

# Economic Survey

Statistics Norway



Statistisk sentralbyrå

# 3/98

## Economic trends

- National accounts for 1 and 2 quarter 1998
- Overview of international and Norwegian economic developments
- Forecasts for the Norwegian economy for 1998-2000

## Article

- Unpaid household production

# Economic Survey

Volume 8

# 3/98

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Inquiries should be directed to Knut Moum, tel.: 22 86 48 20, e-mail: knut.moum@ssb.no or Torbjørn Eika, tel.: 22 86 48 07, e-mail: torbjoern.eika@ssb.no, telefax: 22 11 12 38. Economic Survey is available on internet at <http://www.ssb.no>

## Economic Survey

**Editorial board:** Øystein Olsen (ed.), Julie Aslaksen, Halvard Hansen, Bodil M. Larsen, Kjersti-Gro Lindquist, Knut Moum, Karine Nyborg and Inger Texmon. **Editorial assistant:** Wenche Drzwi, tel.: 22 86 49 74, telefax: 22 11 12 38. **Design:** Enzo Finger Design. **Print:** Falch Hurtigtrykk. **Editorial address:** Statistics Norway, Research Department, P.O. Box 8131 Dep., N-0033 Oslo. **Sales- and subscription service:** P.O. Box 1260, N-2201 Kongsvinger, tel.: 62 88 55 00, telefax: 62 88 55 95, e-mail: salg-abonnement@ssb.no.



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## Economic Survey

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# Economic trends\*

Preliminary national accounts figures indicate that output and employment growth in the mainland economy continued in the first half of 1998, albeit at a somewhat slower pace than through 1997. Growth was primarily fuelled by petroleum investment and a pronounced rise in household purchases of goods. The sharp rise in interest rates in late summer 1998 will contribute to curbing growth in household demand in the period ahead in spite of the sharp rise in wages. There are also indications that both petroleum investment and mainland investment may generate a weaker growth impetus towards the end of the year. As a result of brisk growth through 1997, however, demand, production and employment on an annual basis may rise almost as strongly in 1998 as in the previous year.

Even with the prospect of noticeably higher price inflation through the remainder of this year, the decline in electricity prices in the first half of 1998 will probably entail that consumer prices will not increase by more than 2.5 per cent from 1997 to 1998. High imports, partly as a result of extensive investments on the shelf, and an historically low oil price may result in a current-account surplus equivalent to about 1 per cent of GDP this year, the lowest level recorded since 1989.

For 1999, high interest rates at the beginning of the year, a somewhat weaker trend for traditional merchandise exports and a pronounced fall in petroleum investment are expected to contribute to a substantial turnaround in the mainland economy. Mainland GDP growth may be reduced to 0.5 per cent, the lowest in 8 years. Unemployment, which as an average for this year is likely to be 3.3 per cent, may edge up to about 4 per cent in 1999. The cost impetus from the wage settlement and the depreciation of the krone through 1998 will contribute to appreciably higher price inflation next year, but real wages will still continue to rise.

With a considerable improvement in the current-account balance as a result of a renewed rise in petroleum production, slightly higher oil prices and lower growth in domestic demand, we project that money market rates will again move downwards towards the European level through 1999. This fall in interest rates will result in a somewhat stronger growth in consumption in 2000 than in 1999.

Combined with a near stabilization of petroleum investment, this will contribute to boosting the level of activity in the mainland economy again, but mainland GDP growth in the year 2000 will still be lower than the average of 2.5 per cent for the past 25 years. In the absence of any inflationary impetus from exchange rate movements and with slower wage growth, the difference between consumer price inflation in Norway and our main trading partners may again narrow.

The picture outlined above reflects the strong links that have been established between the petroleum sector and the rest of the Norwegian economy. A sharp rise in petroleum investment appears to have generated a solid impetus to growth in the mainland economy both in 1997 and 1998, and the decline in this investment next year is an important factor behind the projected turnaround in the economy. Moreover, the substantial fluctuations in oil prices and the current account over the past three years have probably been an important factor underlying both appreciation pressures on the Norwegian krone around the end of 1996 and the depreciation of the krone through 1998. The calculations presented in this report indicate that financial markets in 1998, as at the end of 1996, may have overestimated the long-term effects of oil price fluctuations on the current account. However, changes in the exchange rate and interest rates through 1998 underline the vulnerability of the Norwegian economy to events in important commodity markets. In addition, lack of active fiscal policy management in the last phase of the cyclical upturn has probably contributed to amplifying the effects on the exchange rate and interest rates and reducing the scope for manoeuvre in economic policy in the period ahead.

## Main indicators for the Norwegian economy

Growth from previous year. Per cent

	1996	1997	1998	1999	2000
GDP	5.5	3.4	3.0	1.9	1.7
- mainland Norway	4.1	3.7	3.5	0.5	1.3
Consumption in households and non-profit organizations	4.7	3.4	3.5	1.6	2.2
Unemployment rate	4.9	4.1	3.3	4.0	4.4
Consumer price index	1.3	2.6	2.5	3.6	2.4
Current balance <sup>1</sup>	6.7	5.2	1.1	3.7	6.5

<sup>1</sup> Per cent of GDP

\* Translated from Økonomiske analyser 6/98 by Janet Aagenæs.



## International economy

GDP growth among Norway's main trading partners appears to be slowing somewhat following a rise of 2.7 per cent last year. Japan, in particular, is making a negative contribution, partly because the country has been severely affected by the financial crisis in Asia. GDP growth in the UK and Denmark is also expected to be noticeably lower in 1998 than last year. In the US, the upturn continues, but forecasts also point to a lower growth rate next year. The large continental EU countries as a whole are likely to record about the same rise in GDP in 1998 as in 1997. Reduced demand from a number of Asian countries and a sharp depreciation of their currencies are contributing to a weak trend in commodity prices, especially crude oil prices. Partly as a result of this, consumer price inflation is set to remain below 2 per cent both in the US and in EMU countries. Major changes in monetary policy in these two areas are therefore unlikely.

The US gross domestic product expanded by 3.8 per cent last year, the highest growth rate for nine years. GDP growth in the first two quarters of 1998 averaged 3.4 per cent (annual rate). Negative trade effects from the Asian crisis appear to have been offset by a continued sharp rise in domestic demand. Private consumption is being stimulated by high income growth, and household expectations point to continued high consumption growth in the period ahead. Fixed investment has expanded considerably throughout the upturn in the 1990s, and this trend appears to continue. After six years of economic expansion, unemployment in the US is now at its lowest level for 25 years. In July, the unemployment rate stood at 4.5 per cent, the same as the forecast for 1998 as a whole. In spite of the tight labour market, consumer price inflation has remained subdued during this upturn, and was down to 2.3 per cent last year. Price inflation this year is expected to be less than 2 per cent, helped by a strong dollar and low rise in import prices. With a slower rise in inflation, there has been little reason for the Federal Reserve to raise the interbank rate, which has remained stable at 5.5 per cent since March 1997. The economic crisis in Asia points to reduced growth in foreign demand for American products, and we project that GDP growth will slow somewhat in the period ahead. Consumer price inflation may quicken next year as the price-dampening effects of the appreciation of the dollar and decline in commodity prices diminish.

The Japanese economy has expanded at a far slower rate in the 1990s than in the preceding decade. Although fiscal stimulus measures brought GDP growth up to 3.9 per cent in 1996, policy was reoriented last year in a clearly contractionary direction. GDP fell in both the fourth quarter of 1997 and first quarter of this year, with fixed investment showing a particularly sharp decline. The fall in output has contributed to increasing the number of unemployed by about 25 per cent the past year, and the unemployment rate in June reached 4.3 per cent, the highest level in the post-

war period. Increasing unemployment and the strong focus on the precarious equity capital situation of many financial institutions have prompted many households to take a more cautious view of the future and to save a higher share of their income than previously. Private consumption fell by

### Economic forecasts for Norway's main trading partners

Annual per cent change

	1997	1998	1999
<b>USA</b>			
GDP	3.8	3.4	2.2
Consumer price	2.3	1.7	2.4
Unemployment rate <sup>1</sup> (level)	5.0	4.5	4.7
<b>Japan</b>			
GDP	0.8	-1.5	0.5
Consumer price	1.8	0.4	-0.2
Unemployment rate <sup>1</sup> (level)	3.4	4.2	4.7
<b>Germany</b>			
GDP	2.3	2.6	2.7
Consumer price	1.8	1.1	1.5
Unemployment rate <sup>1</sup> (level)	11.4	11.3	10.8
<b>France</b>			
GDP	2.3	2.9	2.7
Consumer price	1.2	1.0	1.4
Unemployment rate <sup>1</sup> (level)	12.5	11.8	11.3
<b>United Kingdom</b>			
GDP	3.1	2.2	1.4
Consumer price	2.8	2.7	2.5
Unemployment rate <sup>1</sup> (level)	5.5	4.8	5.1
<b>Italy</b>			
GDP	1.5	2.1	2.7
Consumer price	1.7	1.8	1.7
Unemployment rate <sup>1</sup> (level)	12.3	12.1	11.9
<b>Sweden</b>			
GDP	1.8	2.9	2.7
Consumer price	0.5	0.6	1.1
Unemployment rate <sup>1</sup> (level)	8.0	6.7	6.2
<b>Denmark</b>			
GDP	3.5	2.8	2.4
Consumer price	2.1	2.1	2.5
Unemployment rate <sup>1</sup> (level)	7.7	6.6	6.2
<b>The Netherlands</b>			
GDP	3.3	3.7	3.0
Consumer price	2.2	2.2	2.4
Unemployment rate <sup>1</sup> (level)	6.6	5.5	5.0
<b>Memorandum items:</b>			
GDP trading partners	2.7	2.5	2.3
CPI trading partners	1.9	1.4	1.7
ECU interest rate	4.3	4.2	4.4

<sup>1</sup> Per cent of labour force.

Sources: Consensus forecasts. Figures for unemployment in Sweden, Denmark and the Netherlands are collected from national sources.

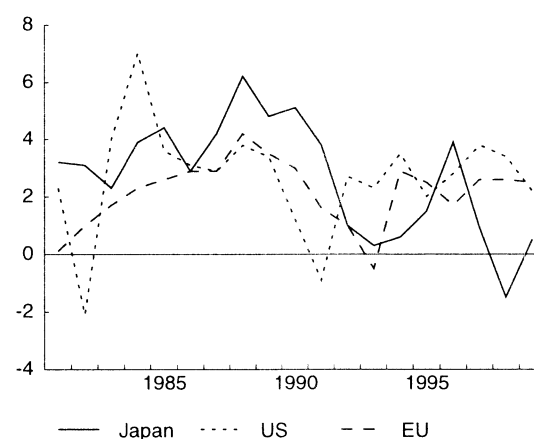
4.5 per cent in the year to the first quarter of 1998. Against this background, domestic demand is expected to be sluggish this year even though additional fiscal stimulus packages have been launched. The new Government has also focused on the need to tackle the problems in the financial industry, but so far few concrete steps have been taken. The economic problems among some of Japan's Asian trading partners have had an adverse impact on exports and contributed to a further depreciation of the yen, which plunged 13.5 per cent against the dollar in the first half of 1998. GDP growth in 1998 will probably be negative for the first time since 1974, and the slump is expected to continue next year, although growth will probably be positive.

