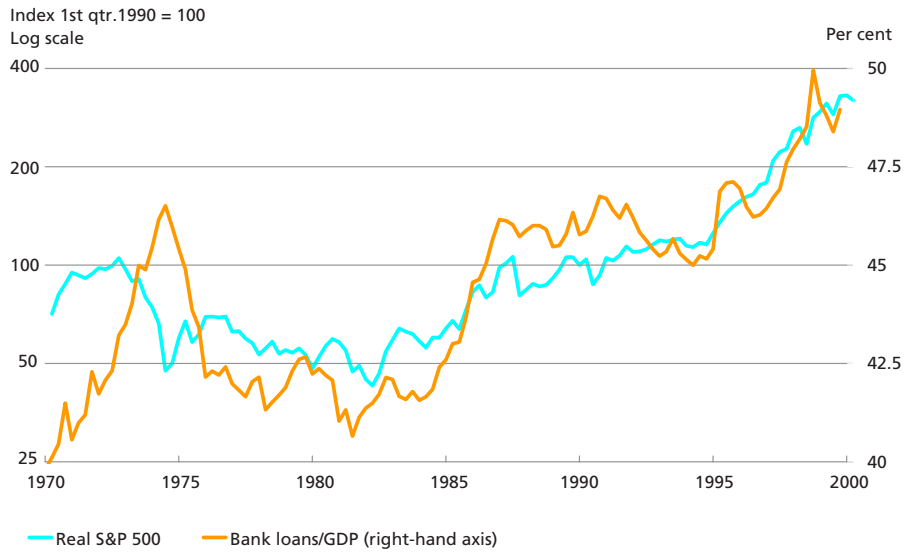
the development in housing prices and the lending by banks and mortgage-credit institutes in Denmark, cf. Chart 8.

Most of the lending to households by banks and mortgage-credit institutes is to finance homes or to finance consumption backed by real property mortgaged as collateral[1]. A high marginal tax rate, together with the tax deductibility of interest payments, provides an incentive to borrow against the free mortgageable value in step with rising property prices. Unless the loan is reinvested in the home, borrowing against the free mortgageable value makes households more vulnerable to falling property prices. New credit products have furthermore affected the borrowers' exposure to changes in interest rates. For example, falling housing prices due to an increase in interest rates will also reduce the debt if the home is financed by a long-term fixed-rate loan. This reduction in the market value of the debt does not equivalently apply to variable-rate loans.

The households' stock portfolios accounted for less than 5 per cent of net wealth in Germany, France and Italy in 1997, and thus the significance of stock prices to credit granting is less pronounced in Europe. In the USA, on the other hand, the stock portfolio constituted almost 25 per cent of

[1] Danish households account for the largest mortgage debt in the EU at approximately 70 per cent of GDP. However, since the various countries' home financing structures differ considerably, this factor does not accurately express the households' total debt compared to other countries.

REAL STOCK INDEX AND BANK LOANS AS A RATIO OF GDP IN THE USA, 1970-2000 Chart 9



Note: Quarterly averages. S&P 500 is deflated by the consumer-price index.
Source: BIS.

net wealth in 1997, so that credit granting in the USA is more sensitive to stock-price fluctuations, cf. Chart 9.

In the USA maximum 50 per cent of an investment in stocks may be financed by borrowing from a stockbroker (margin borrowing). During the 1990s the growth in margin borrowing remained relatively close to the growth in stock-market value, but with a tendency for stronger increases in the last two years.

The financial markets tend to grow faster than the overall economy. Between 1985 and 1998 the value of outstanding bank loans, bonds and shares rose from around 150 per cent of GDP to around 250 per cent in the major OECD countries. In Denmark a similar trend was seen. In view of the appreciation of households' assets as a ratio of GDP, attributable in particular to the strong increases in asset prices, but also households' greater participation in the financial markets, fluctuations in asset prices can be expected to have a stronger impact on the general economic situation.

Denmark currently has a sound financial sector and a well-consolidated business sector. This is typical of a period with high asset prices[1]. The households also show relatively sound balance sheets. The interest burden fell during the 1990s, but the households are still vulnerable to fluctuations in property prices. The mortgage ratio, i.e. lending in mort-

[1] A current assessment of the financial stability in Denmark is presented in Financial Stability, Danmarks Nationalbank, *Monetary Review*, 2nd Quarter 2000.

gage-credit bonds as a ratio of the property value, was relatively stable at around 65 per cent during the 1990s, but somewhat higher than in the mid-1980s when mortgage-credit lending was still subject to a number of restrictions.

MONETARY POLICY

The primary objective of monetary policy in most OCED countries is to maintain price stability. Stable asset prices are not an objective per se. However, large fluctuations in asset prices affect financial and economic stability and can thus have an indirect impact on the primary objective. As a consequence, central banks pay due attention to asset prices in their planning of monetary policy.

Asset prices play an important role since over- or underestimation can amplify cyclical fluctuations, to the detriment of price stability and long-term economic growth and employment. Furthermore, speculative bubbles can distort the utilisation of resources in the economy. For example, over-estimation of an asset will reduce its capital cost and lead to excess investment in that asset. This leads to inefficient allocation of resources, which is comparable to the effect of consumer price inflation.

Asset prices are also important because they contain information on the expectations of future economic activity and inflation which is not contained in other variables. Since assets are claims on future consumption they can in theory be interpreted as the price of future consumption and can therefore be applied to the overall assessment of the future course of inflation. The impact of monetary policy on the real economy is subject to a long time lag, typically more than one year. Forward-looking information from the asset markets can therefore be relevant to the conduct of monetary policy. Financial variables are particularly relevant to economic forecasting, due to their instantaneous nature. Furthermore, they are not subject to revisions and also involve forward contracts, which gives an opportunity for more long-term forecasts than would otherwise be the case.

In Denmark monetary policy is designed to fulfil the fixed-exchange-rate policy, which excludes use of the interest-rate instrument to counter the effect of large fluctuations in asset prices. Other OECD countries such as the USA and the euro area use the interest-rate instrument to influence the economy's course, in order to achieve the primary objective. By adjusting the official interest rate the central bank's monetary policy can influence demand from households and business enterprises for goods and capital goods, thereby ensuring

stable price development[1]. However, monetary policy can also affect economic activity indirectly via the impact of interest-rate adjustments on asset prices, e.g. stock prices and housing prices. For example, reducing the interest rate will increase the discount factor and thereby also asset values. The impact on asset prices may affect the behaviour of households and business enterprises, since fluctuations in asset values affect the size of the net assets (the wealth effect) and may change the access to borrow and the external financing premium by influencing the value of the collateral (the balance-sheet effect).

