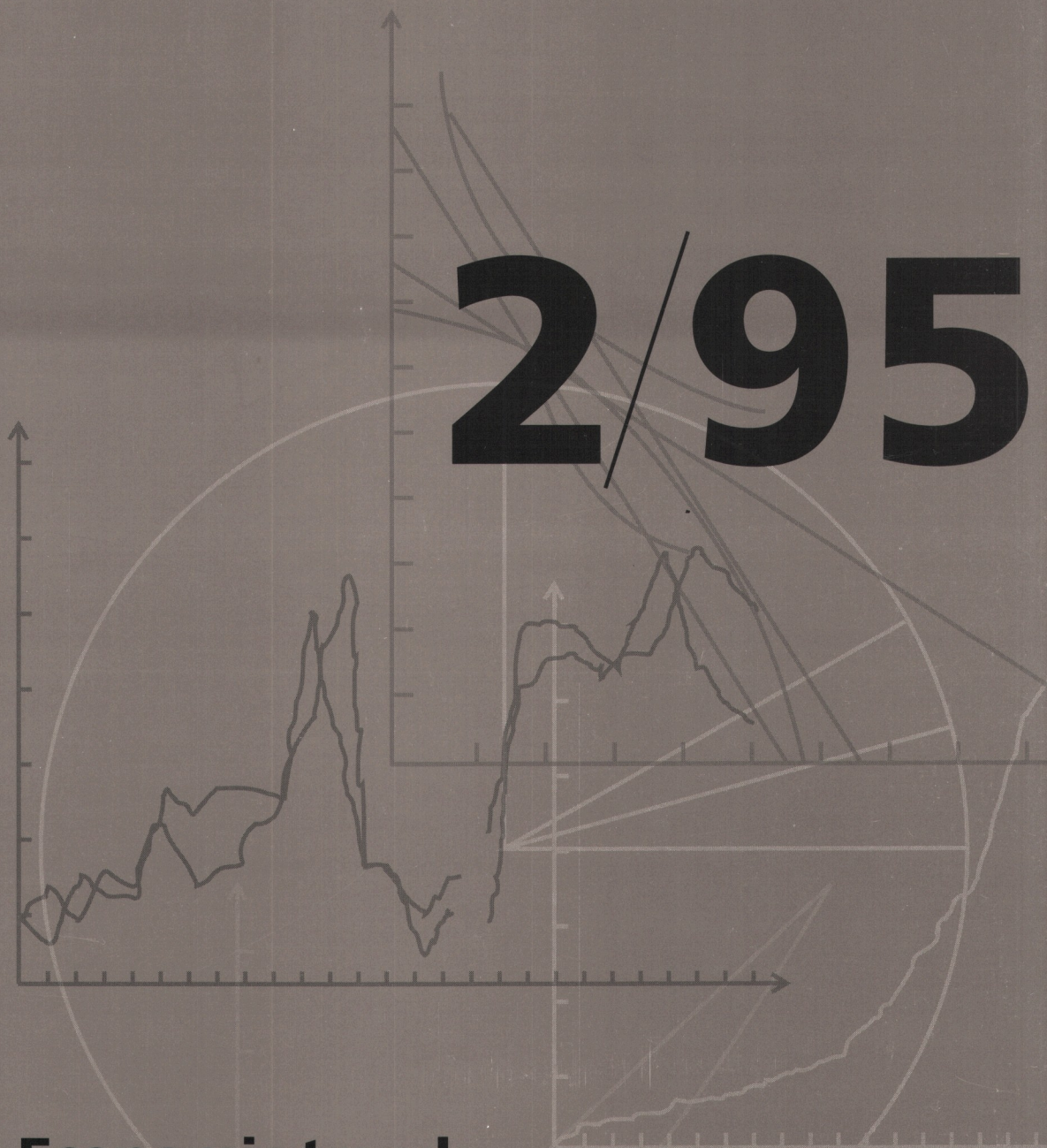


Economic Survey

2/95



Economic trends

- Overview of international economic development
- Forecasts for the Norwegian economy for 1995 and 1996

Articles

- Norway – the Nordic power house
- Prospects for the world economy

Economic Survey

2/95

Contents

Economic trends	3
International background	4
Norwegian economy	7
• Developments thus far this year	7
• Outlook for 1995 and 1996	9
Economic policy calendar 1995	15
<i>Torstein Bye and Tor Arnt Johnsen:</i>	
Norway – the Nordic power house	18
<i>Mette Rolland:</i>	
Prospects for the world economy	26
Research publications in English	32

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Economic trends

Following the pronounced expansion in the Norwegian economy through 1993 and 1994, short-term data from Statistics Norway indicate that underlying growth in output and demand has slowed somewhat thus far in 1995. As a result of vigorous growth through last year, more moderate development in key macroeconomic variables during 1995 may still result in relatively high annual growth rates. According to our forecasts, mainland GDP growth in 1995 will be as strong as last year. In 1996, however, growth in the Norwegian economy is likely to edge down. Short-term indicators also point to a shift in demand from consumption and traditional merchandise exports to investment, a feature which recurs in the projections for 1995 and 1996.

The international recovery, which began in the US in the second quarter of 1991 and later spread to continental Europe, was an important factor behind the upturn in the Norwegian economy in 1993/1994. Growth in the US is now likely to slow through the period 1994-1996. Growth in EU countries this year will probably be a little higher than in 1994, followed by a slightly lower growth rate next year. Moderate price inflation may permit a more expansionary monetary policy in the US, which may help to keep European interest rates at a low level. This may also pave the way for another international upturn towards the end of 1996 or in 1997 at the latest. Both the presidential election in the US next year and the continuation of the Maastricht process contribute to additional uncertainty about developments in 1996-1997.

Even though the upturn in the Norwegian economy will probably be curbed markedly next year, mainland GDP growth in the period 1994-1996 will be approximately the same as during the boom years of 1984-1986. However, while the upturn in the 1980s was fuelled by very strong

Main indicators for the Norwegian economy

Growth from previous year. Per cent

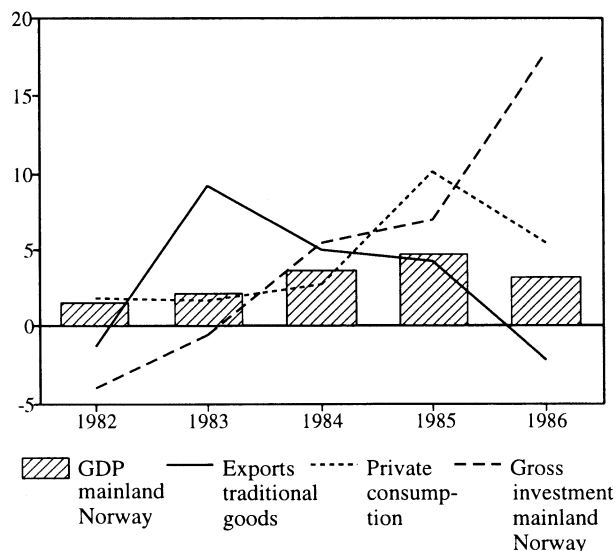
	1994	1995	1996
GDP	5.1	4.8	3.7
Private consumption	4.4	2.7	1.9
Unemployment rate ¹⁾	5.4	5.1	4.8
Consumer price index	1.4	2.5	2.4

1) Level in per cent.

credit-financed growth in private consumption, the impetus from the rise in traditional merchandise exports during the current expansion has been of about the same magnitude as the impetus generated by private consumption. This is because the upswing in consumption during this upturn can largely be attributed to the general fall in interest rates in Europe through 1993-1994, which has also contributed to higher demand for Norwegian export goods. Even though the household saving ratio has fallen during the current expansion, it appears to remain in the range of 3-4 per cent, whereas in 1986 it was down to a negative 6 per cent. As was the case ten years ago, it is now likely that an investment upsurge will help to prolong the upturn, but high earnings in the business sector provide a basis for a greater degree of internal financing compared with the mid-1980s. The relatively low growth in the credit makes it unlikely that the ongoing upturn will be followed by an equality deep slump as during the latter half of the 1980s, even though growth is likely to slow in the period ahead. So far during this upturn there have been no clear signs of a substantial pick-up in the underlying inflation rate. A high level of oil production is resulting in large current-account surpluses, even though the real price of oil is now relatively low historically.

Main macroeconomic indicators 1982-86

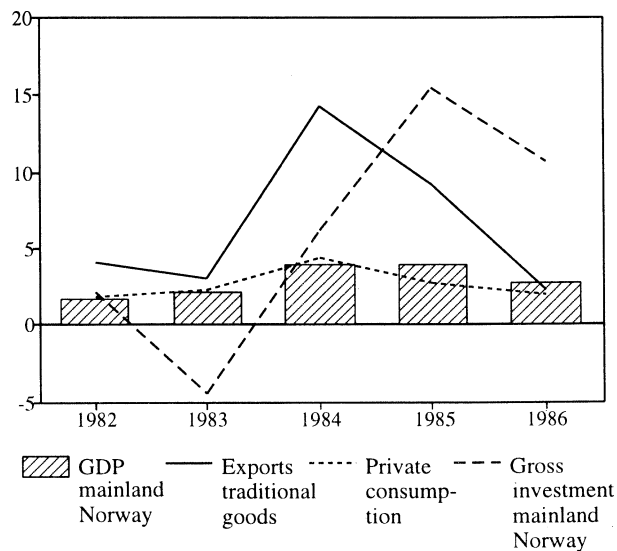
Per cent growth from previous year



Source: Statistics Norway.

Main macroeconomic indicators 1992-96

Per cent growth from previous year



Source: Statistics Norway.

International background

Expectations concerning economic developments in the OECD area have been revised downwards in recent months, primarily as a result of the weaker-than-expected growth in Japan and the financial crisis in Mexico. In Anglo-Saxon countries, with the US leading the way, it appears that the cyclical peak has been passed, while European countries will probably reach a peak this year. For the OECD area as a whole GDP is set to expand by about 2 3/4 per cent in both 1995 and 1996, compared with growth of 3 per cent from 1993 to 1994. Price inflation is expected to remain subdued. The high level of unemployment in several OECD countries, particularly in Europe, started to decline as the recovery gradually gathered pace last year. Unemployment is expected to be around 7 1/2 per cent for the OECD area as a whole in 1996.

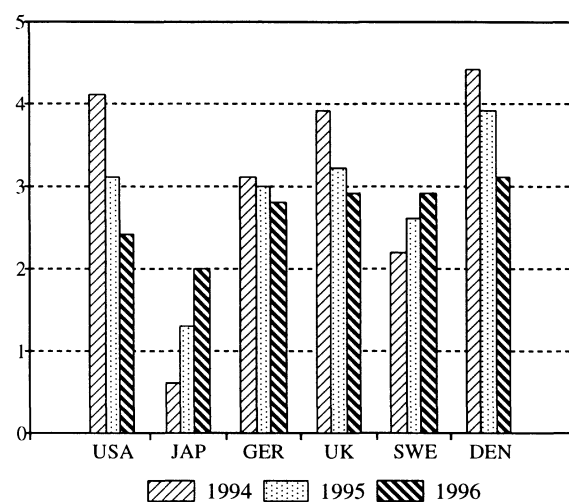
Preliminary national accounts figures for the US show GDP growth of 2.7 per cent (seasonally adjusted annual rate) in the first quarter of 1995. The slowdown in the growth rate compared with the fourth quarter of 1994 - when it was 5.1 per cent - was approximately as expected. Private consumption and investment continued to boost growth, while net exports generated a weak impetus. The slackening in economic activity is particularly ascribable to a tighter monetary policy. The Federal Reserve has raised the Federal funds rates in seven steps since February 1994, from 3 to 6 per cent. The increases in interest rates have been motivated by the growing risk of inflation as a result of the vigorous economic upswing. However, short-term indicators for April and May point to a slightly swifter cooling off of economic growth than projected earlier, and the year-on-year rate of inflation thus far this year has remained a little above 3 per cent. Unemployment has risen by 0.3 percentage point since the beginning of the year and stood at 5.7 per cent in May. The Federal Reserve is therefore expected to trim interest rates in the course of the

summer. Even though interest rates in the US rose at a faster pace and to a higher level than in some of the other G7 countries last year, the US dollar depreciated considerably against other main currencies. The dramatic decline in the exchange rate at the start of 1995 was triggered by the crisis in Mexico. Both the large foreign trade deficit, which is expected to be equivalent to nearly 2 1/2 per cent of GDP this year, and market expectations of an imminent decline in interest rates imply that the US dollar will remain low against important currencies such as the Deutsche Mark and Japanese yen. The trade deficit came to \$ 9.1 billion in March, slightly lower than the average monthly deficits recorded last year. The politically sensitive trade deficit with Japan, however, widened sharply. As a result of stagnation in the two-way negotiations concerning measures to eliminate trade barriers, the US authorities have announced that sanctions will be imposed on imports of luxury cars from Japan at the end of June. The forecasts point to GDP growth of slightly more than 3 per cent in 1995, with the pace of economic expansion slowing further next year.

In Japan, national accounts figures show that GDP expanded by 0.6 per cent from 1993 to 1994, after having declined by 0.2 per cent the previous year. At the beginning of this year there were definite indications that economic growth was picking up. However, Japan has experienced a turbulent period the last few months. The earthquake in Kobe in January this year contributed to a lower level of activity in the first quarter, and repeated terrorist actions have shocked the country's previously sheltered society. In addition, the yen has appreciated by about 15 per cent against the US dollar since the beginning of the year, resulting in strong pressures on the export industry's profitability. Available short-term data for March and April indicate a very sluggish trend in domestic demand, and manufacturing output dropped by 0.2 per cent from March to April. Labour

GNP/GDP growth for selected countries

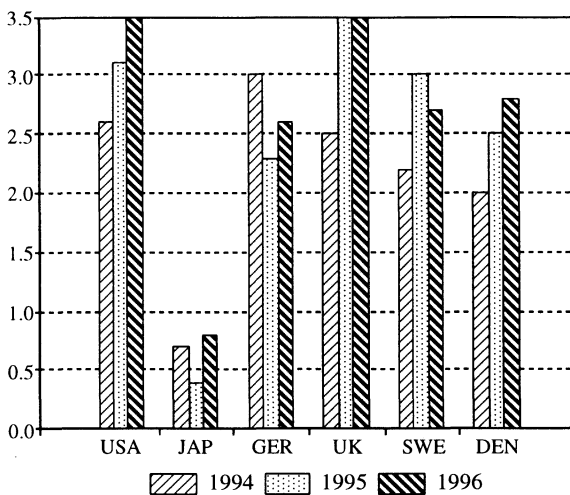
Per cent



Source: Consensus Forecasts and Statistics Norway.

Growth in consumer prices

Per cent



Source: Consensus Forecasts and Statistics Norway.

market statistics also point to a very moderate growth in economic activity. Registered unemployment stood at 3.2 per cent in April, the highest level recorded since the collection of data began in 1953. The public sector's strong financial position has enabled the authorities to conduct an expansionary policy during the recession. The seventh stimulatory package since 1992 was presented in April. As a supplement to the proposed measures, the central bank's official discount rate was lowered by 0.75 percentage point, to 1.0 per cent, a few days later. However, this did not have an immediate impact on the exchange rate, and the yen is still strong against the US dollar. The current-account surplus has fallen for two consecutive months, but still amounted to \$ 10.9 billion in April. The forecasts for GDP growth have been revised downwards since the previous quarter, and now indicate growth of about 1 1/4 per cent in 1995, with slightly higher growth projected next year.

In *Germany*, GDP expanded by nearly 3 per cent last year, with eastern and western Germany recording growth of 9 and 2.3 per cent respectively. The same growth rates is projected for 1995 by the six cooperating German forecasting institutes. While exports have been the most important growth factor so far during this recovery phase, private consumption is expected to take over next year. The strong appreciation of the Deutsche Mark against other European currencies and against the US dollar thus far this year will probably have a slightly negative impact on export growth, while higher household income may result in a quickening of consumption growth in the period ahead. Unit labour costs declined last year and contributed to an improvement in competitiveness and a favourable trend in exports. Following a brief strike, this year's wage settlement in the western länder resulted in pay increases of 3.5-4 per cent for the private sector. Combined with a reduction in working hours of 1 hour per week from 1 October, this will contribute to a substantial growth in labour costs. Price inflation has remained at around 2.3 per cent in the first five months of 1995, while unemployment appears to have stabilized at slightly more than 8 per cent in the western länder and around 14 per cent in the eastern länder after declining slightly last year. Capacity utilization in manufacturing industry (in the western länder) rose from 80.3 per cent in the first quarter of last year to 85.4 per cent in the same quarter this year, still clearly below the peak level recorded during the last economic upturn. The Bundesbank lowered its official discount rate from 4.5 to 4 per cent at the end of March. This must be viewed against the background of the strong appreciation of the Deutsche Mark as well as very low money supply growth and stable price trends. Public sector finances improved considerably last year, primarily as a result of the recovery, and the total budget deficit (including Treuhand) is expected to fall to about 2 per cent of GDP this year, i.e. clearly below the Maastricht requirement of a maximum 3 per cent.