Economic activity in EU countries picked up somewhat last year, with GDP showing an average growth of 2.6 per cent, compared with 1.8 per cent the previous year. The four major EU countries in particular recorded a higher growth rate. Net exports were the most important driving force in Germany, France and Italy, while domestic factors fuelled the upturn in the UK to a greater extent. The growth rate for the EU area as a whole is expected to remain around 2.5 per cent both in 1998 and next year. In the large continental countries, there are signs that domestic demand is picking up and contributing to higher growth, while external impulses are being reduced as a result of market developments in Asia. The UK has probably passed a cyclical peak and will record lower economic activity in the period ahead. The rise in interest rates and the strong pound have contributed to this development. In Sweden, it appears that economic growth is now picking up following several years of sluggish growth, whereas Denmark may experience slightly slower growth in the period ahead following several years of robust growth. The financial crisis in Asia, however, may contribute to reducing foreign demand for products from EU countries by a greater margin than assumed in the forecasts, thereby dampening the growth prospects for the entire area.

Consumer price inflation has slowed in most EU countries the past year, including countries that have recorded sharp GDP growth. In Germany, for example, inflation was only 0.9 per cent in July despite the one percentage point increase in VAT in April. This must be viewed in connection with the slower rise in import prices in many countries as a result of the Asian crisis and the fall in crude oil prices. Despite a slight decline in unemployment in many countries, the unemployment rate is still at a high level and wage growth is moderate in most EU countries. Consumer price inflation is expected to quicken slightly again next year as a result of a somewhat sharper rise in domestic demand.

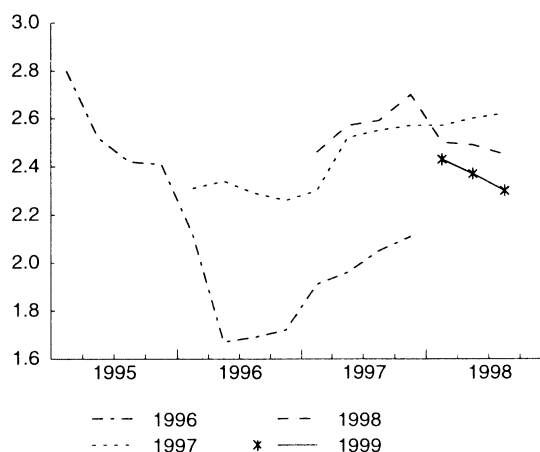
As expected, it was clear at the beginning of May that 11 EU countries will participate in European Monetary Union at its inception on 1 January 1999, thereby transferring responsibility for monetary policy to the European Central Bank (ECB). According to the Maastricht treaty, the ECB shall orient monetary policy with a view to maintaining price stability. Since the euro countries are currently recording very subdued price inflation, the ECB is not likely to

**GDP-growth in US, Japan and EU (per cent)**  
Measured from the same quarter the previous year



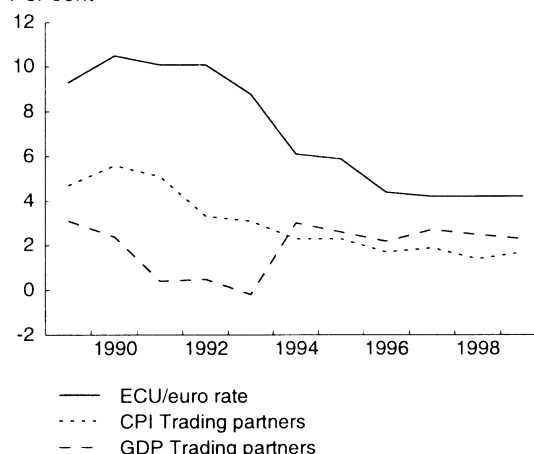
Sources: NIESR and Statistics Norway.

**GDP-growth forecasts for Norway's main trading partners for 1996 - 1999 given on different dates**



Source: Consensus Forecasts.

**GDP and consumer price growth for Norway's main trading partners, and 3 month ECU/euro rate**  
Per cent



Source: Statistics Norway.

### Economic developments in Southeast Asia

The financial crisis in Southeast Asia is primarily associated with the collapse in exchange rates and the substantial problems in the financial sectors of Thailand, Indonesia, Malaysia, the Philippines and South Korea. All in all, these five countries only account for about 7 per cent of world trade, but they have recorded very strong GDP growth for a long period and have therefore made a substantial contribution to sustaining growth in the global economy. This situation has now been reversed as it appears that GDP on average may fall sharply in these countries this year. Published first-quarter GDP figures show a decline in most of these countries.<sup>1</sup>

The sharp depreciation of exchange rates was primarily caused by the withdrawal of foreign investors from the Asian market. Since then, local companies have experienced considerable problems in satisfying their capital requirements, partly as a result of the sharp rise in debt measured in national currency, a steep rise in borrowing rates and a general credit squeeze. The financial problems have also resulted in a fall-off in domestic demand and rising unemployment in a number of countries. The situation is most serious in Indonesia even though the country has received substantial liquidity from the IMF. The economic downturn in Indonesia appears to be more severe than in the other countries. Earlier this year the recession led to extensive social unrest and contributed to Suharto's resignation in May. In Thailand, South Korea and Malaysia, the forecasts also point to a sizeable drop in GDP this year, and all domestic demand components are having a negative impact. The only bright spot is export growth in South Korea and Thailand which seems to remain high, stimulated by the fall in exchange rates. Among the troubled economies, the Philippines is the country where the adverse effects on the real economy have so far been least. The exchange rate has depreciated to a far lesser extent against the dollar than in the other countries, and GDP expanded by 1.7 per cent in the first quarter of 1998.

Even though both Taiwan and Singapore abandoned their fixed exchange rate regime against the dollar last autumn,

<sup>1</sup> Malaysia has also published figures for the second quarter of 1998, showing a decline of 6.8 per cent from the same quarter last year. The estimate in the table for GDP growth in 1998 will therefore probably be revised downwards.

the countries have been affected by the crisis to a lesser extent. Both countries recorded strong GDP growth in the first quarter of 1998. This must be seen in connection with these countries' sizeable current-account and government budget surpluses and the generally sound position of the financial sector. However, the substantial fall-off in important export markets will also gradually have an effect on domestic developments in these countries. For Singapore in particular, the forecasts point to a substantial fall in the growth rate this year.

China (including Hong Kong) has not devalued after the crisis began in July last year. In Hong Kong, GDP fell by 2 per cent in the first quarter of 1998, whereas China continued to record sharp GDP growth in the same period. The yuan has shown an effective appreciation of about 7 per cent the past year and this has contributed to a pronounced reduction in exports. An imminent devaluation, however, is unlikely, partly because this might trigger a new round of (competitive) devaluations in the region. Moreover, the structure of the export industry in China differs from that of Japan. Retail trade in China has expanded at a considerably slower pace in 1998 compared with last year and the growth in fixed investment has gradually slowed over a period of several years. In addition, the country has been severely affected by floods this summer, which is contributing to curbing economic activity, particularly food production. It is therefore likely that GDP growth will be considerably lower than the authorities' target of 8 per cent.

#### Forecasts for GDP for selected Asian countries

Annual growth rates in per cent

	1997	1998	1999
South-Korea	5.9	-5.7	-0.9
Taiwan	6.8	4.6	4.0
Hong Kong	5.0	-2.7	3.1
Indonesia	4.7	-16.0	-2.0
Malaysia	7.8	-2.2	-1.8
The Philippines	5.1	2.5	4.4
Singapore	7.8	0.7	3.5
Thailand	-0.4	-8.2	-1.8
China	8.8	7.3	7.9

Source: NRI (Nomura Research Institute).

have an immediate need to raise short-term interest rates. The euro rate is expected to hover around 4 per cent at the end of 1998. In the UK, the central bank has raised interest rates a number of times since it was given greater independence in monetary policy following the election last year. Base rates were last raised to 7.25 per cent in June this year, but no further increases are expected in the period ahead. The Swedish central bank lowered its repo rate by 25 basis points in June in response to lower consumer price inflation.

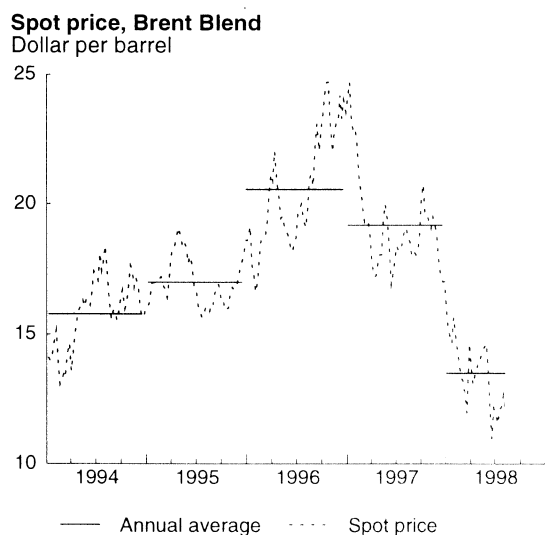
Recent years' endeavours to qualify for EMU have left their mark on economic developments in continental EU countries. The 11 members of the forthcoming EMU recorded an average general government budget deficit equiva-

lent to 4.9 per cent of GDP in the years 1991-1995, while preliminary figures indicate that the deficit was reduced to 2.5 per cent in 1997. With EMU in place, the political motives for further fiscal policy tightening are somewhat reduced. It nevertheless appears that the economic upswing will contribute to further improving general government balances in a number of countries. Both Sweden and Finland will probably record financial surpluses this year following many years of high budget deficits.

#### Oil market

The spot price of Brent Blend fell from a level of \$ 20 a barrel in November last year to about \$ 11 a barrel in mid-June 1998, the lowest level since 1986. The price has





Source: Petroleum Intelligence Weekly.

edged up since then, reaching a little more than \$ 12 a barrel at the end of August. As an average for the first eight months of 1998, the price has been about \$ 13.50 a barrel.

The sharp fall in the oil price must be viewed in connection with several factors. First, OPEC decided in November 1997 to raise its quotas. Second, a new and expanded agreement with the UN extending to December this year entails that Iraq is now exporting a little less than 2 million b/d, compared with about 0.7 million b/d earlier. In addition, a mild winter contributed to low demand for heating oil in the OECD area, while the demand in Asia was reduced as a consequence of the region's economic problems.