A key issue is whether central banks should use the interest-rate instrument to counter a speculative bubble in asset prices with a potential impact on the primary objective of the central bank.

A traditional argument against is that when a central bank focuses solely on its primary objective of a stable consumer price index it also implicitly takes the development in asset prices into account. If the markets for goods and service are efficient, the forward-looking information from asset prices will be contained in current prices in the markets for goods and services. It will therefore be sufficient to conduct monetary policy according to the consumer price index[2]. However, efficient markets for goods and services is a strong assumption to make. If the assumption does not hold, the central bank can gain more information on the economy's future course by also including asset prices.

The inclusion of asset prices in a total cost index together with consumer prices, and the application of this index to the conduct of monetary policy, may enable the central bank to implement more timely measures, with smaller interest-rate adjustments than would otherwise be required. Should a speculative bubble in an asset arise, it could be appropriate to raise the official interest rate, even though this will brake economic activity in the short term, and push inflation down. Timely measures would make it possible to avoid a subsequent strong decline in activity and inflation, and achieve more stable development in output, employment and inflation in the long run[3].

Including asset prices in monetary-policy planning can also pose significant problems, however.

Firstly, the impact of asset prices on economic activity and inflation may vary over time. Periodic fluctuations in asset prices can be caused by

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1 It is normally assumed that the behaviour of households and business enterprises depends on real interest rates rather than nominal official interest rates. However, the nominal rigidity of prices and wages enables the central bank to affect short-term real interest rates by adjusting the official interest rates.

2 This conclusion is reached in e.g. Ben Bernanke and Mark Gertler, Monetary Policy and Asset Prices Volatility, in *New Challenges For Monetary Policy*, Federal Reserve Bank of Kansas City, 1999.

3 The result in Stephen Cecchetti, Hans Genberg, John Lipsky and Sushil Wadhwani, *Asset Prices and Central Bank Policy*, CEPR, 2000.

different underlying factors and have varying overall impacts on real variables.

Secondly, there may be a considerable level of noise in asset prices, which reduces the reliability of the information.

Thirdly, there is a risk of reduced transparency in monetary policy. The individual objectives may send different signals, requiring different responses. In the event of conflicting objectives it can be difficult to communicate simple reasons for monetary-policy adjustments. If there is doubt about the priority given by the central bank to various objectives the credibility of monetary policy will be reduced and its effects weakened.

Fourthly, it is difficult for a central bank to have an explicit or implicit asset-price target. The current value depends on future variables which are subject to great uncertainty. As previously stated, it is not possible to observe the fundamental discount factor, making it difficult to determine whether the current prices include a non-fundamental component.

Even if a central bank is able to determine that asset prices are not fundamentally justified, it is not certain that the central bank's policy instrument is the most appropriate. A speculative bubble in a specific asset makes it desirable to adjust the relative price between the asset and other goods and services, but an interest-rate adjustment has a broadbased impact on the economy. In certain situations other elements of economic policy can have a more effective impact, e.g. via supervision of financial corporations, accounting regulations, and financial legislation, and the elimination of some of the distorting effects of the tax system.

In Denmark the primary objective of monetary policy is to ensure a stable krone rate, while the stabilisation of business cycles is an element of fiscal and structural policy. The economic-policy response to the strong increases in housing prices and private consumption during the 1990s is an example of the application of the fiscal-policy instrument. One of the intentions of the Whitsun package of economic measures was to stabilise the property market by dampening growth in property prices to a level equivalent to inflation[1]. Rising housing prices in the mid-1990s led to expansion of private consumption, partly due to borrowing against free mortgageable property values. The savings ratio fell, and a current-account deficit accumulated. The ensuing tightening of fiscal policy included a reduction of the value of the tax deductibility of interest payments. Since then the propensity to consume has declined and growth in housing prices has subsided. Reducing the value of the

[1] See e.g. *Families and Income*, (in Danish) Økonomisk Tema, Ministry of Economic Affairs, November 2000.

tax deductibility of interest payments can also contribute to reducing future fluctuations in asset prices as it provides an incentive to reduce speculative gearing, i.e. to limit speculation based on borrowed funds.

The primary objective of the Eurosystem is consumer-price stability. The monetary-policy strategy to achieve this objective is based on two pillars. One is the development in the monetary aggregate, M3, and the other is the development in a wide range of economic and financial variables which are of relevance to the development in consumer prices. The development in asset values such as stock and housing prices is an element of the second pillar, and is therefore monitored on an ongoing basis. Furthermore, a speculative bubble in an asset tends to evolve simultaneously with an expansion of the monetary aggregates. The first pillar can therefore indirectly provide signals of asset price trends, and strong increases in the money stock may provoke a monetary-policy response.

There is an inherent risk of a more immediate economic policy response to declining than to increasing asset prices. Strong asset price fluctuations typically have a stronger impact on the real economy than gradual fluctuations, even though the two trends can be of similar size in overall terms. Increases in asset prices are typically gradual, while decreases can be very abrupt in some cases. This may therefore indicate an asymmetrical economic-policy response whereby investors perceive an automatic safety net under falling asset prices and "benign neglect" in the case of rising asset prices. The impression of an asymmetrical response is an inappropriate signal which may induce investors to increase their risk exposure, e.g. by accepting a lower risk premium in stock investments (moral hazard). If major increases in asset prices are followed by strong expansion of lending by banks, increases in the investment ratio of the private sector, a falling savings ratio and considerable current-account deficits, the overall signal will be that the development is not sustainable. It may be important to demonstrate a willingness to act, should several indicators point to an overheating.

The Role of Monetary Policy

By Governor Bodil Nyboe Andersen at the Annual Conference of Danish Industries on 26 September 2000

Thank you for the invitation to speak on the role of monetary policy. Traditionally, this topic has not drawn much attention in Denmark. Some might claim that this is because Denmark does not in fact pursue a monetary policy as such. In normal times we just shadow the euro area, and before that, Germany. However, in conjunction with the debate on whether Denmark should adopt the euro the design of monetary policy has attracted greater interest.

