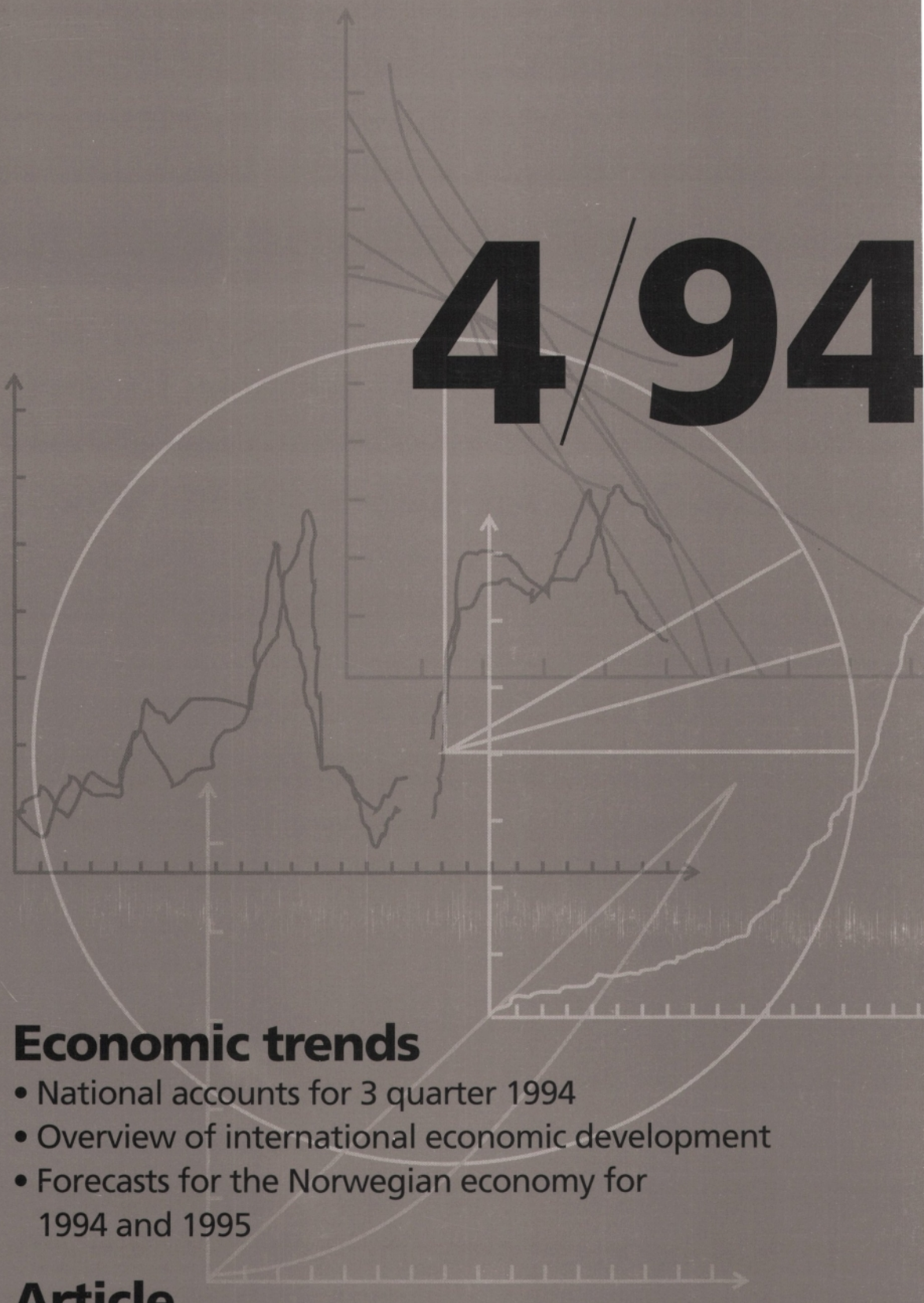
Economic Survey

Statistics Norway

Statistisk sentralbyrå

4/94



Economic trends

- National accounts for 3 quarter 1994
- Overview of international economic development
- Forecasts for the Norwegian economy for 1994 and 1995

Article

- Forecasting labour market imbalances

Economic Survey

4/94

Contents

The cut off date for information used in the publication was 6 December 1994.

Inquiries should be directed to Knut Moum or Mette Rolland.

Economic Survey

Editorial board: Olav Bjerkholt (ed.), Knut H. Alfsen, Iulie Aslaksen, Ådne Cappelen, Solveig Glomsrød, Knut Moum, Tor Skoglund. **Editorial assistant:** Wenche Drzwi, tlf.: 22 86 49 74, telefax: 22 11 12 38. **Design:** Enzo Finger Design. **Print:** Falch Hurtigtrykk. **Editorial adress:** Statistics Norway, Research Department, P.O. Box 8131 Dep., N-0033 Oslo. **Sales- and subscription service:** P.O. Box 8131 Dep., N-0033 Oslo, tel.: 22 86 49 64, telefax: 22 86 49 76.

Economic Survey

is published four times a year by the Research Department of Statistics Norway. The Research Department was established in 1950. The Department has about 90-100 employees (Feb. 1994). The Research Department is today organized in four divisions. Head of Department is *Olav Bjerkholt*.

- Division for Public Economics
  Director of Research Nils Martin Stølen

- Public economics, taxes
- Labour market analysis
- Micro simulation models

- Macroeconomic Division
  Director of Research Ådne Cappelen

- Business cycle analysis
- Macroeconomic models
- General equilibrium models

- Natural Resources Division
  Director of Research Knut H. Alfsen

- Environmental economics
- International energy markets
- Petroleum and energy analysis

- Microeconometric Division
  Director of Research Jørgen Aasness

- Consumer and producer behaviour
- Income distribution analysis
- Econometric methods

Symbols in Tables	**Symbol**
Data not available	..
Not for publication	:
Nil	0
Provisional or preliminary figure	*

Economic trends

Preliminary third-quarter national accounts figures strengthen the impression that 1994 will be a year of pronounced expansion in the Norwegian economy. It is now likely that mainland output will increase by about 3.5 per cent, with total GDP growing at an even higher rate. Growth rates of this magnitude have not been recorded since the mid-1980s.

As was the case during the boom in 1984-1986, changes in financial markets have again generated the strongest impetus to growth in the level of activity. However, while the upturn in the mid-1980s was associated with a sharp rise in lending following the phasing out of credit rationing, the driving force has now been a general decline in interest rates in Europe.

The fall in interest rates through 1993 and into 1994 quickly translated into higher demand from Norwegian households. The upswing in other European countries has also gradually contributed to resumed growth in markets for Norwegian export goods, and all indicators point to record growth in traditional merchandise exports this year. It appears that oil investments are being maintained at a higher level than previously expected, thereby contributing to such a strong upturn in the Norwegian economy in 1994.

The relatively sharp growth in output this year will result in a rise in employment for the first time since 1987. Even though the supply of labour is also increasing, it appears that unemployment will fall by about half a percentage point on an annual basis. Price inflation will nevertheless be record low, and the current-account surplus is likely to be a good 3 per cent of GDP.

The upswing in the Norwegian economy will probably slow in 1995, and the growth rates for demand and output in mainland Norway may be 1-1 1/2 percentage points lower than this year. This will bring growth in the Norwegian economy more in line with the average of our main trading partners.

Even though growth abroad will probably be slightly stronger next year than in 1994, shifts in demand may result in weaker growth in Norwegian exports. Further upward revisions in growth projections for Germany reduce the likelihood of a further decline in interest rates in Europe. The stimulus from interest rate movements to growth in household purchases of goods and services will thus be substantially reduced in the period ahead. Recent estimates indicate that the projected decline in oil investments may be delayed to some extent. As a result of changes in the composition of demand, with a shift towards higher imports, developments in these investments will probably tend to reduce output growth in the Norwegian economy in 1995. The fiscal programme will also, to a greater extent than in 1994, curb demand next year, among other things as a result of the proposed increase in VAT and other planned austerity measures. Nor is it inconceivable that Swedish and Finnish membership in the EU, with Norway outside, can have a dampening effect on investment in parts of the business sector, even with a continuation of the current EEA Agreement.

Higher VAT and a further decline in unemployment will push up price inflation slightly next year, to a level on a par with Germany (west), but still lower than the average of Norway's main trading partners. The rise in price inflation next year must also be viewed against the background of the particularly low inflation in 1994, which is partly ascribable to the effect of interest rate reductions on rents through last year and into 1994.

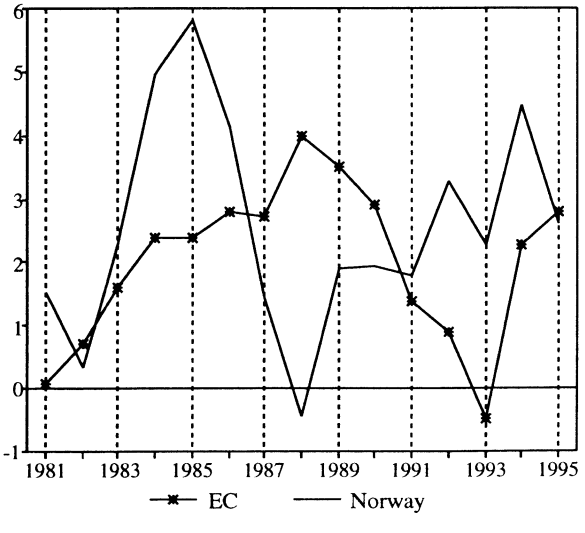
The upturn in the Norwegian economy and developments in the labour market indicate a pronounced reduction in deficits on public sector budgets. This also applies to the planned reorientation of fiscal policy in 1995. There is reason to assume that growth in oil production and decline in central government oil investments will result in a further improvement in public finances in the years ahead.

Main indicators for the Norwegian economy
Growth from previous year. Per cent

	1993	1994	1995
GDP	2.3	4.5	2.6
Private consumption	1.7	4.7	2.7
Unemployment rate[1)]	6.0	5.4	5.0
Consumer price index	2.3	1.4	2.6

1) Level in per cent.

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



Source: Statistics Norway, OECD and Consensus Forecasts.

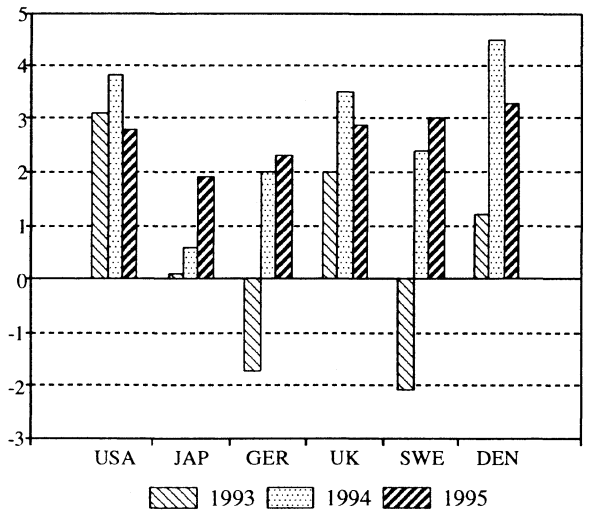
International background

The outlook for economic developments in the OECD area remains bright. In Anglo-Saxon industrial countries, with the US leading the way, economic growth remains high, while activity in continental Europe has picked up markedly the past year. GDP is likely to expand by about 2 1/2 per cent in EU countries this year, compared with a decline of 0.4 per cent from 1992 to 1993. The forecasts point to a further rise in growth, to nearly 3 per cent next year. As a result of sluggish production trends, unemployment rose sharply in many countries in western Europe last year. Even though economic activity is projected to increase in the period ahead, unemployment is not expected to decline to any great extent in these countries. The forecasts indicate unemployment of 10.9 per cent in EU countries in 1994, edging down to 10.4 per cent next year. Inflation in EU countries is expected to be reduced to a little less than 3 per cent in 1995.

Preliminary third-quarter national accounts figures for the *US* show that GDP expanded at an annual rate of 3.9 per cent from the previous quarter. This was higher than expected even though growth was slightly lower than in the second quarter (4.1 per cent). The expansion was primarily fuelled by private and public consumption, stockbuilding and non-residential investment, while net exports had a dampening effect. The high growth has resulted in a 1.1 percentage point decline in unemployment since the beginning of the year, reaching 5.6 per cent in November. Strong domestic demand in the US combined with the recession in traditionally important trade areas have contributed to a negative trend in the external account. The trade deficit stood at $ 10.1 billion in September, $ 0.4 billion higher than in August. At the beginning of December Congress approved the GATT agreement, which entails a liberalisation of international trade, and US ratification is expected to have a bearing on approval by other countries. The Federal Reserve has continued its progressive tightening of monetary policy; the Federal funds rate has been raised in six steps since February this year, from 3 to 5.5 per cent. The increases in interest rates have been motivated by the growing risk of inflation as a result of relatively strong economic growth. Thus far this year, however, the upturn in the US has not had a strong impact on the consumer price index, which rose by 2.6 per cent in the twelve months to October this year. Nevertheless the fear of higher inflation has probably been a factor contributing to the pronounced rise in long-term interest rates over the past year, to nearly 8 per cent at end-November. The rise in interest rates is expected to have a dampening effect on GDP growth in 1995.

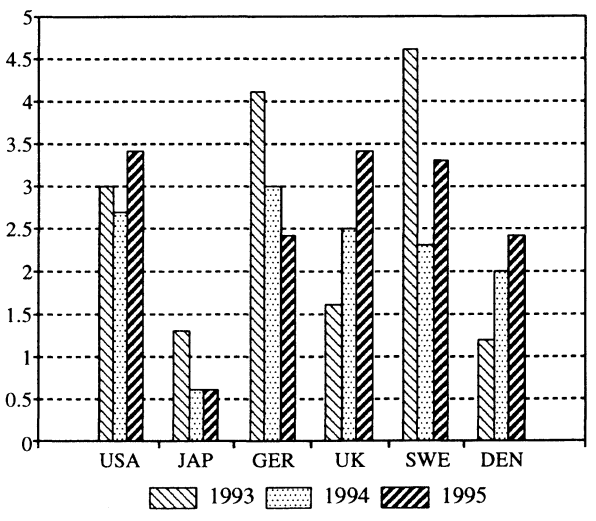
In *Japan*, preliminary national accounts figures show that GDP expanded by 0.9 per cent between the second and third quarter of 1994 after having increased by 0.2 per cent in the previous quarter. Private consumption and housing investment made the strongest contribution to growth. Available short-term data for October and November provide a slightly mixed picture of the economic situation, but there are many indications that the recovery is not yet firmly established. The recession is largely related to a sharp fall in private investment following several years of overinvestment and inflated property and asset prices. The decline in household income as a result of lower bonus payments and rising unemployment has amplified the negative picture. Unemployment stood at 3.0 per cent in September and is expected to increase marginally next year. The public sector's strong financial position, however, has enabled the authorities to conduct an expansionary policy,

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.

with six stimulatory packages being presented since 1992. The latest package was launched in November, and entailed a relief in personal taxation. The authorities are planning on a total tax relief of Y 16 500 (about $ 168 billion) over a three-year period. In order to prevent a deterioration in the budget balance, however, VAT will be raised from 3 to 5 per cent in April 1997. However, the politically unstable situation, with constantly changing coalitions, may hinder the implementation of the measures. The current-account surplus remains high, $ 10.5 billion in September, but is expected to be gradually reduced as imports pick up and exports begin to slow. The projected decline in export volumes must be viewed in connection with the sharp appreciation of the yen the last few years. The forecasts point to continued weak GDP growth in the last part of this year, while output is expected to expand by a little less than 2 per cent next year.

The economic recovery in *Germany* (west) seems to be stronger in 1994 than previously expected, with GDP growth now estimated at 2.2 per cent between the first half of 1994 and 1995. Exports have shown a particularly high growth, which must be viewed against the background of the positive impetus from the US, Southeast Asia and some EU countries. Moreover, German competitiveness vis-a-vis Japan has improved considerably the past few years. Private fixed investment has also picked up slightly this year, probably stimulated by the decline in interest rates through 1993. German forecasting institutes do not entirely agree on future economic developments. DIW (Deutsches Institut für Wirtschaftsforschung) maintains that the rise in long-term interest rates will have a dampening effect on investment next year and projects a GDP growth of 1.5 per cent in 1995, while the other institutes forecast a GDP growth of 2.5 per cent. The German labour market has shown some improvement through the summer and autumn of this year, and the unemployment rate fell below 8 per cent in September. As a result of the sluggish trend in private consumption, however, unemployment is not expected to show any substantial reduction next year. Consumer price inflation has slowed cautiously over the past year, and according to preliminary figures stood at 2.6 per cent in the twelve months to November. Consumer prices are estimated to rise by 2.5 per cent from 1994 to 1995. The Bundesbank has not reduced its key rates since 11 May this year. This is probably ascribable to stronger-than-expected economic growth and the fact that money supply growth is still above the target zone of 4-6 per cent. The favourable trend in exports has contributed to a substantial improvement in the trade balance this year, while the current balance, which also includes interest and transfers, has deteriorated, primarily as a result of a decline in net interest income.

The *eastern länder* of Germany continue to record high economic growth. Both fixed investment and exports are expected to grow by more than 15 per cent this year. In contrast to the western länder private consumption is also expanding. The strong upturn is expected to continue, and the six German institutes estimate GDP growth at 8.5 per cent next year. The upswing in production has gradually contributed to a slight reduction in unemployment, but the unemployment rate is still higher than 13 per cent. Consumer price inflation is approaching the level in the western länder and is expected to be about 3.5 per cent.