The oil market imbalance has increased oil stocks by more than 2 million b/d through the first half of 1998. According to the IEA, oil stocks have never been higher, at least not in the OECD area. As a result, the production cuts adopted by OPEC and a few other countries in March and June of this year had little effect on the oil price. OPEC decided to reduce oil production by altogether 2.6 million b/d. At the same time, Norway, Mexico, Russia and a few other countries announced that they would cut production by 450 000 b/d. Estimates show that OPEC succeeded in fulfilling 80 per cent of the approved reductions in March, and around 85 per cent of the last production cut. Because the cartel previously raised quotas and Iraq is not covered by the production cuts, OPEC's total production may be slightly higher in 1998 than in 1997. Moreover, production has edged higher in Latin America and in part on the British sector of the North Sea.

According to the new agreement with the UN, Iraq can export oil worth \$ 5.2 billion over a six-month period, against \$ 2 billion in the previous six-month period. Based on current oil prices, this translates into exports of about 2.4 million b/d. However, because of poor maintenance over a period of several years it is uncertain whether Iraq is in a position to maintain such a high level of production over a longer period.

### Effects of a sharp fall in global equity prices

Following a prolonged rally in global equity markets, prices have now started to fall. In the US, the Dow Jones index has dropped by about 17 per cent since mid-July, and major European exchanges have also recorded a sharp decline in recent weeks. This development must be seen in connection with the financial crisis in Southeast Asia, which has gradually been perceived as more extensive and prolonged than first envisaged and that it has spread to Latin America. In addition, the conditions in Russia are influencing European exchanges.

With the help of calculations using the macroeconomic model NIGEM<sup>1</sup>, we have estimated the potential effects of a 30 per cent fall in equity prices in G-7 countries in the third quarter of 1998. The magnitude of the decline is slightly more than the average drop in prices at the end of 1987, and for the sake of simplicity is set at the same level for all countries. The fall in equity prices will have real economic consequences primarily because it reduces household financial wealth, and thereby private consumption. It is assumed that the reduction in economic activity is gradually offset by a more expansionary monetary and fiscal policy.

The calculations illustrate that a drop in equity prices of this magnitude may contribute to a considerable slowdown in the growth of the global economy next year. The effect on GDP is greatest in the US (1 percentage point) because households there have a higher share of their financial wealth invested in equities than is the case in other countries. Inflation will also slow as a result of the decline in economic activity. The international interest rate level will be reduced as a result of slower GDP growth and consumer price inflation. For Norway, the fall in equity prices will result in a substantially weaker trend for our main export markets and a lower rise in import prices. Moreover, the fall in interest rates abroad will, in isolation, contribute to lower interest rates in Norway.

<sup>1</sup> NIGEM (National Institute Global Econometric Model) is a model developed by the research institute NIESR in London.

### Effects of a 30 per cent fall in equity prices in the third quarter of 1998

Changes in growth rates in percentage points unless otherwise noted

	1999
<b>G-7 countries</b>	
GDP	-0.8
Consumer prices	-1.2
<b>Euro area</b>	
Short-term interest rates (change in level)	-0.4
<b>Norway</b>	
Export market growth	-2.1
Import prices	-0.5

If, following two mild winters, we experience a normal, cold winter this year, and OPEC succeeds in fulfilling most of its announced production cuts, oil stocks may be reduced by 1-2 million b/d this winter. According to the IEA,

however, excess demand must be substantial for a longer period if the reduction in stocks is to be appreciable. The IEA projects that total global demand for oil will rise a little more than the total supply in 1999, thereby providing little scope for higher exports from Iraq or a reduction in stocks. Future price movements particularly depend on OPEC's response. OPEC has indicated that the cartel will wait with new cuts until September in order to first determine whether the various member countries have implemented the approved reductions in July and August. If OPEC does not adopt new production cuts and Iraq maintains its production at the current level, oil prices are not likely to show a moderate increase until the winter of 1999/2000. This development also includes the assumption that low oil prices do not result in reduced production in non-OPEC countries next year, which would have resulted in a higher oil price at an earlier date.

**Commodity prices**

Commodity prices, excluding energy, peaked in May last year and have since fallen by about 20 per cent. The decline must be viewed in connection with the Asian crisis, which has resulted in lower demand for commodities on the world market. Prices for food and beverages and metals showed the steepest drop, falling by almost 27 per cent, while prices for agricultural raw materials declined by 15 per cent in the same period. In an analysis published in April this year, the AIECE nevertheless projected that commodity prices will level off and gradually edge up again in 1999. These forecasts, however, were probably based on too optimistic projections for GDP growth in both Japan and NICs in Asia. A further decline in commodity prices in the period ahead may therefore not be ruled out.

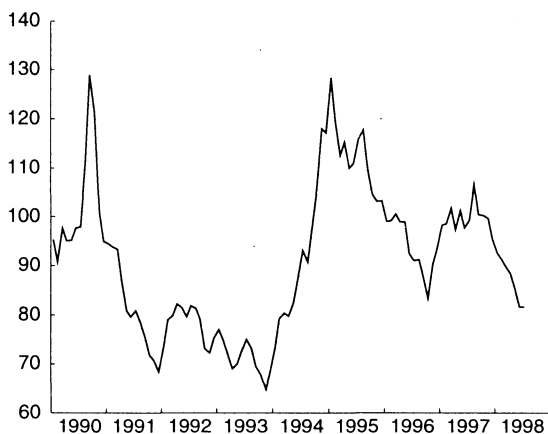
Metal prices fell markedly last autumn and were flat in the first few months of 1998, but then resumed a downward trend when it was clear that the financial crisis in Asia was more serious and prolonged than first envisaged. In 1996,

demand from East Asia (including Japan) accounted for about one third of world consumption of non-ferrous metals. Zinc prices plunged by nearly 40 per cent from August 1997 to July this year, albeit from an historically high level. Copper and nickel prices started to edge down just after the crisis started last summer and have dropped by more than 30 per cent the past year. Aluminium prices fell by 23 per cent in the same period, and continued growth in production in Eastern Europe will probably contribute to curbing a rise in prices. Lead prices have fallen by 15 per cent since September 1997, and price increases have also been curbed by the low demand for batteries as a result of the mild winter. So far tin prices appear to have been the least affected by falling demand from Asia, but developments the past year must be seen in the light of the extensive contractionary period for this commodity which started four years ago.

World steel production grew by 6.3 per cent last year after remaining unchanged through 1996. Production showed a particularly sharp rise in Western Europe and Asia, expanding by 9 and 7 per cent respectively. The Asian crisis thus appears to have had little impact on steel production in 1997. Demand picked up last year, but will probably be affected by lower growth in the Asian market in 1998.

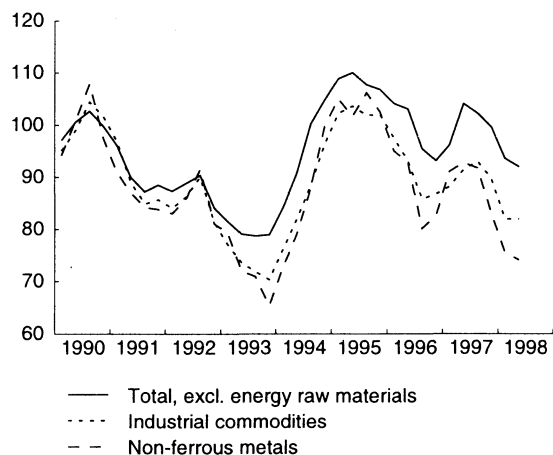
Prices for agricultural raw materials have also been heavily influenced by the Asian crisis, partly in the form of lower demand for textiles. Pulp prices also appear to have been affected after rebounding last year. Pulp prices fell sharply between November 1997 and March 1998. Timber prices have also moved on a weak trend so far this year, probably as a result of the sluggish construction market in Western Europe, particularly in Germany.

**Aluminium price**  
Dollar based index. 1979=100



Source: World Metal Statistics.

**Commodity prices on the world market**  
Dollar based indices. 1990 = 100



Source: HWWA-Institut für Wirtschaftsforschung.

## Norwegian economy

### Developments so far in 1998

Preliminary, seasonally adjusted figures from the quarterly national accounts (QNA) show a clear growth in mainland GDP in the second quarter of 1998 following a relatively sluggish trend in the previous quarter. For the first half of the year as a whole, both demand and output in the mainland economy were about 2.5 per cent higher than the half-year average for 1997. According to Statistics Norway's Labour Force Survey (LFS), employment rose by a seasonally adjusted 1 per cent from the second half of 1997 to the first half of 1998. There were, however, clear signs of slower employment growth and a levelling off in unemployment from the first to second quarter of this year.

Preliminary QNA figures show a levelling off in manufacturing output through the first half of the year, while activity in the construction sector and in many private service industries continued to expand sharply. Crude oil and natural gas production has remained relatively stable over the past four quarters, and in the first half of 1998 was on a par with the half-year average for 1997. Low oil prices and production limitations effective from 1 May until the end of the year point to a fairly weak trend in petroleum production through the remainder of 1998.

The volume of traditional merchandise exports fell markedly in the second quarter of 1998 after expanding by the same margin in the previous quarter. For the first half of 1998 as a whole, these exports were 1.5 per cent above the level in the second half of 1997 and 3 per cent higher than the average for last year. External trade statistics for the first seven months of 1998 show that the value of exports of traditional goods to Norway's European trading partners grew at a noticeably faster pace than the total, whereas exports to Japan and other countries in Asia exhibited a very

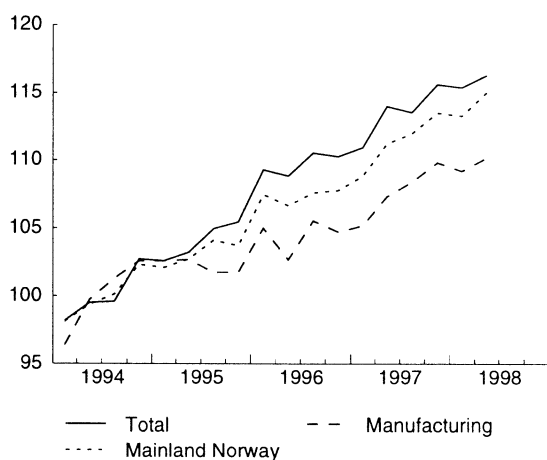
weak trend. The reversal of last year's pattern reflects signs of slightly stronger growth in the level of activity among some of our European trading partners in 1998 compared with last year, but is primarily ascribable to the major economic problems in important Asian economies.

At the moment, however, there are few signs that the Asian crisis has influenced prices for traditional merchandise exports, which have remained fairly stable during the last three quarters. This may be because some export products are sold at contractually stipulated prices, which have not yet been affected by the pronounced fall in spot prices for metals and industrial commodities during the past year. Prices for refined oil products, however, have fallen sharply, in line with the decline in the crude oil price. For the first eight months of the year as a whole, the spot price of Brent Blend averaged \$ 13.30 a barrel, 30 per cent below the average for 1997. In August, the price was down to \$ 12.