PRICE STABILITY

In all countries the primary task of monetary policy is to contribute to price stability. The approach is either direct inflation targeting or more indirect control by maintaining a stable exchange rate against another currency which is characterised by price stability. Price stability is defined as very low inflation, preferably below 2 per cent.

The prevailing view in the post-war period was that a certain element of inflation helped the economy to function more smoothly. In recent decades there has been growing recognition that this is not the case.

Instead of an inflation rate of 10-12 per cent, low, stable inflation at no more than 2-3 per cent has proved to be a better way of ensuring sound and steady economic growth. Even moderate inflation increases the uncertainty of long-term economic decisions and entails inappropriate redistribution of resources in society.

In the years around 1980 Denmark had high inflation and high interest rates and the krone was devalued on every possible occasion. This course was stopped in 1982 and from that time inflation was reduced significantly by means of a consistent fixed-exchange-rate policy. This strategy was supported by the trade union movement, which during the 1980s came to realise that inflation did not benefit its members. Some very different groups in society were the real winners of the inflation game.

But moving from high to low inflation had its price. Most of us can remember a lot of problems in the years around 1990. They were the

result of far too many inappropriate economic decisions during the inflation years.

As stated, during the 1980s the benefits of low inflation were generally acknowledged in Europe. Germany became the role model. Although this was probably the result of many different factors in Germany, the prevailing view became that the low inflation rate was especially attributable to the Bundesbank's successful monetary policy, of which the main objective was keeping down inflation.

A basic assumption of the negotiations prior to the Maastricht Treaty was that a single European currency and a single monetary policy should be based on the objective of price stability. This objective was therefore incorporated in the Treaty.

INDEPENDENT CENTRAL BANKS

It was also decided to make the European Central Bank independent of the political system in order to assure this objective the greatest possible credibility. Since the 1980s central-bank independence has been a global trend. It is stipulated in the Treaty that all EU central banks must be independent of the political system. This meant that Sweden, for example, had to amend the Act on Sveriges Riksbank, even though Sweden is outside EMU. The UK is subject to a special exemption from the Treaty requirements, but it has nevertheless been decided to give the Bank of England operational independence.

The Danish central bank is independent by long-standing tradition, as set out in the Danmarks Nationalbank Act of 1936. In view of this statutory provision, no amendment was necessary as in Sweden's case. However, legislation will have to be amended should Denmark decide to adopt the euro, since a number of provisions would have to be adjusted to be in line with our participation in the single monetary policy.

Subject to the shared objective of price stability, there is great variation in the structure of monetary policy in respectively a floating and a fixed exchange-rate regime. I would first like to point out certain characteristics of monetary policy in a floating exchange-rate regime and then proceed to the fixed-exchange-rate policy and Denmark's experience.

INFLATION MANAGEMENT

In a floating exchange-rate regime monetary policy is used as an instrument to influence inflation via the impact of interest rates on economic activity and on expectations.

The effect of interest rates on the economy – what the economists call the transmission mechanism – is not immediate, but takes place over time. It is therefore not the inflation rate here and now that is managed. Inflation in the medium term, typically two years, is the anchor of monetary policy.

Moreover, economists by no means agree on how effectively monetary policy can influence the economy's course.

Central banks which have an inflation target can choose between various monetary-policy approaches. However, irrespective of the approach, it is the same economic fundamentals that are considered.

An estimate of inflation two years ahead can be made on the basis of various economic indicators, including money supply, market interest rates, consumer expectations, raw materials prices, etc. This estimate takes the current monetary policy as its starting point.

Should future inflation calculated in this way be outside the central bank's target range, it should also be calculated how monetary policy should be adjusted to achieve a successful result two years ahead.

INFLATION FORECASTS

Some central banks have published their forecasts and then explained their decisions based on the forecast results. The UK and Sweden have opted for this approach. This is not yet the approach of the European Central Bank, but its President, Wim Duisenberg, has officially stated that the ECB plans to publish its forecasts.

In its first years the ECB has faced the specific problem that it is difficult to construct a reliable model based on statistics and trends from the period before the introduction of the single currency. This adds to the challenges faced by the model designers and is probably the reason that the ECB prefers to try out various models before a model-based forecast that can be released to the general public is chosen.

Presentation of a model-based forecast has obvious benefits since it summarises a number of the factors influencing inflation. This gives a better overview of the process – to outsiders – but does not disguise the fact that even the best model cannot provide precise mechanical answers on what action to take. It must be supplemented with assessments. The "human factor" will therefore always be in strong demand – irrespective of the model-based results.

DECISION FORUM

Once the basis for decision is in place, decisions are most often made by a group of people – a board of governors or a monetary policy committee.

In many cases it used to be committees of directors of central banks comprising a majority of political representatives. With certain exceptions this model has now been abandoned in favour of a council of independent representatives. These may be governors or part-time members of the council, i.e. individuals with a "neutral job".

The idea of a group as the decision-making forum is a natural consequence of the fact that the outcome cannot be calculated. It must be supplemented with evaluations. There is reason to assume that these evaluations will be more exhaustive when made by a group of people with various backgrounds, but all with the required professional expertise.

PRESENTATION OF DECISIONS

How decisions, and the basis for decision, are communicated to the general public varies considerably, however. This variation is often taken to reflect differences in content and ways of thinking, but this is not necessarily the case.

One model is the well-known Bundesbank approach, which is also applied by the European Central Bank. It is also the practice in Norway. According to this model a press conference is held where the chairman of the council, the central-bank governor, presents the decision with a detailed explanation of the background to the decision. In certain cases a press release is issued instead of the verbal presentation at a press conference. This is then supplemented, typically on a quarterly or monthly basis, with the central bank's evaluation of the economic development, with special emphasis on the financial situation.

The other members of the decision-making council may make statements in various fora, at lectures and in interviews, but the chairman makes the official presentation of the collective decision. As a result the chairman is very much in the spotlight, and sometimes people may wrongly believe that he more or less makes the decisions alone.

The other model is used in such countries as the UK and Sweden. The views of the individual members are emphasised, since edited minutes of the decision-making meetings are published, subject to a certain time lag. This can lead to excessive interest in each member's views, and particularly in whether they change their minds. Since the whole idea of

discussion in a group forum is that you can learn from listening to the arguments of the other members it should be perfectly all right to change your mind.