Main international economic forecasts

	1993	1994	1995
USA			
GDP[1]	3.1	3.8	2.8
Growth in consumer prices	3.0	2.7	3.4
Current balance (level, per cent of GDP)	-1.6	-2.1	-2.0
Unemployment (level)	6.8	6.2	5.8
Short term interest rate (per cent)	3.3	4.6	5.5
Long term interest rate (per cent)	5.9	7.0	7.3
Japan			
GDP[1]	0.1	0.6	1.9
Growth in consumer prices	1.3	0.6	0.6
Current balance (level, per cent of GDP)	3.1	2.7	2.4
Unemployment (level)	2.5	2.9	3.0
Short term interest rate (per cent)	2.4	2.3	2.4
Long term interest rate (per cent)	3.7	3.7	4.1
Germany (west)			
GDP[1]	-1.7	2.0	2.3
Growth in consumer prices	4.1	3.0	2.4
Current balance (level, per cent of GDP)[2]	-1.2	-1.4	-0.9
Unemployment (level)	8.9	9.7	9.4
Short term interest rate (per cent)	7.2	5.2	5.2
Long term interest rate (per cent)	6.5	6.8	7.1
UK			
GDP[1]	2.0	3.5	2.9
Growth in consumer prices[3]	1.6	2.5	3.4
Current balance (level, per cent of GDP)	-1.6	-0.8	-0.9
Unemployment (level)	10.3	9.4	8.6
Short term interest rate (per cent)	5.9	5.4	6.6
Long term interest rate (per cent)	7.5	8.2	8.4
Sweden			
GDP[1]	-2.1	2.4	3.0
Growth in consumer prices	4.6	2.3	3.3
Current balance (level, per cent of GDP)	-1.0	0.7	2.7
Unemployment (level)	8.2	7.9	7.7
Short term interest rate (per cent)	8.3	7.3	7.0
Long term interest rate (per cent)	..	..	..
Denmark			
GDP[1]	1.2	4.5	3.3
Growth in consumer prices	1.2	2.0	2.4
Current balance (level, per cent of GDP)	4.1	2.7	2.5
Unemployment (level)	12.2	11.9	10.7
Short term interest rate (per cent)	6.9	6.4	6.8
Long term interest rate (per cent)	..	..	..

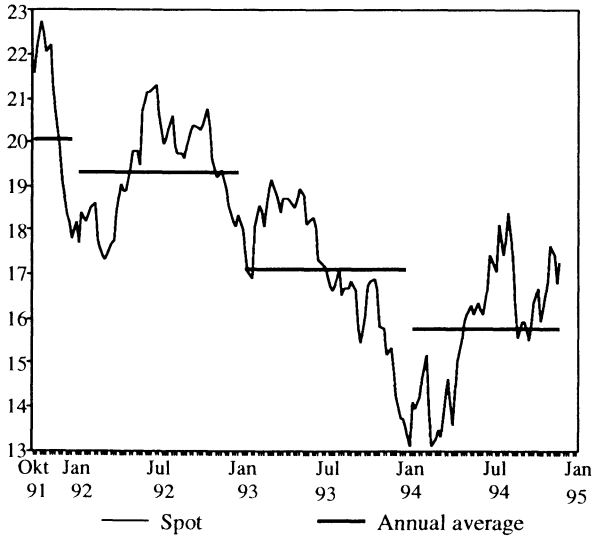
1) Percentage change from previous year, volume.
2) Total Germany.
3) Retail price index.
Source: Consensus Forecasts and DRI (interest rates). National sources for Sweden and Denmark.

The economic recovery in the *UK* has gathered pace through 1994. National accounts figures show that GDP expanded by 4.2 per cent in the year to the third quarter of 1994, compared with 2.9 per cent in the first quarter and 3.8 per cent in the second quarter. For a long time the recovery was fuelled by higher private consumption, but

exports have picked up considerably this year and there have been signs of investment growth. The forecasts indicate that GDP may slow slightly next year as a result of lower growth in private consumption. Unemployment began to fall at an early stage of the recovery and the number unemployed has continued to decline through 1994. The number unemployed fell from a level corresponding to 10 per cent of the labour force in January to 8.9 per cent in October. The base rate has been raised three times this year, most recently by half a percentage point to 6.25 per cent on 7 December. This was motivated by the desire to curb high economic growth before it results in accelerating price inflation. At the moment there are no signs of an increase in price inflation. Consumer price inflation (excluding mortgage interest) has slowed from 2.8 per cent in January (year-on-year basis) to 2 per cent in September and October. The low rate of price increases is often ascribed to severe competition in the retail sector and very moderate wage increases. Along with an increase in the tax level, the economic recovery has contributed to reducing the central government borrowing requirement considerably over the past year.

The economic recovery continues in *Sweden*. GDP grew by 3.6 per cent in the year to the second quarter of 1994. Two thirds of this growth, however, is ascribable to stock-building in retail trade. For 1994 as a whole, GDP is expected to increase by 2.4 per cent. Exports continue to be the engine of the recovery, while domestic demand is still exhibiting sluggish growth. Fixed non-residential investment, however, is picking up. Exports are expected to show pronounced growth also in 1995. It is estimated that continued exports growth combined with a slight increase in domestic demand will result in a 3.0 per cent growth in GDP next year. Inflation is expected to rise moderately, to an average 3.3 per cent in 1995, primarily due to a higher level of domestic activity. According to the forecasts, unemployment will only fall negligibly, from 7.9 per cent in 1994 to 7.7 per cent in 1995, while a good 5 per cent of the labour force will be employed on public job-creation schemes in both 1994 and 1995. The public sector's financial deficit, which is estimated at 11.7 per cent of GDP in 1994, will remain at a high level in the years ahead. General-government gross debt has grown substantially in recent years and now amounts to about 90 per cent of GDP. In November the Government presented an austerity programme, entailing government budget savings of about SKr 60 billion in the years to 1998. The aim is to stabilize public debt relatively to GDP by 1998.

Spot price, Brent Blend
Dollar per barrel



Source: Petroleum Intelligence Weekly

In *Denmark*, the economic upturn continued through the first half of 1994. GDP expanded by 5.7 per cent in the year to the second quarter of 1994. Private consumption and investment contributed to boosting growth, while public consumption exhibited a sluggish trend. The upswing in domestic demand has resulted in a sharp growth in imports which, according to the forecasts, will increase by more than 12 per cent from 1993 to 1994. Exports of goods and services have also picked up substantially through 1994, but imports have risen at an even higher rate. The forecasts indicate that the deterioration in the balance of trade will contribute to a decline in the current-account surplus this year. The upswing in economic activity has gradually been reflected in a decline in unemployment; the unemployment rate fell from 12.5 to 11.4 per cent from July to October of this year. The Government estimates that unemployment will continue to decline into 1995, partly as a result of high economic activity and partly as en effect of the introduction of a special leave-of-absence scheme. Despite the high growth in domestic demand, there have only been minor upward revisions in the projections for consumer price inflation in 1994 and 1995, to 2 and 2.4 per cent respectively. Proposals have been tabled for fiscal policy tightening in the area of 0.3 per cent of GDP for 1995, and the adoption of these measures will contribute to curbing economic activity somewhat.

As expected, a somewhat tighter oil market contributed to a slight rise in *oil prices* during the autumn, and the price of Brent Blend averaged $ 17 p/b in November. Expanding economic activity in large parts of the world has resulted in a steadily growing demand for oil. The supply of oil, however, has so far risen at almost the same pace as demand in spite of relatively stable production in OPEC since last summer. At its meeting on 22 November OPEC countries decided to maintain the production ceiling of 24.5 million b/d through 1995. Following a sharp growth this year, it is assumed that production in the North Sea will level off next year, while production is expected to increase faster in Latin America. In Russia, the decline in both oil production and consumption has slowed slightly, but exports remain relatively stable on an annual basis. Forecasts for the market situation in 1995 indicate a slightly tighter market than this year, particularly in the second half. This may generate moderate upward pressures on prices, but the possibility that Iraq will resume its exports of oil in 1995 represents an uncertain factor.

Norwegian economy

Developments thus far this year

Preliminary figures from the quarterly national accounts show a sharp growth in traditional merchandise exports in the third quarter of 1994 following a pronounced rise through 1993 and into 1994. The increase in exports was particularly high for engineering products, chemical and mineral products and processed fish products, but paper and pulp, metals and chemical raw materials also posted considerable gains. A decline in exports of oil, ships and platforms and services entailed that total exports only showed a negligible rise from the second to third quarter of this year.

A pronounced turnaround in the growth rate for traditional merchandise exports took place at the beginning of 1993, and exports of such goods have grown by a good 20 per cent in two years. This rise is related to the cyclical turnaround among Norway's main trading partners, but is stronger than would normally be expected from the observed growth in markets for Norwegian export products. This may be due to shifts in demand in these markets, but may also be an indication that total imports in some EU countries continue to be underestimated following the reorganisation of foreign trade statistics at the end of 1992.

The rise in demand from mainland Norway continued in the third quarter of this year, and both investment and total consumption exhibited growth. Direct purchases abroad by resident households rose further in the third quarter of 1994 after expanding through the previous six quarters. Developments in retail sales also helped to boost growth in private consumption in spite of the levelling off of purchases of new passenger cars. Figures on new car registrations in October and November, however, point to a further rise in car purchases between the third and fourth quarter of this year. Preliminary national accounts figures may indicate that public consumption thus far this year has shown a weaker development than assumed in public budgets, but there is considerable uncertainty attached to these estimates.

Mainland investment also expanded in the third quarter of 1994 after rising substantially between the first and second quarter. Mainland investment, however, is still considerably below the level recorded during the recession year 1982/1983, even though investment in manufacturing and private services is higher. Statistics Norway's third-quarter investment intentions survey indicates approximately zero growth in manufacturing investment this year following an unusually strong upward revision of the estimates over the past five quarters.

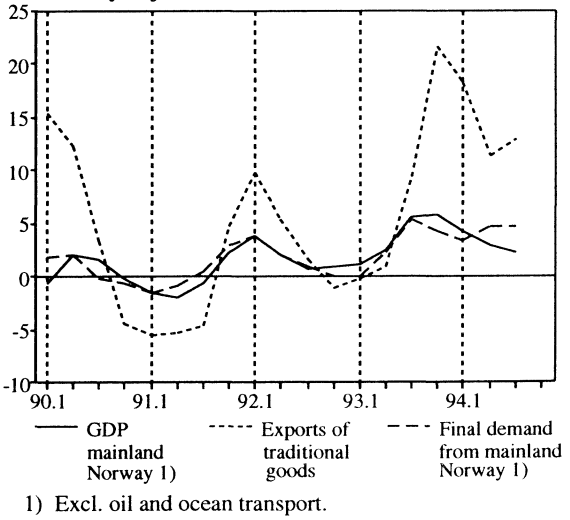
Accrued oil investment showed a steep rise between the second and third quarter of 1994, and such investment thus far this year has been at a higher level than in the same period one year earlier. The third-quarter investment intentions survey nevertheless indicates a slight decline in accrued investment on an annual basis.

Housing starts showed resumed growth in the third quarter from an approximately constant level over the previous three quarters. This contributed to a continuation of the sharp rise in estimated housing investment, which began in the second half of 1993. The rise in house prices, however, seems to have slowed slightly during the last few quarters, and figures from several sources indicate that the rise in larger towns may be coming to a halt. This can probably be ascribed to interest rate developments.

A sharp decline in long-term interest rates through 1993 was replaced by a rise in the middle of the first quarter of this year following a turnaround in the markets for US and German bonds. At the beginning of December the yield on Norwegian government bonds with a ten-year residual maturity was nearly 8.5 per cent, a rise of 3 percentage points from the level in mid-February. Money market rates also began to rise in the middle of the second quarter. From a level just below 5 per cent, three-month rates rose by 2.3 percentage points in the period to the week prior to the referendum on Norwegian membership in the EU. Interest rates began to fall again after the referendum result was known, and at the middle of December three-month NIBOR was down to 6.4 per cent, on par with the corresponding ECU rate.

The rise in market rates through the second and third quarter removed the basis for further reductions in financial institutions' deposit and lending rates, and the sharp decline in these rates through last year came to a complete halt in the third quarter of 1994. A number of financial institu-

Cyclical development
(Per cent growth from previous quarter.
Seasonally adjusted and smoothed. Annual rates.)



1) Excl. oil and ocean transport.
Source: Statistics Norway.

Macroeconomic indicators
Growth from previous period unless otherwise noted. Per cent[1)]

		Seasonally adjusted[2)]				
	1993	93.3	93.4	94.1	94.2	94.3
Demand and output						
Private consumption	1.7	2.5	-0.1	2.1	0.1	1.5
Public consumption	1.8	4.3	-0.3	1.5	-0.6	-0.8
Gross fixed investment	8.0	26.5	-11.7	-2.0	15.0	6.4
- mainland Norway	-4.7	1.4	4.0	-11.4	11.6	5.7
- accrued petroleum investment[3)]	15.9	47.7	17.2	19.5	-7.8	11.1
Final domestic demand from mainland Norway[4)]	0.7	2.8	0.4	-0.1	1.4	1.5
Exports	1.8	-3.4	6.0	1.9	-0.5	0.3
- crude oil and natural gas	5.8	-4.0	13.9	1.0	0.1	-5.4
- traditional goods	3.0	-4.4	7.8	4.6	-0.6	7.3
Imports	3.3	6.7	-3.1	1.1	3.7	6.1
- traditional goods	1.7	5.6	3.3	4.0	4.2	3.8
Gross domestic product	2.3	2.7	1.3	1.5	1.1	-0.2
- mainland Norway	2.0	1.6	1.0	1.3	0.8	0.1
Labour market[5)]						
Man-hours worked	0.0	-0.6	0.8	1.0	0.3	0.4
Employed persons	0.0	0.3	0.6	0.0	0.4	0.7
Labour force	0.0	0.3	0.1	-0.1	0.8	0.1
Unemployment rate, level	6.0	6.1	5.6	5.5	5.8	5.2
Prices						
Consumer price index[6)]	2.3	2.2	1.9	1.2	1.0	1.6
Export prices, traditional goods	0.2	0.1	-1.6	1.5	-0.2	1.3
Import prices, traditional goods	0.4	0.9	-0.1	0.7	-1.8	0.7
Balance of payment (unadjusted, level)						
Current balance, bill. Nkr	17.1	4.1	0.1	8.5	5.1	5.5
Memorandum items (unadjusted, level):						
Eurokrone rate (3 month NIBOR)	7.2	6.1	5.6	5.1	5.2	5.9
Average lending rate[7)]	11.4	10.7	9.4	8.9	8.5	8.3
Crude oil price, Nkr (Spotprice Brent Blend)[8)]	121.9	121.8	112.2	105.1	116.0	117.6
Importsweighted krone exchange rate (1992=100)	101.9	102.7	102.8	104.4	103.7	102.4

1) Figures for 1993 may deviate somewhat from those published in Economic Survey 3/94 due to new information.
2) The method for seasonal adjustment has been changed.
3) Growth from previous year.
4) Private consumption + public consumption + gross fixed capital formation in mainland Norway.
5) Based on monthly figures, seasonally adjusted.
6) Percentage change from previous year.
7) Private financial institutions.
8) Average, Norwegian oil production.
Source: Statistics Norway.

tions have since then already raised their interest rates or announced plans to do so. A fall in Norwegian money and capital marketrates to ECU levels, however, is not likely to spur a resumed decline in financial institutions' rates inasmuch as ECU rates now are noticeably higher than the level used as a basis by financial institutions when they reduced their rates earlier this year.

Traditional merchandise imports have also expanded sharply so far this year after rising throughout 1993. The steep growth in imports can also be ascribed to a greater need for intermediate goods in export-oriented activities, although changes in the composition of oil investment may also have been a factor. There has also been pronounced growth in imports of passenger cars and other consumer goods in 1994. As a result of a sharp rise in imports of ships and oil platforms, combined with a marked rise in crude oil imports, total imports increased faster than traditional merchandise imports in the third quarter.

Mainland GDP was approximately unchanged between the second and third quarter of this year following clear growth through the previous five quarters. Output in manufacturing and mining, which has generally been moving on an upward trend since the end of 1991, rose by a good 1/2 per cent, while production in the construction sector rose markedly. Developments in service sectors, however, reduced output growth. As a result of lower production in oil activities in connection with a maintenance halt on Ekofisk, GDP fell marginally between the second and third quarter of this year.

Employment has moved on an upward trend since the beginning of 1993, providing further evidence of an economic upturn in mainland Norway. A brighter outlook in the labour market and underlying demographic factors are also contributing to an increase in the labour force. There has nevertheless been a noticeable decline in unemployment over the last five quarters, to 5.2 per cent of the labour force in the third quarter (seasonally adjusted).

The consumer price index rose by 1.3 per cent from January-October 1993 to the same period in 1994. On a year-on-year basis the rise in the consumer price index slowed in the period to May. The increase in some indirect taxes from 1 July this year, however, contributed to boosting the 12-month rise by 0.3 percentage point from June to July. The 12-month rise increased a further 0.3 percentage point from July to October, to 1.7 per cent.