Following a sluggish trend in the first quarter, a pronounced rise in household purchases of goods contributed to higher growth in household consumption in the second quarter of 1998. In the first half of this year household consumption was 1.7 per cent higher than the level in the second half of 1997 and 2.7 per cent higher than the average level for last year. Even though there was a pronounced rise in household purchases of private cars in the second quarter, the level in the first half of the year was only marginally higher than the average level for 1997. Figures on new car registrations in July and August show approximately unchanged car purchases compared with the level in the second quarter, while the July figures from the retail sales index show a continued rise in this component of goods purchases.

### Gross domestic product

Seasonally adjusted volume indices, 1994=100



Source: Statistics Norway.

### Exports

Seasonally adjusted volume indices, 1994=100



Source: Statistics Norway.



**Macroeconomic indicators**

Growth from previous period unless otherwise noted. Per cent

	1996	1997	Seasonally adjusted			
			97.3	97.4	98.1	98.2
<b>Demand and output</b>						
Consumer in households and non-profit organizations	4.7	3.4	0.8	0.7	0.4	1.9
General government consumption	3.2	3.0	0.8	1.1	1.1	0.0
Gross fixed investment	9.6	12.6	0.2	2.1	2.0	2.1
- mainland Norway	11.0	9.7	2.6	1.8	-0.9	-0.3
- petroleum activities <sup>1</sup>	1.5	15.5	-9.9	9.1	2.4	20.4
Final domestic demand from mainland Norway <sup>2</sup>	5.4	4.5	1.1	1.0	0.3	1.0
Exports	9.8	5.8	-0.3	0.1	2.6	-3.0
- crude oil and natural gas	15.6	2.3	-7.4	3.7	-0.6	-1.4
- traditional goods	10.0	8.0	1.3	-0.9	3.9	-3.7
Imports	8.3	12.3	-0.8	3.1	4.5	-2.5
- traditional goods	10.0	8.6	0.4	5.5	2.8	0.8
Gross domestic product	5.5	3.4	-0.4	1.8	-0.2	0.8
- mainland Norway	4.1	3.7	0.7	1.3	-0.2	1.5
<b>Labour market<sup>3</sup></b>						
Man-hours worked	2.1	2.3	-0.5	2.3	1.5	0.4
Employed persons	2.5	2.9	0.7	0.5	0.8	0.0
Labour force	2.1	2.4	0.4	0.2	0.4	0.1
Unemployment rate, level <sup>4</sup>	4.9	4.1	4.0	3.7	3.4	3.4
<b>Prices</b>						
Consumer price index <sup>5</sup>	1.3	2.6	2.3	2.2	2.1	2.2
Export prices, traditional goods	-1.2	0.5	5.1	0.0	-1.0	-0.5
Import prices, traditional goods	0.1	-1.1	2.6	-2.4	0.6	1.2
<b>Balance of payment</b>						
Current balance, bill. NKr	68.6	55.8	14.4	9.7	8.2	-0.3
<b>Memorandum items (unadjusted, level)</b>						
Money market rate (3 month NIBOR)	4.8	3.6	3.9	3.8	3.8	4.4
Average borrowing rate <sup>6</sup>	7.1	6.0	5.9	6.0	6.0	6.2
Crude oil price NKr (level) <sup>7</sup>	133.1	135.6	137.8	133.9	106.7	100.0
Importweighted krone exchange rate	100.7	100.3	103.0	100.3	102.8	103.6
Norges Bank's ECU-index	102.5	100.3	101.9	100.1	102.5	103.5

<sup>1</sup> Figures for petroleum activities now covers the sectors oil and gas extraction proper, transport via pipelines and service activities incidental to oil and gas extraction.

<sup>2</sup> Consumption in households and non-profit organizations + general government consumption + gross fixed capital formation in mainland Norway.

<sup>3</sup> Figures for 1996 and 1997 are from the national accounts. The quarterly figures are from Statistics Norway's Labour force survey (LFS), since the new quarterly national account series for employment are too short for seasonal adjustment.

<sup>4</sup> According to Statistics Norway's labour force survey (LFS).

<sup>5</sup> Percentage change from previous year.

<sup>6</sup> Households' borrowing rate in private financial institutions.

<sup>7</sup> Average spot price, Brent Blend.

Sources: Statistics Norway and Norges Bank.

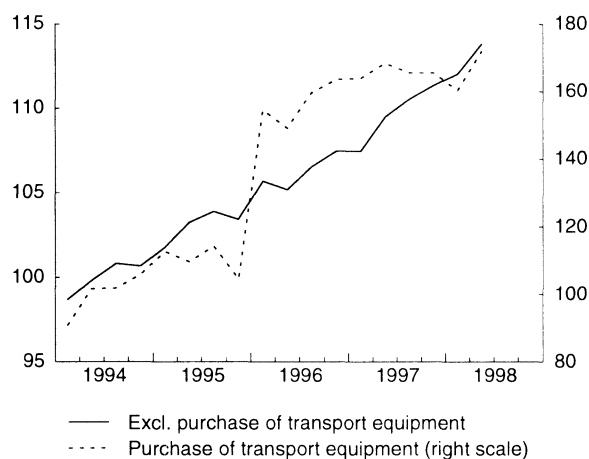
So far during this upturn household consumption has risen at about the same pace as income. According to preliminary estimates, the household savings ratio was 6.6 per cent last year, almost on a par with the peak level of 1993. So far this year developments in wages and employment have contributed to brisk growth in household disposable income, and this is a likely explanation for the high growth in purchases of consumer durables, excluding cars. The levelling off in car purchases must be viewed in connection with the pronounced rise in the stock of cars the past few years. The sharp rise in lending and deposit rates, which has in part been implemented and in part been announced for the third quarter of 1998, will increase the costs of owning consumer durables in the period ahead. This indicates a substantially weaker trend in this com-

ponent of household consumption as well as a further rise in the savings ratio this year.

The increases in interest rates will probably also contribute to curbing the brisk rise in house prices that we have witnessed the past five years. Between the trough year 1992 and 1997 prices for existing owner-occupied dwellings rose by about 45 per cent, increasing by a further 10 per cent in the period to the second quarter of 1998. Prices for existing cooperative dwellings increased as much as 16 per cent in the same period. Despite the persistent rise in prices in the resale housing market, housing starts fell sharply between the first and second quarter of 1998. In the first seven months of this year housing starts ended up being nearly 7 per cent below the level in the same period one year earlier. Delays in municipal processing of applica-

**Consumption in households**

Seasonally adjusted volume indices, 1994=100



Source: Statistics Norway.

tions as a result of the new Planning and Building Act may have contributed to this. With higher interest rates and a slower rise in prices for existing dwellings in the period ahead, residential construction is not likely to increase in 1998 and 1999.

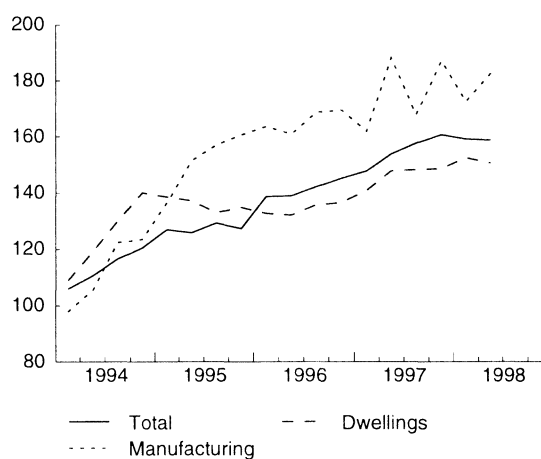
Gross fixed investment in mainland Norway showed a seasonally adjusted moderate decline in both the first and second quarter of 1998. For the first half of the year as a whole, manufacturing investment was at approximately the same level as the average for 1997. Statistics Norway's investment intentions survey for the third quarter indicates, however, that this investment will increase on an annual basis in 1998, implying a rise through the remainder of the year. Investment in private service industries, excluding dwellings, showed a pronounced decline from the first half of 1997 to the first half of 1998, while housing investment edged up in the same period. This investment component, however, fell through the first half of 1998, and figures on housing starts indicate that this trend will persist in the third quarter. A clear downward trend in commercial building starts indicates that construction investment in the business sector will also edge down during the rest of the year.

Investment in petroleum activities expanded both in the first and second quarter of 1998. Even though the authorities' plans have called for postponing some petroleum investment projects from this year until after 1 July next year, this investment component is still set to rise by about 15 per cent this year, according to Statistics Norway's investment statistics. The growth in petroleum investment represents a demand impetus for Norwegian and foreign suppliers equivalent to 1 per cent of mainland GDP, approximately on a par with the impetus in 1997.

Measured at constant prices, traditional merchandise imports rose in both the first and second quarter, albeit at a slowing rate. Both imports of services and imports of ships and platforms recorded a decline from the first to second quarter of 1998. Prices for traditional merchandise imports

**Gross fixed capital formation, mainland Norway**

Seasonally adjusted volume indices, 1994=100



Source: Statistics Norway.

have shown little change during the last three to four years, and on a seasonally adjusted basis the level in the first half of 1998 was on a par with the level in the second half of 1997 and moderately lower than the average level for 1995. The stability of import prices through this period must be viewed in connection with the fact that the appreciation of the import-weighted exchange rate from 1994 to 1995 was not reversed until this year.

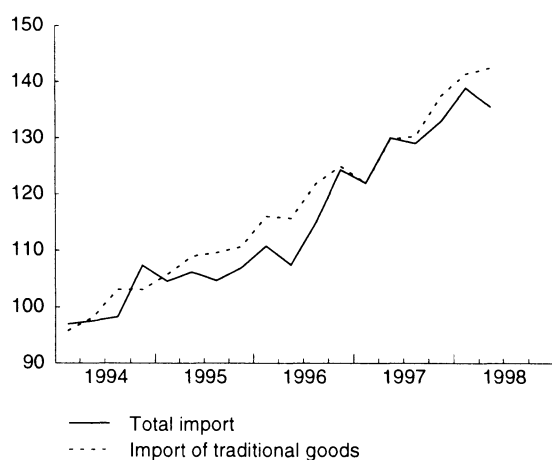
On a 12-month basis consumer prices rose at a slower rate in the first seven months of 1998 than in the same period last year, on average 2.2 and 2.8 per cent respectively. This decline can primarily be ascribed to lower prices for clothing and electricity. From May/June to July, however, year-on-year price inflation drifted up from 2.1 to 2.4 per cent. In the five-year period 1992-1996 inflation in Norway was generally a good half a percentage point lower than among our trading partners. Last year, however, this pattern was reversed, and so far in 1998 inflation has been a good half a percentage point higher in Norway than the average for our trading partners. Developments in exchange rates and wage rates thus far in 1998 indicate, in isolation, that this difference may widen slightly in the period ahead.

This year's pay settlement was a main settlement and was implemented on a union-by-union basis for industrial workers. In general, the results so far indicate noticeably stronger wage growth (before wage drift) this year than in 1997, with wages per standard man-year showing a rise of around 5 to 6 per cent.