The Federal Reserve also publishes minutes of the meetings of the Federal Open Market Committee. This has been the Federal Reserve's practice for years, although it has not prevented the widespread misunderstanding that Alan Greenspan alone makes the monetary-policy decisions.

FISCAL POLICY

Although the central bank is responsible for managing inflation, this does not imply unlimited scope to design fiscal policy. An inappropriate fiscal policy – e.g. a very expansionary policy in a situation with full capacity utilisation – can be a serious obstacle to the work of the central bank. This is taken into account in the structure of EMU, since the provisions of the Stability and Growth Pact ensure that a sound fiscal policy is pursued. This not only applies to the euro area, but to all EU member states, including Denmark.

In countries with no formal restrictions it is nevertheless essential that politicians understand the need for a prudent fiscal policy. Otherwise the financial markets may respond with rising interest rates, showing in this way how they feel about the fiscal policy.

It is therefore no coincidence that in speeches and articles central-bank governors often emphasise an appropriately balanced fiscal policy as the background to the central bank's price stability task.

FIXED OR VARIABLE EXCHANGE RATES

If a central bank's task is to manage price development via its monetary policy the latter cannot be used to manage the exchange rate. This is the lesson learned by the British business community in recent years. The Bank of England has pursued a tight monetary policy in order to contain inflation. But in certain periods this led to a strengthening of sterling, which presented problems for the export sectors.

The European Central Bank has witnessed how the markets have strongly traded down the euro, which is found to be out of line with the economic fundamentals. Last week the European Central Bank took the initiative with the USA, Japan, the UK and Canada to intervene in the currency market in support of the euro. The authorities of these countries shared a concern about the potential implications of recent movements in the euro exchange rate for the world economy.

Just as it was not the Bundesbank's task to design monetary policy for management of the D-mark's rate against the dollar, it is not the European Central Bank's responsibility to manage the euro/dollar rate via its interest-rate policy. The European Central Bank has to react by raising interest rates only if price stability is threatened by the exchange rate's development. In view of the size of the euro area, most of its trade is internal. This considerably reduces the significance of the exchange rate to price trends compared to smaller countries with extensive foreign trade.

If the purpose of monetary policy is to ensure low inflation it cannot also be used to manage the exchange rate. On the other hand, if a fixed-exchange-rate policy is pursued, the monetary policy must be designed accordingly. This rules out a further objective to adjust interest rates to domestic economic trends.

FIXED-EXCHANGE-RATE POLICY

A fixed-exchange-rate regime entails a political decision to maintain a stable exchange rate vis-à-vis another – typically major – currency. This decision is made in order to create stable exchange-rate conditions for the business community. The currency chosen is therefore usually one which is of great significance to the country's foreign trade.

However, a further consequence is that the country in question indirectly pursues a policy of price stability, since the fixed-exchange-rate policy is only sustainable if the country's inflation is generally equivalent to that of the country whose currency it shadows.

Denmark's fixed-exchange-rate policy dates back to 1982. It is widely agreed that this policy has served Denmark well and has promoted understanding of the necessity of the stability-oriented economic policy, i.e. a policy which keeps the economy on track. It is also clear that Denmark's fixed-exchange-rate policy has achieved a high degree of credibility.

Firstly, the Danish authorities, i.e. the government and the Nationalbank, have stated on every possible occasion that devaluation is out of the question and that this instrument is not even considered as an option. Over time this view has gained the widespread support of the general public and among the political parties.

Secondly, for many years Denmark has shown the willingness and the ability to adhere to the rules and conventions of the fixed-exchange-rate policy.

MONETARY POLICY SHADOWS ANCHOR CURRENCY

In "normal" times monetary policy must be designed to match the monetary policy of the country whose currency is shadowed. For Denmark, until 1998 this country was Germany. As from 1999 Denmark has pursued a fixed-exchange-rate policy vis-à-vis the euro. This means that when the European Central Bank adjusts interest rates, Danmarks Nationalbank follows suit. However, Denmark's level of interest rates is slightly higher than the euro-area level, as it was previously vis-à-vis D-mark interest rates. The greater the credibility of our fixed-exchange-rate policy over the years, the narrower Denmark's interest-rate differential to the anchor currency.

A sudden event may upset this state of affairs – and not necessarily an event in Denmark. When the international financial crisis arose in September 1998 many investors preferred to move their assets to bigger currencies such as the dollar and the currencies which were then about to become part of the euro.

Such a situation can exert pressure on the Danish krone. In the first instance, in order to maintain a relatively stable exchange rate, the Nationalbank has to support the krone by selling foreign exchange from its reserve. If intervention is extensive it can be necessary to raise interest rates. In September 1998 the discount rate was thus raised by ½ per cent and the Nationalbank's lending rate by 1 per cent. Bond yields also rose.

The Nationalbank's monetary policy is thus completely bound by the development in the exchange rate, even though formally we pursue a separate monetary policy. In a stable exchange-rate environment we pursue exactly the same monetary policy as the European Central Bank, but with slightly higher interest rates. In the event of exchange-rate unrest we have to raise interest rates, only to normalise them as the markets return to stability.

This monetary-policy stance also makes it very clear that special Danish requirements of higher or lower interest rates due to employment or price trends cannot be accommodated.

In reality these are the same terms as apply to the euro area member states: neither Finland nor Ireland is free to adjust its interest rates to fit the country's own economic situation.

REQUIREMENTS OF FISCAL POLICY

A fixed-exchange-rate policy also imposes the requirement that fiscal policy be designed to ensure the balance in the economy which is a pre-

condition for maintaining the credibility of the fixed-exchange-rate policy. Inflation may not significantly exceed inflation in the euro area, and excessive current-account deficits must be avoided. It will therefore be necessary to dampen excessive economic growth.

The two best-known examples of fiscal-policy measures to stabilise the exchange rate are the October 1986 package of economic measures, the "potato-diet", and the Whitsun 1998 package of economic measures. These examples are only the best-known of many as consideration of the requirements set by the fixed-exchange-rate policy is always an element of fiscal-policy planning.

Even if Denmark adopts the euro, fiscal policy will still be used to stabilise the domestic economy. However, the special consideration of the balance of payments and the foreign-exchange market, which today are basic conditions, will no longer apply.