The current account of the balance of payments showed a surplus of NKr 19.1 billion in the period to end-September, NKr 2 billion higher than in the same period last year. A reduction of a good NKr 4 billion in the surplus on the balance of goods and services from the first three quarters of 1993 to the same period this year was more than offset by a decline in the deficit on the interest and transfers balance.

Outlook[1]

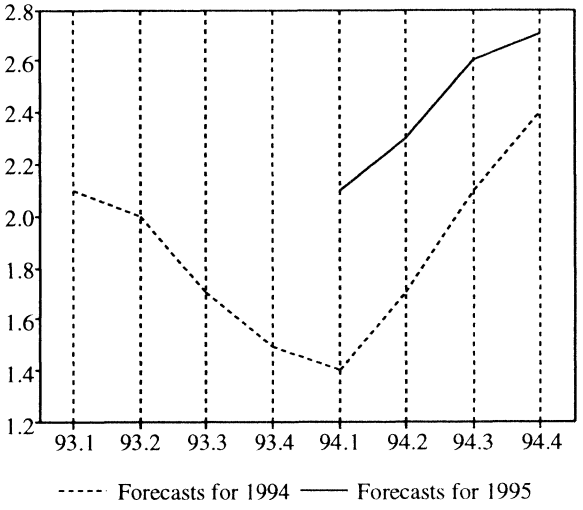
The clear upturn in mainland demand through the first three quarters is expected to level off somewhat in 1995 in spite of the considerable growth impetus from the household sector and mainland business fixed investment. Growth in public sector demand, however, will be subdued next year. Demand from the petroleum sector for goods and services produced in Norway is projected to show a noticeable reduction from 1994 to 1995.

The external growth impetus is expected to be strong in 1995, but slightly less than this year. According to the calculations, mainland GDP growth in 1995 will be reduced to the level in 1993, clearly below the figure for this year. Employment growth may nevertheless be as strong next year as in 1994. The labour force will also expand, but unemployment will still decline substantially through the projection period.

Changes in indirect taxes are expected to boost consumer price inflation slightly later in 1995. Along with slightly stronger inflationary impulses from abroad and a levelling off of the interest rate level, this will result in slightly higher price inflation in 1995 than in 1994. Wage growth will also pick up somewhat.

The forecasts for 1994 and 1995 are relatively close to the projections presented in Economic Survey 3/94. For 1994 the new figures entail a slight shift in demand from the public to the private sector. For 1995 the growth projections for total investment are slightly higher than in the last Economic Survey, while there has been a slight downward revision in the projection for consumption growth. The changes in GDP projections are small, but a lower estimate for the growth in the labour supply results in a decline in unemployment figures both years.

GDP-growth forecasts for Norway's main trading partners for 1994 and 1995 given on different dates



Source: Consensus Forecasts.

Exchange rates and interest rates at about the current level

Short-term rates in the ECU area are expected to remain approximately at the current level throughout the projection period, rising slightly towards the end of 1995. Economic fundamentals should be favourable for a continued decline in Norwegian money market rates, as we have witnessed following the EU referendum. Money market rates may be reduced to the same level as corresponding rates in the ECU area in the course of the year, and are then expected to remain at the same level as or slightly below these interest rates.

In the projections we have assumed a dollar exchange rate of NKr 6.85 from the third quarter of this year, while other exchange rates are assumed to remain at the level prevailing at the beginning of December. This entails a weakening of the trade-weighted exchange rate of about 1.3 per cent this year compared with nearly 2 per cent last year. Because the Norwegian krone appreciated during the second quarter of 1994, our projections entail a slight strengthening of the trade-weighted exchange rate from 1994 to 1995.

Tighter economic policy

The estimates concerning economic policy in 1995 are largely based on the guidelines drawn up in the National Budget for 1995. Based on the signals for the formulation of fiscal policy in the event of a No vote in the EU referendum, the general VAT rate has been increased from 22 to 23 per cent. The VAT base, however, has not been changed. The investment tax has been reduced by about NKr 1 billion from 1994 to 1995. Other indirect tax rates have been kept unchanged in real terms. Moreover, the pro-

1 The projections for macroeconomic developments from the fourth quarter of 1994 and through 1995 are derived from Statistics Norway's macroeconomic quarterly model, KVARTS. The calculations are based on preliminary national accounts figures up to and including the third quarter of 1994.

Main economic indicators
Percentage change from previous year unless otherwise noted

	1993	1994			1995		
	Accounts	SN	MoF[1]	NB[2]	SN	MoF[1]	NB[2]
Demand and output							
Private consumption	1.7	4.7	4.8	4 3/4	2.7	1.5	2 1/2
Public consumption	1.8	2.1	3.1	2 1/2	0.7	0.9	1
Gross fixed investment	8.0	6.2	..	4	8.3	..	2 1/2
- mainland Norway	-4.7	6.1	4.1	4 3/4	10.1	9.5	8 1/4
- accrued petroleum investment	15.9	-2.2	-14.2	0	6.7	-2.9	-10
Demand from mainland Norway[3]	0.7	4.3	4.7	4 1/4	3.3	2.8	3
Exports	1.8	7.0	8.9	9	5.2	4.8	4 1/2
- crude oil and natural gas	5.8	9.4	17.3	14 1/4	4.5	6.6	5 3/4
- traditional goods	3.0	13.3	13.0	13 3/4	5.8	7.0	6 1/2
Imports	3.3	7.5	6.2	7	7.9	3.8	3 1/4
- traditional goods	1.7	15.0	12.0	14	7.0	4.0	5 1/2
Gross domestic product	2.3	4.5	5.5	5 1/4	2.6	2.8	2 3/4
- mainland Norway	2.0	3.5	3.5	4	2.2	2.3	2 1/2
Labour market							
Persons employed	-0.0	1.5	1.5	1 1/2	1.6	1 1/4	1
Unemployment rate (level)	6.0	5.4	5 1/2	5 1/2	5.0	5	5
Prices and wages							
Wages per man-hour	2.7	3.0	3	3	3.7	2 1/2	3 1/2
Consumer price index	2.3	1.4	1.4	1 1/2	2.6	2 1/4	2 1/2
Export prices, traditional goods	0.2	1.3	3	..	9.6	5	..
Import prices, traditional goods	0.4	0.6	1	..	4.1	2	..
Balance of payments							
Current balance (bill. Nkr)	17.1	24.2	23	23	27.1	37.9	36
Memorandum items:							
Money market rate (3 month NIBOR, level)	7.2	5.8	..	..	5.8	..	..
Average borrowing rate (level)[4]	11.4	8.5	..	..	8.6	..	..
Crude oil price Nkr (level)[5]	121.9	112.9	110	110	116.5	115	115
International market growth	0.5	8.3	4 1/2	..	7.3	6 1/4	..
Importsweighted krone exchange rate[6]	1.9	1.3	..	..	-0.6	..	..
Current balance in per cent of GDP	2.3	3.2	..	3	3.3	..	4 1/4

1) MoF: Ministry of Finance's forecasts. Final budget bill 1995.
2) NB: Forecast according to Penger og kreditt 1994/4.
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 entails depreciation.

jections incorporate a tax increase for households amounting to NKr 1.4 billion from 1994 to 1995.

Based on the preliminary national accounts figures for the first three quarters of 1994, growth in public consumption is expected to be slightly lower than the estimate in the National Budget. This entails that growth in 1995 is expected to be a little higher than in the National Budget, but still below 1 per cent. Expenditure in connection with the Winter Olympics in Lillehammer contributed to boosting public consumption in 1994, and this is part of the reason for slower public consumption growth from 1994 to 1995.

Public sector investment is assumed to be reduced by a good 6 per cent from 1993 to 1994 and then remain approximately unchanged next year. Local government investment is expected to increase slightly, but this will be offset by an equivalent decline in central government investment.

Higher tax revenues will help to improve the general-government budget balance: Measured by the definitions of the Maastricht Treaty, the deficit will be reduced from a good 2 1/2 per cent of GDP in 1993 to about 1 per cent in 1994, while there may be a surplus of about 1/2 per cent of GDP in 1995.

Negative demand impetus from the petroleum sector

After expanding substantially over the last three years, it now appears that accrued petroleum investment will edge down this year. According to new estimates, accrued investment will increase by about 7 per cent in 1995. However, imports related to the completion of several major investment projects are expected to be considerable. Adjusted for these imports, the estimate for next year entails that investment in the petroleum sector will impart a pronounced negative demand impetus to the Norwegian eco-

nomy. The decline in demand in 1995 will primarily affect platform construction.

Investment in exploration and production drilling will rise in both 1994 and 1995. Investment by the petroleum sector in mainland Norway is projected to rise sharply in 1994, but decline by the same margin next year. Investment in oil and gas pipelines increased sharply between 1992 and 1993. Pipeline investment is expected to rise further this year and then edge down in 1995. The level, however, will remain high in an historical context.

Continued buoyant growth in export markets

Growth in markets for traditional Norwegian export goods picked up markedly towards the end of 1993, and this trend has persisted in 1994. In the calculations, the expansion is assumed to continue into 1995. A substantial upturn during 1993 and through the third quarter of 1994 entails that growth in traditional merchandise exports may reach more than 13 per cent for 1994 as a whole. Developments in traditional exports are expected to be more normal in 1995, with growth put at 5.8 per cent. Oil and gas exports are projected to increase substantially in volume in 1994, while growth in 1995 is expected to be more in line with other exports.

The improved economic situation internationally is expected to push up import prices next year. Prices of traditional merchandise imports are expected to rise by 4.1 per cent in 1995. Prices of industrial raw materials are generally expected to rise more than the prices of finished goods, which helps to explain the sharp rise in prices of Norway's traditional export products in 1995.

Slightly higher price and wage inflation in 1995

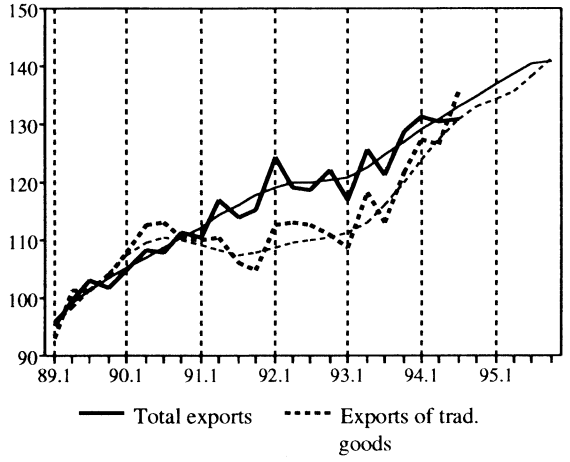
The rise in the consumer price index is estimated at 1.4 per cent in 1994, increasing to 2.6 per cent next year. The fall in interest rates through 1993 and in the first half of 1994 is an important factor underlying low price inflation this year. Rents are an important component in the consumer price index and the fall in interest rates has entailed that the rise in rents has virtually come to a halt over the last 18 months. Interest rate movements cannot be expected to dampen price inflation to the same extent in 1995.

The projected one percentage point increase in VAT with effect from 1 January 1995 is another factor indicating slightly higher price inflation next year. On an uncertain basis, we have estimated that the price feed-through for 1995 as a whole will be 80 per cent. Based on this assumption, the VAT increase will contribute 0.4 percentage point to the rise in the consumer price index next year. Increased inflationary impulses from abroad have the same effect, while a decline in telecommunication rates from the beginning of the year points, in isolation, to lower price inflation.

The growth in hourly wages in 1994 is estimated at 3.0 per cent. Improved profitability in the business sector as a re-

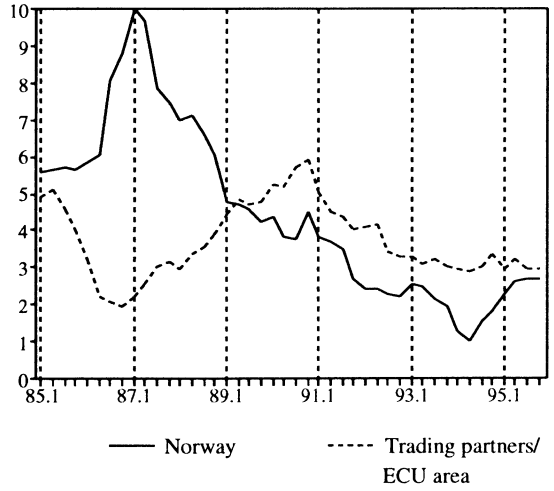
Exports

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



Source: Statistics Norway

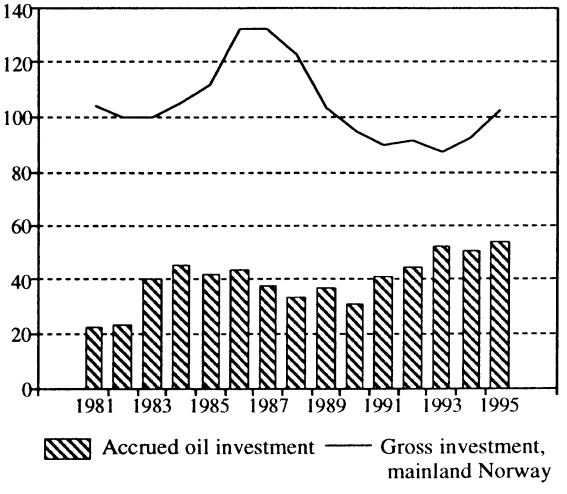
Consumer price index
Percentage growth from same quarter previous year



Source: Statistics Norway, OECD and Eurostat

Accrued oil investment and investment in mainland Norway

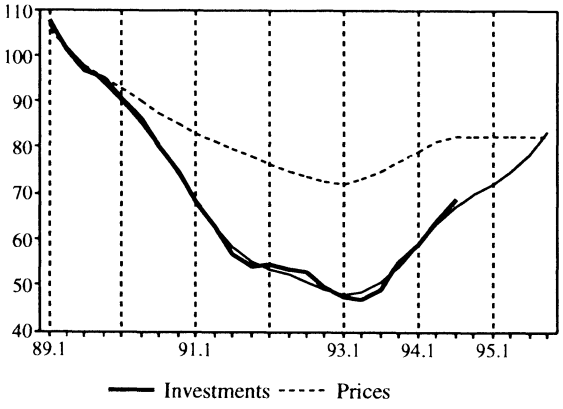
Nkr billion 1991



Source: Statistics Norway.

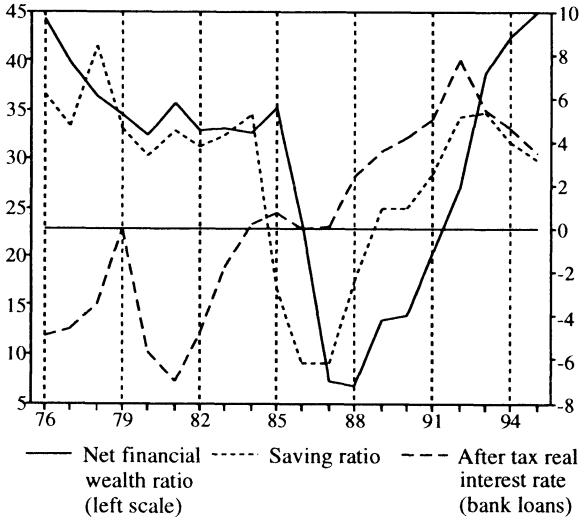
Real price on houses (second-hand market) and housing investments

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



Source: Statistics Norway

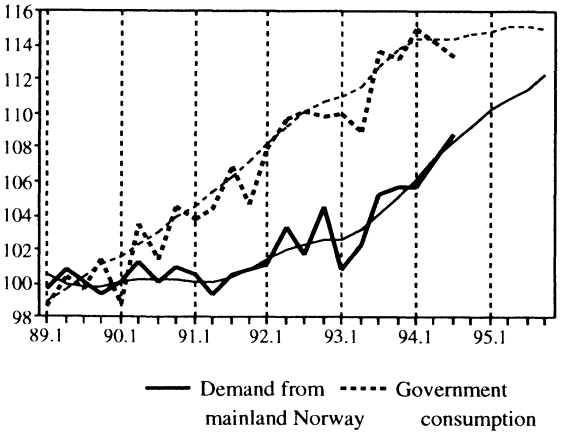
Net wealth ratio, saving ratio and after tax real interest rate 1976 - 1995



Source: Central Bank of Norway and Statistics Norway.

Demand from mainl. Norway and governm. consumption

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



Source: Statistics Norway

sult of the cyclical upturn both in Norway and abroad will contribute to higher wage growth next year. The estimated 3.7 per cent growth in wages per man-hour worked, however, is also influenced by the fact that there are two fewer working days compared with 1994. On this basis, average wage growth per normal man-year is estimated at a good 3 per cent.

Growth impetus from the mainland economy

Output growth and the decline in interest rates have resulted in a noticeable upswing in mainland fixed investment in 1994, and the expansion will continue in 1995 albeit at a slower pace. The development of Gardermoen airport and the rise in housing investment are important factors behind the projected growth, but the calculations also point to a clear investment upturn in some service sectors. According to the calculations, growth in manufacturing investment will be very moderate this year and slightly higher next year.