According to preliminary national accounts figures, GDP in the *UK* grew by 3.7 per cent in the year to the first quarter of 1995, while GDP growth for 1994 as a whole was 3.9 per cent. The forecasts point to gradually slower

Main international economic forecasts

	1994	1995	1996
USA			
GDP ¹⁾	4.1	3.1	2.4
Growth in consumer prices	2.6	3.1	3.5
Current balance (level, per cent of GDP)	-2.3	-2.4	-2.0
Unemployment (level)	6.1	5.6	5.7
Short term interest rate (per cent)	4.7	6.1	5.5
Long term interest rate (per cent)	7.1	6.9	6.5
Japan			
GDP ¹⁾	0.6	1.3	2.0
Growth in consumer prices	0.7	0.4	0.8
Current balance (level, per cent of GDP)	2.8	2.6	1.9
Unemployment (level)	2.9	3.0	3.1
Short term interest rate (per cent)	2.3	1.9	3.3
Long term interest rate (per cent)	3.7	3.4	4.1
Germany			
GDP ¹⁾	2.9	3.0	2.8
Growth in consumer prices ²⁾	3.0	2.3	2.6
Current balance (level, per cent of GDP)	-1.1	-0.9	-0.8
Unemployment (level)	8.9	9.2	8.8
Short term interest rate (per cent)	5.3	4.6	5.3
Long term interest rate (per cent)	6.8	6.8	6.6
UK			
GDP ¹⁾	3.9	3.2	2.9
Growth in consumer prices ³⁾	2.5	3.5	3.5
Current balance (level, per cent of GDP)	1.3	1.4	1.5
Unemployment (level)	9.3	8.1	7.4
Short term interest rate (per cent)	5.5	6.9	7.2
Long term interest rate (per cent)	8.2	8.2	8.2
Sweden			
GDP ¹⁾	2.2	2.6	2.9
Growth in consumer prices	2.2	3.0	2.7
Current balance (level, per cent of GDP)	0.5	2.7	4.0
Unemployment (level)	8.0	7.4	6.7
Short term interest rate (per cent)	7.4	8.6	8.8
Long term interest rate (per cent)	9.1	10.0	8.7
Denmark			
GDP ¹⁾	4.4	3.9	3.1
Growth in consumer prices	2.0	2.5	2.8
Current balance (level, per cent of GDP)	2.4	2.0	2.2
Unemployment (level)	12.1	10.2	9.7
Short term interest rate (per cent)	..	..	..
Long term interest rate (per cent)	7.8	8.6	8.1

1) Percentage change from previous year, volume.

2) Germany (west).

3) Retail price index.

Source: Consensus Forecasts and DRI (interest rates). National sources for Sweden and Denmark.

growth the next two years as result of a levelling off in private consumer demand and a reduced contribution from net exports. However, investment in machinery and equipment is expected to rise considerably in the period ahead. There have been signs of a higher rise in consumer prices this year, but continued moderate wage growth and strong productivity gains seem to be curbing inflationary pressures. Underlying inflation (i.e. excluding mortgage interest payments) averaged 2.7 per cent in the first four months of 1995. The sterling effective exchange rate has fallen by 5 per cent so far in 1995, implying subsequent increases in domestic prices. Unemployment began to decline at an

early stage of the recovery, and the number of persons unemployed now stands at 8.4 per cent of the labour force. On average, unemployment was reduced by 25 000 a month in the first quarter of this year, and altogether the number of persons unemployed is 600 000 below the level recorded in 1993. The central bank has raised its base rate by altogether 1.5 percentage points since September last year, and it now stands at 6.75 per cent. A further tightening of monetary policy was expected at the beginning of May, but the Chancellor refused to follow the central bank's recommendation, probably due to investment considerations. The decision not to raise interest rates seems to have created some doubt about the possibilities for keeping price inflation within the lower part of the 1-4 per cent target range. In recent years fiscal policy has been contractionary and it is estimated that the average income tax will increase from 40.6 per cent in 1993 to 42.5 per cent in 1995. The central government borrowing requirement has therefore been reduced and is expected to reach a level corresponding to 3.4 per cent of GDP during this fiscal year.

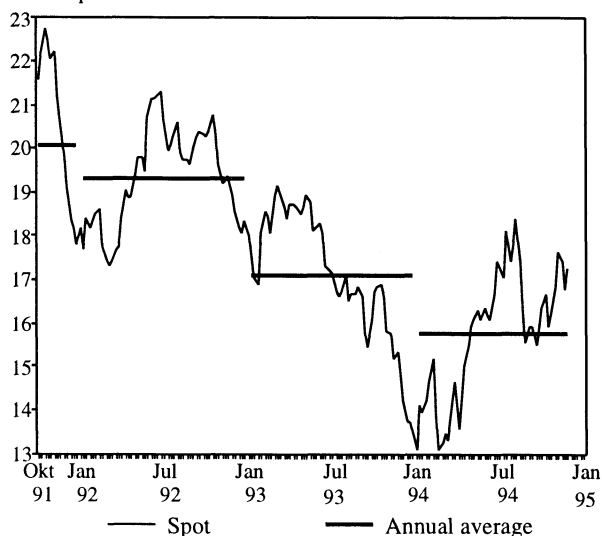
A moderate economic recovery continues in *Sweden*. GDP expanded by 3.5 per cent from the fourth quarter of 1993 to the same quarter last year, and GDP growth for 1994 as a whole was thus 2.2 per cent. Exports posted gains of as much as 13.8 per cent in 1994, while domestic demand exhibited a sluggish trend. The decline in investment and consumption, however, appears to have come to a halt. The moderate recovery is expected to continue the next two years; GDP growth is projected at 2.6 per cent this year, edging up next year. Investment, particularly in manufacturing industry, will probably take over as the main driving force in the economy, while export growth is not expected to be as high as earlier. Despite the rise in the level of activity, tax increases entail that household disposable income is projected to fall in 1995 and remain approximately unchanged in 1996. Private consumption is nevertheless expected to be stable this year, rising slightly next year. Infla-

tion is projected to rise slightly in the period ahead, primarily as a result of increased indirect taxes and higher import prices. Unemployment is forecast to decline the next two years, from 8.0 per cent in 1994 to 6.7 per cent in 1996, while the share of the labour force employed in job-creation schemes is expected to remain stable at about 5 per cent. The central government's financial position is still difficult, but the Swedish Government's forecasts are more optimistic than previously. The central government's debt is now expected to stabilize in relation to GDP as early as 1996, while it was previously assumed that this would occur in 1998. This is partly ascribable to further fiscal tightening and the improved cyclical situation.

National accounts figures for *Denmark* show annual GDP growth of 4.4 per cent in 1994. According to the forecasts, the expansion will slow through 1995 and 1996, primarily due to expectations of lower output growth in the public sector as well as a slightly weaker growth rate for private consumption. Both exports and imports picked up through the first two months of 1995 and were on average 10.0 and 12.2 per cent, respectively, higher than in the same period one year earlier. A continued strong expansion in the markets for Danish products accounts for the export growth projections of 6.9 per cent in 1995 and 5.7 per cent in 1996. With a correspondingly sharp rise in imports, there is little reason to expect considerable changes in the balance of trade. The special leave-of-absence scheme which has been introduced now seems to have contributed to a marked reduction in the number unemployed. The forecasts indicate that the unemployment rate will fall from a little more than 12 per cent in 1994 to about 10 per cent in 1995 and next year. Even though the number of unemployed declined by about 65 000 last year, the number of long-term unemployed has increased by 15 000. This year's wage negotiations and the final figures for inflation last year may provide a basis for an upward revision in inflation projections for 1995 and 1996. In addition, there is uncertainty as to what extent local pay increases will contribute to additional price pressures. The deficit on public sector budgets is expected to fall from 4 per cent of GDP in 1994 to 2.1 per cent in 1996, with Denmark thereby fulfilling the Maastricht requirement.

Spot price, Brent Blend

Dollar per barrel



Source: Petroleum Intelligence Weekly

Oil prices have moved on a rising trend so far this year, and the price of Brent Blend has recently hovered around \$ 18 p/b, against \$ 16 at the beginning of the year. The rise is partly ascribable to the higher demand for oil in OECD-Europe where consumption has been stable the last three years. The demand for petrol has increased considerably in the US, and this has had a major effect on oil prices. The sharp rise in prices in April can also be attributed to the completion of routine maintenance at several refineries, entailing that these refineries wanted to build up new stocks of oil products. At the same time, some production fields were about to begin their maintenance season, with production somewhat below capacity. Forecasts for the market situation in the second half of 1995 do not indicate any substantial changes in the overall picture. Oil prices are therefore expected to remain relatively stable this year, with possibilities of a slight rise next year.

Norwegian economy

Developments thus far this year¹

Based on available information, the increase in mainland GDP from the fourth quarter of 1994 to the first quarter of 1995 is estimated at a seasonally adjusted 1.5 per cent, moderately higher than the trend growth through the previous two years. Developments in manufacturing production and the construction industry helped to boost the growth rate, while service industries appear to have moved on a weaker trend. Monthly figures from the production index up to end-April this year, however, indicate slower underlying growth in manufacturing output over the last six months. As a result of bad weather in the North Sea in January, the production of oil and gas fell by a good 1 per cent, seasonally adjusted, from the fourth quarter of 1994 to the first quarter of 1995, and total GDP increased less than GDP for mainland Norway.

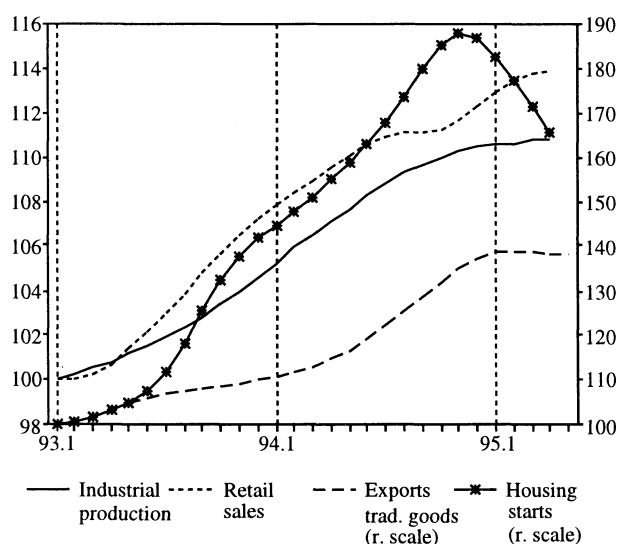
Statistics Norway's short-term indicators and other information point to a slight decline in underlying growth in household demand. Preliminary estimates show a rise in private consumption of about 1/4 per cent from the fourth quarter of last year to the first quarter of 1995. This is on a par with developments in the fourth quarter of 1994, but noticeably weaker than underlying growth through the previous six quarters. The consumption of goods rose at a faster pace than total consumption, but the brisk rise in car purchases through 1993 and 1994 appears to be levelling

off. After rising by a seasonally adjusted 19 per cent between the first and fourth quarter of 1994, the number of new passenger car registrations dropped by 0.8 per cent in the first quarter of this year. New car registrations in the period April-May were nevertheless 2.8 per cent above the level in the fourth quarter of last year. The seasonally adjusted volume of retail sales, which is an indicator for changes in the consumption of goods, was at about the same level in April as the average for the first three months of the year. Housing investment expanded by a little more than 2.5 per cent in the first quarter of 1995, markedly less than the average growth recorded in the previous six quarters. The April figures for housing starts, however, point to slightly higher growth in the second quarter. Prices in the market for existing dwellings continued to rise in the first quarter of this year, but the increase seems to be slowing.

It is natural to consider the slower growth in household demand against the background of developments in financial institutions' lending and deposit rates. Households' real borrowing costs fell from about 7.5 per cent in 1992 to about 4.5 per cent last year. The decline in interest rates, however, came to a halt in the second half of 1994, and lending rates at the end of the first quarter of 1995 were only about half a percentage point lower than at the same time one year earlier. Developments in market interest rates thus far in 1995 do not indicate a further decline in

Trend growth in some important short-term indicators

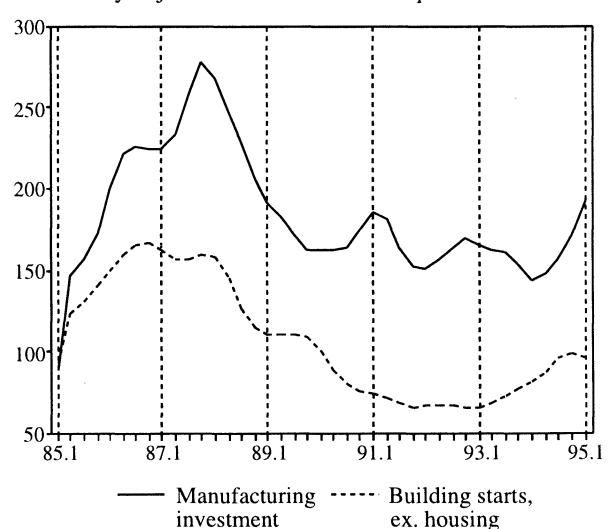
Index. January 1993 = 100



Source: Statistics Norway.

Two capital formation indicators

Seasonally adjusted and smoothed. 1. quarter 1985=100



Source: Statistics Norway.

¹ Statistics Norway is currently undertaking an extensive revision of the national accounts. The work is described further in Weekly Statistics no. 49/94. Revised figures for the years 1988-1992 are scheduled to be published in Weekly Statistics on 6 July. Revised national accounts figures for the entire period 1988-1994 as well as figures for the first and second quarter of 1995 will be published in September. As a result of the work on the revision, no figures from the quarterly national accounts for the first quarter of 1995 are published in this issue of Economic Survey. The quantification of national accounts variables for the first quarter of 1995 reported below is based on a more summary treatment of Statistics Norway's short-term statistics and other indicators of economic developments than customary when drawing up quarterly national accounts figures.

Macroeconomic indicators¹⁾

	Billion 1991-NKr		Percentage change from the same period the previous year				Growth from the previous quarter seasonally adjusted			
	1994	1994	94.2	94.3	94.4	95.1	94.2	94.3	94.4	95.1
Demand and output										
Private consumption	380.1	4.4	4.8	3.5	3.1	1.4	0.0	1.2	0.2	0.3
Public consumption	161.0	2.7	5.2	0.9	0.3	1.5	-0.3	-0.3	-0.0	2.0
Gross fixed investment	147.2	7.9	29.3	4.7	4.5	21.5	11.0	9.6	-17.5	17.8
- mainland Norway	92.9	6.2	4.2	8.4	9.4	20.0	10.5	5.1	4.5	-1.1
- accrued petroleum investment ²⁾	52.9	1.8	-7.8	5.7	-6.1	12.8	7.2	22.4	-32.1	24.5
Final domestic demand from mainland Norway ³⁾	634.0	4.2	4.8	3.6	3.4	3.8	1.3	1.4	0.8	0.5
Exports	357.1	7.6	3.7	7.9	7.3	4.8	0.2	0.5	5.5	0.6
- crude oil and natural gas	126.1	11.2	10.6	8.6	7.9	3.0	-0.0	-5.6	12.9	-3.3
- traditional goods	137.9	14.3	7.0	20.3	13.9	15.4	0.8	7.5	2.2	2.3
Imports	281.0	7.2	8.5	9.1	3.4	8.0	3.2	7.4	-8.0	5.1
- traditional goods	183.8	15.2	19.0	16.1	11.9	9.8	3.0	4.1	-0.3	2.3
Gross domestic product	764.4	5.1	7.0	3.1	4.5	4.2	0.9	-0.1	2.0	1.0
- mainland Norway	610.4	3.9	5.2	2.7	3.7	4.5	0.8	0.3	1.4	1.5
Labour market⁴⁾										
Man-hours worked		1.5	..	..	..	..	0.6	0.9	0.0	0.5
Employed persons		1.5	..	..	..	..	0.6	0.8	0.5	0.5
Labour force		0.9	..	..	..	..	0.9	0.3	0.5	0.7
Unemployment rate, level		5.4	..	..	..	..	5.8	5.2	5.2	5.4
Prices										
Consumer price index ⁵⁾		1.4	1.0	1.6	1.8	2.6	..	..	..	..
Export prices, traditional goods		1.6	0.3	1.7	4.7	7.0	-0.1	1.8	1.5	2.9
Import prices, traditional goods		0.4	0.1	0.1	0.9	3.2	-3.5	4.0	0.0	1.4
Balance of payment										
Current balance, bill. NKr		23.7	4.7	1.8	9.2	8.0	..	..	..	..
Memorandum items (unadjusted level):										
Eurokrone rate (3 month NIBOR)		5.7	5.2	5.9	6.7	5.4	..	..	..	..
Average lending rate ⁶⁾		8.4	8.4	8.1	8.1	8.1	..	..	..	..
Crude oil price, NKr (Spotprice Brent Blend) ⁷⁾		112.0	116.0	114.6	112.5	110.2	..	..	..	..
Importsweighted krone exchange rate (1992=100)		106.3	106.8	105.5	105.4	103.7	..	..	..	..