Although the results of this year's wage settlement must partly be viewed in conjunction with the trend in relative pay over several years, they are primarily related to the situation in the labour market. From a peak equivalent to 6.8 per cent of the labour force (seasonally adjusted) in the third quarter of 1993, LFS unemployment fell to 3.7 per cent in the fourth quarter of 1997. It appears, however, that LFS unemployment has since levelled off, while the sum of registered unemployed according to the Directorate of

**Imports**

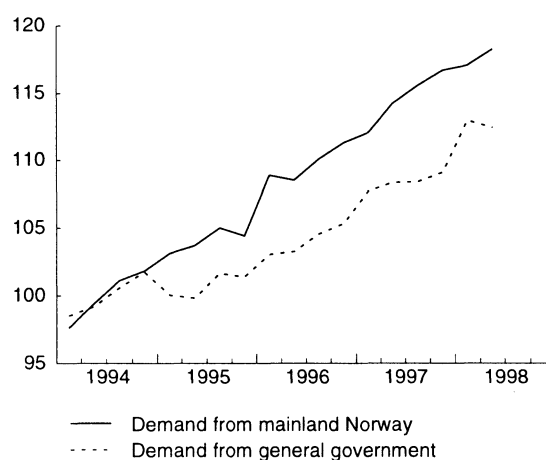
Seasonally adjusted volume indices, 1994=100



Source: Statistics Norway.

**Demand from mainland Norway**

Seasonally adjusted volume indices, 1994=100



Source: Statistics Norway.

Labour and persons participating in ordinary labour market measures continued to decline through August 1998. The number of vacancies at employment offices has moved on a sharp upward trend the past two years, reaching about 19 000 in the second quarter of 1998, equivalent to 23 per cent of LFS unemployment and 26 per cent of the sum of registered unemployed and persons participating in labour market measures. The substantial regional differences in changes in the ratio of number of vacancies to number of unemployed indicate that we have also experienced growing regional imbalances in the labour market the past few years.

Employment growth has also been very strong during this upturn, but there were signs of a levelling off in the second quarter this year. At that time around 240 000 more people were employed than at the trough in the first quarter of 1993, corresponding to a rise of 12 per cent. As during the upturn in the mid-1980s, the growth in employment in private service industries has been brisk the past few years. Unlike the previous upturn, however, manufacturing employment has also risen sharply, while the growth in public sector employment has been relatively modest. The bulk of the employment growth in the last five years has its corollary in an expansion in the labour force, partly as a result of a growth in the working-age population and partly as a result of a sharp rise in participation rates, particularly for women. In the second quarter of 1998, as much as 73.7 per cent of the population in the age group 16-74 years was in the labour force, a record high level both by Norwegian and international standards.

During the past two years the exchange rate between the Norwegian krone and European currencies has fluctuated considerably more than in the first half of the 1990s. Measured by the ECU, we have in this period experienced two periods of appreciation in the order of 3.5 to 5 per cent, and two periods of depreciation of between 6 and 7 per cent. Norges Bank has changed its key rates 11 times in the past two years in order to curb exchange rate move-

ments. This year's seventh adjustment resulted in a rise in these interest rates of altogether 4.5 percentage points from mid-March to end-August, with money market rates rising by almost the same margin.

Whereas the three-month Norwegian Euro-rate in January and February was still about the same as the average level of 3.7 per cent for 1997, it reached a good 8.2 per cent in the last week of August. This resulted in an interest rate differential against the corresponding ECU rate of about 4.1 per cent. Financial institutions' lending and deposit rates normally shadow short money market rates with a lag. At the end of the second quarter of 1998 the average lending rate in private financial institutions stood at about 6.2 per cent, 0.4 percentage point higher than the level prevailing one year earlier. Based on changes in market rates the last two months, it is likely that average lending rates will reach nearly 10 per cent at the end of the third quarter. With price inflation ranging from 2.5 to 3 per cent, this interest rate level will result in a real after-tax interest rate of 4 to 4.5 per cent, i.e. about the same as in 1994 and 1996.

Several factors may have contributed to the pressure on the Norwegian krone this year. In isolation, higher labour costs contribute to a deterioration in Norwegian producers' cost competitiveness, and may thereby point to slightly lower current-account surpluses in the period ahead. The uncertainty surrounding the future stance of fiscal policy may also have generated fears of a further deterioration in cost competitiveness in the period ahead. So far, however, movements in oil prices have had the most visible impact on Norway's current account. The current-account surplus fell from nearly Nkr 33 billion in the first half of 1997 to nearly Nkr 8 billion in the first half of this year. During this period the spot price of crude oil fell by a good 23 per cent, while oil and gas exports declined by nearly 20 per cent or Nkr 16.2 billion. This corresponds to about two thirds of the decline in the current-account surplus in the period.



## Outlook for the period ahead

### Growing international uncertainty

Developments in the world economy in the period ahead now seem to be more uncertain than was the case a short while ago. Whereas the financial problems in many Asian countries have influenced developments the past year, attention in recent months has also been focused on developments in Russia. The decline in a number of commodity prices has an adverse impact on the trade balance of countries with relatively high commodity production, which in turn can lead to a depreciation of these countries' currencies. Equity prices have dropped substantially in most countries and this may have a negative influence on demand. Developments among Norway's main trading partners have so far not been heavily influenced by these events, but growth is expected to be lower in both the US and the UK in the period ahead, while growth in the EU is projected to continue as in 1998.

Against this background, we have revised downwards market growth among our trading partners both for 1998 and 1999 compared with the projections in our last quarterly survey. We now project that growth in our traditional export markets will be a good 5 per cent in 1998 and 1999, edging up to about 6 per cent in 2000.

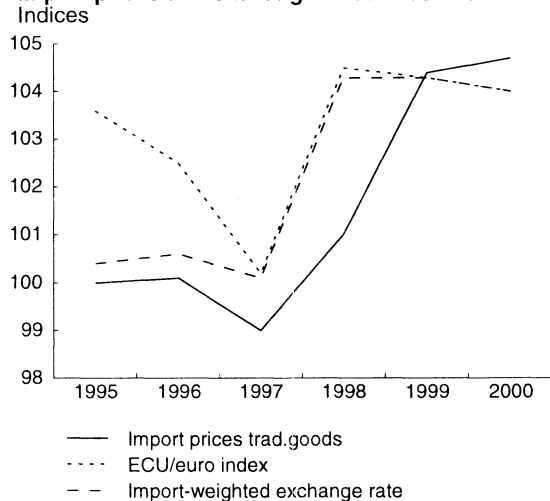
There are few signs that inflation and interest rates will change much in the OECD area the next few years. Partly as a result of the crisis in Asia, the rate of inflation has fallen in the OECD area and is low in an historical context. Also money market rates have generally remained low and there are few indications that they will rise to any extent in the period ahead. In the euro area, the three-month rate is expected to be about 4 per cent at the beginning of next year. We project an increase to about 4.5 per cent in the year 2000 in step with a slightly higher inflation rate. The projections thus entail that real interest rates in the ECU/euro area will remain unchanged.

### Interest and exchange rates in Norway

Recent developments in interest rates and the krone exchange rate have been very turbulent. The krone exchange rate has depreciated substantially during the summer and interest rates have risen sharply. Many factors may have played a role, but it is difficult to estimate the quantitative importance of each one. Nor is it any easier to predict future movements in the krone exchange rate and money market rates. This is nevertheless necessary in order to present quantitative projections for developments in the Norwegian economy during the remainder of 1998 and for the next two years. Interest rate changes influence domestic demand, and exchange rate movements have an impact on export and import prices measured in Norwegian kroner, which in turn influence inflation and the current account.

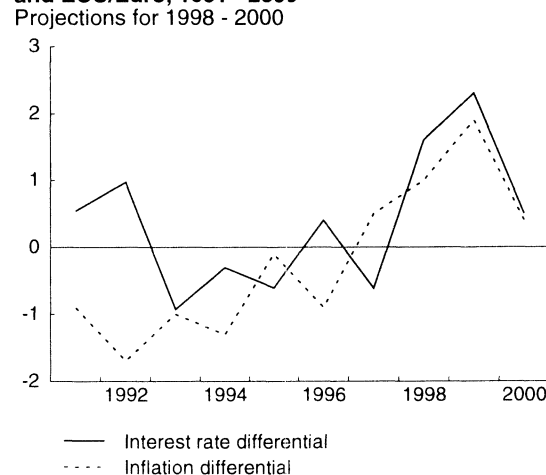
In the first half of 1998 the average ECU index was 103 and the import-weighted index was approximately the same, both up from an average of 100,3 in 1997. So far in

### Import prices and exchange rates 1995-2000



Source: Statistics Norway

### Interest rate and inflation differential between Nkr and ECU/Euro, 1991 - 2000



Source: Norges Bank and Statistics Norway.

the third quarter these indices have risen sharply. We project that the import-weighted krone exchange rate will on average be 105 in this quarter and 106 in the fourth quarter. This means that the krone will appreciate slightly compared with the level prevailing at the end of August when the exchange rate was about 110, measured by Norges Bank's ECU index. We also project that the exchange rate will appreciate further this winter and reach the mid-point in the existing band of fluctuation for the krone exchange rate (which is 104) in the second quarter of 1999. Furthermore, we project that the short-term money market rate will be 8.0 per cent through the remainder of 1998, but that it will begin to fall when the krone exchange rate expectedly returns to the interval 103-105 during the first quarter of 1999. Interest rates are expected to edge down through 1999 and reach a level of 5.0 per cent in 2000, half a percentage point higher than the projection for the ECU rate this year. Interest rate differentials in 1999 approximately correspond to the projected inflation differential between Norway and the EU area.

The main reason for the projected path for interest rates and the exchange rate is that, with the exception of special episodes a relatively stable exchange rate historically have been associated with approximate equality between exchange rate and inflation differentials. The fact that the Norwegian economy is projected to grow at an appreciably slower pace in 1999 than in earlier years comes in addition. The current account of the balance of payments, which at the moment is approximately in balance after having shown sizeable surpluses up to the end of the first quarter of 1998, will again show considerable surpluses in 1999. In our view, this provides a basis for a normalization of conditions in the foreign exchange market, although there is naturally substantial uncertainty concerning this point.

Based on the exchange rate movements assumed for the period ahead, import prices measured in Norwegian kroner will increase faster in 1998 and 1999 than was the case in previous years, when nominal prices for traditional merchandise imports measured in Norwegian kroner were approximately unchanged. The level of import prices in Norwegian kroner was the same in the first half of 1998 as the average for 1995. With a weaker krone exchange rate, import prices will rise, and are now projected to increase by 2 per cent in 1998 and a good 3 per cent in 1999. Prices are not expected to change to any great extent in the period thereafter inasmuch as the exchange rate is projected to remain approximately unchanged and the inflationary impetus from the world economy is expected to remain moderate.

Due to the uncertainty concerning interest and exchange rate assumptions, we have made some calculations which illustrate the importance of certain adjustments in the projections described above. These are reported at the end of this section.