Following several years of growth in household income, the pronounced decline in real interest rates last year spurred the demand for dwellings. The turnaround in the housing market started as early as 1993 when house prices began to pick up. Prices of resale homes are expected to rise by a good 12 per cent this year. Even if the effects of the decline in interest rates are gradually being exhausted, prices have reached a more reasonable level in relation to building costs. This helps to explain why the rise in prices in 1995 is estimated at a little less than 4 per cent. The increase in prices in 1993 and so far this year has stimulated housing starts, and after having touched bottom in 1993 housing investment is estimated to expand by 33 per cent in 1994 and nearly 17 per cent in 1995. In spite of this growth, housing investment in 1995 will probably remain at an historically low level: except for the beginning of the 1990s, the volume of housing investment has not been lower since 1971.

Household real disposable income is projected to rise by 3 1/2 per cent in 1994 and about 2 per cent in 1995. The income growth can largely be ascribed to higher income from employment as a result of higher real wages and gains in employment, but net interest income will also make a positive contribution. The contribution from higher transfers from the public sector is declining, but is still substantial.

In the last few years net lending has been positive for the household sector. With house prices also picking up, total household wealth is moving on an upward trend following several years of decline. As a result of the increase in wealth, the fall in interest rates and growth in real income, private consumption is estimated to expand by 4.7 per cent in 1994 and 2.7 per cent next year. An important element in consumption growth in the projection period is a sharp rise in sales of new cars, which also must be viewed on the background of the low level of car purchases for many years.

According to the calculations, the household saving ratio will be reduced from 5.3 per cent in 1993 to 4.0 per cent in 1994 and further to 3.1 per cent in 1995. Much of the growth in consumption, however, is related to purchases of consumer durables. When consumption is adjusted for such purchases, the decline in the saving ratio from 1993 is negligible. In spite of the vigorous growth in household consumption and fixed investment in both 1994 and 1995, the household sector will continue to improve its net financial asset position.

Moderate GDP growth in 1995

Manufacturing output is expected to rise by a good 3 per cent this year. Lower demand from the petroleum sector will probably entail that growth in manufacturing output will be very moderate next year in spite of the cyclical upturn in Norway's main trading partner countries.

A sluggish trend in the construction industry for a number of years came to an end and recovery began at the end of 1993. The sharp rise in housing and construction investment will result in higher production growth in this industry in 1994 and 1995.

Production in private service industries is also expected to increase considerably both in 1994 and 1995. This will contribute to boosting overall production growth in the mainland economy in 1994, but cannot prevent a slower growth rate in 1995. According to the calculations, mainland GDP growth will be 3.5 per cent in 1994 and 2.2 per cent next year.

Oil and gas production is projected to advance sharply in 1994, entailing that total GDP growth may reach 4.5 per cent. Next year output growth in the offshore sector will be more in line with the increase in mainland activity, with GDP growth estimated at 2.6 per cent.

Lower unemployment

Pronounced growth in the mainland economy in 1994 has resulted in a clear improvement in the labour market and employment is now increasing for the first time since 1987. The number employed is expected to grow by 1.5 per cent from 1993 to 1994. The growth rate will probably be about the same next year and, according to the calculations, the number employed will be 30 000 higher in the fourth quarter of 1995 than in the same period one year earlier. The labour force is also expanding sharply for the first time since 1988. The calculations indicate that the rise in the supply of labour will be higher than the growth implied by underlying demographic trends both in 1994 and 1995. Unemployment is projected to fall to 5.4 per cent in 1994, edging down to 5.0 per cent in 1995.

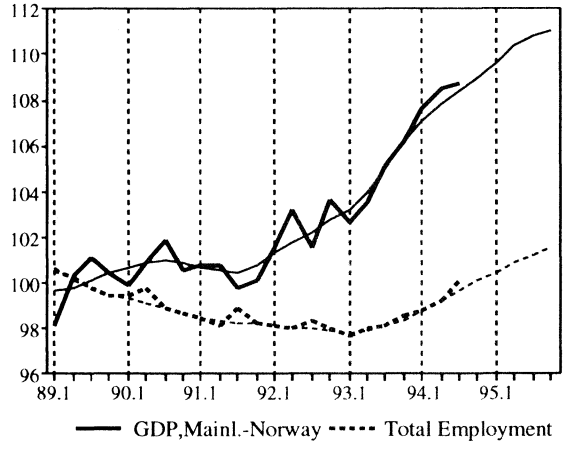
Sizeable current-account surplus

Crude oil prices are assumed to remain at $ 16.50 p/b in the fourth quarter of 1994, rising to $ 17 p/b in 1995. With a projected dollar exchange rate of NKr 6.85 from the third quarter of this year, this is equivalent to NKr 113 p/b in 1994 and about NKr 117 p/b in 1995.

The brisk growth in imports this year will contribute to reducing the balance of trade surplus between 1993 and 1994. Even though the volume of imports will rise faster than exports in 1995, an improvement in the terms of trade will entail that the balance of trade remains at approximately the same level as in 1994. The deficit on the interest and transfers balance will decline in both 1994 and 1995. Lower net interest payments abroad will make a contribution both years, underpinned in 1994 by a decline in share dividend payments. The current-account surplus is estimated at NKr 24.2 billion in 1994 and NKr 27.1 billion in 1995.

Gross domestic product and employment

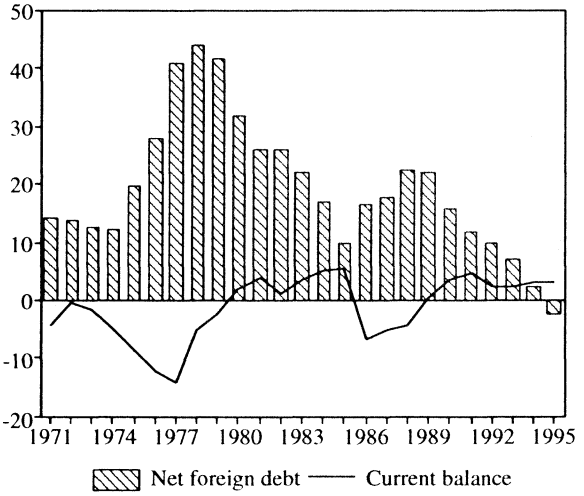
1989=100. Seasonally adjusted (QNA)
Seasonally adjusted and smoothed (KVARTS)



Source: Statistics Norway

Current balance and foreign debt

Per cent of GDP



Source: Statistics Norway.

Norway: Trends in selected macroeconomic variables
Percentage volume changes in 1991 prices*)[1)]

	Billion 1991-Nkr	Growth from the same period previous year								
	1993	1993	92.4	93.1	93.2	93.3	93.4	94.1	94.2	94.3
Private consumption	361.9	1.7	2.0	0.2	-0.6	4.2	2.7	6.5	4.7	3.9
Goods	222.4	1.6	2.5	-0.3	-1.1	5.0	2.8	9.4	6.2	4.3
Services	127.9	1.7	1.2	0.7	0.8	3.0	2.1	3.6	2.7	2.5
Norwegian consumption abroad	24.7	3.5	0.9	1.0	1.0	5.0	6.3	5.5	6.7	10.2
- non-residents' consumption	-13.1	5.1	-0.1	-3.2	7.8	6.1	7.9	31.5	13.1	8.9
Government consumption	156.7	1.8	5.0	3.0	-1.2	2.9	2.7	4.6	4.6	-0.3
Central government	62.3	1.6	7.6	4.8	-6.6	4.2	4.2	7.9	9.6	-3.2
Civilian	41.6	7.3	8.8	9.9	-2.8	8.6	14.3	5.9	6.2	-6.5
Military	20.7	-8.3	6.3	-7.6	-13.9	-3.7	-7.7	13.6	16.7	3.7
Local government	94.5	2.0	3.1	1.9	2.6	2.1	1.5	2.6	1.6	1.5
Gross fixed capital formation	152.8	15.2	-1.6	7.8	-20.6	95.0	3.1	9.7	-15.5	-27.2
Oil and shipping	65.5	59.4	-31.9	98.1	-35.1	405.6	56.3	38.7	-40.4	-51.3
Mainland Norway	87.4	-4.7	9.2	-6.3	-4.0	1.4	-8.7	0.1	3.9	9.1
Manufacturing and mining	13.3	-1.2	16.9	-1.9	7.1	4.4	-10.6	-1.6	-1.1	1.3
Production of other goods	11.9	-2.0	-5.4	-1.9	5.0	6.1	-16.3	-12.9	-1.8	-8.2
General government	22.6	-11.6	6.5	-9.7	-20.3	1.1	-14.3	-11.0	-7.3	-4.8
Dwellings	11.7	-5.2	-7.8	-12.5	-12.9	-6.7	11.3	23.8	34.9	39.5
Other services	27.9	-0.9	23.4	-4.0	6.6	1.7	-6.2	3.4	5.3	20.3
Stocks (contribution to GDP growth)[4)]	-15.5	-1.4	-0.8	1.8	2.6	-10.7	1.0	-1.8	7.8	8.9
Other commodities (contribution to GDP growth)[3)4)]	-7.5	0.2	-0.8	0.4	-1.0	0.9	0.5	-1.5	3.3	-0.7
Ships and oil platforms in progress (contribution to GDP growth)[4)]	-8.0	-1.5	0.1	1.4	3.6	-11.6	0.5	-0.3	4.5	9.6
Gross investment (incl. stock changes)	137.3	8.0	-6.3	16.0	-15.4	22.9	10.0	-2.5	30.7	4.3
Final domestic use of goods and sevices	656.0	3.0	1.1	4.1	-3.8	7.7	4.0	4.0	9.5	3.0
-accrued petroleum investment[2)]	52.0	15.9	6.5	12.6	-4.9	47.7	17.2	19.5	-7.8	11.1
-demand from mainland Norway	606.1	0.7	3.9	-0.0	-1.2	3.5	0.7	5.1	4.6	3.6
Exports	332.6	1.8	5.7	-6.2	5.2	2.7	5.7	11.9	3.7	7.7
Traditional goods	120.6	3.0	5.9	-3.3	4.4	0.7	10.1	16.8	7.2	20.4
Crude oil and natural gas	113.4	5.8	7.6	-0.6	7.6	1.7	14.2	18.4	10.6	8.9
Ships and oil platforms	13.0	-12.5	0.4	-52.4	45.8	54.7	-35.4	-21.4	-54.1	-43.8
Services	85.6	-2.2	4.3	-4.6	-2.2	1.4	-3.8	1.0	1.3	-1.5
Total use of goods and services	988.6	2.6	2.6	0.4	-0.8	6.0	4.6	6.6	7.5	4.5
Imports	262.3	3.3	-2.9	0.0	-4.4	11.3	6.7	8.0	8.4	7.8
Traditional goods	159.6	1.7	0.6	-3.0	-1.4	3.0	7.8	14.1	19.3	16.5
Crude oil	1.2	18.9	-47.3	64.7	-25.4	16.5	59.2	-21.4	-33.6	-36.5
Ships and oil platforms	15.9	44.4	-51.4	78.8	-14.8	166.8	40.9	-4.3	-36.6	-8.6
Services	85.7	0.8	4.4	-1.1	-7.0	12.0	-0.4	-1.7	-1.9	-2.1
Gross domestic product (GDP)	726.2	2.3	4.6	0.6	0.6	4.2	3.8	6.2	7.1	3.3
Mainland Norway	586.6	2.0	3.9	1.0	0.1	4.3	2.4	4.3	5.3	2.9
Oil activities and shipping	139.6	3.8	8.0	-1.1	2.4	3.7	10.0	14.0	14.6	5.0
Mainland industry	541.0	1.8	3.7	0.8	0.3	3.9	2.2	3.7	4.9	2.8
Manufacturing and mining	97.6	1.6	1.2	0.1	0.6	2.8	3.1	1.9	8.1	5.5
Production of other goods	73.9	1.9	10.0	0.2	-4.0	8.4	1.4	-0.0	2.2	-2.4
General government	119.1	2.8	3.2	2.7	1.9	2.6	3.8	3.3	2.4	1.7
Private services	250.4	1.4	3.2	0.5	0.4	3.5	1.4	5.7	5.5	4.1
Correction items (contribution to GDP growth)[4)5)]	45.6	0.2	0.3	0.2	-0.1	0.5	0.3	0.7	0.6	0.3

*) Notes. see "Technical comments".

Norway: Trends in selected macroeconomic variables
Percentage volume changes in 1991 prices*)[1]

	Billion 1991-Nkr	Growth from previous quarter seasonally adjusted[6]								
	1993	1993	92.4	93.1	93.2	93.3	93.4	94.1	94.2	94.3
Private consumption	361.9	1.7	1.4	-1.5	1.6	2.5	-0.1	2.1	0.1	1.5
Goods	222.4	1.6	2.1	-2.9	2.5	3.5	-0.1	3.3	-0.7	1.7
Services	127.9	1.7	-0.3	0.0	1.6	1.2	-0.5	1.7	0.4	0.6
Norwegian consumption abroad	24.7	3.5	0.1	2.4	-1.0	2.9	1.6	0.2	4.1	3.7
- non-residents' consumption	-13.1	5.1	-5.9	-5.4	10.7	6.2	-1.8	14.1	-4.1	0.4
Government consumption	156.7	1.8	-0.3	0.2	-1.0	4.3	-0.3	1.5	-0.6	-0.8
Central government	62.3	1.6	-2.4	0.0	-3.7	11.0	-1.4	2.1	-1.3	-2.1
Civilian	41.6	7.3	-3.6	7.5	-4.6	11.2	-0.5	-1.0	-2.5	-1.6
Military	20.7	-8.3	-0.5	-12.4	-1.8	10.8	-3.1	8.4	1.0	-3.2
Local government	94.5	2.0	1.2	0.3	0.7	0.1	0.5	1.2	-0.2	0.1
Gross fixed capital formation	152.8	15.2	8.5	-11.8	40.9	44.7	-41.3	-10.0	11.4	23.4
Oil and shipping	65.5	59.4	-10.2	9.7	155.1	102.3	-71.4	-6.4	10.9	64.4
Mainland Norway	87.4	-4.7	14.1	-16.8	5.4	1.4	4.0	-11.4	11.6	5.7
Manufacturing and mining	13.3	-1.2	13.9	-18.2	8.8	5.2	-1.4	-13.5	9.9	7.4
Production of other goods	11.9	-2.0	-0.1	-2.0	4.2	3.1	-19.7	-0.6	18.9	-3.2
General government	22.6	-11.6	14.2	-13.6	1.2	0.6	-1.0	-12.9	9.2	-0.1
Dwellings	11.7	-5.2	-6.2	-3.9	-1.2	4.5	11.9	7.0	8.3	7.5
Other services	27.9	-0.9	30.1	-28.4	11.2	-1.7	19.0	-20.3	13.0	12.2
Stocks (contribution to GDP growth)[4]	-15.5	-1.4	-1.9	3.2	-7.8	-4.9	9.8	1.3	0.9	-2.7
Other commodities (contribution to GDP growth)[3][4]	-7.5	0.2	-1.8	2.3	-3.1	2.9	-1.9	1.2	0.6	-0.3
Ships and oil platforms in progress (contribution to GDP growth)[4]	-8.0	-1.5	-0.1	0.9	-4.7	-7.8	11.8	0.1	0.3	-2.4
Gross investment (incl. stock changes)	137.3	8.0	-3.2	6.6	-8.7	26.5	-11.7	-2.0	15.0	6.4
Final domestic use of goods and sevices	656.0	3.0	0.1	0.5	-1.2	7.6	-2.8	1.1	2.9	2.1
-accrued petroleum investment[2]	52.0	15.9	-3.4	2.5	42.0	5.3	-22.7	3.5	9.6	26.6
-demand from mainland Norway	606.1	0.7	2.8	-3.5	1.5	2.8	0.4	-0.1	1.4	1.5
Exports	332.6	1.8	2.7	-4.1	7.5	-3.4	6.0	1.9	-0.5	0.3
Traditional goods	120.6	3.0	-1.5	-1.8	8.5	-4.4	7.8	4.6	-0.6	7.3
Crude oil and natural gas	113.4	5.8	1.1	-2.7	7.4	-4.0	13.9	1.0	0.1	-5.4
Ships and oil platforms	13.0	-12.5	78.5	-30.1	57.0	-20.8	-25.7	-15.0	-8.3	-3.1
Services	85.6	-2.2	2.6	-4.0	-0.1	2.3	-1.5	1.3	-0.5	-1.7
Total use of goods and services	988.6	2.6	0.9	-1.0	1.7	3.8	0.1	1.4	1.7	1.5
Imports	262.3	3.3	0.7	-0.8	4.0	6.7	-3.1	1.1	3.7	6.1
Traditional goods	159.6	1.7	-1.9	-3.2	2.0	5.6	3.3	4.0	4.2	3.8
Crude oil	1.2	18.9	-32.1	54.7	-13.0	27.7	-7.3	-23.6	-26.5	22.1
Ships and oil platforms	15.9	44.4	39.4	11.2	36.7	25.9	-26.4	-24.4	-9.5	81.7
Services	85.7	0.8	2.6	1.7	3.2	4.6	-9.4	0.1	4.6	1.9
Gross domestic product (GDP)	726.2	2.3	1.0	-1.1	0.9	2.7	1.3	1.5	1.1	-0.2
Mainland Norway	586.6	2.0	2.1	-1.0	0.8	1.6	1.0	1.3	0.8	0.1
Oil activities and shipping	139.6	3.8	-3.2	-1.7	1.3	7.7	2.3	2.2	2.0	-1.7
Mainland industry	541.0	1.8	2.3	-1.0	0.6	1.2	1.5	0.8	0.8	0.1
Manufacturing and mining	97.6	1.6	0.4	-0.2	0.8	1.6	1.1	0.2	3.4	0.7
Production of other goods	73.9	1.9	3.7	-3.5	0.3	2.9	2.0	-3.8	0.5	1.8
General government	119.1	2.8	0.4	1.3	0.5	0.3	1.7	0.1	0.0	-0.0
Private services	250.4	1.4	3.6	-1.7	0.7	0.9	1.5	2.8	0.2	-0.5
Correction items (contribution to GDP growth)[4][5]	45.6	0.2	-0.1	-0.0	0.2	0.4	-0.3	0.5	0.1	0.0

*) Notes, see "Technical comments".