EURO PARTICIPATION OR FIXED-EXCHANGE-RATE POLICY

Adopting the euro would widen the scope of economic policy compared to the situation where a fixed-exchange-rate policy is pursued. We would gain a share of influence on Europe's monetary policy and we would have a little more room for manoeuvre in fiscal policy.

There is widespread agreement in the euro debate that Denmark must chose between a fixed-exchange-rate policy and adoption of the euro. Changeover to the euro would be a natural continuation of the fixed-exchange-rate policy which is so well-established in Denmark.

Under the fixed-exchange-rate policy first the D-mark and then the euro has been a fixed element of business enterprises' foreign-exchange transactions. The euro is by far the most important currency to Denmark's foreign trade and Danish business enterprises have learned to handle the fluctuations against other currencies.

I do not think anybody seriously wants Denmark to reintroduce a devaluation policy since this had such negative consequences in the 1970s and the early 1980s.

It is important to emphasise that one-off devaluation of the Danish krone would not be in our best interests now or at a later time. Damage to the credibility of our fixed-exchange-rate policy would take many years to repair. Nobody would believe our assurances that such a devaluation was a one-off measure, never to be used again.

A variable exchange rate is the natural choice for large countries and currency areas, but in small countries with extensive foreign trade a floating exchange rate exposes the business community to greater uncertainty.

Experience shows that many small and medium-sized countries that today have floating exchange rates were forced to let their currency float because their fixed-exchange-rate regime was destroyed by speculation. Such a shift was often associated with considerable costs. We are therefore naïve if we believe that Denmark easily and painlessly would be able to switch to a floating exchange rate. This would eliminate the fixed currency foundation for the planning of the business community, which they have been accustomed to for the last almost 20 years.

In conclusion I would therefore like to emphasise very strongly that there must be no doubt whatsoever that the fixed-exchange-rate policy will not falter should Denmark decide not to adopt the euro. In that situation we must not embark on any monetary or exchange-rate policy experimentation.

If Denmark chooses to adopt the euro most of the strategies for economic policy will be well known from Denmark's many years with a fixed-exchange-rate policy.

Articles in the Monetary Review 4th Quarter 1998 – 3rd Quarter 2000

Press Releases

ON 26 SEPTEMBER ON INTEREST RATE INCREASE

Danmarks Nationalbank's lending rate and the rate of interest on certificates of deposit are raised by 0.10 per cent to 5.10 per cent. The increase will have effect as from 27 September 2000.

The interest rate increase is a consequence of today's tender operations of the European Central Bank, resulting in an increase in the marginal rate.

The discount rate and the rate of interest on the banks' current accounts with the Nationalbank remain unchanged at 4.50 per cent.

For further information please contact Bjarne Skafte on telephone +45 33 63 60 21.

ON 28 SEPTEMBER FROM THE DANISH GOVERNMENT AND DANMARKS NATIONALBANK

Given the result of the referendum Denmark shall not abrogate its exemption from Danish participation in the euro.

Denmarks EU-membership remains unchanged.

Denmark will continue the present fixed-exchange-rate policy vis-à-vis the euro within the framework of the narrow band of EU's exchange rate mechanism, ERM II.

The Danish economy is fundamentally sound. Danmarks Nationalbank and the Government will follow developments in financial markets closely and stand ready if need be to take measures in order to maintain and continue the fixed-exchange-rate policy.

The Fiscal Bill for 2001 is based on Danish participation in the euro. The negotiations on the budget will start next week, and in this context the Government is ready to tighten fiscal policy if this should prove necessary to maintain Denmark's fixed-exchange-rate policy.

ON 29 SEPTEMBER ON INTEREST RATE INCREASE

The Danish fixed-exchange-rate policy will be maintained after yesterday’s referendum.

There has recently been some pressure against the Danish krone. This has resulted in short-term interest rates that are significantly higher than the Nationalbank's official interest rates, and intervention in support of the krone by the Nationalbank.

In order to avoid uncertainty concerning the krone the Nationalbank's lending rate and the rate of interest on certificates of deposit are raised by 0.50 per cent to 5.60 per cent with effect from 29 September 2000.

The discount rate and the rate of interest on the banks' current accounts with the Nationalbank remain unchanged at 4.50 per cent.

For further information please contact Bjarne Skafte on telephone +45 33 63 60 21.

ON 5 OCTOBER ON INTEREST RATE INCREASE

The discount rate is raised by 0.25 per cent to 4.75 per cent. Likewise the rate of interest on the banks' current accounts with the Nationalbank is raised by 0.25 per cent to 4.75 per cent. The increase will have effect as from 6 October 2000.

The interest rate increase is a consequence of the increase by 0.25 per cent in the European Central Bank's minimum bid rate on the main refinancing operations.

The Nationalbank's lending rate and the rate of interest on certificates of deposit remain unchanged at 5.60 per cent.

For further information please contact Bjarne Skafte on telephone +45 33 63 60 21 or +45 23 40 32 87.

Tables

Danmarks Nationalbank's Statistical Publications

Symbols and Sources

0 Magnitude nil or less than one half of unit employed.

… Data not available or of negligible interest.

Some of the most recent statistics can be provisional. Due to rounding-off there may be small differences between the sum of the individual figures and the totals stated.

Date of going to press: 12 December 2000.

The Tables section of this publication is thus based on more recent information than the equivalent section of the Danish edition.

Danmarks Nationalbank is the source for Tables 1-6, while the Copenhagen Stock Exchange is the source for series of bond yields and the share-price index in Table 1. Statistics Denmark is the source for Tables 7-11, apart from the exchange-rate series in Table 9, for which Danmarks Nationalbank is the source.