1) Figures for 1994 may deviate somewhat from those published in Economic Survey 1/95 due to new information.

2) Growth from previous year.

3) Private consumption + public consumption + gross fixed capital formation in mainland Norway.

4) Based on monthly figures, seasonally adjusted.

5) Percentage change from previous year.

6) Private financial institutions.

7) Average, Norwegian oil production.

Source: Statistics Norway.

interest rates in financial institutions in the period ahead. While money market rates showed a decline up to mid-April, they have since edged up and the differential between Norwegian rates and corresponding German rates has widened markedly. Long-term interest rates, however, have shadowed corresponding German rates and are at present about 3/4 percentage point below the level at the beginning of the year.

Following two and a half years of weak underlying growth, manufacturing investment increased markedly through 1994. The buoyant growth continued in the first quarter of 1995, and Statistics Norway's investment statistics for the second quarter indicate that manufacturing investment may expand by between 30 and 40 per cent this year, rising further next year. Investment in the power supply sector also edged up in the first quarter of 1995, while

preliminary information indicates a relatively sluggish trend in investment in service industries. Accrued investment in the oil sector increased by nearly 25 per cent on a seasonally adjusted basis from the fourth quarter of 1994 to the first quarter of this year, and a further rise in this investment is likely through the remainder of 1995.

While it appears that demand from mainland Norway exhibited a weaker trend than production in the first quarter of 1995, growth in traditional merchandise exports continued at about the same pace as in 1994. Prices of traditional merchandise exports also showed a sharp rise, and in the first quarter of 1995 were a seasonally adjusted 5 per cent above the average level for 1994. Seasonally adjusted monthly figures for foreign trade in goods show that the value of traditional merchandise exports has remained relatively constant through the first five months of the year.

Exports of petroleum declined slightly in volume terms from the fourth quarter of 1994 to the first quarter of 1995, in line with developments in production.

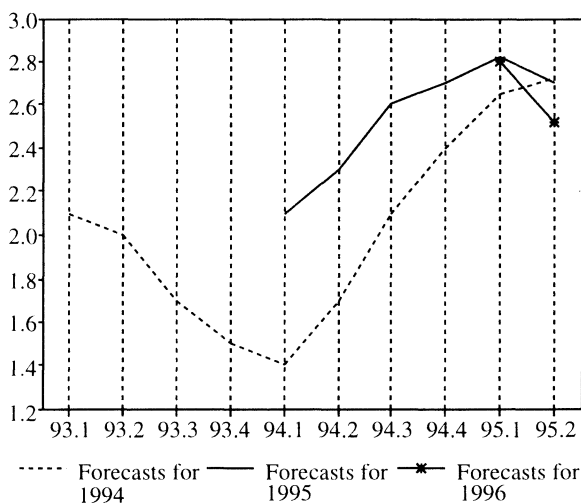
Traditional merchandise imports also expanded in the first quarter both in terms of volume and prices, but growth was slower than for exports. Monthly figures point to a further rise in the value of imports in the second quarter.

According to figures from Statistics Norway's labour force survey (LFS), both the number of man-hours worked and the number of persons employed increased by about 0.5 per cent, seasonally adjusted, in the first quarter of 1995, following an equally pronounced rise through last year. The growth in the labour force, however, was even greater, and the number of job-seekers without income from employment rose on a seasonally adjusted basis from a level corresponding to 5.2 per cent of the labour force in the fourth quarter of 1994 to 5.4 per cent in the first quarter of this year. On the other hand, the sum of registered unemployed and persons employed on labour market schemes, excluding rehabilitation, declined through April of this year, but edged up again in May. Both demographic factors and the sharp growth in the number of persons in the education system in recent years indicate continued strong growth in the supply of labour in the period ahead.

The consumer price index rose by 2.6 per cent from January-May 1994 to January-May 1995. On a year-on-year basis, price inflation has been relatively stable thus far in 1995. Developments in house rents and the price of agricultural and fish products are still helping to curb the general rise in prices, while the prices of other Norwegian-made consumer goods are growing faster than the general price level. The results of the income settlements so far indicate an average wage growth in the public sector of about 3 per cent this year, if wage drift is about the same as in the preceding two years. For groups covered by the Norwegian Federation of Trade Unions and the Confederation of Norwegian Business and Industry, the wage carry-over and contractual increases will contribute about 1 3/4 percentage point to the average growth in wages. Based on the same wage drift as in 1993 and 1994, annual wage growth will be around 2 1/2 per cent, but the sharp rise in profitability in some manufacturing sectors points to slightly higher wage drift than the last couple of years.

The current account of the balance of payments showed a surplus of nearly Nkr 8 billion in the first quarter of this year, the same as in the first quarter of 1994. An increase in the trade surplus of Nkr 2.3 billion was offset by an equivalent rise in the deficit on the interest and transfers balance. This must be viewed on the background of an unusually low deficit on the interest and transfers balance in the first quarter of 1994 as a result of extraordinarily high interest income for Norges Bank and the Norwegian Broadcasting Corporation's revenues in connection with the Winter Olympics in Lillehammer.

GDP-growth forecasts for Norway's main trading partners for 1994 - 1996 given on different dates



Source: Consensus Forecasts.

Outlook for 1995 and 1996

It appears that the positive trend in the Norwegian economy will continue in 1995 and next year, but growth is expected to slow through the period. The production of petroleum will rise sharply, thereby contributing to maintaining GDP growth at an historically high level. The growth in public sector demand is projected to be moderate the next few years. The growth impetus from abroad and from households is expected to taper off slightly compared with 1994. Growth in domestic production through 1993 and 1994 and increased profitability in industry and commerce will contribute to a pick-up in mainland investment, while the petroleum sector's demand for investment goods and services from domestic suppliers will decline both in 1995 and 1996.

According to the calculations, employment will continue to rise throughout the period. The fall in unemployment, however, will be curbed by a substantial growth in the labour force. Price inflation, measured by the consumer price index, will remain at a moderate level. The increase in VAT at the beginning of the year and rising capacity utilization will contribute to boosting price inflation by about 1 percentage point. The rise in the inflation rate and high profits in the business sector point to a slight rise in wage growth this year and in 1996.

The forecasts for 1995 and 1996 are close to the projections presented in Economic Survey 1/95, but the calculations this time point to a clearer slackening in the cyclical upturn in 1996.

Exchange rates and interest rates at about the current level

Money market rates in the ECU area are projected to decline moderately from the current level through the remainder of 1995 and first half of 1996. In the second half of

Trends in selected macroeconomic variables

Growth from previous period unless other noted. Per cent

	1994			1995			1996		
	Accounts	SN	MoF ¹⁾	NB ²⁾	SN	MoF ¹⁾	NB ²⁾		
Demand and output									
Private consumption	4.4	2.7	2.6	3	1.9	2.2	2 1/2		
Public consumption	2.7	1.2	1.2	1 1/4	2.0	0.9	1		
Gross fixed investment	7.9	16.7	..	9 1/4	-1.6	..	- 3/4		
- mainland Norway	6.2	15.4	14.0	12 3/4	10.0	8.1	9 1/2		
- accrued petroleum investment	1.8	13.9	4.0	3 1/2	-22.9	-24.4	-20		
Demand from mainland Norway ³⁾	4.2	4.1	4.1	4	3.2	2.8	3 1/4		
Exports	7.6	7.9	8.3	8	6.5	6.2	5 1/2		
- crude oil and natural gas	11.2	10.1	16.7	14 1/4	8.9	9.8	8 3/4		
- traditional goods	14.3	9.4	7.5	8 1/4	3.8	6.4	5 3/4		
Imports	7.2	9.9	7.5	7 1/4	0.9	0.1	3/4		
- traditional goods	15.2	8.9	5.8	5 3/4	2.9	5.5	4 3/4		
Gross domestic product	5.1	4.8	5.1	4 1/2	3.7	3.6	3 3/4		
- mainland Norway	3.9	4.0	3.1	3 1/4	2.7	2.5	2 3/4		
Labour market⁵⁾									
Persons employed	1.5	1.8	1.6	1 1/4	1.1	1.1	1		
Unemployment rate (level)	5.4	5.1	5	5	4.8	..	4 1/2		
Prices and wages									
Wages per man-hour	2.9	3.6	2 1/2 ⁷⁾	3 1/4 ⁷⁾	3.5	..	4 ⁷⁾		
Consumer price index	1.4	2.5	2 1/2	2 1/2	2.4	..	2 1/4		
Export prices, traditional goods	1.6	7.7	7.5	5 3/4	0.9	2.9	2 1/2		
Import prices, traditional goods	0.4	3.0	2.0	2	1.6	2.1	2 1/4		
Balance of payment									
Current balance (bill. Nkr)	23.7	30.0	35.7	39	53.4	65.4	62		
Current balance (per cent of GDP)	3.1	3.6	4.3	4 3/4	6.1	..	7		
Memorandum items:									
Money market rate (level)	5.7	5.3	..	..	5.5	..	..
Average borrowing rate (level) ⁴⁾	8.4	8.0	..	..	8.0	..	..
Crude oil price Nkr (level) ⁵⁾	112.0	112.8	115	115	116.6	..	119		
International market growth	8.9	7.2	7 1/2	..	5.2	..	..
Importsweighted krone ⁶⁾	1.3	-3.4	..	..	-0.3	..	..
Households saving ratio	3.4	3.3	2.8	2	3.1	2.8	2 1/4		

1) MoF: Ministry of Finance's forecasts. Revised national budget 1995.

2) NB: Forecast according to Central Bank of Norway, Penger og kreditt 1995/2.

3) Private consumption + public consumption + gross fixed capital formation in mainland Norway.

4) Households' borrowing rate in private institutions.

5) Average, Norwegian oil production.

6) Positive sign implies depreciation.

7) Growth from previous year.

1996 a rise in short-term German interest rates is expected to push up interest rates in the ECU area. As a result of the improvement in the current-account balance and slightly lower price inflation in Norway than in the ECU countries, Norwegian money market rates will remain lower than the average for those countries. Financial institutions' deposit and lending rates are thus expected to remain stable through 1995 and 1996.

In the projections we have assumed a dollar exchange rate of Nkr 6.30 from the third quarter and throughout the projection period. Other exchange rates are assumed to remain at the level prevailing at the beginning of June, entailing that the import-weighted value of the Norwegian krone will strengthen about 3.4 per cent from 1994 to 1995.

Tighter economic policy

The assumptions concerning economic policy are largely based on the Revised National Budget for 1995. Expenditure on the Winter Olympics in Lillehammer contributed to boosting public consumption in 1994, and this is one of the reasons for the projected low growth in this demand component from 1994 to 1995. For 1996, the projections incorporate the assumption that public consumption growth will be noticeably lower than mainland output growth. The current tax and excise duty programme is extended to 1996.

Higher revenues from taxes and petroleum production and a lower level of unemployment benefits will contribute to an improvement in the public sector's budget balance in the projection period. Measured according to the Maastricht definition, the general government budget balance

will move from a negligible deficit in 1994 to a surplus of about 2 per cent of GDP in 1995 and a good 3.5 per cent in 1996.

Slightly negative growth impetus from petroleum investment

Investment in the petroleum sector is projected to expand by about 14 per cent from 1994 to 1995, entailing a small upward adjustment compared with the estimate presented in Economic Survey 1/95. Imports related to the completion of several major projects are still expected to be considerable. In 1996, investment in the petroleum sector is projected to decline by about 23 per cent. When adjusted for the unusual high import share in 1995, it is likely that the demand impetus from investment in the petroleum sector will fall slightly in both 1995 and 1996.

Continued brisk growth in export markets

The international recovery resulted in a sharp increase in spot prices for a number of industrial raw materials last year. Due to the lag in the adjustment of contractual prices, this is contributing to a brisk rise in the prices of Norway's traditional export goods from 1994 to 1995. The rise in import prices is also expected to pick up, from 0.4 per cent in 1994 to 3 per cent this year. Excluding industrial raw materials, import prices for traditional goods are anticipated to increase by 0.9 per cent in 1995 and 1.4 per cent in 1996, against 0.1 per cent last year.

In line with the growth prospects for Norway's main trading partners, it is assumed that market growth for Norway's traditional export products will be more moderate in 1995 than in 1994, slowing further next year.

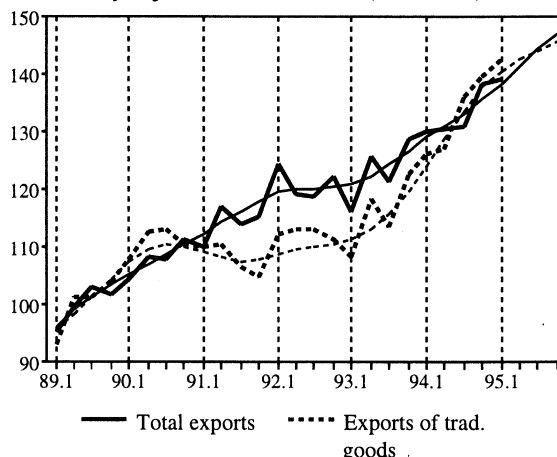
Growth in traditional merchandise exports is likely to be slightly stronger than market growth this year. In the calculations, a higher rise in the prices of Norwegian export goods through 1995 than in prices of competing goods from other countries results in a loss of Norwegian producers' market shares in 1996.

Slightly higher price and wage inflation

The fall in interest rates through 1993 and into 1994 was an important factor underlying low price inflation in 1994. Rents are an important component in the consumer price index and the decline in interest rates entailed that the rise in rents virtually came to a halt through 1994. Interest rate movements cannot be expected to dampen price inflation to the same extent in the period ahead. The one percentage point increase in VAT on 1 January 1995 will also contribute to a slightly higher rise in consumer prices. Based on an estimated feed-through of 80 per cent, this will contribute about 0.4 percentage point to the rise in consumer prices this year. Prices on electricity consumed by households have increased markedly thus far this year, after edging down from 1993 to 1994. If these prices show no

Exports

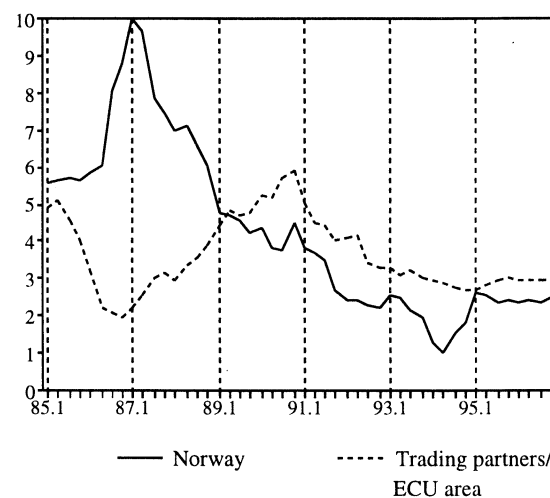
1989=100. Seasonally adjusted (QNA)
Seasonally adjusted and smoothed (KVARTS)



Source: Statistics Norway

Consumer price index

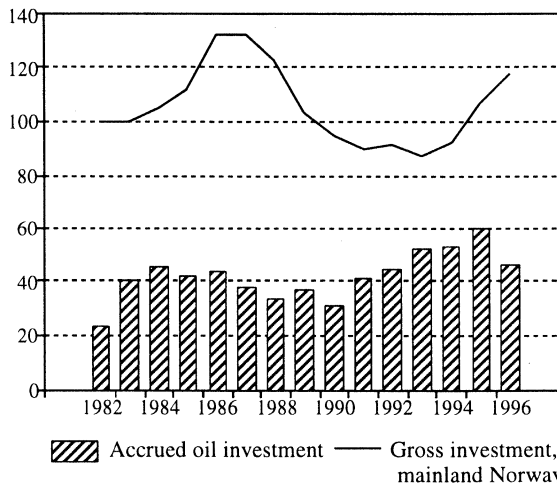
Percentage growth from same quarter previous year



Source: Statistics Norway, OECD and Eurostat

Accrued oil investment and investment in mainland Norway

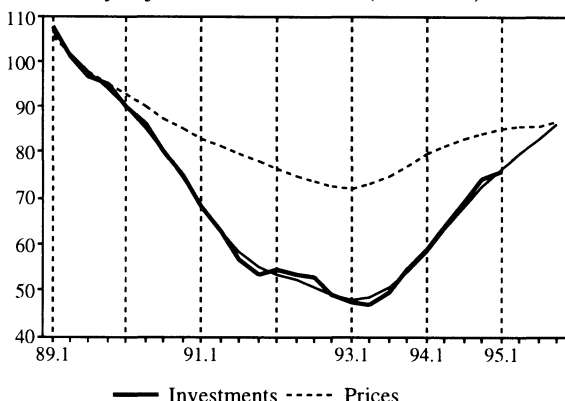
NKr billion 1991



Source: Statistics Norway.