Norway: Price indices for selected macroeconomic variables

	Percentage change from the same period the previous year					Growth from previous quarter seasonally adjusted. Per cent[6]			
	1993	93.4	94.1	94.2	94.3	93.4	94.1	94.2	94.3
Private consumption	1.9	1.5	1.0	1.1	1.8	0.4	0.1	0.5	0.7
Government consumption	1.0	1.4	2.5	1.9	1.5	0.4	0.9	-0.1	0.3
Gross fixed capital formation	3.4	2.9	1.4	0.4	-1.3	-0.1	-0.1	-0.5	-0.6
- mainland Norway	1.1	1.8	3.6	2.6	0.8	0.0	1.2	0.2	-0.5
Final domestic use of goods and services	1.9	1.7	1.2	0.8	0.8	0.2	0.8	-0.2	0.1
- demand from mainland Norway	1.6	1.6	1.7	1.5	1.6	0.4	0.5	0.3	0.4
Exports	2.9	-2.3	-5.3	-2.5	-0.8	-4.2	-0.7	2.4	1.7
- traditional merchandise exports	0.2	-1.6	-0.6	-0.1	1.1	-1.6	1.5	-0.2	1.3
Total use of goods and services	2.2	0.4	-1.1	-0.2	0.3	-1.4	0.3	0.7	0.6
Imports	2.8	2.9	1.4	-0.1	-1.8	-0.7	0.7	-1.9	-0.1
- traditional merchandise imports	0.4	1.7	0.8	-0.2	-0.4	-0.1	0.7	-1.8	0.7
Gross domestic product (GDP)	2.0	-0.5	-2.0	-0.2	1.1	-1.6	0.1	1.6	0.9
- mainland Norway	1.6	1.1	1.6	1.9	2.2	-0.2	0.9	0.6	0.9

Technical comments on the quarterly accounts figures

Footnotes:
1) Figures for 1993 may deviate somewhat from those published in Economic Survey 3/94 due to new information.
2) Including ships, oil platforms and platform modules in progress.
3) Excluding ships, oil platforms and platform modules in progress.
4) Contributions to GDP growth are calculated as the difference between corresponding figures calculated as a precentage of GDP.
5) Corrected for free bank services and certain indirect taxes.
6) The method for seasonal adjustment has been changed.

Quarterly calculations: The calculations are made on a less detailed level than the calculations for the annual national accounts, and are based on more simplified procedures. The quarterly national accounts figures for the years up to and including 1991 have been reconciled against the most recently published annual accounts figures.

Gross fixed capital formation: Total gross fixed capital formation is heavily influenced by significant fluctuations in investment in oil activities. These fluctuations are inter alia due to the fact that platforms that have been under construction for several years are counted as investment in the quarter and with the capital value they have at the time they are towed out to the field.

Seasonally-adjusted figures: The original quarterly national accounts are not seasonally adjusted, as these accounts are attempts to register the actual transactions that have taken place in each quarter. Many of the statistical series thus show clear seasonal variations. Most series are therefore seasonally adjusted on the detailed accounts level and then aggregated to obtain the figures presented in the tables and charts of this volume.

Underlying trend: The Norwegian economy is so small that random or single important occurences can give wide variations in the figures. The seasonally adjusted figures are therefore smoothed so that it is possible to calculate the underlying trend for each series. Smoothing is an attempt to distinguish between random and systematic variations in the series.

Norway: Revisions of underlying trend

Percentage growth from previous quarter. Seasonally adjusted and smoothed. Annual rates

Publ.		90.4	91.1	91.2	91.3	91.4	92.1	92.2	92.3	92.4	93.1	93.2	93.3	93.4	94.1	94.2	94.3
								GDP mainland Norway									
June	-91	0	-1														
Sep.	-91	0	0	-1													
Dec.	-91	0	0	-1	-1												
Feb.	-92	0	0	0	0	1											
June	-92	1	0	-1	-1	0	1										
Sep.	-92	0	0	-1	-1	0	2	3									
Dec.	-92	0	0	-1	0	0	1	1	0								
Feb.	-93	0	0	-1	0	1	2	2	1	-1							
June	-93	0	-1	-1	-1	1	2	2	2	2	0						
Sep.	-93	0	-1	-1	-1	1	2	2	2	2	0	-1					
Dec.	-93	0	-1	-1	-1	1	2	2	2	2	1	1	2				
Feb.	-94	0	-1	-1	-1	1	2	2	2	2	2	2	4	4			
June	-94	0	-2	-2	-1	2	4	3	1	1	1	3	6	7	4		
Sep.	-94	0	-2	-2	-1	2	4	2	1	1	1	2	5	5	4	2	
Dec.	-94	0	-1	-2	-1	2	4	2	1	1	1	3	6	6	4	3	2
								Final demand from mainland Norway									
June	-91	0	0	-2													
Sep.	-91	0	-1	-2	-3												
Dec.	-91	0	-1	-2	-2	0											
Feb.	-92	0	-1	-1	0	3	4										
June	-92	1	0	0	0	2	2	2									
Sep.	-92	1	0	0	0	1	2	2	3								
Dec.	-92	1	0	0	0	1	2	2	2	1							
Feb.	-93	1	0	0	0	1	2	2	2	1	0						
June	-93	1	0	-1	-1	1	2	2	3	2	1	-1					
Sep.	-93	1	0	-1	-1	1	2	2	2	2	1	-1	-1				
Dec.	-93	1	0	-1	-1	1	2	2	2	1	1	1	2	4			
Feb.	-94	1	0	-1	-1	1	2	2	2	2	1	1	3	4	4		
June	-94	-1	0	-1	-1	1	3	4	2	2	-1	-1	3	6	4	2	
Sep.	-94	0	-1	0	1	3	4	2	1	0	-1	2	6	5	3	4	
Dec.	-94	-1	-1	-1	1	3	4	2	1	0	0	2	5	4	3	5	5

Comments on the revisions

Revisions can either be due to new/revised quarterly figures for the current year, new/revised annual national accounts figures for previous year, or a change to a new base year. Because the growth rates calculated as annual rates are rounded off to the nearest whole per cent, a 1 percentage point change in the growth rate can be due to different rounding.

Published:		Price basis:	New annual accounts:	Other comments:
Dec.	-89	1987		Revised seasonal adjustment programme
Feb.	-90	"		
June	-90	1988	1987-88	
Sep.	-90	"		
Dec.	-90	"		
Feb.	-91	"		
June	-91	1989	1988-89	
Sep.	-91	"		
Dec.	-91	"		
Feb.	-92	"		
June	-92	1990	1989-90	
Sep.	-92	"		
Dec.	-92	"		
Feb.	-93	"		
June	-93	1991	1990-91	
Sep.	-93	"		
Dec.	-93	"		
Feb.	-94	"		
June	-94	"		Revised seasonal adjustment programme
Sep.	-94	"		
Dec.	-94	"		

Economic policy calendar 1994

September

1. AS Betonmast secures the contract for building an 80-kilometre long power line in central Thailand. The contract is worth NKr 110 million and is the company's second major contract in Thailand.

2. The Norwegian State Railways (NSB) awards ABB Strømmen the contract for 22 electric locomotives. NSB will pay NKr 735 million for the locomotives, to be delivered in 1996 and 1997, and ABB Strømmen will handle about 30 per cent of the work.

9. The British authorities approve Helicopter Service's acquisition of the Bond Group. The agreement entails that the Norwegian company will pay NKr 800 million for the takeover, initially acquiring 49 per cent of the shares and the remainder after three years.

12. The Ministry of Environment decides that Norsk Fett- og Limindustri in Ringerike must be closed as a result of offensive fumes from emissions. It is probably the first time that the authorities order a company to close down pursuant to the Pollution Act.

14. Statoil announces further budget overruns of NKr 250 million for the refinery project in Kalundborg. Total budget overruns have now reached nearly DEK 1.4 billion.

14. Minister of Industry and Energy Jens Stoltenberg presents proposals for changes in the operating conditions for petroleum activities on the continental shelf. The Government advocates that the tax system for the petroleum sector be retained, but proposes changes in the sliding scale, reduced central government participation in the 15th round of licences and a more active adjustment of state shares in licenses that have already been allocated.

20. Statoil and seven other western oil companies sign a production agreement with Azerbaijan on oil production in the Caspian Sea. Total investment is estimated at NKr 54 billion, of which Statoil will contribute about NKr 5 billion. Total reserves in the two fields to be developed are put at about 4 billion barrels of oil, with Statoil accounting for 8.56 per cent of production.

21. Russia does not accept the agreement between the authorities in Azerbaijan and eight western oil companies, including Statoil. The Russian authorities are of the view that the resources in the Caspian Sea are of decisive importance to all surrounding nations, and that unilateral agreements on the part of one nation are a violation of other countries' interests.

21. Minister of Industry and Energy Jens Stoltenberg receives a plan for the development and operation of the Norne field amounting to NKr 9.8 billion. Statoil's threat to refrain from developing the lucrative field unless the oil companies' operating conditions are improved thereby fails to materialise.

22. The construction of the cavalry's new camp in Åmot Municipality in Østerdalen begins. The camp project is estimated to cost NKr 1.3 billion and over the next three years an area covering 78 000 square metres will be built.

26. Statoil awards Odfjell Well Services a contract for up to NKr 150-200 million for well maintenance on the Gullfaks, Veslefrikk, Troll and Heidrun fields. The project will extend over a period of three years, with an option for an additional two two-year periods.

October

4. The Government tables proposals for the government budget for 1995. The budget proposal shows a deficit before loan transactions of NKr 20.9 billion. The general government deficit is NKr 4.3 billion and is equivalent to about 0.5 per cent of Gross Domestic Product.

12. Statoil and Norsk Hydro sign a cooperation agreement with the two German gas importers Ruhrgas and BEB for the construction and operation of the gas pipeline system to the eastern länder. The pipeline system will require investments of about NKr 4.4 billion, with Statoil and Hydro responsible for 25 per cent. The agreement will give the Norwegian companies improved opportunities for following price trends in the user market and probably ensure a higher share of the profit from gas sales.

13. The Russian Foreign Minister reaches agreement with the President of Azerbaijan on cooperation in connection with the agreement for oil production in the Caspian Sea which Statoil/BP recently concluded with the Government of Azerbaijan. When the agreement was signed, Russia refused to approve it, thereby creating uncertainty about the possibilities for implementation.

13. Texaco awards the ABB Group in Norway project responsibility for the development of the Captain field north of Scotland. The development is estimated to cost NKr 3 billion. ABB's share, including supplies, amounts to about NKr 1 billion.

14. Saga presents a plan for the development and operation of the Vigdis field to the Ministry of Industry and Energy. Total field investment is estimated at a little less than NKr 5 billion. Eight production wells and four injection wells are planned. Production on the field, which contains 180 million barrels of recoverable oil reserves, is expected to begin in the summer of 1997.

14. The Storting's Standing Committee on Local Government and Environment presents proposals for a new Working Environment Act which include a ban on the use of temporary labour for companies' ordinary activities.

16. In a consultative referendum in Finland 57 per cent of the voters vote Yes to Finnish membership in the EU from 1 January. The final decision will be made by the National Assembly later this year.

17. Norsk Hydro pays $ 15 million for a 10 per cent stake in a new aluminium smelter in Slovakia. The European Bank for Reconstruction and Development (EBRD) will also have an interest amounting to $ 15 million and will provide a loan of $ 115 million. Norsk Hydro has an option to purchase the EBRD's share in the smelter.

18. The Ministry of Industry and Energy issues a licence to Norsk Krafteksport AS for a power exchange agreement with the Dutch power company N.V. Samenwerjende elektriciteits-produktiebedrijven (Sep). Norsk Krafteksport will make available power supplies of 2.16 TWh a year. Sep has an option to export, and the Norwegian parties to the agreement the right to import 0.6 TWh a year at an agreed price. The exchange shall take place through a new cable which will be put into operation in 2001, and the agreement applies for 25 years.

18. Saga revises upwards the recoverable reserves in the Snorre field from 717 million to 1 billion barrels of oil. Total investments for development are revised down to about NKr 4.5 billion, a considerable reduction from the original plans. Oil on the Vigdis field will also be processed on the Snorre field, and substantial coordination gains will increase the fields' profitability.

19. Statoil and Saga conclude a cooperation agreement on the development of the Midgard and Smørbukk fields on Haltenbanken in order to reduce the costs of development and operations. The agreement entails that the companies will be equal partners, with Statoil having operator responsibility. Based on the new plans, the companies expect savings of at least NKr 8 billion from the original costs of NKr 47 billion.

19. Statoil makes a large gas discovery in the North Sea, close to the Gullfaks field. The field may contain 60 billion cubic metres of gas, thereby representing gas reserves worth about NKr 40 billion.

20. The Union Group approves investments of about NKr 650 million. The bulk, NKr 530 million, will be used to modernise Union Bruk at Klosterøya in Skien. In addition to paper and pulp, Union will also invest in properties.

28. The Storting gives its approval to an increase in the tax on housing. 750 000 Norwegians must pay higher taxes. The assessed value of all real property, excluding forests, is increased 10 per cent. A new two-tiered system is introduced where the normal rate is 2.5 per cent on dwellings and cottages with an assessed value of up to NKr 440 000, while a rate of 5 per cent is levied on dwellings with an assessed value exceeding NKr 440 000. The tax-free allowance for dwellings is set at NKr 50 000.

29. The Government appoints Thorvald Stoltenberg as Norway's representative in the EU Commission. Stoltenberg will be the EU's Fisheries Commissioner if Norway becomes a member of the Union.

31. Norges Bank launches a new 200-krone note and a new 20-krone coin in the Northern Lights Planetarium in Tromsø.

November

1. The small contractor Boye Pedersen from Sandefjord is awarded a contract, worth NKr 1.6 billion, for a development project in Turkey. Through its recently established subsidiary Boye Pedersen International, the firm will build nearly 2 000 exclusive one-family dwellings and flats for members of parliament in Ankara.

2. Swedish Minister of Finance Göran Persson presents the largest austerity package in Swedish history. More than SKr 58 billion is to be saved up to 1998.

3. The subsidiary of Maritim Group, Unit Rig, is awarded a drilling contract worth NKr 150 million for Texaco's Captain field in sharp competition with the company Noble Drilling.

3. As operator of the Norne field, Statoil is now in the process of distributing contracts worth altogether NKr 2.3 billion. Kværner Energi can add NKr 600 million to its order backlog, while Ugland Coflexip is awarded a contract for NKr 500 million. NKr 1.1 billion goes to the company Far East Levingston in Singapore. The company will build the hull of the production ship, which from 1997 will pick up oil from the Norne field.

4. Wilh. Wilhelmsen Limited AS acquires the holdings of the two remaining Finnish investors in Wilhelmsen Lines AS, thereby increasing its ownership interest from 70 to 100 per cent. The purchase price is $ 47.2 million.

4. The Office of the Auditor General refuses to approve Postal Giro's accounts. NKr 1 billion has vanished, and the head of Postal Giro, Roald Ulltang, is unable to account for these funds. The Office of the Auditor General has uncovered erroneous entries, unexplained discrepancies and accounting errors that go back to 1985.

10. The Oil Taxation Office releases the oil companies' tax assessment figures for 1993, showing that the central government's revenues will be NKr 1.5 billion lower than in 1992. Total assessed taxes amount to about NKr 15.3 billion. Statoil is still the decidedly largest taxpayer with assessed taxes of NKr 6.9 billion.

11. Statoil's activities in Asia yield results. Gas revenues from the Bangkot field in Thailand, where Statoil and BP have ownership interests, have thus far this year generated earnings of NKr 140-150 million.

12. Two new controversial tax proposals from the Government are turned down by the Storting. This means that Pilsner beer will remain Pilsner beer next year and food packaging will not be subject to an environmental tax.

14. The Swedish people vote Yes to Swedish membership in the EU. The result of the referendum is 52.2 per cent in favour and 46.9 per cent against membership.

16. By extinguishing the torch on the Gullfaks A platform, Statoil marks an international environmental event. Large quantities of gas shall be sold on the market instead of being burned. In addition, the company will avoid paying the state carbon tax. The torch on the sister platform Gullfaks C will be extinguished in the near future.

20. Statoil confirms that the exploration rig "Deepsea Bergen" has made a discovery outside the Møre coast, 50 kilometres northwest of Florø. Both oil and gas have been found in the reservoir, but this is probably a small find.

21. Smedvig Robray Ltd. in Singapore signs a contract with the Chinese oil company Arco China. The contract will secure up to two years of employment for the mobile drilling rig "West Alpha" in the South China Sea. Including options, the contract is worth NKr 225 million. Mobilisation costs of NKr 70-80 million come in addition.

22. OPEC decides to freeze oil production in its member countries at 24.52 million barrels per day throughout 1995. As a result of the surprising decision, oil prices rise to more than $ 17 p/b.