### **Tighter fiscal policy ahead?**

General government consumption and investment rose by 4.2 per cent from 1996 to 1997, measured at constant 1995-prices. Growth in 1998 is now projected at 2.5 per cent. In line with the estimates for 1999 presented in the Revised National Budget for 1998, it is assumed that this growth will be reduced further to about 1.5 per cent in 1999. In isolation, this entails a tighter fiscal policy. On the other hand, the rate of growth in transfers to households has been rising appreciably in the period. In 1997, the real growth in transfers (increase in transfers deflated by the CPI) was only 1.5 per cent. For 1998, we project a real growth of 4.5 per cent, primarily reflecting the social security settlement. If the cash grant reform is implemented, this combined with the full-year effects of higher minimum pensions may result in continued high real growth in transfers next year, estimated at 4 per cent. All in all, real spending growth will therefore decline by about one percentage point from 1998 to 1999 if our estimates are correct. As usual, we have assumed adjustments in the rules for direct personal taxes based on wage growth and an in-

flation adjustment for specific duties. Budget revenues are therefore assumed to be cyclically neutral.

The need for a tighter fiscal policy has been discussed for some time in the public debate. A number of concrete proposals have been launched for tightening policy. As a simple illustration of some effects of a slightly tighter fiscal policy, we have looked at some of the consequences of reducing the level of general government investment equivalent to about half a per cent of mainland GDP. This calculation is discussed below.

### **Fall in petroleum investment next year**

Petroleum investment is still projected to expand by a good 15 per cent in 1998. This is approximately on a par with the estimates now being reported by oil companies. Partly based on the latest investment intentions survey in August, investment is expected to fall next year by about the same margin as the increase this year. The decline in investment will be particularly strong for the most import-intensive components. The outlook for petroleum investment is now particularly uncertain due to the low oil price. Many companies have decided to cut back substantially on exploration activities, which may reduce investment in the slightly longer term. In the projections we have assumed a moderate fall in investment from 1999 to 2000 in line with the estimates in the oil report from the Ministry of Petroleum and Energy. If oil prices remain at a level of about NKr 100 a barrel or lower, investment may fall by a greater margin in 2000. In the baseline scenario, however, we have assumed that the price of oil will gradually increase to a good NKr 120 a barrel at the end of 1999 and remain at this level in 2000.

It now appears that oil production will remain approximately unchanged in 1998 compared with the previous year. Gas production may rise slightly this year, but the growth is expected to be far greater next year. Total oil and gas production is projected to grow by a good 10 per cent from 1998 to 1999. For the year 2000, the growth in gas production is expected to continue as in 1999, while oil production is projected to show little growth.

### **Low GDP growth in 1999?**

In our earlier quarterly surveys we projected that the growth rate in the mainland economy would slow in 1999, primarily due to a projected turnaround in investment in both petroleum activities and in the mainland economy. In addition, a tighter labour market will limit the possibilities for continued growth without being accompanied by accelerating inflation. Developments through 1998 have resulted in higher price and wage inflation in Norway than in other European countries. The sharp rise in interest rates this summer, which were far greater than assumed in our previous analyses, is now reinforcing a future turnaround in the Norwegian economy and may entail that growth in the mainland economy virtually comes to a halt next year. Whereas our projection for growth is still about 3.5 per

cent in 1998, we have revised downwards the growth projection for 1999 by almost one percentage point. We now project that mainland GDP will expand by 0.5 per cent next year. As a result of higher oil and gas production, total GDP may grow by about 2 per cent in 1999, against 3 per cent in 1998.

As noted earlier in this quarterly report, there are very few or no indications in QNA figures through the second quarter of 1998 that the Norwegian economy is facing a strong cyclical turnaround. Events so far in the third quarter and projections for future developments are the primary factors underlying our expectation that this turnaround will materialize.

Brisk employment growth and this year's wage settlement will contribute to a substantial rise in household income, and consumption growth so far in 1998 indicates that annual growth may be about the same as in 1997. Strong income growth entails that the household savings ratio will increase appreciably again in 1998. In 1999, the increase in interest rates is expected to contribute to substantially lower growth in consumption. For consumer durables like cars, etc., growth is likely to slow as early as this year. Housing investment may also decline in the period ahead. The generally low growth in the economy will reduce employment growth, which will also curb the growth in household income. On the other hand, the high growth in transfers to households will make a positive contribution to income growth. Higher inflation next year, however, will curb growth in real terms. A projected rise in banks' interest margins will have the same effect. All in all, the growth in household income will be reduced substantially from 1998 to 1999. Consumption growth is expected to be reduced by about half next year, and the household savings ratio is projected to show a noticeable fall for the first time in the 1990s.

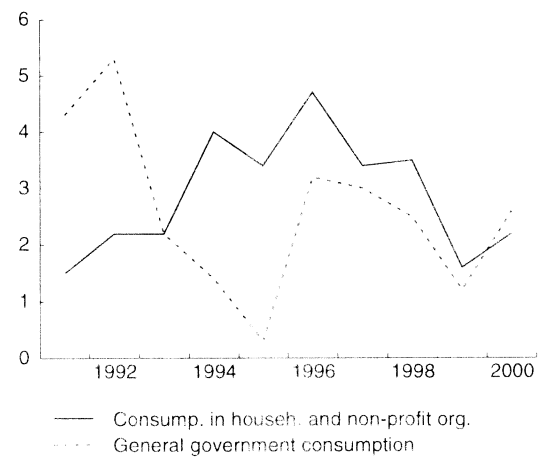
For 2000, we expect a more parallel trend in household income and consumption. A projected normalization of the situation in the foreign exchange market entails that households' borrowing rates are assumed to decline through 1999. This will contribute to stimulating consumption growth in 2000, which is estimated at a good 2 per cent.

Whereas in the previous report we projected a sharp rise in housing investment through 1998 and 1999, this is now expected to show little change in the period ahead as a result of lower income growth and higher interest rates than assumed earlier. For 2000, however, we project a sharp rise in housing investment, partly as a result of the fall in interest rates through 1999.

Manufacturing investment has expanded sharply during this upturn and growth will continue to be brisk in 1998. For 1999, however, a turnaround in manufacturing investment is projected, although we have assumed a slightly smaller decline than the level implied by manufacturing industry's latest plans according to the investment intentions survey. The decline in manufacturing investment is expected to continue in 2000, but only to a modest degree.

### Consumption

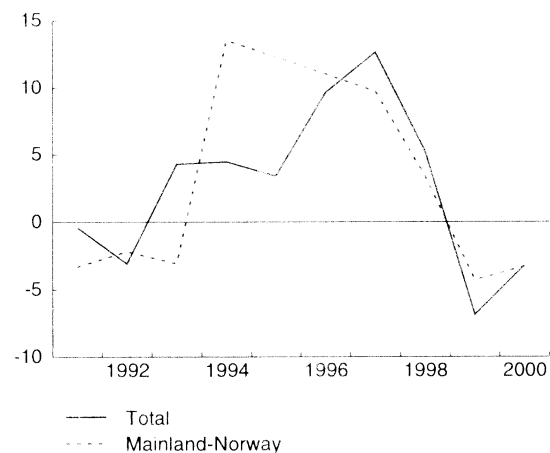
Percentage growth



Source: Statistics Norway

### Gross fixed capital formation

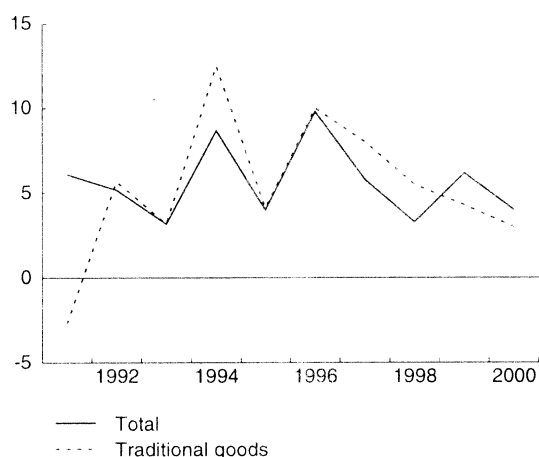
Percentage growth



Source: Statistics Norway

### Exports

Percentage growth

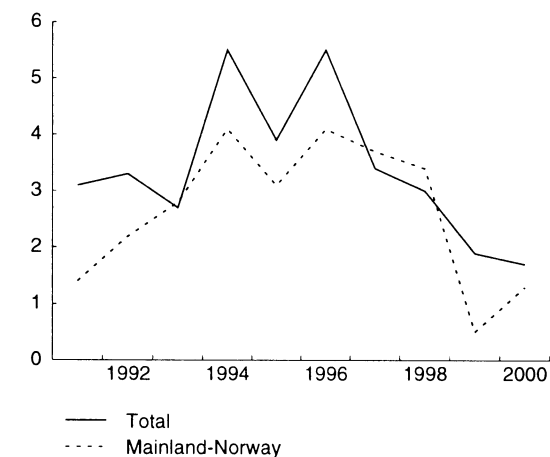


Source: Statistics Norway



### Gross domestic product

Percentage growth



Source: Statistics Norway

### Labour market

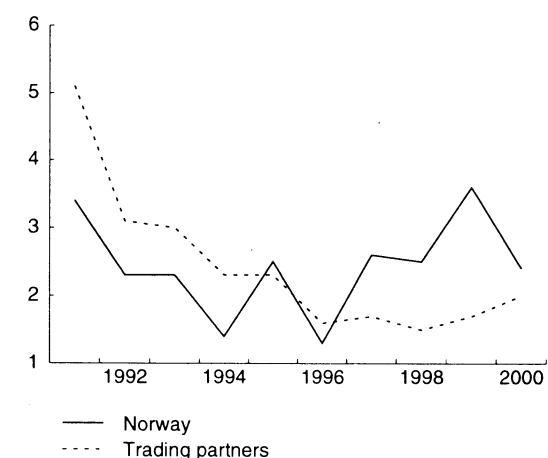
Percent



1) Adj. for stat. rev. from 1996.  
Source: Statistics Norway

### Consumer price indices

Percentage growth



Source: Statistics Norway

Investment in other sectors of the mainland economy is also expected to fall in 1999 after expanding sharply in recent years. Figures on new commercial building starts show a clear levelling off, and a number of major projects will be completed in the period ahead. It must also be assumed that generally lower economic growth will contribute to reducing the need for expanding capacity, a factor which will reduce the level of investment from the current high level.

Traditional merchandise exports are now projected to be slightly lower in 1998 than in 1997. In the period ahead the effect of the sizeable pay increases will contribute to a loss of market shares. Inasmuch as the projected return of the krone exchange rate to its "normal range" will result in a weaker krone in 1999 than in 1997 and earlier years, part of the increase in costs will be compensated. Lower market growth abroad than assumed earlier, will also contribute to weaker growth in traditional merchandise exports, and thereby to the cyclical turnaround next year.