INTEREST RATES AND SHARE-PRICE INDEX — Table 1

Effective end-of-year/ from	The Nationalbank's interest rates: Discount rate	The Nationalbank's interest rates: Lending and certificates of deposit	End of period	Inter-bank interest rate, 3-months uncollateralized	Bond yields: 10-year central-government bond	Bond yields: 30-year mortgage-credit bond	The Copenhagen Stock Exchange share-price index (total)
	Per cent per annum			Per cent per annum			1.1.83 =100
1995	4.25	4.60	1995	4.65	7.23	8.36	366
1996	3.25	3.50	1996	3.57	6.52	7.87	472
1997	3.50	3.75	1997	3.93	5.63	7.28	676
1998	3.50	3.95	1998	4.05	4.35	7.10	639
1999	3.00	3.30	1999	3.57	5.64	7.45	768
Sep. 29, 2000	4.50	5.60	1999 Nov	3.74	5.57	7.54	745
Oct. 6, 2000	4.75	5.60	2000 Jun	5.35	5.70	7.64	863
Oct. 13, 2000	4.75	5.50	Jul	5.70	5.69	7.55	888
Oct. 27, 2000	4.75	5.40	Aug	5.65	5.67	7.48	984
			Sep	5.83	5.66	7.46	990
			Oct	5.43	5.55	7.41	996
Dec. 12, 2000	4.75	5.40	Nov	5.41	5.35	7.31	927

SELECTED ITEMS FROM THE NATIONALBANK'S BALANCE SHEET — Table 2

End of period	The foreign-exchange reserve (net)	Notes and coin in circulation	The central government's account with the Nationalbank	The banks' and the mortgage-credit institutes' net position with the Nationalbank: Certificates of deposit	Deposits (current account)	Loans	Total net position
	Kr. billion						
1995	63.6	34.7	38.8	33.6	1.9	44.0	-8.5
1996	85.2	36.6	35.0	30.6	15.2	33.7	12.1
1997	129.7	38.7	34.0	52.1	18.0	19.8	50.3
1998	101.4	41.0	37.1	34.2	12.4	29.6	17.0
1999	165.3	46.4	39.7	99.4	5.9	33.0	72.4
1999 Nov	167.9	42.0	55.4	70.8	13.6	24.5	59.9
2000 Jun	122.8	43.6	54.4	46.4	5.5	35.6	16.3
Jul	120.2	43.8	66.0	49.1	8.4	55.7	1.8
Aug	119.4	43.2	57.4	63.8	7.6	62.0	9.4
Sep	108.1	42.6	64.2	64.7	5.9	77.7	-7.1
Oct	126.8	42.4	59.8	48.3	15.3	48.7	14.9
Nov	123.7	43.0	38.0	65.6	11.1	43.8	33.0

FACTORS AFFECTING THE BANKS' AND THE MORTGAGE-CREDIT INSTITUTES' NET POSITION WITH THE NATIONALBANK

Table 3

	Central-government finance			Net purchase of foreign exchange by the National-bank	The National-bank's net bond purchases	Other factors	The banks' and the mortgage-credit institutes' net position with the Nationalbank	
	Domestic gross financing require-ment	Sales of domestic central-govern-ment securities	Liquidity effect				Change in net position	End of period
	Kr. billion							
1995	138.8	137.2	1.6	32.9	-7.2	-8.4	18.9	-8.5
1996	94.7	96.0	-1.2	25.9	-0.1	-3.9	20.6	12.1
1997	73.8	73.0	0.8	43.2	-1.5	-4.3	38.2	50.3
1998	64.1	68.0	-3.8	-28.7	3.2	-4.0	-33.2	17.0
1999	67.9	68.8	-0.9	62.7	1.9	-8.3	55.3	72.4
1999 Nov	3.8	-5.8	9.7	0.7	0.8	-2.1	9.1	59.9
2000 Jun	9.1	11.0	-1.9	-10.2	0.1	-0.1	-12.1	16.3
Jul	1.2	11.4	-10.3	-4.0	0.1	-0.3	-14.5	1.8
Aug	-1.7	-9.7	8.0	-0.2	0.3	-0.5	7.6	9.4
Sep	-0.7	6.4	-7.1	-11.1	0.4	1.3	-16.5	-7.1
Oct	14.6	8.2	6.3	16.8	-1.1	-0.1	22.0	14.9
Nov	22.2	0.4	21.7	-3.1	0.6	-1.2	18.1	33.0

SELECTED ITEMS FROM THE FINANCIAL INSTITUTIONS' BALANCE SHEET, AND THE MONEY STOCK

Table 4

End of period	Mortgage-credit institutes		The banks					
	Domestic lending		Domestic lending		Residents' deposits			
	Total	of which: Owner-occupied dwellings	Total	of which: Private individuals	Total	of which: Private individuals	Holdings of domestic bonds	Money stock
	Kr. billion							
1995	783.2	399.4	286.7	114.8	491.4	164.3	176.8	410.1
1996	828.4	434.1	302.7	122.3	527.8	172.8	181.0	439.8
1997	888.2	481.3	330.1	131.1	556.5	185.6	174.9	462.6
1998	968.7	539.3	373.4	141.3	573.3	195.1	199.3	476.7
1999	1,032.2	582.7	393.2	145.8	596.4	194.1	185.6	496.9
1999 Oct	1,029.7	579.2	387.7	142.2	609.7	201.7	176.9	520.1
2000 May	1,059.1	600.1	472.1	147.9	620.1	206.2	189.0	522.4
Jun	1,057.3	600.9	493.2	153.8	603.8	201.3	183.7	507.4
Jul	1,066.3	606.6	491.9	152.5	618.1	203.8	184.5	521.3
Aug	1,070.9	610.3	484.2	152.8	624.6	205.1	186.2	527.8
Sep	*1,072.6*	*612.0*	*486.6*	…	*611.3*	…	…	*521.1*
Oct	*1,078.1*	*615.5*	*487.8*	…	*623.3*	…	…	*533.2*
	Change compared with previous year, per cent							
1995	4.1	5.4	6.1	8.7	3.2	7.6	-3.4	4.1
1996	5.1	7.9	6.8	6.9	7.2	5.1	-2.7	7.2
1997	6.8	9.9	9.9	8.8	5.3	7.4	-4.4	5.2
1998	7.8	10.1	13.7	8.7	2.8	4.9	11.8	2.9
1999	6.0	7.5	6.1	4.5	3.9	-0.6	-6.4	4.2
1999 Oct	6.6	7.8	8.2	3.9	1.5	0.9	-13.4	1.9
2000 May	4.6	5.9	23.9	7.6	2.0	-2.4	2.8	1.6
Jun	5.3	6.2	23.9	8.9	2.9	-0.5	-5.8	2.5
Jul	5.0	5.9	27.3	9.7	0.8	-1.3	4.5	-0.2
Aug	4.0	4.7	27.7	9.9	2.3	-2.5	7.1	1.6
Sep	*4.5*	*5.4*	*24.2*	…	*2.8*	…	…	*3.4*
Oct	*4.1*	*5.0*	*26.8*	…	*2.1*	…	…	*2.5*