22. Defence Ministers from Norway, Sweden, Finland and Denmark agree to cooperate on the procurement and development of defence materiel. The countries will sign a framework agreement totalling more than NKr 50 billion before Christmas.

22. SAS sells the SAS hotel in Brussels to a German property broking firm. The price tag is about NKr 550 million. SAS International Hotels shall continue to be responsible for the hotel's management.

24. Diderik Schnitler, Group Managing Director of Kværner, is elected president of the Confederation of Norwegian Business and Industry (NHO) after Svein Aaser. Mr. Schnitler, who was recommended by the election committee, received 211 votes while his opponent Leif Frode Onarheim received 141 votes. This is the first time in NHO's history that an election has taken place with rival fractions at the general meeting.

25. Statoil has awarded Eeg-Henriksen Anlegg and NCC AB the contract for the construction work for the extension on the gas terminal, methanol and gas plant in Tjeldbergodden. The contract, worth NKr 250 million, is to be shared between Eeg-Henriksen (two thirds) and NCC AB (one third).

28. The Norwegian people vote No to Norwegian membership in the EU. The result of the referendum shows that 52.2 per cent of the voters say NO to membership while 47.8 per cent say Yes.

30. The Storting gives its approval to Norwegian ratification of the establishment of the World Trade Organisation (WTO). WTO is the result of the Uruguay Round in GATT, and was signed by 110 countries earlier this year.

December

1. Statoil announces the allocation of steel contracts for NKr 8 billion. European and Japanese steel suppliers will handle deliveries for 5 new gas pipeline projects in the North Sea in the years to the turn of the century. The agreement, which covers 1.5 million tons of steel, is one of the world's largest in this decade, and the largest ever in development projects on the Norwegian shelf.

6. Statoil has extended and expanded the contract with Helikopter Service for flights from Bergen's Flesland Airport to installations in the North Sea. The new, expanded contract will run until 15 January 2000 and is worth NKr 250 million.

Forecasting labour market imbalances[1]

Ådne Cappelen and Nils Martin Stølen

High and rising levels of unemployment are on the policy agenda in most OECD-countries. It is generally acknowledged that unemployment is higher among unskilled than skilled labour. Using a large-scale disaggregated macroeconometric model of the Norwegian economy, we describe the present imbalances in the Norwegian labour markets and forecast possible changes in these imbalances during the 1990s. As a result of a substantial growth in the educational propensities since 1987, the projection shows that growth in supply of persons with university education is much stronger than the expected growth in demand.

Introduction

Unemployment is a key policy issue for many governments. Lowering unemployment will meet objectives such as efficient resource utilization and the reduction of social problems. Also, in countries with well developed "welfare states" high unemployment involves large direct and indirect budgetary costs that may lead to unsustainable fiscal deficits if unemployment persists.

It is well known that unemployment differs across educational categories with unemployment being highly concentrated among less skilled individuals, see Juhn et al. (1991). This has also been the case in Norway where unemployment increased from 2% in 1987 to 6% in 1993. Although unemployment is now clearly coming down, the worry is that the structure of labour demand with regard to various skill groups, will not increase sufficiently for less skilled persons to bring unemployment for this category much down. If this view is correct, we may fairly quickly experience excess demand for skilled persons as the average unemployment rate comes down. Thus wage pressures may mount even if average unemployment remains above normal historical levels.

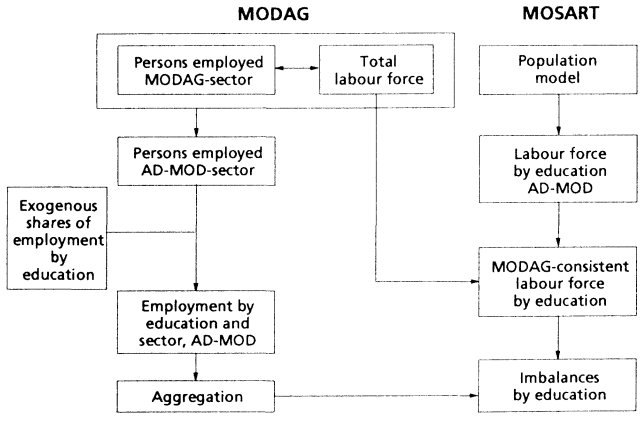
In order to analyse the possiblity of disequilibrium in various labour markets we rely on a combination of models of the Norwegian economy which are briefly presented in the following section. These models are then used to forecast labour market imbalances during 1994-2000.

The model structure

An overview of the model structure is presented in chart 1. Total employment which is an aggregate of employment by industry, is determined in the macroeconometric model MODAG[2]. The model is based on a disaggregated input-output core (40 goods and 30 industries). Factor inputs consist of capital, labour (hours and persons), energy inputs and other material inputs. Labour demand equations are of the cost-minimizing type based on a Cobb-Douglas production function in labour, capital stock and other material inputs. Thus labour demand depends on wage costs per hour divided by the price index of other material inputs, the capital stock as well as gross output. There is increasing returns to scale in most production functions but constant returns in variable factors (labour, energy and material inputs). Demand for labour as well as the other factor demand equations are estimated as error-correction equations using annual data for the period 1962-1991[3].

Total supply of labour in MODAG is determined in a consistent way with employment, and the total number of unemployed corresponds to the definition used in Statistics Norway's Labour Force Sample Surveys (LFSS). This definition of unemployment corresponds to international standards (ILO). The supply of labour, defined by the number of persons in the labour force, is modelled separately for different demographical groups by gender, age and for women also marital status. The labour force depends on the number of people at working age and participation rates for the different groups. For most groups labour market conditions, such as unemployment and composition of labour demand, are found to be quite important for labour supply. After tax consumer real wages are only of little importance.

Chart 1. The model structure in AD-MOD



1 Based on a paper presented at the 14th International Symposium on Forecasting, Stockholm, Sweden, June 12-15, 1994.
2 Cf. Cappelen (1992) for a detailed presentation of MODAG.
3 Cf. Bowitz and Cappelen (1994) for a detailed discussion of price formation and factor demand in Norwegian industries.

The wage equations are of the error correction type and there is consequently no long run Phillips-curve equation. In the long run wages in manufacturing depend on a value added deflator which incorporates the whole system of indirect taxes such as the payroll tax and sector subsidies, wages in alternative employment and finally the rate of unemployment. The latter enters the wage equations in a highly non-linear way so that the effect on wages of changes in unemployment is low when unemployment is as high as it has been so far in the 1990s. Wages in other sectors (services and the public sector) are mainly driven by alternative wages in other sectors, consumer prices adjusted for direct taxes as well as unemployment. Labour productivity enters all equations so that changes in productivity are equally shared by employers and employees.

MOSART is a stochastic microsimulation model which projects population size and composition, labour force, educational level and future pension benefits, cf. Andreassen et al. (1993 and 1994) and Fredriksen and Spurkland (1993) for a further description of MOSART. The model simulates life histories for a representative sample of the Norwegian population and includes events like immigration and emigration, births, deaths, marriage, divorce, education, labour force participation, disability retirement and labour market earnings. The model is a discrete time model (as is also the case with MODAG), with one year intervals and has a recursive structure. The events which may occur for each individual are given by a set of transition probabilites.

Labour force participation rates are in the present version of MOSART assumed to be exogenous for different groups of the population. The projection thus shows the effects on the labour force of changes in size and composition of the population, and in contradiction with MODAG, the participation rates are neither dependent on the actual situation in the labour market, nor on after tax real wages.

In the submodel AD-MOD demand and supply for different kinds of labour are compared by using the number of persons as the unit of measurement. The submodel contains 27 sectors and the divison is rather close to the one used in MODAG. Education has been preferred rather than occupation to characterize labour because this has simplified data construction and has given data of higher quality by use of different population registers. The classification in MOSART is also based on education. By combining the classifications in sectors and education it is, however, possible to obtain a classification by occupation for the most important occupational groups. To achieve this in a satisfactory way, a classification of 33 educational groups is chosen.

The classification is based on four main educational levels dependent on the number of years spent in education:

- Primary school / secondary school level I (-10 years)
- Secondary school level II (11-12 years)
- University level I (13-16 years)
- University level II (17 years-)

For the last three main groups education is thereafter divided in different programmes. The classification is chosen to correspond with MOSART, but in some cases (especially for secondary school) it is more disaggregated.

The model structure in AD-MOD is rather simple. The total number of persons employed (wage earners, self employed and family workers) in each sector in MODAG is aggregated and transferred to the sectors in AD-MOD using a set of exogenous coefficients. Conscripts and foreigners in ocean transports are treated separately. The total number of persons in each sector in AD-MOD is further subdivided by a set of exogenous coefficients which may be changed over time.

To present a consistent picture of the development in total employment, unemployment and the labour force, total supply of labour is derived from MODAG. The projections of labour supply by education from MOSART are therefore adjusted proportionally. By comparing supply and demand for labour with different kinds of education the model gives an indication of possible future imbalances in the labour market for 24 kinds of eduction.

The present version of the model system contains no repercusions from the projected imbalances to wage formation by educational groups, substitution with other kinds of labour or choice of education.

Macroeconomic development 1993-2000

During 1988-1993 unemployment in Norway rose to 6 percent. Historically this rate is very high by Norwegian standards. The previous peak unemployment rate was 3.4 percent (in 1983). The recession that has taken place in Norway in these years is the longest although not the dee-

Table 1. Macroeconomic development. 1990-2000. Growth rates in per cent

	1990-1993	1994-1996	1997-2000
Private consumption	1.0	3.1	1.7
Public consumption	2.9	2.0	1.8
Gross investment	2.7	3.1	1.2
Mainland economy	-2.8	7.5	3.0
Exports	4.7	3.6	2.5
Imports	2.5	4.4	2.5
GDP	2.4	3.1	1.6
GDP-mainland	1.1	2.6	1.9
Consumer prices	2.7	1.9	2.3
Wage rates	3.5	3.0	3.6
Unemployment rate (level in %)[1)]	6.0	4.7	4.1
Employment	-0.4	1.4	0.7
General gov. net fin. inv. (% of GDP)[1)]	-2.7	1.6	1.6
Current account (% of GDP)[1)]	2.3	4.1	8.7

1) End of period.

Figure 1. Labour market indicators. Total unemployment rate 1987-2000
Per cent

Source: Statistics Norway.

pest in this century! During the second half of 1993 and in 1994, unemployment has clearly come down and this decline is expected to continue for some years according to our simulations. The reasons for this improvement in the labour market are a significant increase in household demand (both private consumption and housing investment), which is already visible according to quarterly national accounts data, and an expected cyclical upturn in the European OECD-countries during 1994 and 1995. Lower growth in government sector demand as well as lower investment in the oil sector will moderate the cyclical upturn and continue to keep total gross investment growth at moderate levels for the rest of this decade. Growth in employment is expected to be somewhat higher than growth in labour supply also during 1997-2000, thus bringing unemployment further down. In spite of this the unemployment level is expected to be very high by Norwegain standards even at the end of the decade, cf. figure 1 and table 1.

Table 2 presents the overall labour market situation and employment according to some broad industry aggregates. We predict a further decline in primary industries which is mainly taking place in agriculture. Employment in manufacturing is also declining somewhat. One reason for this decline is the reduction in oil investment which is at a historically very high level and is expected to decline for the rest of the decade. Employment in construction is expected to pick up after the recent recession, and the current increase in housing investment is important for the development in this sector. The employment increase in the service sectors is to a large extent driven by higher consumer spending and the general economic recovery. Employment in the public sector is assumed to increase much no than during recent years partly because private sector employment is increasing and there is less need for a fiscal stimulus, and partly because there is a need for improving public sector financial balances in the years ahead. Real wage growth is expected to pick up somewhat, and the growth rate will gradually equal the growth in labour productivity. The reason why wage-growth does not increase more in spite of lower unemployment is that wage formation is estimated to be highly non-linear in the unemployment rate so that the level of unemployment has to become lower than 4 percent before wage-rates really begin to pick up.

Government net financial investements are expected to improve significantly during the coming years. This is partly caused by cyclical factors and partly by higher real oil prices and production as oil revenues are heavily taxed and government participation in the sector is substantial. Lower growth in government transfers is due to demographic factors in addition to the cyclical factors such as lower unemployment benefits. Higher surpluses on the current account are mainly explained by higher oil exports.

Table 2. Projection of labour force, unemployment and employment. 1 000 persons

	1990	1992	1995	2000
Labour force	2 163	2 154	2 200	2 268
Unemployment	112	126	111	93
Employment	2 051	2 028	2 089	2 175
-Primary industries	130	118	114	104
-Manufacturing	308	296	290	272
-Oil and ocean trsp.	53	54	48	46
-Constr. and electr.	166	149	147	163
-Wholesale and retail tr.	288	277	285	297
-Domestic transport	148	143	147	154
-Other private services	391	393	424	455
-Public sector	567	600	634	684

An earlier study of future labour market imbalances, cf. Drzwi et al. (1994), was based on a macroeconomic projection from The Norwegian Employment Commission (NOU 1992:26) called the "solidarity scenario". In that scenario wage growth was assumed to be lower than what is shown in table 1 as the commission assumed that a successful incomes policy would limit real-wage growth. The contribution from the government in this policy package was higher growth in public sector employment. The combination of these two changes in our assumptions would be to increase employment growth and reduce unemployment below 4 per cent by the end of the decade. At present it is difficult to say if these assumptions will materialize, and we have instead chosen to present a projection which is rather close to the baseline scenario according to the commission.

Since 1989, government expenditures on education have been increased and lead to an increase of capacity in the education system. One reason for this policy has been to reduce youth unemployment. This has increased the number of pupils and students in the early 1990s. As discussed below, this change will alter the composition of the labour force with regard to educational background in the years ahead. It is probably correct to say that the capacity has determined the supply of labour with higher education. During the coming years this may change as job opportunities improve and may lead young people to choose more work and less education.

Demand for labour by education

During the past decades the share of employment with education from secondary school or university level has grown rapidly in almost all sectors, while the share with education from primary school only has declined substantially. Changes in relative wages and technical progress may have been important factors, but an expansion of the capacity in the educational system and thereby increased supply of labour with secondary and higher education may also have had an effect. In the present version of the model, the development in the employment shares for different kinds of education by sector is exogenous. The projection in this paper is based on assumptions made by The Directorate of Labour (1993).

Table 3. Demand for labour by education 1990-2000. 1 000 persons

	1990	1995	2000
Primary school /secondary I	937	818	719
Secondary school II	584	676	779
University level I	337	410	478
University level II	89	101	115
Unspecified	60	44	46
Total*)	2 007	2 048	2 140

*) Excl. conscripts and foreigners in ocean transport.

The projections of employment shares are based on the trends during the past decade. Thus, for most sectors the growth in the share for university level I and II is assumed to continue. For the employment shares with education from secondary school, growth is assumed to decline in most sectors, and in some sectors there may also be a decline in the level as a consequence of a rather strong growth in the share with education at the university level. As a consequence of the above assumptions, the share of employees with only primary school declines in all sectors.

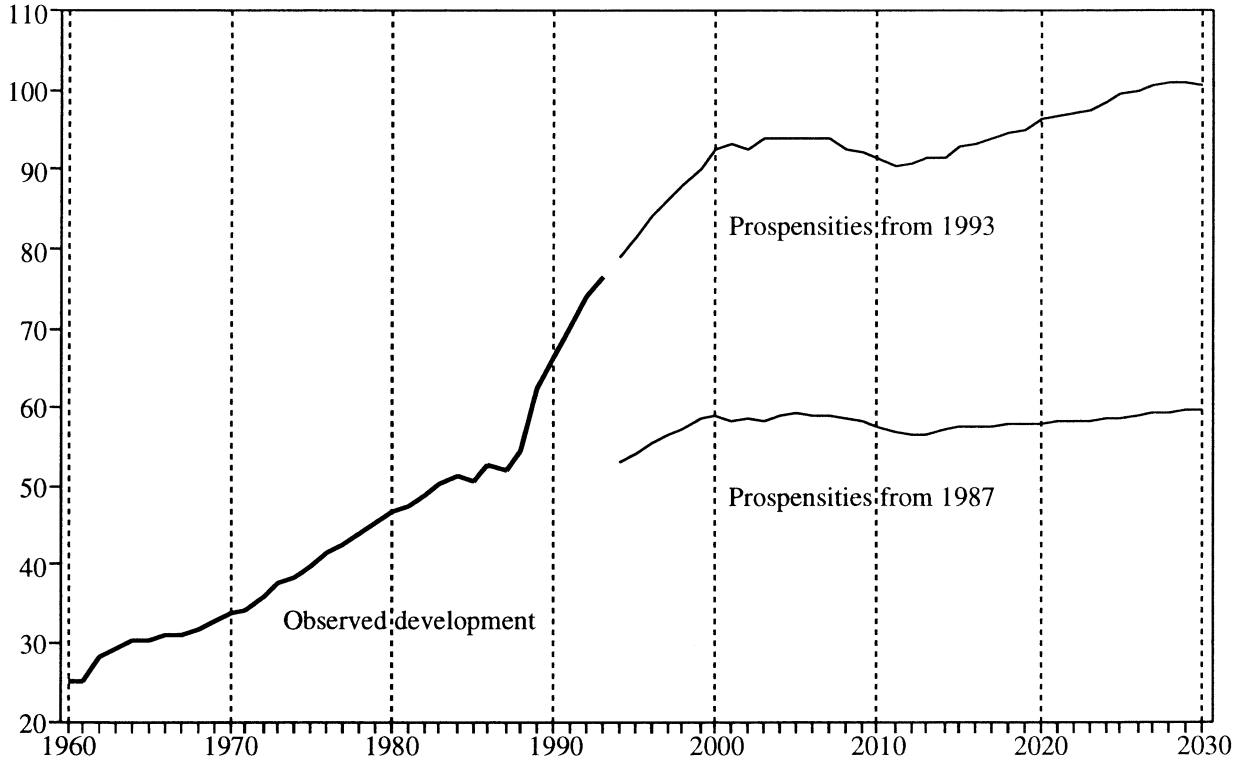
Table 3 shows the resulting growth in demand for the different main groups of education. Demand for persons with education from secondary school and university level increases substantially in the years ahead, while demand for persons with only primary school declines. From 1990 to 2000 demand for persons with education from secondary school is estimated to grow by 195 000 persons, or 33.5 per cent, while demand for persons with education at university level I is estimated to grow by 141 000 persons, or 41.8 per cent. The growth in demand for labour is especially expected to be strong for nurses and other groups with education in health care, teachers, lawyers, economists and social scientists.