### Higher unemployment next year

Employment growth has been very strong in recent years. Even though growth may now have come to a halt, developments through the first quarter of 1998 will, if not reversed, result in an annual growth rate of more than 2 per cent. There is also increasing evidence that the growth in participation rates is slowing, and unemployment so far in 1998 has shown signs of levelling off. The LFS unemployment rate is now projected at about 3.5 per cent in 1998.

A pronounced turnaround in output growth in the period ahead will contribute to lower employment growth in 1999. Our projections indicate that employment will not expand next year. As a result, unemployment may start to rise this winter and as an average for 1999 might return to the level prevailing in 1997. The growth in the labour supply will slow and the increase will be no greater than the level implied by purely demographic factors. Participation rates in 1999 will thus be about the same as in 1998. In 2000, small changes in employment, the labour supply and unemployment are expected compared with 1999.

The cyclical upturn which now seems to be peaking has been characterized by an unusually sharp rise in participation rates, partly reflecting the inflow of labour from Norway's neighbouring countries. As the growth rate in the economy slows and unemployment increases, it is conceivable that some workers will return to their own countries, not least when unemployment in Sweden and Denmark is now declining. This may imply that unemployment will not increase as much as indicated in our projections.

### Relatively high wage and price inflation ahead

So far in 1998 consumer price inflation has been somewhat lower than assumed earlier. However, a weaker krone exchange rate and the substantial pay increases in connection with the wage settlement are expected to result

in higher price inflation in the period ahead. Against this background, our projection of a 2.5 per cent rise in consumer prices in 1998 still applies. For 1999, we have made an upward revision of our projection for the rise in consumer prices. This is primarily due to a 3 percentage point upward revision in the estimated rise in import prices as a result of a projected depreciation of the krone of about 4 per cent from the fourth quarter of 1997 and up to 1999. In isolation, this pushes up consumer price inflation by 0.8 per cent in 1999. An increase in prices of a good 3.5 per cent in 1999 will be almost 2 per cent higher than price inflation among our trading partners. Higher interest rates will in the short run result in higher house rents and thereby a higher CPI, but will also gradually lead to a lower level of activity and therefore lower wage and price levels.

For 2000, we expect an approximately unchanged import-weighted krone exchange rate compared with 1999. With continued subdued price inflation internationally, this will contribute to a low rise in import prices. Due to slower growth in 1999 and rising unemployment, wage growth is also expected to be substantially lower in 2000, and consumer price inflation will approach the level in the Euro area, which is estimated at 2 per cent in 2000. Slightly lower interest rates in 2000 compared with 1999 will, in isolation, contribute to pushing down house rents. Consumer price inflation is therefore projected at 2.5 per cent in 2000. We would emphasize that the price projections for both 1999 and 2000 are based on the assumption that the authorities do not increase net indirect taxes in excess of the inflation rate.

As in the last quarterly report, wage growth is projected at about 6 per cent in 1998. Next year, when an interim settlement will be concluded, wage growth may be slightly lower. Higher unemployment will also reduce the pressures in the labour market and contribute to lower wage growth. Higher consumer price inflation and a considerable wage carry-over into 1999 point to the opposite. The net effect of this is that wage growth is now projected at about 5.5 per cent next year, which is slightly higher than our earlier projection. Real wage growth, on the other hand, will fall from about 3.5 per cent in 1998 to less than 2 per cent in 1999.

For 2000, when there will again be a main settlement, real wage growth is projected to be about the same as in 1999, based on the assumption that higher unemployment through 1999 and into 2000 will reduce wage growth. Real wage growth in 2000 is on a par with the estimate for the growth in labour productivity in the private sector of the mainland economy, whereas real wage growth in both 1998 and 1999 is higher than productivity gains.

### Substantial current-account surpluses again

In our baseline scenario, a rising oil price measured in Norwegian kroner has been assumed in the period ahead. For 1998, we expect an oil price of about Nkr 102 a barrel, while the estimate for 1999 is Nkr 113, rising to about Nkr 124 as an average for the year 2000. With a dollar exchange rate of Nkr 7.50, this corresponds to an oil price of

### Main economic indicators

Percentage change from previous year unless otherwise noted

	Accounts		Forecasts	
	1997	1998	1999	2000
<b>Demand and output</b>				
Consumption in households and non-profit organizations	3.4	3.5	1.6	2.2
General government consumption	3.0	2.5	1.2	2.6
Gross fixed investment	12.6	5.3	-6.9	-3.2
- mainland Norway	9.7	3.4	-4.3	-3.3
- petroleum activities <sup>1</sup>	15.5	15.1	-16.3	-3.4
Demand from mainland Norway <sup>2</sup>	4.5	3.2	0.4	1.3
Stockbuilding <sup>3</sup>	0.6	0.3	0.0	0.0
Exports	5.8	3.3	6.2	4.0
- crude oil and natural gas	2.3	0.5	10.8	3.9
- traditional goods	8.0	5.5	4.3	3.0
Imports	12.3	6.0	0.1	2.4
- traditional goods	8.6	7.7	-0.5	0.4
Gross domestic product	3.4	3.0	1.9	1.7
- mainland Norway	3.7	3.5	0.5	1.3
<b>Labour market</b>				
Employed persons	2.9	2.2	-0.3	0.1
Unemployment rate (level)	4.1	3.3	4.0	4.4
<b>Prices and wages</b>				
Wages per standard man-year	4.6	5.9	5.4	4.1
Consumer price index	2.6	2.5	3.6	2.4
Export prices, traditional goods	0.5	0.6	2.2	2.8
Import prices, traditional goods	-1.1	2.0	3.4	0.2
Real price, dwellings	5.8	6.5	-1.1	4.9
<b>Balance of payment</b>				
Current balance (bill.Nkr)	56.8	12	44	81
Current balance (per cent of GDP)	5.2	1.1	3.7	6.5
<b>Memorandum items:</b>				
Households savings ratio	6.6	7.7	6.8	6.7
Money market rate (level)	3.6	5.7	6.5	5.0
Average borrowing rate (level) <sup>4</sup>	6.0	7.4	8.9	7.2
Crude oil price Nkr (level) <sup>5</sup>	134	102	113	124
International market growth	6.8	5.3	5.3	5.9
Importweighted krone exchange rate <sup>6</sup>	-0.5	4.1	0.0	-0.3

<sup>1</sup> Oil and gas extraction proper, pipeline transport and service activities incidental to oil- and gas extraction.

<sup>2</sup> Consumption in households and non-profit organizations + general government + gross fixed capital formation in mainland Norway.

<sup>3</sup> Change in stockbuilding. Per cent of GDP.

<sup>4</sup> Households' borrowing rate in private financial institutions.

<sup>5</sup> Average Norwegian oil production.

<sup>6</sup> Increasing index implies depreciation.

\$ 16 a barrel in 2000. Higher oil prices and oil and gas production, along with a slower growth in imports as a result of the cyclical turnaround in the Norwegian economy, will translate into a larger trade surplus and current-account surplus the next two years. The current-account surplus in 1998 is projected at Nkr 12 billion, equivalent to 1 per cent of nominal GDP, about the same as estimated earlier. For 1999, this surplus is put at Nkr 44 billion or almost 4 per cent of nominal GDP, and the surplus is projected to almost double in 2000. With an oil price of Nkr 94 a barrel, the current-account surpluses will be approximately halved in relation to the projections above.

### Some alternative scenarios

In the above we have described the underlying assumptions and results of our latest projections for macroeconomic developments in Norway. As noted, there is now considerable uncertainty particularly with regard to developments in the exchange rate, interest rates, oil prices and fiscal policy. In the following, we illustrate how a slight change in some assumptions affect the forecasts (baseline scenario).

We have looked at three alternative scenarios, each of which can be perceived as very stylized. The calculations do not provide an overall and consistent macroeconomic picture, but illustrate some partial effects of altered assumptions. These alternative scenarios are being presented partly in order to illustrate our own uncertainty with regard to future developments, but also because the public debate demonstrates that there are differing views concerning the workings of the Norwegian economy. The alternative scenarios can be combined in different ways, and along with the baseline scenario be used to draw up projections other than those we have emphasized in the presentation above. Let us illustrate some possible combinations:

In the baseline scenario we have assumed that the krone exchange rate relatively swiftly returns to a "normal range" and that the interest rate differential against the ECU/euro rate will narrow substantially through 1999. Some will object that this is not realistic without a tighter fiscal policy than that assumed in our baseline scenario. One can then combine the baseline scenario with the alternative scenario involving a tighter fiscal policy and produce a different scenario.

Others might argue that the interest and exchange rate situation will be normalized more quickly than we have assumed, possibly that this will occur if a tighter fiscal policy is conducted. One can then combine the baseline scenario with the scenario involving a swifter fall in interest rates and an exchange rate normalization, possibly also including the alternative scenario involving a tighter fiscal policy.

Some may be of the view that our oil price projections for 1999 and 2000 are too optimistic. One can then combine the baseline scenario with the alternative scenario involving lower oil prices and lower petroleum investment in 2000. One can go even further by including a tighter fiscal policy in order to illustrate that the authorities will have to reduce government budget expenditure since petroleum revenues largely accrue to the state. Others in turn will maintain that this is unreasonable and that with a lower economic rent from oil and gas, the Petroleum Fund must bear the burden, i.e. in practice smaller current-account surpluses.

As we pointed out earlier, some of the background for these calculations is that we are not able to explain quantitatively the interest and exchange rate movements we have experienced this summer. Nor are we able to ascertain what is necessary to normalize the situation or how long it

will take before this normalization takes place. It is worth noting that the Norwegian economy has experienced abnormal situations earlier, without being able to explain easily why these occurred. We need go no further than the period around the EU referendum when the interest rate differential was very high and was eliminated following the referendum.

### Alternative scenario A: Effects of a tighter fiscal policy

In this scenario the level of general government investment is reduced compared with the baseline scenario. The tightening corresponds to 0.5 per cent of mainland GDP and starts from the first quarter of 1999. Interest rates and the exchange rate are assumed to be unaffected by this tightening. In Statistics Norway's model KVARTS there is no direct link between government budgets and interest rates, and the indirect effects are also weak. The effect of a tighter fiscal policy on interest rates is thus marginal according to KVARTS.

This tightening of fiscal policy will entail a reduction in activity growth of 0.4 percentage point in 1999 and an additional 0.1 percentage point in 2000. As a result of slightly higher unemployment, wage growth will be somewhat lower both years. A lower level of activity contributes to reducing imports and thus results in an improvement in the current-account balance. Lower price inflation and larger current-account surpluses will, in isolation, reduce interest rates, but according to the model the effects are small.