THE BANKS' LENDING Table 5

End of period	From banks in Denmark				From Danish-owned banks abroad			
	To Danish residents		To non-residents		To Danish residents		To non-residents	
	In kroner	In foreign currency	In kroner	In foreign currency	In kroner	In foreign currency	In kroner	In foreign currency
	Kr. billion							
1995	272.4	14.3	35.5	31.4	27.6	46.8	2.8	68.3
1996	287.8	14.9	44.1	40.8	37.3	36.7	3.9	93.5
1997	312.7	17.4	61.7	49.9	46.4	38.2	3.4	132.0
1998	346.5	26.9	26.6	46.8	52.5	43.9	3.1	148.6
1999	357.7	35.5	43.1	60.4	62.4	60.9	3.2	218.8
1999 Oct	355.3	32.4	50.0	66.0	60.1	54.1	2.9	213.3
2000 May	411.9	60.3	31.2	53.8	40.8	44.1	2.0	231.4
Jun	432.3	60.9	32.5	57.1	38.8	41.6	2.0	232.9
Jul	427.1	64.8	37.8	57.9	33.3	40.2	2.0	238.3
Aug	417.2	67.0	37.5	65.8	32.4	40.6	2.0	247.6
Sep	…	…	…	…	…	…	…	…
Oct	…	…	…	…	…	…	…	…
	Change compared with previous year, per cent							
1995	6.5	0.6	6.4	-24.1	-3.2	-12.3	2.4	26.6
1996	6.8	5.5	24.4	29.5	34.8	-21.6	39.7	37.7
1997	9.5	17.3	40.3	22.7	24.5	4.2	-13.6	41.4
1998	11.4	54.1	-56.8	-6.2	13.1	15.0	-8.1	12.9
1999	4.0	33.1	62.5	29.4	18.8	38.7	2.4	47.4
1999 Oct	7.0	23.3	2.2	45.7	21.2	35.4	-1.0	41.2
2000 May	17.2	102.5	-45.9	-5.3	-29.9	-8.9	-45.2	30.8
Jun	17.7	98.4	-44.1	1.4	-33.2	-17.0	-42.0	13.3
Jul	20.0	111.5	-39.8	6.2	-44.3	-20.2	-38.4	11.6
Aug	19.7	118.9	-28.9	4.4	-45.2	-22.6	-31.7	13.2
Sep	…	…	…	…	…	…	…	…
Oct	…	…	…	…	…	…	…	…

EXTERNAL PAYMENTS (NET PAYMENTS FROM ABROAD) Table 6

	Current payments	Capital transfers	Financial payments				Errors and omissions	Increase in the foreign-exchange reserve
			Total	of which:				
				Direct investments		Danish krone-denominated bonds		
				Foreign in Denmark	Danish abroad			
	Kr. billion							
1995	6.5	-0.5	1.6	21.5	-16.6	37.8	5.8	13.4
1996	13.2	0.2	14.2	2.7	-14.4	30.8	-6.8	20.8
1997	9.7	0.7	52.7	18.5	-27.8	44.8	-20.1	43.0
1998	-8.6	0.3	-18.7	49.3	-30.1	0.1	-2.2	-29.2
1999	16.7	0.9	58.0	75.5	-84.7	14.6	-11.4	64.2
Oct 98 - Sep 99 ..	-0.8	1.2	80.5	56.9	-65.4	38.6	-9.4	71.4
Oct 99 - Sep 00 ..	28.8	-0.4	-44.2	142.1	-64.1	-26.0	-44.4	-60.2
1999 Sep	3.4	0.1	4.8	2.1	0.4	7.2	-4.2	4.1
2000 Apr.....	-1.1	0.0	7.0	48.6	-7.6	-7.5	-10.9	-5.0
May.....	3.9	0.0	-12.2	3.8	-5.8	1.4	7.2	-1.0
Jun	3.9	0.0	-10.7	14.8	-20.4	10.6	-3.1	-9.9
Jul	3.9	-0.3	-2.2	0.9	-2.7	3.0	-4.0	-2.6
Aug.....	3.1	0.0	-5.8	18.1	13.8	-11.5	1.9	-0.8
Sep.....	2.1	0.0	-7.2	5.4	0.7	5.0	-6.2	-11.3

GDP BY TYPE OF EXPENDITURE — Table 7

	GDP	Final domestic demand					Exports of goods and services	Imports of goods and services
		Private consumption	General-government consumption	Gross fixed capital formation	Change in inventories	Total		
	Kr. billion							
1995	1,009.8	509.6	260.3	189.3	9.3	968.4	357.5	316.1
1996	1,060.9	533.2	274.6	198.4	2.5	1,008.7	379.4	327.2
1997	1,112.0	564.0	284.5	218.0	6.5	1,073.1	405.7	366.8
1998	1,163.8	594.3	300.1	236.3	10.9	1,141.6	410.7	388.5
1999	1,215.8	613.5	312.9	241.3	-3.0	1,164.7	448.4	397.3
1999 Q2	302.8	150.8	78.5	61.6	-1.0	289.8	108.7	95.8
Q3	302.6	151.2	79.1	57.7	1.0	289.0	113.0	99.3
Q4	317.7	162.4	78.8	61.2	-2.3	300.2	123.4	105.8
2000 Q1	311.3	153.5	79.6	67.7	2.3	303.1	116.3	108.1
Q2	322.4	156.3	81.2	70.4	0.3	308.2	125.0	110.8
	Real growth compared with previous year, per cent							
1995	2.8	1.2	2.1	12.0	…	4.2	2.9	7.3
1996	2.5	2.5	3.4	3.6	…	2.1	4.3	3.5
1997	3.1	3.7	1.3	8.0	…	4.4	4.1	8.0
1998	2.5	3.5	3.0	6.7	…	4.3	2.2	7.3
1999	1.7	0.6	1.4	0.3	…	-0.4	7.9	2.2
1999 Q2	2.3	-1.1	1.4	3.5	…	-0.8	13.0	4.1
Q3	1.4	0.6	1.8	-2.4	…	1.0	3.9	3.0
Q4	2.5	0.4	1.0	-4.1	…	-1.6	11.2	0.1
2000 Q1	2.6	-0.4	1.1	7.4	…	2.3	5.0	4.2
Q2	3.6	0.4	0.8	12.0	…	3.5	6.3	6.4
	Real growth compared with previous quarter (seasonally adjusted), per cent							
1999 Q2	0.2	-1.6	0.4	-1.7	…	0.0	1.9	-0.3
Q3	1.2	1.5	0.5	-0.5	…	1.6	2.0	1.6
Q4	1.0	0.2	0.1	0.0	…	0.0	3.4	0.2
2000 Q1	0.2	-0.6	0.1	9.1	…	0.5	-2.2	2.5
Q2	1.1	-0.6	0.1	2.8	…	1.2	3.1	1.9