Two factors explain the strong increase in demand for labour with higher education. An increasing share of the labour force is employed in private and public services, where the share of persons with secondary and higher education is relatively high. However, the assumption of an increasing share of demand for labour with higher education by sector is the main factor.

Supply of labour by education

As mentioned above, total supply of labour from MODAG is disaggregated to different categories of education by shares simulated by MOSART. A projection of the population assuming a constant rate of fertility at 1.89 and a net immigration of 8 000 persons per year forms a basis for the projections. As pointed out by Andreassen et al. (1993) the results are sensitive with regard to the assumption about immigration while fertility obviously is of little importance for the size of population older than 15 years the first two decades.

Figure 2. The number of pupils and students relative to the number of persons in age 16-24 years



Source: Statistics Norway.

Table 4. Supply of labour by education. 1990 - 2000. 1 000 persons

	1990	1995	2000
Primary school/secondary I	1005	870	756
Secondary school II	615	697	757
University level I	344	431	528
University level II	90	109	140
Unspecified	65	54	51
Total *)	2 119	2 160	2 232

*) Excl. conscripts and foreigners in ocean transport

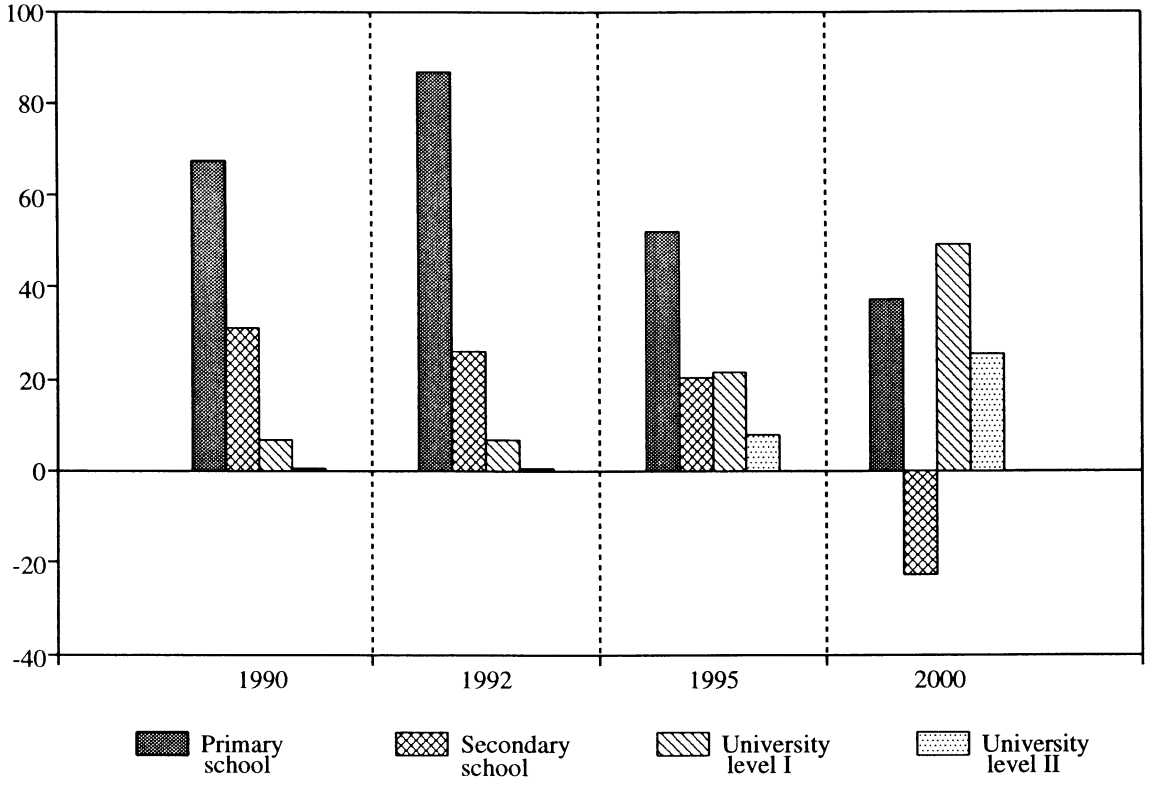
New analyses based on participation rates and educational propensities from 1993 have recently been carried out. Compared to the projections presented in Andreassen et al. (1993) based on educational propensities from 1991, the growth in the number of persons with education at the university level is much stronger due to the marked increase in the educational capacity the last years. The growth in the number of pupils and students relative to the number of persons in the age group 16-24 years is shown in figure 2. Based on the educational propensities from 1987, the number of pupils and students would constitute about 50 per cent of this group of population, while the proportion with the propensities from 1993 is estimated to reach more than 90 per cent before 2000. As a result, growth in supply of persons with higher educations is much stronger than presented in the analyses by Drzwi et al. (1994) which were based on the earlier projections of educational propensities.

The projection of supply of labour by education is presented in table 4. Total supply is estimated to increase by 113 000 persons, or 5.3 per cent, from 1990 to 2000. This growth is mainly caused by a change in the composition of the population, with the strongest growth in the age groups 30 - 54 years where labour participation rates are relatively high. Participation rates for youths and women may also grow as a result of higher demand for labour (fewer "discouraged workers") and real wage growth. The strong growth in education capacity, especially at the university level, causes supply of labour among persons with education from university level I to increase by 184 000 persons, or 53 per cent, from 1990 to 2000. The number of persons with education from university level II is estimated to increase by 56 per cent in the same period. The growth in supply of labour is estimated to be particularly strong for persons with education in law, economics and administration and social sciences.

Imbalances in the labour markets

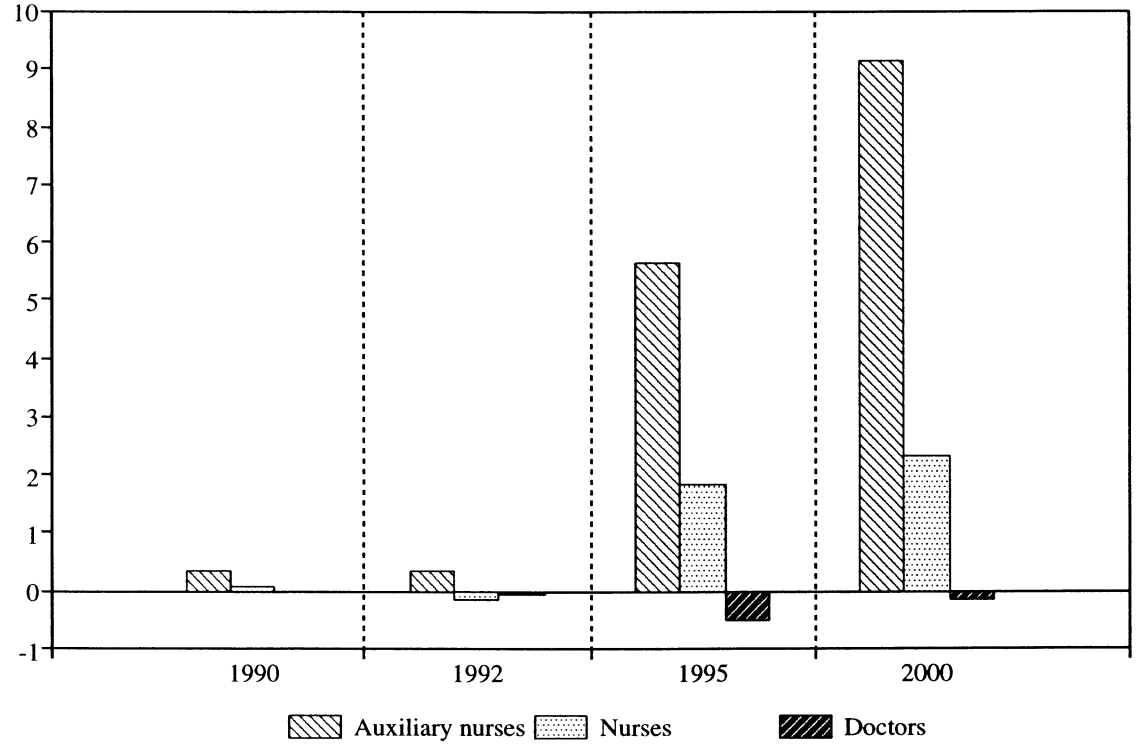
By comparing the projections for demand and supply of the different labour categories, the model gives an indication of possible imbalances arising in the future. Although total demand and supply of labour in MODAG is treated

Figure 3. Projections of excess supply for different educational groups
1000 persons



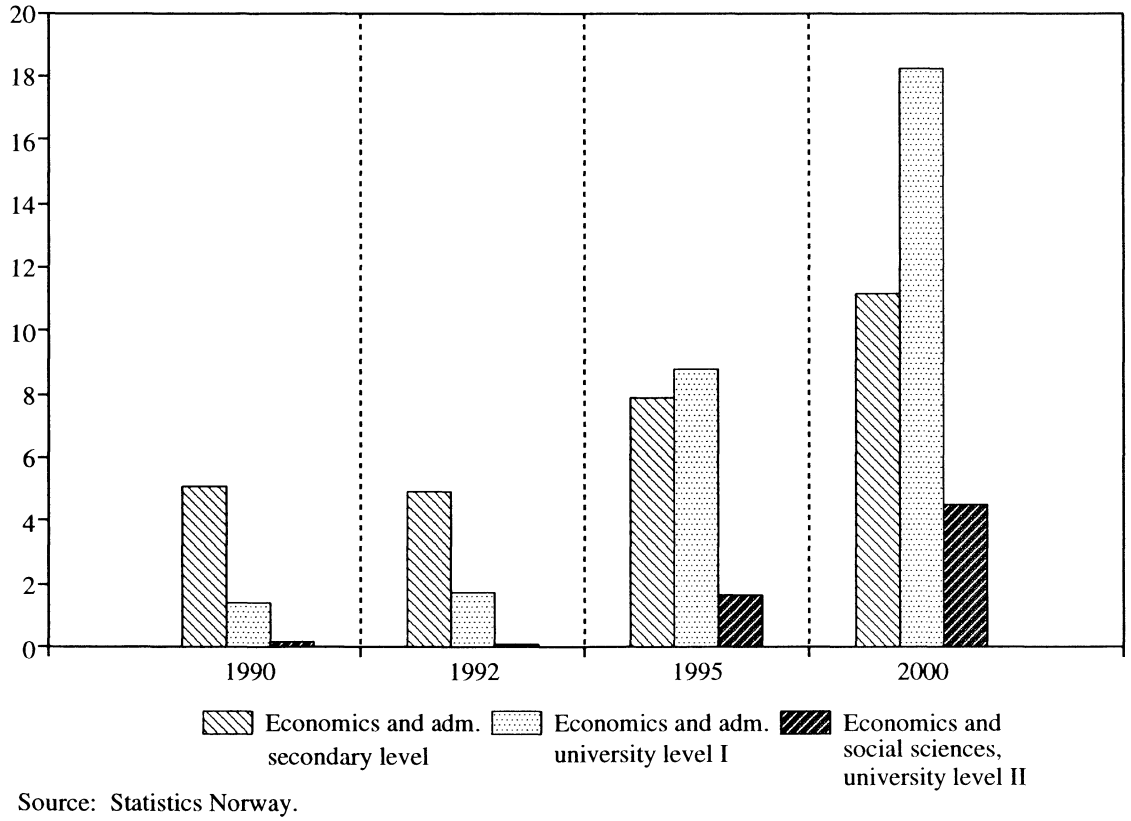
Source: Statistics Norway.

Figure 4. Projections of excess supply for education in health care
1000 persons



Source: Statistics Norway.

Figure 5. Projections of excess supply for education in economics and administration. 1000 persons



Source: Statistics Norway.

consistently, demand and supply for different kinds of labour are projected independently in the present version of the model. As a consequence, the model predicts excess demand or excess supply for almost all groups of education. Because the macro projection implies a situation with unemployment for the entire labour market, there is a tendency to excess supply in a majority of the submarkets. Mismatch between demand and supply for one category of education may introduce mechanisms which are not included in the present simple submodel. Some of the persons abundant in one market segment may get jobs in a related field normally preferring another kind of education. Excess supply of labour with a particular education may also lower supply in the future and may have a negative effect on the relative wage position. The actual excess demand or supply for the different categories may thus be smaller than shown by the projections. The figures for excess supply should therefore not be interpreted as the expected level of unemployment for the different groups. In spite of these modifications, the predicted imbalances provide indications of the future development for the submarkets.

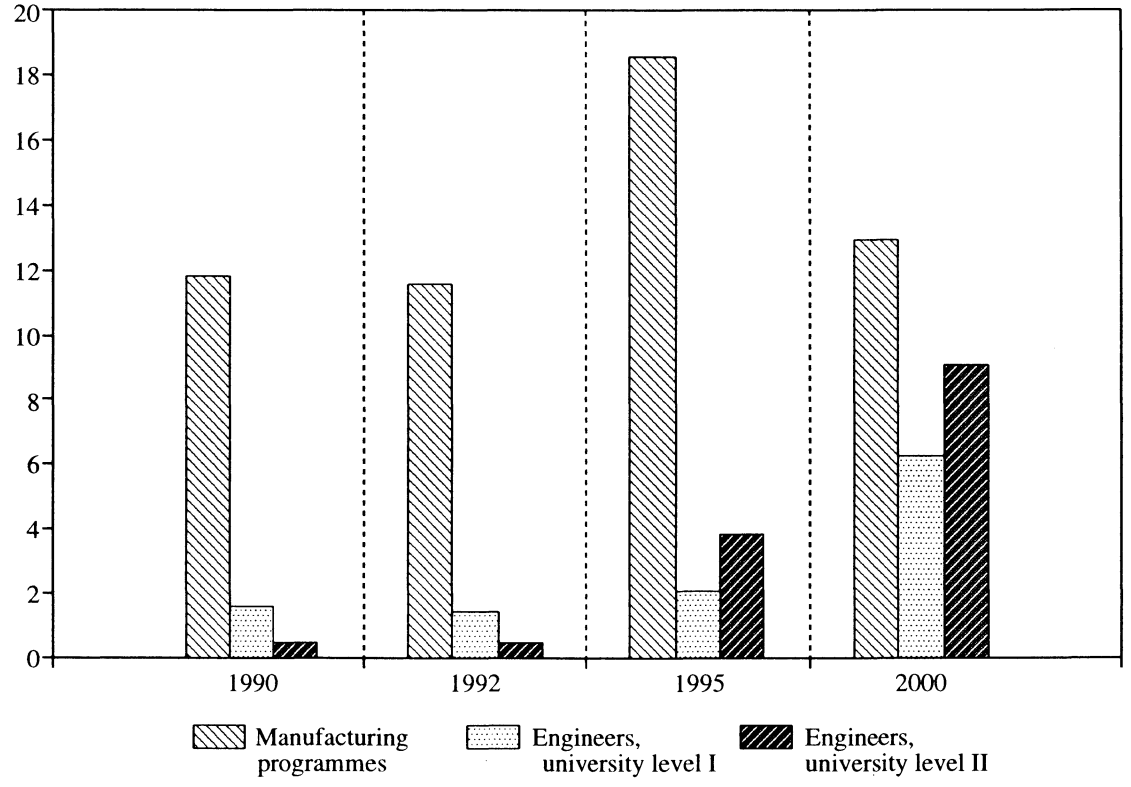
The projection of excess supply by education in figure 3 shows that growth in supply of persons with university education is much stonger than the expected growth in demand, indicating that at lot of persons within these groups may have troubles in finding a job in accordance with their education. This does not necessarily mean that unemployment becomes high for these groups as they may fill up jobs which traditionally have been occupied by persons with lower education. While unemployment for persons with education from university level I was 1.8 per cent in 1992, excess supply is now estimated to 9.3 per cent in 2000. For persons with education at university level II the situation may become even more severe, with an estimated excess supply of 18 per cent in 2000.