Real price on houses (second-hand market) and housing investments

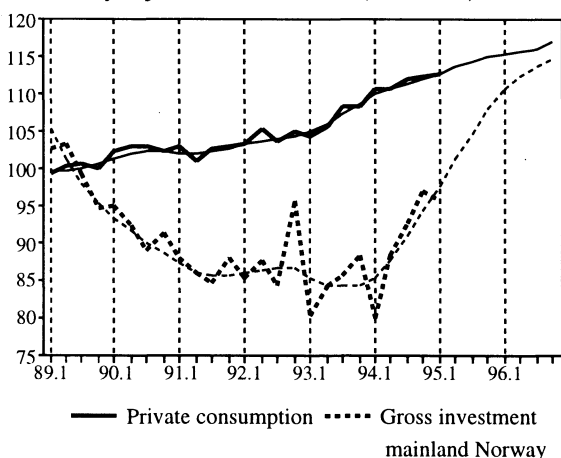
1989=100. Seasonally adjusted (QNA)
Seasonally adjusted and smoothed (KVARTS)



Source: Statistics Norway

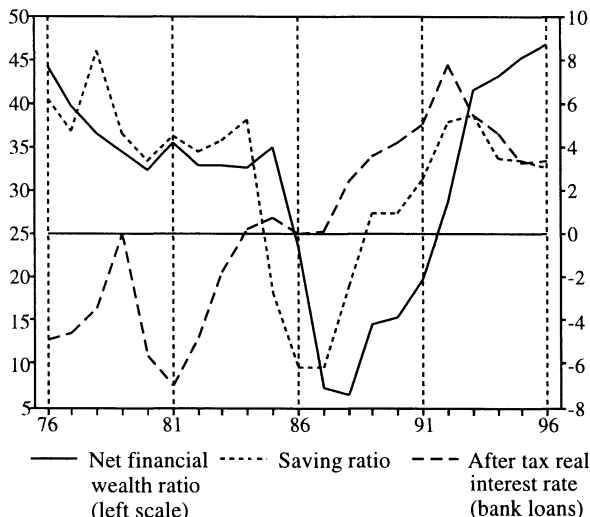
Consumption and investment

1989=100. Seasonally adjusted (QNA)
Seasonally adjusted and smoothed (KVARTS)



Source: Statistics Norway

Net wealth ratio, saving ratio and after tax real interest rate 1976 - 1996



Source: Central Bank of Norway and Statistics Norway.

further change in 1995, the contribution to the rise in the consumer price index will be about 0.3 percentage point.

The calculations show a rise in consumer price inflation from 1.4 per cent in 1994 to 2.5 per cent this year. Price inflation is expected to show a moderate decline between 1995 and 1996. The projections embody an assumption of an unchanged indirect tax programme in 1996 and a halving of the rise in electricity prices next year. These factors point to lower price inflation, although this will be partly offset by lower productivity gains and a sharper rise in import prices in 1996 compared with this year. According to the calculations, improved profitability in enterprises as a result of the sharp rise in export prices will contribute to pushing up the rise in hourly wages from 2.9 per cent in 1994 to 3.6 per cent this year. This increase must also be viewed in light of the fact that there are two fewer working days in 1995 than in 1994. On this basis, average wage growth per normal man-year is estimated at a good 3 per cent this year. In the calculations, continued favourable profitability and a gradual improvement in the labour market results in an average growth in hourly wages of 3.5 per cent in 1996. Since there is one additional working day in 1996 compared with 1995, the growth in wages per normal man-year will be slightly higher than this.

Investment-led growth in the mainland economy

Output growth and the decline in interest rates resulted in an upswing in mainland fixed investment in 1994, and the expansion appears to have continued this year. According to the calculations, mainland fixed investment will rise by about 15 per cent in 1995 and 10 per cent next year, following a growth of 6 per cent in 1994.

The development of Gardermoen airport is an important factor behind the projected growth in mainland investment. The vigorous growth in Norwegian merchandise exports combined with a gradual improvement in profitability in export-oriented sectors have contributed to a projected rise of a good 33 per cent in manufacturing investment this year. This brings manufacturing investment, excluding refinery activities, up to the peak level recorded in 1986. Manufacturing investment will remain high in 1996 even though growth is projected to slow to 4 per cent.

The effects of the decline in interest rates on house prices are expected to be gradually exhausted. The rise in prices of existing homes is projected to slow down from about 13 per cent in 1994 to 7 per cent this year and a good 4 per cent in 1996. This will bring prices of existing dwellings to a more reasonable level in relation to building costs. We also expect a gradual reduction in the rate of growth of housing investment from 33 per cent in 1994, to 22 per cent this year and about 17 per cent in 1996.

Household real disposable income increased by 2.2 per cent in 1994, and the calculations indicate approximately the same growth in 1995 and slightly lower in 1996. The income growth can largely be ascribed to the growth in

real wages and the increase in employment. The decline in interest rates through 1993 and into 1994 was an important factor underlying the buoyant growth in private consumption in 1994. In the projection period the positive effects of the fall in interest rates will peter out, while higher real income and increases in wealth will contribute to consumption growth of 2.6 per cent in 1995 and 1.9 per cent in 1996.

According to the calculations, the household saving ratio – which was 3.4 per cent in 1994 – will remain at about that level in 1995, edging down to 3.1 per cent in 1996. In spite of the vigorous growth in household fixed investment, household saving is sufficient to permit a further improvement in this sector's net financial asset position.

Lower GDP growth in 1996

According to the calculations, GDP growth will reach 4.8 per cent in 1995, edging down to 3.7 per cent next year. As a result of the investment upswing in mainland Norway, production in the construction industry picked up considerably through 1994 and into 1995. Continued high growth in construction investment will help to maintain output growth in this industry in the projection period. Growth in manufacturing production is expected to be about 5 per cent in 1995, the same as last year, but will slow to around 2 per cent in 1996. GDP growth in 1995 is being spurred by the expansion in exports, while demand from the petroleum sector will make a negative contribution in both 1995 and 1996.

Production in private services grew by a good 5 per cent in 1994. The growth in the level of activity in service industries will decline slightly through the projection period, primarily as a result of slower growth in private consumption.

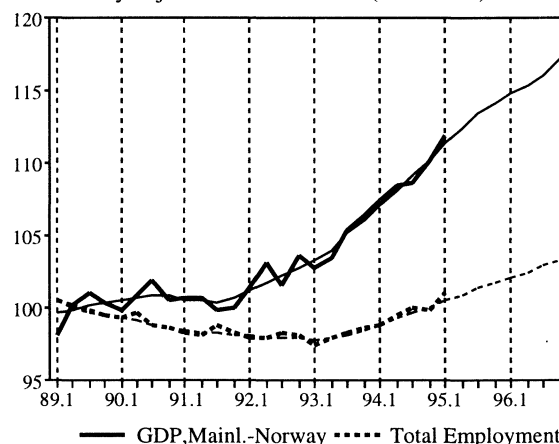
Growth in public sector production is expected to be subdued in 1995, but edge up in 1996. According to the calculations, output growth in the mainland economy will remain high in 1995, but slow through 1996.

Oil and gas production is projected to advance markedly in both 1995 and 1996. Output in the shipping sector is also expected to expand.

Lower unemployment

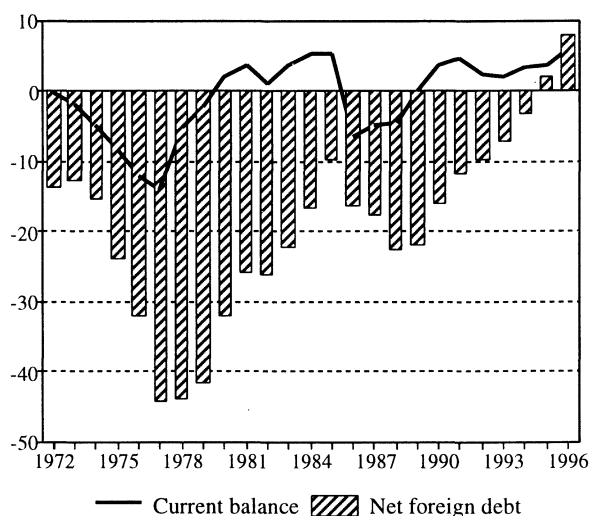
The high level of activity will result in a continued improvement in the labour market. Even though employment growth is expected to slow through the projection period, growth in employment is now estimated at 36 000 this year and 23 000 in 1996, compared with 30 000 in 1994. The labour force is also increasing in tandem with employment growth. Demographic factors alone indicate labour force growth of 10-15 000 a year. Experience shows that higher employment contributes to an increase in participation rates. According to the calculations, the labour force will expand by a good 30 000 in 1995 and about 15 000 next

Gross domestic product and employment
1989=100. Seasonally adjusted (QNA)
Seasonally adjusted and smoothed (KVARTS)



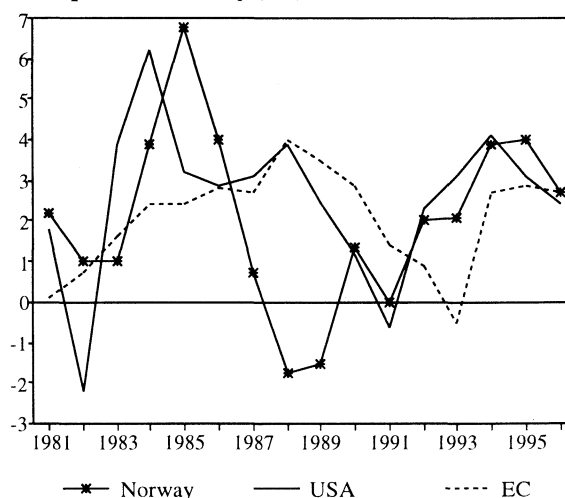
Source: Statistics Norway

Current balance and foreign debt
Per cent of GDP



Source: Statistics Norway.

GDP growth, mainland Norway, USA and European Community (EC). Annual rates



Source: Statistics Norway, OECD and Concensus Forecasts.

year. Unemployment is thus projected to decline moderately from 5.4 per cent in 1994 to 5.1 per cent this year and 4.8 per cent in 1996.

Sizeable current-account surplus

Crude oil prices are assumed to remain at \$ 18 p/b throughout 1995, rising to \$ 18.50 p/b in 1996. With a projected dollar exchange rate of Nkr 6.30 from the third quarter of this year, this is equivalent to a crude oil price of Nkr 112 p/b in 1995 and Nkr 116.60 p/b in 1996.

In 1995, the contribution from the sharp rise in exports to the current-account surplus will be offset by a brisk growth in imports, especially related to petroleum investments. According to the calculations, the balance of trade surplus will remain approximately unchanged from 1994 to 1995, but will increase markedly in 1996. Continued high growth in petroleum exports and a substantial reduction in import-intensive petroleum investments are important factors behind this projected improvement in 1996. The deficit on the interest and transfers balance will decline further in both 1995 and 1996. The current-account surplus is estimated at about Nkr 30 billion in 1995, rising to Nkr 53 billion in 1996. According to the calculations, Norway will become a net foreign creditor during the second half of 1995.

Economic policy calendar 1995

March

13. T. Skretting and AS Biomar are awarded a contract, worth about Nkr 500 million, to supply feed to the fish farming companies Frøya Holding AS and Mowi AS. After having negotiated individually, the two buyers decided to cooperate on the contract. T. Skretting will be responsible for 80 per cent of the deliveries and AS Biomar the remainder.

13. Oil production on the Statfjord field passes 3 billion barrels, entailing that the field has produced oil worth more than Nkr 500 billion since 1979.

14. SAS orders 35 Boeing 737 aircraft, model 600, worth SKr 8.5 billion. Options for another 35 planes, which can be converted to larger aircraft, come in addition. The first aircraft will be delivered at the end of 1999, and thereafter on a regular basis up to 2002.

15. Norsk Hydro, which is operator for the Njord field, signs a letter of intention with Aker Stord AS concerning an EPC contract (engineering, procurement and construction) for a floating steel platform. The contract, worth about Nkr 2.8 billion, entails that the platform shall be ready to be towed out from Aker Stord by 30 June 1997.

15. The Norwegian Federation of Trade Unions (LO) breaks off negotiations with the Norwegian Confederation of Business and Industry (NHO). The wage settlement for 250 000 employees in the private sector must therefore be settled through mediation. The negotiations were broken off due to dissatisfaction with the pay increase and arrangements offered by the employers.

16. Tofte Industrier AS sells its ultra-modern chlorine factory to India, where it will produce environmentally toxic agro-chemicals. The plant, located in Hurum, had to close in 1991 due to protests from both the authorities and environmental organizations.

17. Kværner's Swedish subsidiary Kværner Enviro Power is to supply a complete waste recovery plant to Thailand. The plant will cost about Nkr 375 million.

21. The Australian mining company Broken Hill takes over parts of the ilmenite smelter in Tyssedal. Nkr 200 million will be invested in the smelter. In the future the smelter will use raw materials from Australia and no longer purchase raw materials from Titania in Dalane.

22. The insurance group which insured the Sleipner platform, led by Vesta, brings an action against Norwegian Contractors (NC) and the parent company Aker. They demand the repayment of Nkr 2.3 billion of the insurance paid. This is the largest recourse claim ever raised in Norway. The Sleipner platform sank in the Gansfjord in 1991.

22. The Norwegian-Swedish working partnership AF MNFP is awarded a contract by NSB Gardermobanen A/S worth about Nkr 1.8 billion. The company will be responsible for site preparations for the stretch between Åråsen and Leirsundveien in connection with the new railway extension.

27. On behalf of its 22 Norwegian electricity producers, Euro-Kraft Norge AS concludes a power exchange contract with Germany's largest electricity producer EuroStrom. The contract will result in investments worth about Nkr 4 billion in new power cables from Norway to Germany. The contract involves reciprocal supplies for 25 years starting on 1 January 2003 at the latest.

30. Statoil doubles its reserves estimates for the Smørbukk field, i.e. an increase of about 290 million barrels. For the owners, this will boost sales revenues by Nkr 32 billion.

31. Norske Skog buys out its partner in a French paper mill, expands the chipboard factory in Braskereidfoss and acquires the chipboard competitor Agnes Fabrikker. Altogether, the investments, purchases and takeover of loans come to Nkr 840 million.

April

3. Orkla buys Procordia from Volvo for nearly Nkr 3.7 billion. Orkla thus becomes the largest food and beverage company in the Nordic area, with 21 000 employees and turnover of Nkr 26 billion.

3. Transocean and Wilrig merge and become the world's third largest rig company. The new company is expected to have sales of Nkr 3.5 billion this year.

3. Transocean Petroleum Technology signs a contract with Saga Petroleum for drilling services and maintenance of the drilling module Snorre TLP. The contract, worth Nkr 310 million, will extend over a period of four years.

4. NHO and LO reach agreement on the wage settlement (see 15 March). The centrally negotiated pay increases will come on top of wage carry over of about one per cent. For average wages, the agreed increase of 80 øre, plus 85 øre for those who do not have local negotiating rights, will amount to about 0.6 per cent on an annual basis. Altogether, the pay increases will represent slightly more than two per cent. Those earning less than 90 per cent of the average will receive an additional 80 øre, or altogether Nkr 1.60, while those earning less than 80 per cent of the average will receive pay increases of well over 3 per cent.

5. The National Insurance Institution shelves plan to switch to the new computer system Tress 90 after having spent more than Nkr 600 million. The change-over to the

new system originally had a price of Nkr 1.3 billion. The National Insurance Institution will continue to use its current nine-year old system.

5. Alcatel Telettra Norway is awarded a framework contract worth Nkr 500 million by British Telecom. The company will supply fibre optic cable systems to the British high-frequency network for speech and data.

5. Sweden's Minister of Finance, Göran Persson, presents a new austerity package to reassure the money market. This includes proposals to reduce sickness, maternity and unemployment benefits to 75 per cent of the current level and a reduction in the VAT rate for food from 21 per cent to 12 per cent.

7. Statoil invests about Nkr 1 billion in Malaysia. The company wants to strengthen its trading position in South-east Asia and buys a 15 per cent stake in the expansion of the Melaka refinery.

20. Kværner Pulping is awarded contracts worth altogether Nkr 190 million by the Brazilian group Votorantim. The contract covers equipment in connection with Votorantim's plans to modernize its pulp and paper factories.

21. The employee organisations in the state present their demands in connection with the central government settlement. Common to all the demands are higher purchasing power and measures to achieve equal pay.

24. Norway and the European Commission reach agreement on new duty-free quotas for Norwegian fish exports to the EU. The agreement takes account of new member countries in the EU, and Norway's duty-free quota increases by the average of exports to these countries in the period 1992 to 1994.

25. Westamarin AS is awarded a contract, worth Nkr 1.4 billion, for building Stena Line's four new catamarans.

25. The heads of the two farmers' unions present their demands in connection with the agricultural settlement. The demands entail a price decline for farmers of Nkr 195 million as well as zero growth in support over the government budget.

25. Municipal employees' representatives present their pay demands. The municipal sector in LO's negotiating group (LOK) demands an additional Nkr 5 700 for those earning less than Nkr 146 700, and an additional Nkr 4 500 for those with earnings above this level (pay grade 11). In addition, LOK wants to have extra increases in pay grades 1 to 5. The Federation of Norwegian Professional Associations in the municipal sector demands that all its members be moved up a pay grade and that additional pay increases of 0.5 per cent be granted to those with pay exceeding Nkr 309 800 (pay grade 51). The Confederation of Vocational Unions in the municipal sector demands a flat nominal increase of Nkr 5 500 a year for all its members.