PRINCIPAL ITEMS OF THE BALANCE OF PAYMENTS (NET REVENUES) Table 8

	Goods (fob)	Services	Goods and services	Wages and property income	Current transfers	Total current account
	Kr. billion					
1995	36.3	4.7	41.1	-21.4	-9.6	10.0
1996	43.9	8.4	52.3	-21.9	-11.7	18.7
1997	38.4	0.9	39.3	-22.5	-12.3	4.6
1998	26.2	-3.4	22.9	-18.9	-13.6	-9.6
1999	48.8	9.7	58.5	-12.5	-19.0	27.0
Sep 98 - Aug 99	37.9	3.6	41.5	-16.6	-17.2	7.7
Sep 99 - Aug 00	50.2	11.2	61.4	-14.4	-21.9	25.1
1999 Aug	4.2	1.1	5.3	-1.0	-1.8	2.5
2000 Mar	3.4	1.3	4.6	-1.5	-1.4	1.8
Apr	3.5	1.0	4.5	-4.1	-2.4	-2.0
May	5.0	2.1	7.1	-1.0	-1.9	4.2
Jun	3.5	0.8	4.3	1.3	-3.0	2.6
Jul	4.7	1.4	6.1	-0.6	-1.7	3.7
Aug	3.7	2.1	5.9	-0.3	-3.2	2.4

PRICES AND EXCHANGE RATES Table 9

	Consumer price index	Index of net retail prices	Wholesale price index	Kroner per EUR 100	Kroner per USD 100	Effective krone rate	Real effective krone rate based on consumer prices
	Change compared with previous year, per cent			Average		1980=100	
1995	2.1	2.0	2.9	…	560.53	103.9	106.4
1996	2.1	2.0	1.1	…	579.59	102.9	105.7
1997	2.2	2.2	1.9	…	660.86	100.0	103.0
1998	1.9	1.5	-0.6	…	669.70	101.3	104.6
1999	2.5	2.1	0.5	743.56	698.34	99.6	104.2
1999 Nov	3.0	2.8	3.5	743.65	718.71	98.2	103.4
2000 Jun	3.3	3.5	6.6	746.01	785.11	96.1	101.4
Jul	3.1	3.4	5.8	745.88	793.22	95.9	100.8
Aug	2.4	2.6	6.4	745.78	824.04	95.1	99.7
Sep	2.7	2.9	6.9	746.23	856.51	94.4	99.2
Oct	2.7	2.9	6.9	744.73	870.72	94.3	99.4
Nov	2.6	2.9	…	745.67	870.68	94.5	…

SELECTED MONTHLY ECONOMIC INDICATORS — Table 10

	Unemployment		Quantitative index for sales in sectors of		Construction projects commenced	New passenger car registrations	Consumer confidence indicator
	1,000 persons	Per cent of labour force	Extraction of raw materials and manufacturing 1995=100	Retail trade 1990=100	1,000m²	Number	Balance per cent
1995	288.4	10.4	100	108.0	5,858	135,245	9
1996	245.6	8.9	102	109.6	7,351	142,175	5
1997	220.2	7.9	107	111.8	8,364	152,869	9
1998	182.7	6.6	109	114.3	9,052	162,708	2
1999	158.2	5.7	111	115.6	8,450	144,246	-2
			Seasonally adjusted				
1999 Nov	149.7	5.4	115	117.2	642	11,433	-2
2000 Jun	150.5	5.4	111	114.1	622	8,627	5
Jul	151.2	5.4	118	117.1	655	9,752	3
Aug	150.1	5.4	120	118.9	672	9,299	4
Sep	152.5	5.5	121	118.7	689	8,986	2
Oct	153.7	5.5	115	116.8	…	8,970	3
Nov	…	…	…	…	…	…	1

SELECTED QUARTERLY ECONOMIC INDICATORS — Table 11

	Employment		Hourly earnings in manufacturing industry	Real effective krone rate based on hourly earnings	Composite cyclical indicator for		Property prices (purchase sum, one-family dwellings)
	Total	Private			Industry	Building and construction	As a percentage of property value 1998
	1,000 persons		February 1996=100	1980=100	Balance per cent		
1995	2,539	1,769	97.6	103.4	6	10	…
1996	2,573	1,792	101.4	102.5	-8	7	99.2
1997	2,604	1,809	105.2	100.5	6	7	110.5
1998	2,659	1,853	109.8	103.5	0	-2	120.5
1999	2,681	1,872	114.4	103.0	-14	-8	128.6
				Seasonally adjusted			
1999 Q4	2,683	1,875	115.9	101.6	-7	-8	130.5
2000 Q1	2,704	1,891	117.2	100.0	-1	11	132.3
Q2	2,707	1,895	117.6	98.2	3	-7	135.2
Q3	…	…	118.9	…	4	-4	…
Q4	…	…	…	…	6	-1	…
				Change compared with previous year, per cent			
1995	0.7	1.0	3.8	4.1	…	…	…
1996	1.3	1.3	3.8	-0.9	…	…	…
1997	1.2	0.9	3.8	-2.0	…	…	11.4
1998	2.1	2.4	4.4	3.0	…	…	9.0
1999	0.8	1.0	4.1	-0.4	…	…	6.7
1999 Q4	0.0	-0.1	3.9	-3.9	…	…	5.3
2000 Q1	0.9	0.9	3.5	-4.8	…	…	5.2
Q2	1.6	2.1	3.3	-4.8	…	…	5.9
Q3	…	…	3.8	…	…	…	…
Q4	…	…	…	…	…	…	…

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