Table 5. Excess supply for different kinds of education in 2000 under different assumptions of educational propensities. 1000 persons

	1991-propensities	1993-propensities
Primary school/secondary I	93	37
Secondary school II	-13	-23
University level I	0	49
University level II	6	25

As shown in table 5, the growth in the educational propensities from only 1991 to 1993 is the main factor behind the predicted excess supply of persons with education at the university level. On the other hand the higher educational propensities lead to a decrease in supply of labour from persons with education from secondary school, and especially primary school so that the situation in the labour market may improve for these groups towards 2000. For persons with education from secondary school the projection

Figure 6. Projections of excess supply for education in manufacturing and technology. 1000 persons



Source: Statistics Norway.

shows excess demand of 3.0 per cent in 2000, while unemployment was 4.1 per cent in 1992. For persons with education from primary school the projection shows an excess supply of 5.0 per cent in 2000 against 9.1 per cent in 1992. Because persons with higher qualifications may fill up some of the unskilled jobs, the projections for the two lowest educational groups are probably too optimistic.

The development of excess supply for the most important kinds of labour by education in health and social services is presented in figure 4. At present there is almost no unemployment among persons with these kinds of education, and except for auxiliary nurses, the labour market seems to be rather tight for these groups. Even with the assumptions in the present calculations there may be a weak excess demand for dentists, doctors and some other categories with higher education of relevance for health and social services. The educational capacity seems to limit the growth for these groups. While a small excess supply of nurses is predicted by the present calculations, a somewhat higher growth in health and social services than in the actual macroeconomic scenario may also cause excess demand for this group.

The employment prospects for persons with education in economics and administration are presented in figure 5. In spite of a significant growth in demand, the labour market situation is expected to get worse for all levels of education within this profession. The main reason is a strong growth in the number of persons choosing this kind of education. For persons with education in economics and administration, university level I, supply is estimated to grow by about 80 per cent from 1990 to 2000, while growth in supply of persons with education in economics and social sciences from university level II is estimated to grow by more than 90 per cent in the same period. The excess supply of persons with these kinds of education is probably exaggerated because many of them may get jobs which today are occupied by other educational groups. Supply of lawyers is expected to double between 1990 and 2000, also creating a subtantial excess supply for this group.

The situation in the labour market for persons with education in manufacturing and technology is presented in figure 6. In 1992 unemployment among persons with secondary education in manufacturing and technology was rather large, and the problems are expected to last as a consequence of a substantial growth in supply. Persons with technical education at university level are also expected to face increasing problems. This is particularly the case for engineers with education from university level II because of a strong growth in supply and a decrease in demand for persons directed towards investments in the oil sector. On the other hand, the demand for engineers may be stimulated by growth in other manufacturing industries and building and construction. A successful incomes policy as suggested by The Employment Commission would cause a higher demand for persons with education in manufacturing and

technology, thus improving the future situation in the labour market for this group.

Final Remarks

The results from the present projections are significantly influenced by the strong growth in the educational capacity which has taken place in the last years. If these propensities to enter into higher education last for several years, there will be excess supply of people for most kinds of education except from educations relevant for jobs in the health and social services. The predicted situation in the labour market for the different categories of education is also dependent on the overall macroeconomic picture. Although the scenario may be modified, the main development in employment by sector will not be much influenced. The assumptions about the composition of demand for the different kinds of education are probably more essential for the presented results. To improve the projections further, analyses of factors determining the composition of employment by education and sector are necessary. Both supply and demand factors may turn out to be of importance. It is also of interest to analyse the choice of education and how imbalances in the labour market may influence demand for a substitutable labour category and wage formation. This is the subject of ongoing research activities.

References

Andreassen, L., T. Andreassen, D. Fredriksen, G. Spurkland and Y. Vogt (1993): *Framskriving av arbeidsstyrke og utdanning, mikrosimuleringsmodellen MOSART* (Projections of supply of labour and education, microsimulation model MOSART), Reports 93/6 (in Norwegian), Statistics Norway.

Andreassen, L., D. Fredriksen and O. Ljones (1994): The Future Burden of Public Pension Benefits: A Microsimulation Study, Discussion Paper 115, Statistics Norway.

Bowitz, E. and Å. Cappelen (1994): *Prisdannelse og faktoretterspørsel i norske næringer*, (Price Formation and Factor Demand in Norwegian Industries), Social and Economic Studies 85 (in Norwegian), Statistics Norway.

Cappelen, Å. (1992): "MODAG: A Medium Term Macroeconometric Model of the Norwegian Economy" in L. Bergman and Ø. Olsen (eds.): *Nordic Macroeconometric Models,* North Holland.

Directorate of Labour (1993): Fremtidens arbeidsmarked (The labour market in the future), Kvartalsrapport om arbeidsmarkedet 2/1993 (in Norwegian), pp. 40 - 50.

Drzwi, W. L. Lerskau, Ø. Olsen and N.M. Stølen (1994): *Tilbud og etterspørsel etter ulike typer arbeidskraft* (Supply and demand for different categories of labour), Reports 94/2 (in Norwegian), Statistics Norway.

Fredriksen, D. and G. Spurkland (1993): *Framskriving av alders- og uføretrygd ved hjelp av mikrosimuleringsmodellen MOSART* (Projections of oldage and disabilty pensions using the microsimulation model MOSART), Reports 93/7 (in Norwegian), Statistics Norway.

Juhn, C., K.M.Murphy and R.H.Topel (1991): Why Has the Natural Rate of Unemployment Increased over Time? Brookings Papers on Economic Activity, 2:1991,75-142.

The Ministry of Finance (1992): *En nasjonal strategi for økt sysselsetting i 1990-årene* (A national strategy to increase employment in the 1990s). Norwegian Official Reports NOU 1992:26 (in Norwegian), Oslo: Akademika.

Research publications in English

New titles

Discussion Papers

Tor Jakob Klette and Zvi Griliches:
The Inconsistency of Common Scales Estimators when Output Prices are Unobserved and Endogenous
DP no. 127, 1994. pp. 36.

This paper explores the consistency of common scale estimators when output is proxied by deflated sales, based on a common output deflator across firms. The problems arise when firms operate in an imperfectly competitive environment and prices differ between firms. In particular, we show that this problem reveals itself as a downward bias in the scale estimates obtained from production function regressions, under a variety of assumptions about the pattern of technology, demand and factor price shocks. The results also holds for scale estimates obtained from cost functions. The analysis is carried one step further by adding a model of product demand. Within this augmented model we examine the probability limit of the scale estimate obtained from an ordinary production function regression. This analysis reveals that the OLS estimate will be biased towards unity - or possibly a value below unity. We have included an empirical section which illustrates the issues. The empirical analysis presents a tentative approach to avoid the problems discussed in the theoretical part of this paper.

Knut Einar Rosendahl:
Carbon Taxes and the Petroleum Wealth. DP no. 128, 1994. pp. 33.

The aim of this paper is to examine the impacts of a global carbon tax on fossil fuel markets. In particular, the effect on the Norwegian, as well as the global, petroleum wealth is studied. Most empirical models of fossil fuel markets either use an exogenous price path, or model the supply side as being independent of future expectations. Hence, they are not able to test how the exhaustibility feature of fossil fuels affects the sharing of the tax burden between producers and consumers. We study a simple, dynamic model of a competitive fossil fuel market, and we first derive some general theoretical results regarding how a carbon tax may affect the producer and consumer prices. Then, simulations of the global oil market indicate that a fixed carbon tax of e.g. $ 10/barrel of oil may reduce the petroleum wealth of the average oil producer by 33-42%. The Norwegian petroleum wealth may decrease more than this, by 47-68%. The latter reduction may correspond to yearly income loss of about 3% of Norwegian GDP. However, the figures should only be considered as very rough estimates, because of the simplistic nature of the model.

Søren Johansen and Anders Rygh Swensen:
Testing Rational Expectations in Vector Autoregressive Models
DP no. 129, 1994. pp. 16.

Assuming that the solutions of a set of restrictions on the rational expectations of future values can be represented as a vector autoregressive model, we study the implied restrictions on the coefficients. Nonstationary behavior of the variables is allowed, and the restrictions on the cointegration relationships are spelled out. In some interesting special cases it is shown that the likelihood ration statistic can easily be computed.

Tor Jakob Klette:
Estimating Price-Cost Margins and Scale Economies from a Panel of Microdata. DP no. 130, 1994. pp. 37.

Hall's (1988) approach to study price-cost margins is adapted to simultaneously estimate price-cost margins and scale economies from a panel of plant level data. The paper shows how this methodology provides a very flexible framework with only a few, economically interesting parameters to be estimated. The econometric model is tested and estimated on different panels of plants, covering most manufaturing industries in Norway 1980-90. The GMM-estimates suggest significant, but quite small, markups in all industries. No industry exhibits increasing returns to scale; the average firm (in all industries) seems to face constant or moderately decreasing returns to scale. Estimates suggest that there is more variation in the price-cost margins and scale coefficients within the fairly narrow industry groups investigated, as compared to between the industry groups.

Leo Andreas Grünfeld:
Monetary Aspects of Business Cycles in Norway. An Exploratory Study Based on Historical Data.
DP no. 131, 1994. pp. 34.

Based on the methodology developed by Hodrick & Prescott (1980), it is shown that monetary activity in Norway by no means obeys the cyclical patterns described by Lucas (1983). By constructing annual time series covering monetary data from 1900 to 1992, combined with the use of varying filtering parameter values, it is demonstrated that only credit volume has followed a procyclical pattern. Furthermore, prices are found to be countercyclical during the post war period. Tests of relative volatility and cyclical skewness are presented as well as prospects for future studies of business cycles in Norway based on historical data.

Kjersti-Gro Lindquist:
Testing for Market Power in the Norwegian Primary Aluminium Industry
DP no. 132, 1994. pp. 33.

The hypothesis of market power in the Norwegian primary aluminium industry is tested using plant-level panel data. Economies of scale are found to be present, and Norwegian aluminium plants charge a procyclical price-cost margin that significantly exceeds zero. Consequently, the simple competitive hypothesis is rejected. The hypothesis that products are differentiated is not rejected, since several plants are found to charge a price permanently over the world market price. A decline in industry concentration internationally, which is assumed to increase the degree of competition, has no significant effect on the price-cost margins of Norwegian plants.

Tor Jakob Klette:
R&D, Spillovers and Performance among Heterogenous Firms. An Empirical Study Using Microdata.
DP no. 133, 1994. pp. 40.

Empirical research has established that there is a significant, positive relationship between productivity growth and R&D-expenditure at the firm level. Yet, while interesting, the conventional production function approach applied in such studies

has some well known limitations. This paper attempts to provide new insights into three main issues: (i) Heterogeneity in production relationships, in particular differences in innovative opportunities, across firms are emphasized throughout. (ii) There tends to be a correlation between investment decisions and the error term in production function regressions (even when specified in a growth rate form), that will bias the estimated parameters. The paper handles this problem more carefully than usual, by dealing explicitly with uncertainty and expectation-errors by means of instrumental variable estimation. (iii) R&D is an investment activity which involves significant adjustment costs. This paper presents a new specification of adjustment costs, where rapid changes in the R&D-program reduce the growth in knowledge capital. The results confirm the view that there are significant differences in innovative opportunities across firms (within narrowly defined industries). There is clear evidence that R&D-activity in a firm improves its performance. The results suggest that R&D-activities in competing firms will have a positive or negative effect on a firm's performance, depending on whether the firm is technologically advanced or not.

Kjell Arne Brekke and Hanne Gravningsmyhr:
Adjusting NNP for Instrumental or Defensive Expenditures. An Analytical Approach. DP no. 134, 1994. pp. 25.

In this paper we provide a formal analysis to evaluate the subtraction of defensive expenditures from GDP. We consider expenditures that are used to produce non-market goods as candidates for being subtracted from GDP. It will be demonstrated that income net such expenditures will account for total welfare changes only if the supply of the non-market good is constant, while the expenditures should not be subtracted if external factors are constant. We argue that the latter case will apply to most use of the GDP incator for planning purposes.

We also consider a model of disamenities of urbanization, and argue that there are important shortcomings in the meghods used to estimate these. Daly and Cobb's estimate considers only a selection of disamenities, and only those that are negative. We also argue that Nordhaus and Tobins migration based procedure will significantly overestimate the level of disamenity, but is correct at the margin. On the other hand, there may be important problems with double counting.

Reprints

John K. Dagsvik:
Discrete and Continuous Choice, Max-Stable Processes, and Independence from Irrelevant Attributes
Reprints no. 70, 1994. pp. 26.
ISSN 0800-7500

Reprint from Econometrica, Vol. 62, 1994, No. 5. 1179-1205.

Previously issued

Social and Economic Studies

Klaus Mohn:
Modelling Regional Producer Behaviour - A Survey. **SES no. 86, 1994.**

Knut A. Magnussen:
Old-Age Pensions, Retirement Behaviour and Personal Saving. A Discussion of the Litterature. **SES no. 87, 1994.**

Reports

Haakon Vennemo:
A Growth Model of Norway with a Two-way Link to the Environment. **Reports 94/5, 1994.**

Klaus Mohn:
Monetarism and Structural Adjustment - The Case of Mozambique. **Reports 94/11, 1994.**

Erling Holmøy, Gunnar Nordén and Birger Strøm:
MSG-5. A Complete Description of the System of Equations. **Reports 94/19, 1994.**

Ragnhild Balsvik and Anne Brendemoen:
A Computable General Equilibrium Model for Tanzania. Documentation of the Model, the 1990 - Social Accounting Matrix and Calibration. **Reports 94/20, 1994.**

Discussion Papers

Snorre Kverndokk:
Depletion of Fossil Fuels and the Impact of Global Warming. **DP no. 107, 1994**

Knut A. Magnussen:
Precautionary Saving and Old-Age Pensions. **DP no. 108, 1994**

Frode Johansen:
Investment and Financial Constraints. An empirical Analysis of Norwegian Firms. **DP no. 109, 1994**

Kjell Arne Brekke and Pål Børing:
The Volatility of Oil Wealth under Uncertainty About Parameter Values. **DP no. 110, 1994.**

Margaret J. Simpson:
Foreign Control and Norwegian Manufacturing Performance. **DP no. 111, 1994.**

Yngve Willasen and Tor Jakob Klette:
Correlated Measurement Errors, Bounds on Parameters, and a Model of Producer Behavior. **DP no. 112, 1994.**

Dag G. Wetterwald:
Car Ownership and Private Car Use. A Microeconometric Analysis Based on Norwegian Data. **DP no. 113, 1994.**

Knut Einar Rosendahl:
Does Improved Environmental Policy Enhance Economic Growth? Endogenous Growth Theory Applied to Developing Countries. **DP no. 114, 1994.**

Leif Andreassen, Dennis Fredriksen and Olav Ljones:
The Future Burden of Public Pension Benefits. A Microsimulation Study. **DP no. 115, 1994.**

Anne Brendemoen:
Car Ownership Decisions in Norwegian Households. **DP no. 116, 1994.**

Audun Langørgen:
A Macromodel of Local Government Spending Behaviour in Norway. **DP no. 117, 1994.**

Kjell Arne Brekke:
Utilitarism, Equivalence Scales and Logarithmic Utility. **DP no. 118, 1994.**

Kjell Arne Brekke, Hilde Lurås and Karine Nyborg:
Sufficient Welfare Indicators, Allowing Disagreement in Evaluations of Social Welfare. **DP no. 119, 1994.**

Tor Jakob Klette:
R&D, Scope Economies and Company Structure: A "Not-so-Fixed Effect" Model of Plant Performance. **DP no. 120, 1994.**

Yngve Willassen:
A Generalization of Hall's Specification of the Consumption Function. **DP no. 121, 1994.**

Erling Holmøy, Torbjørn Hægeland and Øystein Olsen:
Effective Rates of Assistance for Norwegian Industries. **DP no. 122, 1994.**

Klaus Mohn:
On Equity and Public Pricing in Developing Countries. **DP no. 123, 1994.**

Jørgen Aasness, Erling Eide and Terje Skjerpen:
Criminometrics, Latent Variables, Panel Data, and Different Types of Crime. **DP no. 124, 1994.**

Erik Biørn and Tor Jakob Klette:
Errors in Variables and Panel Data: The Labour Demand Response to Permanent Changes in Output. **DP no. 125, 1994.**

Ingvild Svendsen:
Do Norwegian Firms Form Extrapolative Expectations? **DP no. 126, 1994.**

Reprints

Petter Jakob Bjerve:
Feilslegen politikk? Analyse og vurdering av den makroøkonomiske politikken i 1986-1992. **Reprint no. 67, 1994.** Særtrykk fra *Sosialøkonomen*, 1993, 11, 22-27.

Jørgen Aasness, Erik Biørn and Terje Skjerpen:
Engel Functions, Panel Data, and Latent Variables. **Reprint no. 68, 1994.** Reprint from *Econometrica*, 1993, 61, 6, 1395-1422.

Knut H. Alfsen and Hans Viggo Sæbø:
Environmental Quality Indicators: Background, Principles and Examples from Norway. **Reprints no. 69, 1994.** Reprint from *Environmental and Resource Economics*, 1993, 3, 415-435.

Documents

Haakon Vennemo:
Welfare and the Environment. Implications of a recent tax reform in Norway. **Documents 94/1, 1994.**

Knut H. Alfsen:
Natural Resource Accounting and Analysis in Norway. **Documents 94/2, 1994.**

Statistics Norway
Sales- and subscription service
P.O. Box 8131 Dep.
N-0033 Oslo

Telephone: +47 22 86 49 64
Telefax: +47 22 86 49 76

ISBN 82-537-3974-5
ISSN 0801-8324

Statistisk sentralbyrå
Statistics Norway

Falch Hurtigtrykk, Oslo

Economic Survey 4/94

Statistisk sentralbyrå