The Norwegian Federation of State Employees' Unions in LO and the Norwegian Union of Teachers demand increases of Nkr 5 700 for those in pay grades 1 to 11, and Nkr 4 500 for those in pay grades 12 to 75, with effect from 1 May. The organizations also demand a centralised equal pay fund of 1.1 per cent of total annual pay. State employees in the Confederation of Vocational Unions demand an equal nominal amount of Nkr 5 500 a year for all members with effect from 1 May. They also demand a centralized adjustment settlement focused on measures and low-paid employee groups in which women make up the greater part. With regard to the question of equal pay, both the Confederation of Vocational Unions and Federation of Norwegian Professional Associations want to have funds allocated for local negotiations.

28. Saga Petroleum is quoted on the New York Stock Exchange for the first time.

May

6. The Norwegian Defence concludes a contract with Hughes to buy missiles worth about Nkr 4.5 billion. The agreement requires Hughes to buy products from Norwegian industry. The missiles are to be used in the F-16 aircraft.

10. Conoco Norway baptizes the Heidrun platform. The platform is the first concrete tension leg platform in the world and one of Norway's biggest industrial investment amounting to more than Nkr 25 billion. Oil production from Heidrun will start in August, and will give the central government tax and royalty revenues of around Nkr 7 billion annually from the year 2000.

10. The Revised National Budget for 1995 is presented. Minister of Finance Sigbjørn Johnsen reduces the government budget deficit to Nkr 6 billion. In 1996, a surplus of Nkr 10 billion will be allocated to the Government Petroleum Fund.

10. Norway's largest gas customer, the German distributor Ruhrgas, has sent an enquiry to the Gas Negotiations Committee (GNC) concerning the purchase of an additional two billion cubic metres of gas a year. At the end of April the GNC rejected an application from Saga to purchase Norwegian gas which was to be resold to Ruhrgas' competitor Wingas. The enquiry from Ruhrgas represents gas worth Nkr 1.3 billion a year, twice the amount Saga wanted to sell to Wingas.

11 SAS and Lufthansa conclude a cooperation agreement in which the main component will be a coordination of the airlines' scheduled service network throughout the world. The cooperation agreement will come into force on 1 January 1996 provided it is approved by the EU Commission.

12. The central government and farmers' organisations concludes a new agricultural agreement which entails that support to farmers will be reduced by Nkr 900 million. Of

this amount, reduced transfers over the government budget will account for NKr 380 million and reduced prices to farmers for agricultural products for NKr 520 million. This will result in cheaper meat, cheese and milk for consumers.

17. After being towed for a week, the Troll platform reaches the field where it will remain for the next 70 years. The field is Europe's largest offshore gas field with about 1 300 billion cubic metres of recoverable gas reserves. The Troll platform is the world's largest concrete platform, and the first platform secured to the seabed at a depth of 300 metres. The total cost of Troll phase 1 is expected to be about NKr 30 billion.

22. The managing director of the Norwegian State Railways (NSB), Kristian Rambjørg, resigns from his position with immediate effect. The Board of NSB feels that a change in management is necessary to solve the enormous financial problems of the company.

24. The Ullstein Group is awarded a ship contract worth NKr 220 million. The contract was concluded with the state of South Korea, and relates to a seismic research vessel. South Korea is the world's second largest shipyard nation.

30. Wilrig is awarded a contract by the Brazilian oil company Petrobras for drilling deep-sea wells on the Brazilian continental shelf. The contract is worth about NKr 360 million.

31. The Federation of Norwegian Professional Associations, the Norwegian Police Federation and the Norwegian Union of Teachers select some of their members for strike action. Among the strikers are physicians, police officers and nursery school teachers.

June

1. Floods in the eastern part of Norway destroy buildings, roads and cultivated fields.

1. Norsk Hydro and Kværner Masa Yards sign a letter of intention concerning the development of a floating storage unit on the Njord field. The contract is worth NKr 470 million.

1. Norske Skog invests NKr 370 million in Follum Fabrikker in Hønefoss to develop two new high-quality types of paper.

3. The Government decides to introduce compulsory arbitration for the police.

6. After the Federation of Norwegian Professional Associations announces plans for an escalation of the strike, by including air controllers and the weather forecasting service, the Government decides to introduce compulsory arbitration. The Norwegian Union of Teachers has decided that the strike among nursery school teachers shall be escalated.

12. The Storting approves the EU's oil directive, entailing that the EEA Agreement shall also apply to the Norwegian continental shelf.

Norway — the Nordic power house

Torstein Bye and Tor Arnt Johnsen

Abstract: Electricity markets have typically been regulated all over the world. In Europe, UK and Norway have begun to deregulate their electricity markets. Several more countries will probably join them in the near future, for example Finland, Sweden and Spain. The objectives are twofold: to increase efficiency and to contribute both locally and globally to environmental improvement. Even larger regions like the European Union, plan to deregulate their internal electricity markets. For the EU this implies introduction of third party access to the transmission grid within and between the Union member countries. In this context, the Scandinavian push towards deregulation is an interesting experiment. We discuss the consequences of an international deregulation of electricity market using simulations on an empirical energy market model for the Nordic countries. Deregulation may have severe effects on the location of new power plants within the Nordic area and has a major large impact on the income distribution both among countries and between electricity producers and consumers. The beneficial effects of deregulation are highly dependent upon the Nordic natural gas market trade and prices.

1. Introduction

Electricity markets all over the world are still heavily regulated. The most common and important regulatory feature in these markets is the regional electricity companies exclusive right to deliver electricity to all customers in their region. Regulation of foreign trade are also common. In addition the price of electricity is often administratively set rather than determined in the market.

In Europe, UK and Norway have begun to deregulate their electricity markets. Several more countries will probably join them in the near future, for example Finland, Sweden and Spain. In UK, a gradual deregulation is chosen. The process will be completed in 1998 when customers with peak demand less than 100 kW will be free to seek supplies from sources other than their regional electricity company. In Norway, all customers was given free access overnight 1. January 1991. However, much remains to be done; for example, long-term power contracts with power-intensive industries (which comprise 30 per cent of the Norwegian electricity demand) have been excluded from the deregulation. In addition, foreign trade is subject to considerable limitations on the possibilities for entering into long-term export/import contracts. However, an important first step in the direction of a more efficient Norwegian electricity market has been taken¹

Even larger regions, like the European Union, plan to deregulate their internal electricity markets. For the EU, this implies the introduction of third party access to the transmission grid within and among the Union member countries which again requires deregulation within each member state.

In Sweden, the approved deregulation of the electricity market was postponed as of 1. January 1995 pending

further studies. If Sweden follows Norway's example², the two largest national electricity markets in the Nordic area will be deregulated. This permits a more efficient utilisation of these countries' energy resources. If Norway and Sweden are gradually to have one electricity market, this will require an arrangement which allows third-party access to the transmission grids. Solutions will also have to be found for the practical problems associated with a joint Norwegian-Swedish exchange of electricity. Finland has announced that it will follow in the footsteps of Norway and will deregulate its national electricity market in mid-1995. At the moment, it appears that deregulation will not take place in Denmark for a long time.

One factor that is expected to induce a considerable exchange of electricity among the Nordic countries is the difference in cost structures in the national power generation systems. Norway primarily uses hydropower with high fixed costs and low variable costs. Therefore it is not very costly to regulate Norway's electricity production up or down. Sweden has sizeable quantities of hydropower and nuclear power, as well as power generation based on fossil fuels. Denmark has substantial coal-based power production (considerable use of combined heat and power cogeneration) and wind power, while Finland has nuclear power, hydropower and coal-based power generation. Nuclear power generation has high fixed costs, although they are lower than for hydropower. In relative terms, conventional thermal power generation has lower fixed costs and higher variable costs than hydro power generation. Moreover, the short-term regulation of thermal power generation is more costly than for hydropower. In what follows, we will disregard the short-term exchange of electricity and concentrate on long-term trade.³

1 Jess Olsen (1995) gives a more comprehensive discussion of the different regimes and experiences.

2 Sweden has indicated that a deregulation of its electricity market will take place at the beginning of 1996.

3 The consequences of this for our results are commented on below.

Table 1. Electricity production by technology and some purchaser prices, 1991

	Sweden	Norway	Finland	Denmark
Production (TWh):				
Hydro	62.3	110.5	13.0	
Nuclear	73.5		18.4	
Back-pressure ²⁾	6.3	0.3	16.7	0.5
Condens incl. heating ²⁾	0.5	0.2	7.1	32.9
Wind				0.8
Prices (Nkr/kWh):¹⁾				
Households	0.54	0.39	0.55	0.90
Industry	0.33	0.18	0.28	0.39

¹⁾ USD=6.48 Nkr in 1991

²⁾ Based on coal, oil or biofuels

Modernisation of power stations, higher demand for electricity and more stringent environmental requirements all favour the increased use of natural gas. Gas-based power generation and exports of electricity to the other Nordic countries can take place in the event of surplus capacity in electricity transmission lines from Norway. Better utilisation of waste heat from gas-based power generation in other countries⁴ and considerable demand for electricity may, however, justify investment in gas pipelines and could result in power generation through the use of natural gas in the other Nordic countries.

An important basis for profitable trade in electricity is that there are price differentials for electricity between the countries, see Table 1. There are also substantial price differentials for various end uses within each country. The prices are highest in Denmark and lowest in Norway. Some of the differences, especially in the residential sector are due to different electricity taxes. However, correcting for differences in taxes still leaves price dissimilarities.

In recent years, there has been growing interest in the co-ordination of the Nordic countries' measures to combat air pollution. This may be of considerable importance for future electricity trade in the Nordic area. The power generation systems in the various countries are very different with regard to pollution. A co-ordinated climate policy might entail considerable changes in the profitability of thermal power generation in the future. For example, there may be a substantial shift from the use of oil and coal to the use of natural gas in power generation⁵. The export of electricity or natural gas from Norway to the other Nordic countries is thus a relevant issue. The question of when and where possible gas pipelines should be established will be determined by several of the factors mentioned above.

Norway has considerable natural gas resources in the North Sea and Barents Sea. In 1993, about 25 mtoe of natural gas and 3.5 mtoe of NGL/condensate were produced in Norway. This is equivalent to about 0.8 per cent of the world's natural gas production. Norwegian natural gas pro-

duction is expected to increase substantially from 1996 (doubling towards the turn of the century).

The export of natural gas to the Nordic countries is a recurring theme in public debates. The discussion revolves around the use of Norwegian gas, both in industrial processes and for gas-based electricity generation. In recent years, gas-based power generation in Norway for the export of electricity to neighbouring countries and possible gas exports for gas-based power generation in import countries have been the focus of discussions.

In order to analyse the Nordic electricity market more closely, Statistics Norway has developed a Nordic energy market model. In section 2, we describe briefly the most important aspects of this model. In section 3, we present some features of the Nordic natural gas market. The Nordic energy market model can be used for analysis of the electricity market and help us to evaluate the profitability of gas and electricity trade among Nordic countries, see section 4.

2. The model

The Nordic energy market model is a partial equilibrium model, see Figure 1. Partial implies that the model only describes the energy market, i.e. the final uses of oil and electricity and the use of the inputs water, oil, gas, coal and biofuels in electricity generation. The model does not encompass the use of energy for transport purposes. Equilibrium implies that the supply and demand for electricity balance. For other goods, world market prices or constant prices apply, given certain supply limitations (particularly for natural gas and biofuels). Perfect competition ensures that all prices in the model correspond to the world market price or to the marginal production cost, unless autarchy (no trade) is assumed. The model describes the demand for energy in each of the Nordic countries (Norway, Sweden, Denmark and Finland) by five sectors: power-intensive industries, pulp and paper, other manufacturing, services and households.

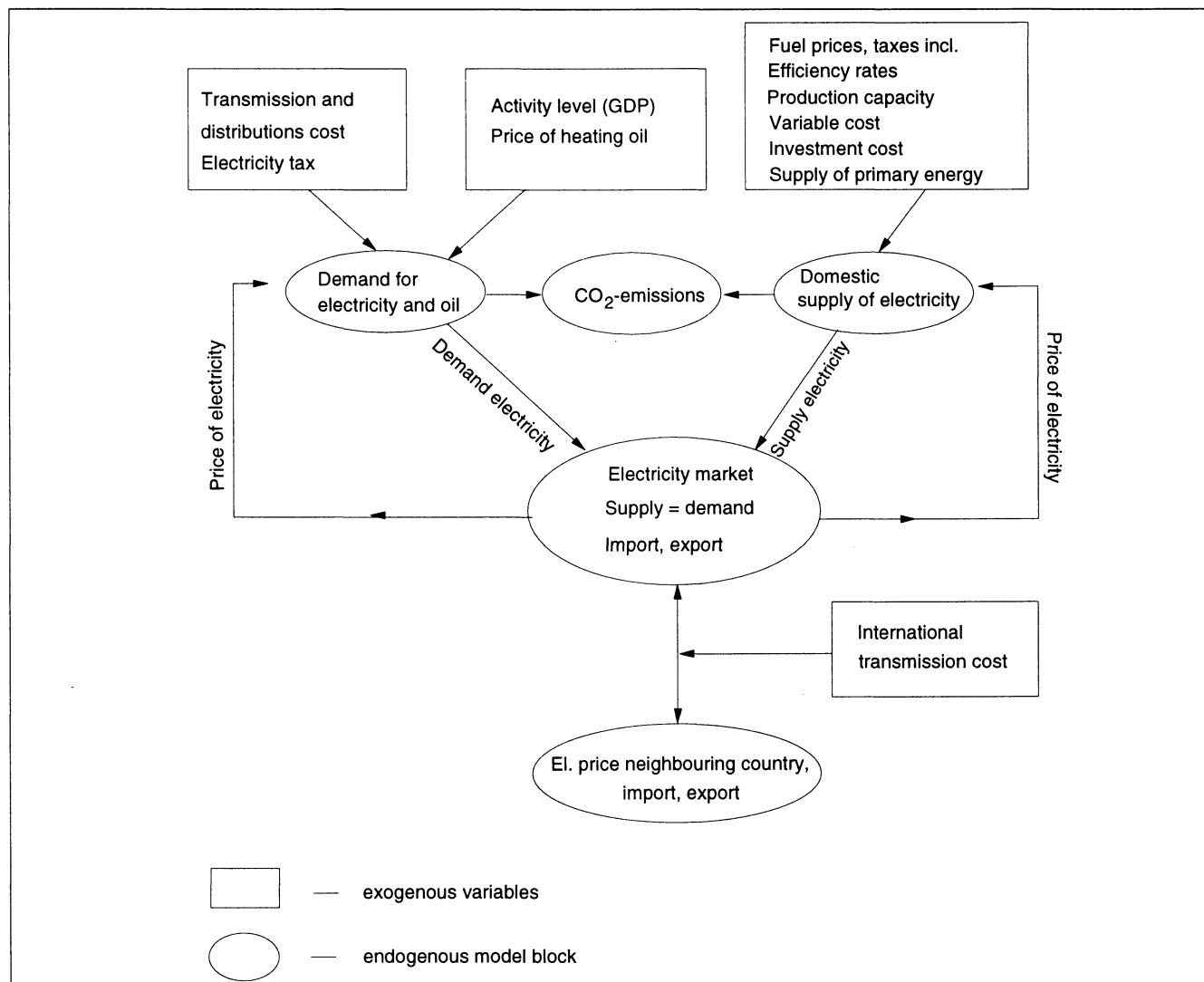
2.1 Demand for electricity and oil for final consumption

Electricity demand in the model is based on actual developments in the 5 specified sectors in each country over the last 15 years. The level of activity (changes in production or revenues), the price of heating oil and the price of electricity are the driving forces in the Cobb-Douglas derived demand functions for electricity and oil. The price elasticities vary between 0.2 and 1.5 dependent upon sector and country. The scale elasticities vary between 0.7 and 1.0. A more detailed description of the demand system is presented in Bye and Johnsen (1995).

⁴ The consequences of this for our results are commented on below.

⁵ See Bye and Johnsen (1995) for a more detailed discussion of the Nordic electricity market and a joint Nordic environmental policy.

Figure 1. The Nordic energy market model



2.2 The supply of electricity

Existing power stations are, on average, assumed to have a remaining life of 15 years, with the exception of hydro-power and nuclear plants which are projected to produce beyond the end of the simulation period (2010). Each technology is described by the fuel, an accompanying fuel price, fuel efficiency and variable cost. World market prices are used as a basis, adjusted for transport and receiving costs for uranium, coal and oil. Biofuels and peat are present in limited quantities in each country, and the prices of these fuels are estimated separately for each country. The price and supply of natural gas are discussed separately in section 3.

In addition to already existing power stations, each country may choose from a selection of new power generation technologies. A large number of alternative technologies with varying operating and investment costs are specified in the model.

In the model, generation capacity will be expanded if the market price exceeds variable costs plus fixed costs (measured as annual cost per kWh). The importance of uncertainty and/or strategic adaption to investments in new capacity is disregarded.

2.3 Transport of electric power

The domestic price of transport of electricity for each country is assumed to cover the costs of the grid owner. A total unit cost is applied for domestic electricity transport. Various consumers, however, use electricity at differing voltage levels, and transport prices therefore vary between users.

Table 2 shows today's capacities for electricity transmission between pairs of Nordic countries.

An efficient use of existing transmission capacity is characterised by price equal to short-term marginal costs (losses and variable operating costs). When the capacity limit of the grid is reached, the price will rise. When the price exce-

Table 2. Existing transmission capacity between the Nordic countries. MW, 1994

	Denmark	Finland	Norway
Norway	990	50	
Sweden	1 870	1 335	2 160

Source: NORDEL (1991)

Table 3. Total unit cost for transmission of electricity between the Nordic Countries, Nkr/kWh

	Denmark	Finland	Norway
Finland	0.056		
Norway	0.035	0.046	
Sweden	0.035	0.020	0.035

Source: NWE and own estimates

eds the cost of developing new grid capacity, new investment will take place. Unit costs for transmission of electricity between the Nordic countries, including investment costs, are reported in Table 3.

2.4 Market clearance

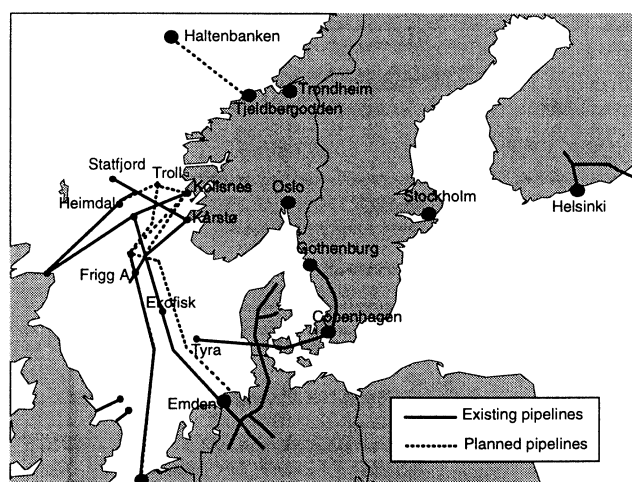
The electricity market is characterised by producers maximising their profits and households maximising their utility. In addition, electricity prices equal the marginal production cost (long run or short run depending upon capacity utilization) plus transport costs and taxes. This implies that the model exclude any type of market power or strategic behavior.

There is a balance between supply (including imports) and use of electricity in each country. Based on the model's solution, consumer and producer surpluses can be calculated for each scenario. The model can also incorporate barriers to trade in electricity. When trade is permitted, the price of electricity will be the same in the various countries, adjusted for the transmission costs between the countries.

3. Natural gas in the Nordic countries

Norway and Denmark extract natural gas from the North Sea. Finland imports natural gas from Russia, while Sweden imports natural gas from the world market. In Denmark, Finland and Sweden, existing transport capacity and terminal capacity limit the quantity of gas that can be used in electricity generation.

Most gas pipelines are located in the North Sea, from which there are pipelines to the UK, Germany and Belgium. Figure 2 shows that there are also pipelines to mainland Denmark which continue on to the Malmø and the Gothenburg area in Sweden. Parts of these pipelines are tied up in deliveries for industrial purposes. In the

Figure 2. Existing and planned gas pipelines

calculations, it is assumed that in Denmark and Sweden the current installations can provide a maximum use of gas in electricity generation of 0.4-0.5 mtoe per year. This corresponds to about 2.5 TWh electric power when gas is utilised in a thermal power plant. In Finland, the transport capacity of the pipeline from Russia sets a limit on imports. This is assumed to be 2.5 mtoe a year (14 TWh). New pipelines must be laid for quantities exceeding this limit. In our analysis we have assumed two possible gas pipelines. Both are based on the delivery of natural gas from the North Sea.

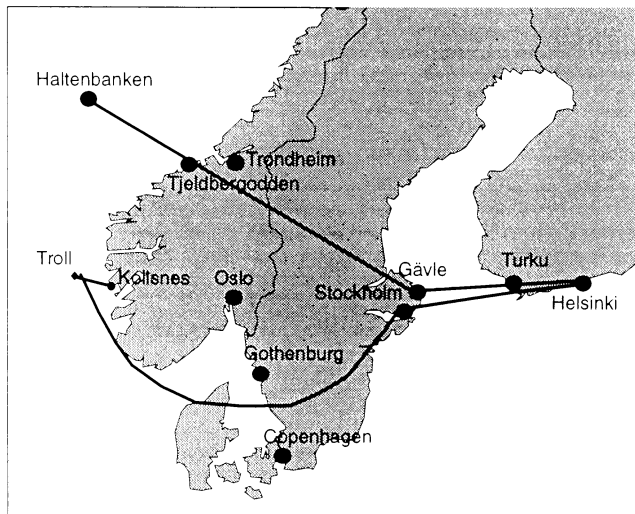
One alternative is based on the production of natural gas on the Haltenbanken. We have assumed a maximum annual supply of natural gas from the Haltenbanken of 3.8 billion Sm^3 (corresponds to about 20 TWh electricity) and an average cost of 0.75 Nkr/ Sm^3 for gas delivered from these fields. The Troll field further south in the North Sea is another alternative with a maximum supply of 8 billion Sm^3 (45 TWh) per year⁶ at a cost of 0.62 Nkr/ Sm^3 . With a higher extraction of gas from the Troll field or surrounding fields, the maximum supply may reach more than 8 billion Sm^3 .

We analyse two gas pipelines for the transport of gas from the Haltenbanken and Troll to the other Nordic countries, cf. Figure 3. The pipeline from the Haltenbanken goes to Tjeldbergodden where Norwegian methanol production has been established. The pipeline continues further across the mountains and into Sweden. It is brought to Gävle, north of Stockholm, and on to Turku, Finland. The pipeline from the Troll field stretches to Denmark, continues to Sweden (south of Stockholm) and from there across the Baltic Sea to Finland.

Based on cost estimates connected with the transport of gas in underwater or onshore pipelines - including capital cost, transport prices for natural gas are estimated for the

6 This refers to the supply for gas-based electricity generation in the Nordic countries. In addition, large quantities of Troll gas are sold to the rest of Europe.

Figure 3. Two pipeline alternatives



various countries. An estimate of USD 2.50 per 100 km per toe is used for all land-based natural gas transport. For the underwater transport of natural gas, an estimate of USD 3.75-7.50 per 100 km per toe is used, depending on the length of the underwater cable. The low estimate is used for the pipeline from Troll to Denmark, while the high estimate is used for the other pipelines.

Our estimates are assuming a transportation volume large enough to make the pipeline investments profitable.

4. Calculations

We run three scenarios on the model to illustrate the effect of different regulatory regimes on the energy and electricity market and on welfare represented by consumers plus producers surpluses. The model is simulated from 1991 (the base year of the model) to the year 2010. In the reference scenario, there is no trade in electricity or natural gas among the countries. In the next scenario we add free trade in electricity among the Nordic countries. In the third scenario, we also allow for trade in natural gas among the Nordic countries.

4.1 Reference scenario

An important explanatory factor for the change in energy consumption from the present time to the year 2010 is the change in the level of economic activity. Economic growth is specified for each sector and is largely based on official country specific projections. Economic growth is exogenous in the sense that it is the same for all scenarios. Average economic growth over the period for each country and each sector is shown in Table 4.

Another important exogenous variable is the world market price of crude oil. It is assumed to be independent of the

Table 4. Average economic growth by sector and country. Percentage

	Denmark	Finland	Norway	Sweden
Metals	-0.5	-0.5	-0.5	-0.5
Pulp and paper	1.0	-0.5	-0.5	-0.5
Other manufacturing	1.0	1.0	1.6	1.5
Services	2.5	2.0	3.0	1.9
Residential	2.0	1.5	2.5	1.7

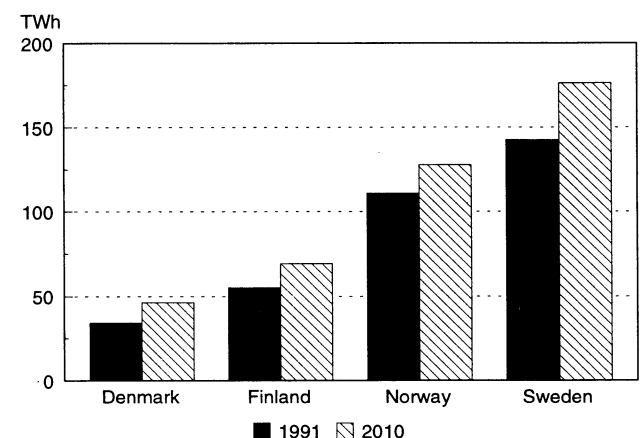
Nordic energy market and is held constant at USD 18 per barrel (1991-prices) throughout the simulation period.

In the reference scenario we assume free competition in the domestic electricity markets, even though this does not correspond to the actual situation in all countries. This has been done in order to isolate the effects of more international and market-based trade in electricity and natural gas in the Nordic countries from the national deregulation effects⁷.

Electricity generation in the base year (1991) and the simulated production in 2010 in the Nordic countries the reference scenario are shown in Figure 4. With an annual growth of 1.6 per cent, Denmark shows the highest percentage rise in electricity production. Estimated production will be 46 TWh in 2010. In Finland and Sweden, the annual growth is 1.2 and 1.1 per cent respectively. Finland's electricity generation in 2010 amounts to 69 TWh, while in Sweden it is 176 TWh. In relative terms, the lowest production growth is found in Norway, with an annual rate of 0.75 per cent. This results in a production of 128 TWh in 2010. In total, electricity generation in the Nordic countries increases from about 340 TWh in 1991 to a little less than 420 TWh in the year 2010, which corresponds to an annual growth of 1.1 per cent.

The new Energy Act in Norway came into force on 1 January 1991. This means that the Norwegian electricity

Figure 4. Production of electricity in year 1991 and 2010. Reference scenario. TWh



⁷ Bye and Johnsen (1991) looks at the domestic effects of deregulation of the Norwegian electricity market.

market was less regulated than the other Nordic electricity markets in 1991. Since the model presumes deregulated markets in all Nordic countries, a large part of the estimated increase in electricity generation in Denmark, Finland and Sweden is due to domestic deregulation, while this is not the case in Norway.

It is important to note, however, that in our calculations the effects of internal deregulation in Norway are underestimated. Even though deregulation entails that all price discrimination ceases, Norwegian power-intensive industries maintain their pre-deregulation production levels and, in part, their electricity consumption as well. This is because the model is a partial energy model in the sense that sectoral production levels outside the power producing sector are exogenously determined. In Bye and Johnsen (1991) it is estimated that 5 - 8 TWh per year might be freed if power-intensive industries were faced with the same transport-adjusted prices as other electricity purchasers. The consequence of this for the scenarios with Nordic electricity trade, presented below, is that the potential for Norwegian export of electricity is underestimated, and the need for expanding Norway's electricity generation is overestimated.

The growth in Denmark's electricity generation of 12 TWh over the simulation period is primarily from coal-based thermal power, partly combined with district heating. The growth in Finland's electricity production largely consists of gas-generated power (14 TWh) based on imports of Russian natural gas. In Norway new waterfalls are developed, increasing hydropower production by 14 TWh. In addition, a gas-generated power station with a production of about 5 TWh is built. The growth in Sweden's electricity generation of 33 TWh is based on oil-fired and coal-fired thermal power. Sweden's thermal power is partly combined with district heating. An important assumption is that Sweden's nuclear power is maintained at the existing level. With a scaling back of nuclear power, the need for new power generation in Sweden (or the need to import power) will increase dramatically.

4.2 Nordic free trade of electricity

In this scenario, free trade in electricity among the countries is permitted, while trade in natural gas is not. Producers and consumers in each country can thereby trade electricity with participants in other Nordic countries. Figure 5 shows the production and consumption of electricity in the year 2010 in the four countries. Finland and Sweden are net importers of electricity while Norway is a net exporter. Norway's electricity export is as high as 26 TWh, of which 19.5 TWh goes to Sweden, while 6.5 TWh goes to Finland. In this scenario Denmark is self-sufficient in electricity in the year 2010.

If we compare this with the scenario with no trade in electricity (reference scenario), we see that consumption in the year 2010 is higher in Sweden and Finland (5.7 TWh and 4.6 TWh respectively), unchanged in Denmark and lower

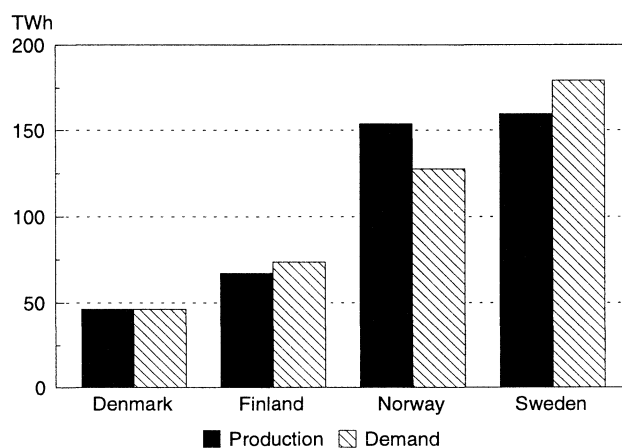
in Norway (0.7 TWh). Similarly, the c.i.f. electricity price is lower in Sweden and Finland, unchanged in Denmark and higher in Norway, see figure 8 below. In total, production and consumption in all four Nordic countries are about 8 TWh higher than in the scenario with no trade in electricity. In the three importing countries, the increase in imports is higher than the increase in consumption from the reference scenario. This implies lower national production than in the reference scenario. Electricity generation in Norway is nearly 26 TWh higher than in the reference scenario. The entire production increase in Norway is exported.

Higher consumption and lower prices in the year 2010 in Sweden and Finland are due to the supply of relatively cheap Norwegian electricity. In Sweden, the use of pulverised coal-based power generation is eliminated when imports of Norwegian electricity are permitted. The same occurs for peat-based condensed power in Finland.

In order to be able to export the quantities referred to above, Norway must build up a large-scale gas-based generation capacity, which in the year 2010 will be as much as 32 TWh. Norway's gas-based electricity generation uses gas from the Troll field. Hydropower production will be the same as in the reference scenario. As a result of the opportunity to import Norwegian electricity, Sweden can refrain from expanding its coal-fired power production, which in the reference scenario amounted to 16 TWh in 2010.

Even though electricity generation and consumption are higher in this scenario than in the reference scenario, the stationary CO₂ emissions will be lower in the year 2010. The lower emissions can primarily be attributed to the use of gas-based power generation instead of coal-based thermal power production. The effects vary sharply, however, in the four countries. While Norway, due to considerable gas-based power production, will have emissions that are twice as high as the emissions in the reference scenario,

Figure 5. Production and demand for electricity in 2010. Trade of electricity alternative. TWh



Sweden's emissions will be reduced by more than 25 per cent.

The results show that the introduction of trade in electricity increases the sum of consumer and producer surpluses in the Nordic countries by 1.4 billion Nkr (approximately .07 per cent of total GDP, i.e. almost negligible). The effects for individual sectors and countries, however, are far greater than this number indicates. For example, electricity consumers in Sweden and Finland each benefit by 3 billion Nkr due to the introduction of trade in electricity. Power producers in these same countries are adversely affected by an equivalent amount. These effects are due to the fact that Sweden and Finland at the outset (i.e. following national deregulation, but before trade) have the highest domestic electricity prices.

4.3 Free trade in electricity and natural gas among countries

When, in addition to free trade in electricity, free trade in natural gas is also permitted (essentially Norwegian natural gas exports), the consequences for the Nordic energy market are important. In this scenario both Denmark and Sweden import natural gas and produce their own gas-generated electricity. Denmark's gas-based electricity generation in the year 2010 is 21 TWh, while in Sweden it will be as much as 29 TWh. Norway's gas-based electricity generation in this scenario is a little more than 3 TWh (i.e. too small to warrant a gas-generated power station) compared with nearly 32 TWh in the scenario entailing no possibilities for trade in natural gas. In this scenario the capacity limit for natural gas from the Troll field is reached, but the extraction of gas from the Haltenbanken is still too expensive for electricity production.

Compared with the scenario involving no trade in natural gas, coal-based power is replaced by gas-generated power in Denmark, while in Sweden electricity imports from

Norway and some oil-based thermal power are replaced by gas-generated power. In the model simulation, however, Sweden's heating coefficient for gas-based power is set higher than that for Norway. This takes into account that Sweden can combine its gas-based power with local district heating, a possibility which Norway does not have due to very high distribution costs in district heating. Thus, Norway exports natural gas to Sweden. In 2010, Norway's exports of natural gas to Denmark and Sweden will be between 6 and 7 billion Sm³. This is a sufficient quantity to make a gas pipeline profitable (pipeline alternative via Jutland to West Sweden).

As Figure 6 shows, the only trade in electricity in 2010 is Sweden's exports to Finland of nearly 6 TWh, which replaces Norway's exports to Finland in the scenario with no trade in natural gas. Compared with the last scenario, the consumption of electricity is higher in Denmark and Sweden (1 TWh and 3.7 TWh) and lower in Finland and Norway (0.8 TWh and 2.3 TWh). Similarly, electricity prices in Denmark and Sweden are slightly lower (0.025 Nkr/kWh and 0.015 Nkr/kWh), while in Finland and Norway electricity prices are slightly higher (0.01 Nkr/kWh and 0.015 Nkr/kWh), see figure 8 below. Lower prices in Denmark and Sweden are due to the availability of Norwegian natural gas and thus cheaper electricity. Increased demand for Norway's natural gas in the gas trade scenario, implies that the available limit from the Troll field is reached. Norway's electricity price thus rises, but not to the extent that new and more expensive power generation in Norway (hydropower or gas-based power using gas from the Halten-banken) becomes profitable. Thus, high Norwegian price also results in a higher electricity price in Finland.

Figure 6. Production and demand for electricity in year 2010. Trade of electricity and gas alternative. TWh

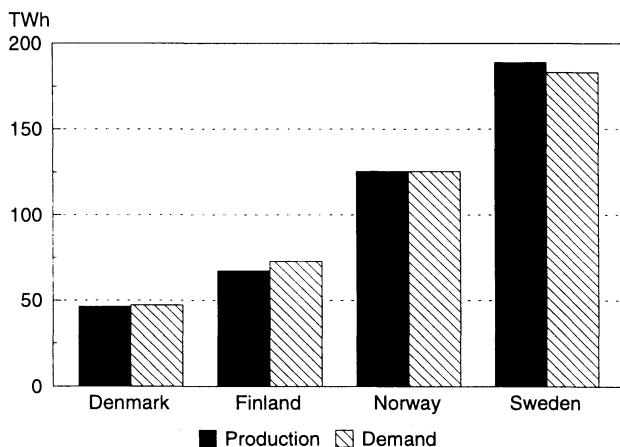


Figure 7. Electricity production in year 2010. TWh

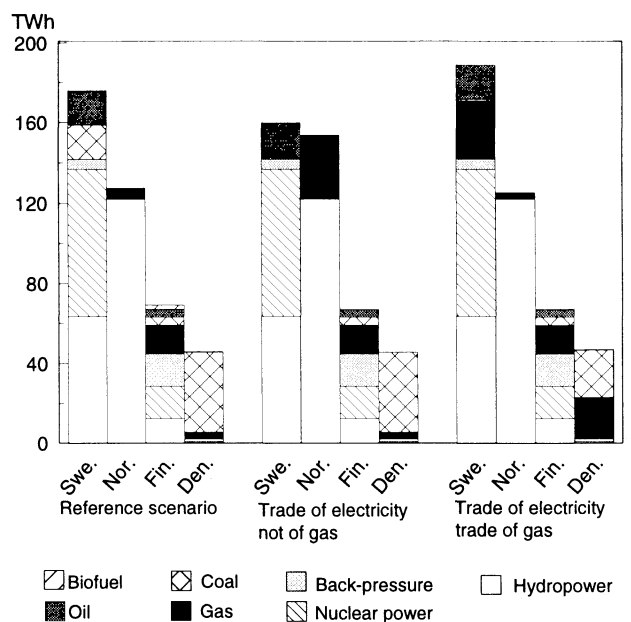
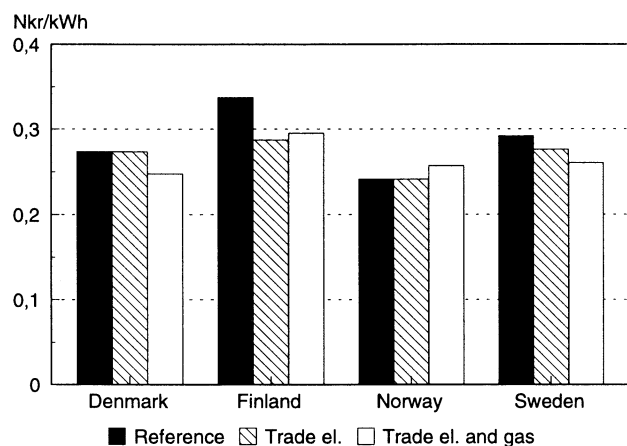


Figure 8. Electricity prices in year 2010. Nkr/kWh

In the scenario involving trade in natural gas, total CO₂ emissions in the Nordic countries in 2010 are nearly 8 million tons (about 7 per cent) lower than in the scenario without this trade, even though total electricity generation is slightly higher than in the previous scenario. The main reason for lower total emissions is that Denmark's coal-based power generation is replaced by gas-based power generation using imported natural gas from Norway.

The right to trade in natural gas increases the total consumer and producer surplus by a further Nkr 0.7 billion. The greatest individual effects from introducing gas trade are found in Norway where electricity purchasers are adversely affected and producers benefit as a result of the higher Norwegian electricity prices. In Sweden, on the other hand, electricity consumers benefit, while power producers are adversely affected as a result of gas trade. An increased supply of gas results in lower electricity prices in Sweden.

Figure 7 shows the composition of the national power systems in the three scenarios. The introduction of trade in electricity and natural gas reduces the use of coal in Nordic electricity generation. Trade in electricity and natural gas contributes to a greater use of natural gas in electricity generation.

Figure 8 shows the electricity prices (c.i.f) in the three scenarios.

5. Conclusions

Our simulations show that opening up the electricity market among the Nordic countries increases the efficiency in production and electricity use. The distribution effects may be substantial both between producers and consumers in each country and also among the Nordic countries. Deregulation also positively affects the ability of the Nordic countries to meet their goal of reducing total CO₂ emissions.

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Prospects for the World Economy

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The western market economies improved their economic situation during the course of 1994. However, average growth is projected to slow down slightly in 1995, and the pattern of growth across countries is likely to change. Economies in most of the developing world will continue to grow about twice as fast as industrialized economies. This optimistic view of the short-term economic prospects is tempered by recognition that financial markets remain volatile, especially in developing countries, and that there are pockets of sluggish growth. Low-growth and no-growth countries are concentrated among the transition economies and in Africa. Recently two interesting trends seem to emerge in the world economy: A decoupling between countries in developing regions and the industrial countries with respect to trade, and an increasing interdependency between the two groups of countries when capital flows are considered

Introduction

The world economy registered important progress on a number of fronts in 1994, indicating the start of a new expansion following the global slowdown in the beginning of the 1990s. Growth is expected to accelerate to above 3 per cent in 1995, despite widespread financial market turbulence triggered by the collapse of the Mexican peso at the beginning of the year. This projection was made during the Spring Meeting of Project LINK held at United Nations Headquarters from 15 to 18 March this year. Project LINK is an international economic research network of more than 50 country teams, of which Statistics Norway is one, coordinated by the United Nations Department for Economic and Social Information and Policy Analysis (DESIPA). The forecasts for the world economy are based on model simulations. Each of the country teams participate with a macroeconomic model for their national economy. The models are then simulated simultaneously to incorporate the effect that one country's export is another

country's import. This makes the projections more consistent than when the national teams simulate their models separately.

Economies in most of the developing world will continue to grow about twice as fast as industrialized economies. The solid growth is matched by increased trade between countries. Spurred by liberalization and the growing impact of regional agreements, world trade is estimated to have grown by more than 8 per cent in 1994, with only a modest deceleration expected in 1995. The trade volume is expanding most rapidly in the developing countries, which are also benefitting from higher world prices for non-oil commodities.

The optimistic view of short-term economic prospects that emerged from the meeting is tempered by recognition that international financial markets remain volatile, especially in developing countries, and that there are pockets of slug-

Table 1. World Output

Annual change of real GDP. Per cent

	Average 1977-86	Average 1987-91	Average 1992-96	1992	1993	1994	1995	1996
Industrial countries	2.7	2.8	2.2	1.5	1.1	2.8	2.6	2.9
USA	2.7	2.0	3.0	2.6	3.1	4.1	2.8	2.4
EU	2.1	2.9	1.9	1.1	-0.4	2.6	3.1	3.1
Japan	4.0	4.8	1.2	1.3	-0.2	0.6	1.2	3.0
Countries in transition	3.3	0.2	-7.1	-15.3	-9.2	-9.4	-3.8	3.5
Central and eastern Europe ¹⁾	2.1	-0.9	0.2	3.5	3.8	4.2
CIS ²⁾	-10.5	-20.0	-13.2	-15.0	-4.4	1.9
Developing countries	4.6	4.7	5.4	4.8	5.6	5.5	5.5	5.5
Africa	2.1	2.5	2.1	1.3	0.9	2.1	3.4	2.6
Latin America	3.2	2.0	2.9	2.1	3.3	4.3	2.1	2.7
Asia ³⁾	6.9	7.0	5.9	4.9	5.3	6.4	6.6	6.5
China	..	..	11.4	12.8	13.4	11.8	10.0	8.9

Sources: IMF (1977-1991) and Project LINK (1992-1996). The figures are estimates for 1994 and projections for 1995-1996.

1) Bulgaria, Czech Republic, Hungary, Poland, Slovakia, and Romania.

2) Source: IMF World Economic Outlook, May 1993. All former Soviet Republics and the three Baltic states.

3) IMF includes China in the figures for Asia, while LINK gives separate projections for China.

gish growth. Low-growth and no-growth countries are concentrated among the transition economies and in Africa.

Industrial countries

There was a marked improvement in the economic situation of the western market economies during the course of 1994. With buoyant economic conditions in North America and the United Kingdom, recovery in continental Europe, and a modest pickup in economic activity in Japan, output in the industrial countries advanced by nearly 3 per cent last year. Average growth is projected to slow down slightly in 1995, and the pattern of growth across countries is likely to change. Looking further ahead, there is scope for output to continue to expand at a rate of 2 1/2 to 3 per cent.

Inflation was reduced to only 2 1/2 per cent in 1994 in the industrial countries as a whole, and the projections indicate only a slight rise the next two years. To contain inflationary pressures the monetary authorities in a number of countries have already tightened monetary conditions by raising interest rates. At the same time, however, differences in cyclical pattern between countries have warranted differentiated policy stances.

Growth in North America remained surprisingly strong in 1994 despite the fact that cyclical recovery already got under way in the United States in the second quarter of 1991. The recovery has been broadly based, but with especially strong support from private consumption and investment in housing and producers' equipment. However, the change in the monetary environment, with both short- and long-term interest rates rising since the beginning of 1994, has cooled off the economic expansion. Short term indicators for the second quarter of this year point to slower growth than expected, and a mild monetary stimulus is expected during the summer. The forecasts indicate that output growth in 1995 and 1996 will be at a more sustainable level. With a reasonable conduct of economic policy, the stage should be set for a new upturn in the latter half of 1996 or in 1997.

For most countries in western Europe the recovery only got under way in the second half of 1993, but it remained weak and hesitant until the first half of 1994, when the upturn gained momentum. EU GDP is expected to grow by about 3 per cent on average in 1995 and probably pass the cyclical peak this year. In spite of the cyclical upturn, unemployment has remained high and is expected to come down slowly to around 10 1/2 per cent by 1996. The west European economies have the prospect not only of a reasonable pace of recovery in 1995 but also a possibility to correct macroeconomic imbalances. Progress with fiscal consolidation would help to alleviate the burden on monetary policy as the expansion matures. Germany, United Kingdom, Ireland and Denmark seem to be well on the way on current fiscal consolidation plans to permit some reduction in debt ratios before the end of the decade. In Austria, Belgium, Finland, France the Netherlands, Portu-

gal and Spain, measures taken so far imply a very slow reduction of underlying fiscal imbalances over the medium term. Their public debt ratios are therefore expected to remain at a relatively high level. The fiscal situation and outlook are of particular concern in Italy, Sweden, and Greece, where gross debt ratios are close to or well above 100 per cent of GDP and still rising.

After definite indications at the beginning of this year that growth in Japan was picking up, the pace of recovery now looks disappointing. The last few months have been turbulent: The earthquake in Kobe in January contributed to a lower level of activity in the first quarter, and repeated terrorist actions have shocked the country's previously sheltered society. Further problems loom with the country's financial sector in deep trouble. The government has recently raised its previous estimate of bad debts in the banking system to 40 trillion yen (10 per cent of GDP), and the situation may be even worse. In addition, the yen has appreciated by about 15 per cent against the US dollar since the beginning of the year, resulting in strong pressures on the export industry's profitability. The projections indicate sluggish growth in Japan in 1995 with a possible upturn in the economic activity next year.

Economies in transition

As the western market economies are emerging from one of the most severe cyclical downturns since the second world war, an increasing number of transition economies in eastern Europe have begun to show signs of recovery from an adjustment slump which has been as, or more, severe than the collapse of the interwar years. In 1994 GDP rose in most of the east European economies. The economic situation in the transition countries of eastern Europe and the former Soviet Union remains very diversified, however. Market reforms and stabilization efforts have proceeded at various speeds, followed different programs and achieved varying degrees of success. Considerable progress has been made in most countries of eastern Europe, where economic recovery is well under way and medium-term prospects for growth are much improved. The situation is very different in the countries of the former Soviet Union. Most of them are still in deep economic decline and macroeconomic, as well as political, stability is far from being achieved.

While the situation differs considerably across the east European region, two main positive tendencies can be observed in nearly all the countries concerned. First, output growth, which in some countries started as early as in 1992-93, has now taken firm hold, especially in countries that are the most advanced in the transition process. Rates of economic growth have picked up steadily and in the Czech Republic, Poland, Slovakia and Slovenia estimated GDP growth ranged from 2 1/2 to 6 per cent in 1994. The projections point to a continued positive development with growth rates approaching or exceeding 5 per cent in 1995. Macroeconomic performance in the Baltic countries has also remained impressive, although stained by severe bank-

ing problems in Latvia recently. The recovery of output is now well under way, however, with real GDP forecast to grow by 5 per cent or more in 1995 in all three countries. Growth was slower in Hungary, and in contrast to most other transition economies of central and eastern Europe, growth is expected to decelerate in 1995.

The second positive tendency that emerged during 1994 was a significant slow-down in inflation, especially in the countries where the rates of price increases were relatively high in 1993. Substantial progress on the inflation front has been achieved in Croatia, Albania and Romania, while inflation seems to be more resistant in Hungary, Poland and, particularly, in Bulgaria. In the latter country substantial currency devaluations and large budgetary spending, as well as increases in domestic tax rates and energy prices have all contributed, to varying degrees, to an upward pressure on prices. As in 1993, the Czech Republic and Slovakia had the lowest inflation rates in the region last year (10 and 13 per cent per annum respectively), and a further slowdown is projected for the next two years.

The economic recovery and the falling inflation of the countries in eastern Europe have to be seen in perspective. The overall level of output in these countries is still some 20 per cent below pre-transition levels, current inflation rates are well above those in most western market economies, and the fledgling capital markets in the region suffered serious setbacks during 1994. More important, prospects for future growth depend heavily on a resolution of important structural problems plaguing transition economies. Some of the main problems are high unemployment, fragile fiscal balance, weak asset portfolios of commercial banks, and heavy indebtedness of state enterprises. Among all these, unemployment is at the forefront of all policy dilemmas, not only because it has assumed very large proportions, but also because a large and growing part of unemployment is now long term. In many of the countries in the region unemployment rates are now well into double digits, with more than half of the unemployed being without a job for more than one year. The Czech Republic is the exception with a registered unemployment rate of 3 per cent last year. The Baltic countries were also in a more favourable position with rates ranging from 4 to 8 per cent.

With all these problems still to be tackled, eastern Europe is nevertheless in a much more favourable position than the countries of the former Soviet Union. Macroeconomic developments in 1994 were worse there than expected, especially with respect to output levels and financial stability. In Russia economic activity contracted sharply last year, with GDP falling by an estimated 20 per cent. Financial instability continued in Russia into the early part of 1995. Stabilization seemed within reach in 1994, as inflation declined to single-digit levels by the summer, and the fall in industrial production seemed to come to a halt. Financial stabilization failed, however, as the fiscal deficit widened and inflation picked up to some 17 per cent a month (over 500 per cent annual rate) by the end of the year. The breakout of open war in Chechnya in December

1994 added further pressures to an already difficult fiscal position. Real GDP is projected to decline further in 1995, although the official statistics probably exaggerate the degree of contraction.

At the heart of the economic problems of Russia is the weakness of the state and the lack of credibility of government policies. The inability to arrive at a political consensus and constant controversies between proponents of market economy and pro-state strategies have been the source of mixed and confusing signals sent to economic agents. As long as the government does not come up with a sensible solution to the widening budget deficit and non-payment in the enterprise sector, the necessary restructuring of the economy is left unsolved. Tolerating massive payment arrears of enterprises is clearly motivated by socio-political considerations. Tough financial discipline on enterprises may cause mass bankruptcies and rapidly growing unemployment. However, the policy of implicit bail-outs only postpones the problem of adjustment, because as long as enterprises are not confronted with a clear and credible threat of bankruptcy, they have little incentive to shift from political lobbying to genuine restructuring. The weakness of the government has been further confirmed by its apparent inability to control its inefficient administration and its inability to improve the discipline of contracts and the enforcement of laws. Only when the Russian government is perceived as being committed to a clear vision of reforms and having the political determination to go ahead with its plans, can stabilization measures be expected to elicit the required reactions by enterprises.

The lack of progress in the transformation process in Russia also has a negative impact on capital flows. In the early stages of the transition, capital flight, debt servicing, and the limited availability of foreign loans resulted in net outflows of capital from all of the former centrally planned economies. In central and eastern Europe, these outflows were reversed in 1992 reflecting external assistance from official creditors and rising inflows of foreign direct investment. In Russia net capital flows were probably still negative in 1994, and the scale of foreign direct investment remained relatively small. Overall, the magnitude of capital flows to transition economies has been smaller than expected early in the transition. Total inflows amounted to \$15 billion in 1993 and preliminary estimates from IMF suggests a decline to about \$10 billion for 1994.

Developing countries

Fundamental improvements have occurred in recent years in economic policies and performances in most of the developing world. These improvements have allowed the developing countries to experience average growth rates of about 5 1/2 per cent during the 1990s, nearly the double rate of the industrial countries. The prospects for sustained gains in output and living standards in the future are also better than they have been for a long time. However, the diversity among the regions are illustrated in table 1. While the Asian countries generally have experienced high

Table 2. Weights of Country Aggregates in the World Economy

In per cent of world GDP 1990 based on purchasing power parities

Industrial countries	54.4
USA	22.5
Japan	7.6
EU	18.5
Rest of OECD	5.8
Developing countries	34.4
Africa	4.0
Latin America	8.2
Asia	17.7
Middle East	4.5
Countries in transition	11.2
Former Soviet Union	8.3
Central Europe	2.9

Source: IMF World Economic Outlook, May 1993

Table 3. Capital flows to developing countries

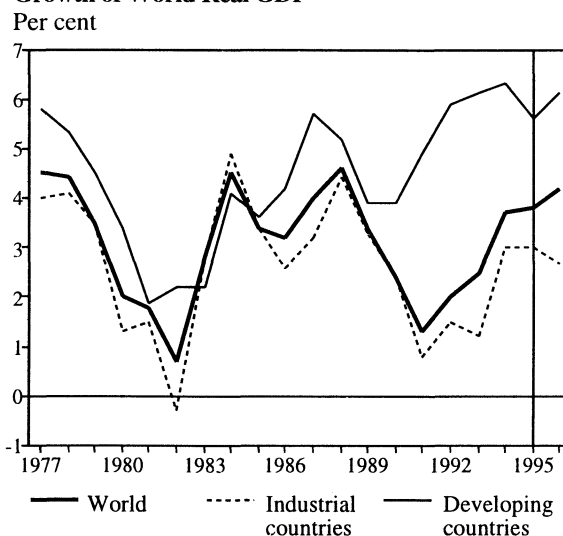
In billions of US dollars

	1989	1990	1991	1992	1993
Africa					
Direct investment	2.7	1.1	2.1	2.4	1.7
Portfolio investment	-0.4	-0.3	..	3.4	-0.4
Latin America					
Direct investment	7.2	6.9	11.2	12.8	14.1
Portfolio investment	-1.3	9.0	16.5	26.5	50.1
Asia					
Direct investment	4.9	9.8	16.2	21.8	40.7
Portfolio investment	0.4	-1.9	2.9	5.3	9.9

Source: IMF Balance of Payments Statistics Yearbook 1994

growth rates the last two decades, Latin America, and particularly Africa have lagged behind. The projections indicate that this situation will continue, despite encouraging outlooks for some of the countries in the slower growing areas. The recent turmoil in financial markets could affect developing country growth adversely in the short run. If the contagion effects from the Mexican crisis were to result in a collapse of confidence in the prospects for all the emerging market countries, with a large slowdown in capital flows, this would give a considerable negative impact to the growth potential.

One interesting trend emerging in the world economy is the decoupling between countries in developing regions and the industrial countries with respect to trade flows. This tendency is particularly pronounced in Asia where intra-regional trade increased from around 30 per cent of total trade in 1986 to 42 per cent in the early 1990s. A similar trend, although to a smaller extent, has been observed in Latin America where the intra-regional trade increased from 13 per cent in 1990 to nearly 22 per cent of total

Growth of World Real GDP¹⁾

1) Projections for 1995 and 1996.

Source: IMF World Economic Outlook.

trade last year. Africa, however, is still very dependent on the industrial countries for foreign trade.

Another feature of the world economy is the increasing interdependency between industrial countries and developing countries when capital flows are considered. The net capital flows to developing countries have increased considerably the last five years. In 1989 there was an outflow of capital from the developing countries of \$14 billion, whereas in 1993 the net inflow exceeded \$130 billion. Among the developing countries, those in Asia have been by far the main recipients of capital inflows (see table 3). Foreign direct investment in Asia, and notably in China, has grown particularly rapidly in recent years, with the region receiving above \$40 billion in 1993. However, intraregional foreign direct investment, notably by residents of Hong Kong and Taiwan, has grown significantly and thereby mitigated the interdependence to a certain degree.

Countries in Latin America, especially Mexico, Argentina and Chile, have also benefited considerably from foreign direct investment, which amounted to over \$14 billion in 1993. But inflows in the form of private bond and equity financing have played an increasingly important role, reflecting the changing structure of capital markets in these countries. Portfolio investment inflows in the region reached \$50 billion in 1993. The recent turmoil in the financial markets following the Mexican crisis illustrate the vulnerable position of countries with large portfolio investment. These capital flows will to a larger extent be reversed in situations of lost confidence than direct investment flows.

An interesting feature of recent capital flows is that they have been directed mainly to successful middle-income countries, and to low-income countries with promising growth prospects such as China and India. These two countries represent the largest markets in the developing world. However, most African countries continue to attract very

little private capital. Although there has been a slight increase in foreign direct investment from the late 1980s, it still remains small compared to other regions, and in 1993 the continent attracted a total of \$1.7 billion. This tendency reflects low growth prospects and political and macro-economic instability which make returns on investments in the African countries highly uncertain.

Africa

The African countries expanded by an estimated real GDP growth rate of 2.1 per cent in 1994. This was an improvement from the mere 0.9 per cent registered in 1993, but still below the population growth rate of 3.1 per cent. The average income per capita has generally fallen every year since 1980. The situation is particularly severe in the Sub-Saharan countries. The declining trend in per capita real incomes coincided with widening domestic and external imbalances, mounting external debt burdens and debt-servicing difficulties, and a worsening in the plight of economically and socially vulnerable groups. A number of factors, both exogenous and policy related, have contributed to the disappointing overall economic performance.

The external environment has been generally unfavourable, with falling commodity prices resulting in substantial losses in terms of trade. The Sub-Saharan African countries are especially vulnerable to terms of trade losses because the export earnings of virtually all the countries are heavily concentrated on one or two primary commodities. The majority of the Sub-Saharan African countries are confronted with deep-rooted developmental constraints. They are plagued with rapid population growth, low human capital development, inadequate economic and social infrastructure, and structural rigidities. All these factors are both a cause and a consequence of poor economic performance. Moreover, political factors have severely worsened and in some cases, devastated the economic environment. Ethnic conflicts, political instability or protracted civil wars have held back economic performance in a number of countries.

The modest recovery in 1994 has not been equitably shared between different countries in the region. Eleven countries recorded negative growth rates, while twelve countries experienced growth rates between 5 and 8 per cent. The output in the majority of African countries was propelled by the agricultural sector which was revived due to improvements in the weather conditions in most parts of the region. A number of countries have implemented structural adjustment programs and there has been some improvement in their economic fundamentals, permitting an increase of real GDP growth.

The projections indicate a brisker growth rate this year, but the risks of setbacks are considerable, and economic conditions remain difficult in many countries. Sustained economic recovery and transformation is unlikely to be achieved in Africa unless there is long-lasting peace and political stability. Progress in removing structural and insti-

tutional rigidities has fallen short of initial expectations and saving and investment rates remain too low to support satisfactory sustainable growth.

Latin America

New evidence of a more positive economic performance in Latin America appeared in 1994. The growth rate of real GDP in the region rose from an average of 2.8 per cent in 1991-1993 to 4.3 per cent in 1994. Average inflation (excluding Brazil) fell to 16 per cent, a record low in recent years. And Latin American countries continued to attract large amounts of foreign capital - nearly \$57 billion in 1994 according to preliminary estimates - which financed the growing current account deficit.

Growth in the Latin American region is projected to slow down in 1995 and 1996 under the influence of tighter policies and a decline in portfolio capital flows from the high levels recorded in recent years (see table 3). In some cases, this tightening of policies represents an effort to avoid overheating of the economy. In others, it reflects responses to the contagion effects in the wake of the Mexican financial crisis. In the event of a very sharp and sudden decline in capital flows, activity would slow down more significantly because of the resulting need to tighten economic policies and reduce domestic demand and imports.

The prospect for the Mexican economy has changed dramatically since December 1994 when the exchange rate crisis began. What started as a peso crisis evolved into a financial crisis and is now an economic one. Output is expected to fall by more than 2 per cent in 1995, but as financial conditions stabilize, activity is assumed to pick up again in 1996. The sharp depreciation of the peso in the first quarter of 1995 led to a substantial increase in prices. Tight fiscal policy is expected to contain the inflation to around 30 per cent this year, with a considerably lower rate expected in 1996. Growth in Argentina is expected to slow significantly in 1995 and 1996, partly as a result of a decline in capital inflows, possibly through an adverse interest rate effect. Chile, which has been less affected by the crisis in Mexico, is expected to see continued solid growth the next two years.

The most dramatic case of stabilization in 1994 was in Brazil, where the Real Plan succeeded in lowering inflation from nearly 50 per cent per month to 0.6 per cent in December. Behind this success was the exchange rate which was allowed to float. The Brazilian currency appreciated sharply during the second half of 1994. Tight monetary policies were an essential complement and real interest rates exceeded 35 per cent last year. Despite an impressive performance in 1994 further stabilization is still essential for the Brazilian economy. The exchange rate is overvalued, but devaluation could easily fuel inflation and reawake the indexation mechanism. Moreover, a large fiscal deficit will emerge in 1995 if drastic measures are not immediately implemented.

Asia

Asia has been the most dynamic region in the world economy since the mid-1980s, with per capita income growing at significantly higher rates than in any other region. The projections indicate continued favourable growth rates in 1995 and 1996. The factors behind the optimistic outlook include high savings- and investment rates and dynamic industrial policies with emphasis on open trade. Some slowdown in portfolio capital flows to the region may have a negative impact on growth rates. In the weeks following the Mexican peso devaluation, foreign investors pulled capital out of the Asian markets. However, the bulk of capital inflows to most of the Asian economies have been in the form of direct investment, as shown in table 3. This puts Asia in a less vulnerable position than Latin America where a large proportion of the capital inflow is portfolio investment.

Production in the four newly industrializing countries Hong Kong, Korea, Singapore, and Taiwan expanded by an average of above 7 per cent in 1994. They are expected to sustain the robust growth for the next two years. The recovery in the industrial countries has given a boost to the exports of the Asian economies. The recent strengthening of yen against US dollar contributed to the improved economic performance by allowing the NICs to capture part of the trade and investment that were diverted from Japan to Southeast Asia. Most of the Asian currencies are either pegged to the dollar or tied to a basket of currencies in which the dollar has significant weight.

The prospects for Southeast Asia are also bright. Significant growth during the early 1990s has increased disposable income and thereby domestic demand. There has also been a considerable growth in private investment, particularly foreign direct investment. Spending on infrastructure by the public sector has made a solid foundation for further growth.

The countries of South Asia have lagged behind the development of the countries further east, but in 1994 the growth rates picked up and ranged from 4 to 7 1/2 per cent. Many of the countries in this area have adopted wide ranging reform programmes over the past few years. In India, the recovery gathered momentum in 1994 as the economy expanded by 5 per cent. Efforts to bring down inflation were thwarted by a substantial increase in money growth, induced partly by capital inflows. The projections indicate growth above 6 per cent in 1995 and 1996, but the forecast depends on the political developments in the country. Despite a cotton virus and a drought, real GDP in Pakistan increased by over 4 per cent in 1994. Further deregulation in the industrial and services sector, and favourable external conditions should lift growth in 1995.

In China, output growth moderated slightly in 1994, to around 12 per cent, while inflation jumped to over 20 per cent, partly reflecting adjustments in administered food prices. An austerity program to cool down the overheated economy has been implemented and real GDP growth

rates are projected to come down to below 10 per cent in 1995 and 1996. The inefficient state sector is in need of an extensive reform to further improve the economic prospects. Rising prices are likely to remain a major concern the next few years. More restrictive monetary and fiscal policies are expected to bring inflation down to 12 per cent in 1996.

Research publications in English

New titles

Social and Economic Studies

Nils Martin Stølen:

Wage Formation and the Macroeconomic Functioning of the Norwegian Labour Market

SES no. 89, 1995. pp. 306.

ISBN 82-537-4141-3

The growing rate of unemployment in Norway since the end of the 1980s has increased the demand for knowledge about wage formation and the macroeconomic functioning in the Norwegian labour market. To analyse these questions the most relevant theoretical aspects for labour market and wage formation are discussed, and the understanding of wage formation is enhanced through a comprehensive empirical analysis. The importance of wage formation for the macroeconomic functioning of the labour market and for policy analyses is further evaluated by analysing the properties of the macroeconomic model MODAG developed in Statistics Norway. A main conclusion is that wages are only weakly influenced by high unemployment, and in the best case the labour market may need several years to restore equilibrium after a negative shock.

Discussion Papers

Annegrete Bruvoll, Solveig Glomsrød and Haakon Vennemo:

The environmental drag on long-term economic performance: Evidence from Norway

DP no. 143, 1995. pp. 34.

The environment drag is the cost to society of environmental constraints. This paper estimates the long-run environmental drag on the Norwegian economy. We employ a model called DREAM (dynamic resource / environmental applied model). This is an applied general equilibrium model extended to include important environmental linkages.

After having explained the structure of our model, the paper presents macroeconomic effects, and impacts on growth and welfare of environmental constraints. To check

robustness we perform a number of sensitivity analyses. Most of the results are remarkably robust to alternative assumptions. Contrary to widespread opinion, a low discount rate increases the environmental drag on welfare. Reducing the rate of technological progress will have similar effects.

Brita Bye:

A Dynamic Equilibrium Analysis of a Carbon Tax

DP 145, 1995. pp. 31.

This paper analyses the effects of a carbon tax on a small open petroleum producing economy, using an aggregate intertemporal general equilibrium model with differentiated products. The long run effects on welfare and capital accumulation of both a unilateral and an international carbon tax are emphasized. It is shown that the steady state welfare effect on a carbon tax can be positive or negative, depending on substitution effects which create efficiency losses, and income effects from changes in terms of trade. The presence of an initial tax wedge implies that there is an ambiguous relationship between the tax level and steady state welfare. With an international carbon tax the terms of trade gain is smaller and the petroleum revenue is reduced compared to a unilateral carbon tax, implying that for a petroleum producing economy an international carbon tax may be less beneficial than a unilateral carbon tax.

Reprints

John K. Dagsvik:

How Large is the Class of Generalized Extreme Value Random Utility Models?

Reprints no. 74, 1995. pp. 9.

ISSN 0800-7500

Reprint from Journal of Mathematical Psychology, Vol. 39, 1995, No. 1. 90-98.

Documents

Eystein Gjelsvik, Torgeir Johnsen, Hans Terje Mysen and Asgeir Valdimarsson:

Energy Demand in Iceland

Documents 95/2, 1995. pp. 34.

This paper describes the development of energy consumption in Iceland and documents the structure and estimation of an energy demand model for Iceland. One purpose of constructing this model is to analyse effects on energy demand of various measures to reduce greenhouse gas emissions i.e. taxes on fossil fuels. With respect to total energy use the Icelandic market is approximately 1.4 per cent of the total Nordic market. Iceland is located too far from the rest of the Nordic countries to make exports of electricity with the present state of technology profitable. Besides, the UK market is closer and offers better prospects. The energy demand model for Iceland is consequently not linked to the Nordic energy market model (Bye et al. (1994)). The estimation results suggest that reduced form models should be preferred to the models based on general cost and utility functions satisfying restrictions from microeconomic theory. This mirrors the lack of substitution possibilities that are characteristic for most energy use in Iceland. The simulations of the model show that Iceland will have no problems with reaching the target of stabilization of emissions of CO₂ in the year 2000 on a 1990 level mainly due to low economic growth forecasts. Implementation of the EC energy/carbon tax leads to emissions below the stabilization target until the year 2010.

Chunping Zhao, Olav Bjerkholt, Tore Halvorsen and Yu Zhu:

The Flow of Funds Accounts in China

Documents 95/3, 1995. pp. 14.

Previously issued

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Discussion Papers

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