### Alternative scenario A: Effect of a reduction in the level of general government investment equivalent to 0.5 per cent of mainland GDP in 1999 and 2000. Percentage deviation from the baseline scenario unless otherwise noted

	1999	2000
Household consumption	-0.1	-0.4
Mainland GDP	-0.4	-0.5
Unemployment rate, level	0.1	0.2
Wages per standard man-year	-0.1	-0.3
Consumer price index	0.0	-0.1
Current-account balance in bill. Nkr	2.4	3.6

### Alternative scenario B: Effect of a swifter fall in interest rates

In this scenario we assume that the demand for Norwegian kroner picks up compared with the baseline scenario, starting at the end of the fourth quarter of 1998 and through the third quarter of next year. The krone appreciates so that Norges Bank lowers its key rates as early as the end of 1998, and thereafter at a faster pace than assumed in the baseline scenario. This is assumed to have an effect on import prices and households' interest rates beginning in the first quarter of 1999.

Import prices are reduced by 0.5 per cent in the first quarter of 1999, 1.0 per cent in the second quarter and 0.5 per cent in the third quarter. The rise in import prices in 1999 is reduced by an average 0.5 percentage point. Households' borrowing and deposit rates in private credit institutions are assumed to be reduced by 1.5 percentage points in the first quarter of 1999, 1.0 percentage point in the second quarter and half a percentage point in the third quarter compared with the level in the baseline scenario. The decline in interest rates on household debt in state banks, excluding the Housing bank, is assumed to be of about the same magnitude, but with a lag. Households' borrowing rates in the Housing Bank are assumed to remain unchanged because in the baseline scenario it is assumed that everyone switches to fixed-rate loans, for which the borrowing rate is given. Interest rates for the household sector are reduced by an average 3/4 percentage point in 1999.

In 2000 the levels of all interest rates and import prices are the same as in the baseline scenario (rise in import prices from previous year will thereby be 0.5 per cent higher in 2000, while the decline in interest rates will be 3/4 percentage point lower). Inasmuch as the changes take place early in the year, the effects on an annual basis will be stronger than if the same overall change had been spread equally through the year.

The effect of this change in interest rates in 1999 will be to boost household demand, thereby increasing the level of activity in the economy. Price inflation will be reduced by 0.2 percentage point in 1999 and increased by 0.1 percentage point the following year in relation to the baseline scenario.

**Alternative scenario B: Effect of a swifter decline in money market rates and appreciation of the krone through the winter of 1998/1999. Percentage deviation from the baseline scenario unless otherwise noted**

	1999	2000
Household consumption	0.3	0.1
Mainland GDP	0.1	0.1
Unemployment rate, level	0.0	-0.1
Wages per standard man-year	-0.1	-0.1
Consumer price index	-0.2	-0.1
Current-account balance in bill. Nkr	-1.2	-1.0

**Alternative scenario C: Effect of continued low oil prices in 1999 and 2000**

In the baseline scenario, oil prices are assumed to pick up gradually through 1999 and 2000. In this scenario we allow the oil price in Norwegian kroner to remain at about Nkr 94 a barrel in 1999 and 2000. Compared with the baseline scenario, this implies an oil price which is 16.6 per cent lower in 1999 and 24.2 per cent lower in 2000.

With this reduction in oil prices, it is likely that petroleum investment will be somewhat lower than assumed in the baseline scenario. Changes in petroleum investment are de-

termined by political and technological as well as business conditions. Expectations concerning future price movements are of particular importance in this connection, and it normally takes some time before reassessments materialize in changes in investment. On an uncertain basis, we assume in this sensitivity analysis that petroleum investment is not affected in 1999, but reduced by 10 per cent in 2000, compared to the level in the baseline scenario.

Low oil prices also influence the economy through channels that are not embodied in KVARTS. Demand in Norwegian export markets will be slightly higher, while price inflation, and therefore interest rates, among our trading partners will probably be somewhat lower than would otherwise have been the case. In order to isolate the more direct effects on the Norwegian economy, we have disregarded these expansionary effects in this scenario. Previous analyses indicate that such effects will be relatively small. It is also conceivable that the oil price will influence exchange rates and the level of interest rates, but such effects are explicitly excluded in this scenario.

The immediate effect of a decline in oil prices is a marked reduction in the current-account surplus and a modest fall in price inflation and, gradually, wage growth. Lower petroleum investment will have more pronounced effects on the real side of the economy. In our calculations, where the projected reduction in petroleum investment in 2000 must be considered moderate, mainland GDP is reduced by 0.2 per cent, while unemployment rises by 0.1 percentage point.

If we, in addition, assume that interest rates in 1999 and 2000 in a situation with stable low oil prices are 1.0 percentage point higher than in the baseline scenario, the effects are considerably stronger: Mainland GDP will then be reduced by 0.2 per cent in 1999 and nearly 0.8 per cent in 2000, while the unemployment rate will be 0.2-0.3 percentage point higher in 2000. Price inflation in this case will not be affected to any noteworthy extent, while wage growth in 2000 may be reduced by 0.4 percentage point.

**Alternative scenario C: Effect of lower oil price in 1999 and 2000. Percentage deviation from the baseline scenario unless otherwise noted**

	1999	2000
Oil price in Nkr	-16.6	-24.2
Gross investment in petroleum sector	0.0	-10.0
Household consumption	0.0	-0.1
Mainland GDP	0.0	-0.2
Unemployment rate, level	0.0	0.1
Wages per standard man-year	0.0	-0.3
Consumer price index	-0.1	-0.2
Current-account balance in bill. Nkr	-22.0	-37.5

### Effects of 2 percentage point increase in interest rates

Here we look at the macroeconomic effects of an isolated increase in interest rates with an unchanged exchange rate. In the calculations, households' interest rates are increased by 2 percentage points (compared with the baseline scenario) starting in the first quarter of year 1. It may take some time before a change in money market rates feeds through to households' interest rates. In this calculation, however, we disregard such factors and allow all interest rates to change immediately. The calculations use 1998 as a point of departure with our forecasts as a baseline scenario. The results will be influenced by the levels in the baseline scenario.

#### Effect of 2 percentage point increase in interest rate<sup>1</sup> Percentage deviation from the baseline scenario unless otherwise noted

	Year 1	Year 2	Year 3
Household consumption	-0.8	-1.9	-1.5
Dwelling investment	-3.2	-13.9	-13.2
Mainland GDP	-0.4	-1.1	-1.0
Unemployment rate, level	0.1	0.3	0.3
Wages per standard man-year	0.0	-0.2	-0.4
Consumer price index	0.2	0.3	0.1
Current-account balance in bill. Nkr	2.2	6.9	6.7

<sup>1</sup> A similar calculation was presented in an article in Economic Survey 2/98. The difference between the results in the two calculations is partly related to the fact that we are now using a new version of the KVARTS model, where the relationships which describe household consumption and a number of other behavioural relationships have been requantified, and partly that in the earlier calculations some lags were assumed in the adjustment of households' interest rates.

According to the KVARTS model, an increase in interest rates affects the real economy through the following channels:

- A change in household income. As a whole, the household sector has considerable interest-bearing assets and liabilities. All total, assets are largest, entailing that income rises as a result of an increase in all relevant interest rates. In isolation, this points in the direction of higher consumption and housing investment. As we will see below, this effect is dominated by the two next.
- Higher interest rates reduce prices for existing homes. This results in lower housing investment and consumer demand as the value of household wealth is reduced.
- Current consumption becomes more expensive compared to future consumption, which results in lower consumption.
- House rents increase, contributing to higher consumer prices and thereby lower real income and consumption in the household sector.

The net effect of a change in interest rates is clearly contractionary. Household consumption is 0.8 per cent lower than it would otherwise have been in the first year of higher interest rates, and 1.9 per cent the second year. Mainland GDP is 0.4 per cent lower the first year, while the effect in the next two years is about 1.0 per cent. Reduced demand for labour pushes up the unemployment rate by 0.1 percentage point the first year and by 0.3 percentage point the next two years.

**National accounts: Final expenditure and gross domestic product**

At fixed 1995 prices. Million kroner

	Unadjusted		Seasonally adjusted							
	1996	1997	96.3	96.4	97.1	97.2	97.3	97.4	98.1	98.2
Final consumption exp. of housh. and NPISHs <sup>1</sup>	479888	496319	120447	121596	121597	123945	124940	125837	126325	128748
Household final consumption expenditure . . .	456574	472933	114629	115780	115823	118042	119085	119983	120506	122982
Goods . . . . .	261607	270914	65456	66507	66132	67323	68446	69013	69026	71480
Services . . . . .	191119	196411	48012	48168	48548	49204	49152	49506	49853	49954
Direct purchases abroad by resident househ . . .	18844	20731	4835	4701	4898	5342	5256	5234	5338	5239
-Direct purchases by non-residents . . . . .	-14996	-15124	-3673	-3596	-3755	-3828	-3769	-3772	-3712	-3691
Final consumption exp. of NPISHs . . . . .	23315	23386	5817	5816	5774	5904	5854	5854	5819	5766
Final consump. exp. of general government . . .	200797	206781	50268	50520	51274	51397	51783	52327	52923	52924
Final consump. exp. of central government . . .	80085	82027	20084	20162	20447	20330	20506	20744	20948	20901
Central government, civilian . . . . .	58726	59735	14708	14800	14901	14781	14951	15101	15328	15398
Central government, defence . . . . .	21358	22292	5377	5362	5545	5549	5554	5643	5620	5502
Final consump. exp. of local government . . . .	120713	124754	30184	30358	30827	31067	31277	31583	31976	32023
Gross fixed capital formation . . . . .	211084	237777	52748	57385	56652	59891	59988	61246	62499	63819
Petroleum activities . . . . .	48667	56206	11880	15016	12713	15079	13591	14823	15180	18277
Ocean transport . . . . .	6113	10124	1560	2210	3062	2289	2768	2005	3316	1670
Mainland Norway . . . . .	156303	171447	39309	40159	40877	42523	43629	44418	44003	43872
Mainland Norway ex. general government . . .	125301	136709	31350	32018	32148	33565	35030	35966	34000	34185
Manufacturing and mining . . . . .	17175	18270	4371	4391	4199	4876	4347	4848	4472	4734
Production of other goods . . . . .	12762	12995	3131	3285	3200	3193	3378	3224	3351	3256
Dwellings . . . . .	26149	28497	6612	6646	6855	7193	7214	7235	7425	7330
Other services . . . . .	69215	76946	17235	17696	17894	18303	20091	20659	18753	18866
General government . . . . .	31002	34738	7959	8142	8730	8958	8599	8452	10003	9687
Changes in stocks and stat. discrepancies . . .	22054	23922	7703	4106	3285	7250	4390	8997	7692	6674
Gross capital formation . . . . .	233138	261698	60451	61491	59937	67141	64378	70242	70191	70493
Final domestic use of goods and services . . . .	913823	964798	231167	233606	232808	242483	241100	248406	249439	252164
Final demand from mainland Norway <sup>2</sup> . . . .	836989	874546	210024	212275	213748	217865	220351	222582	223251	225543
Final demand from general government <sup>3</sup> . . . .	231799	241519	58227	58661	60003	60355	60382	60779	62926	62610
Total exports . . . . .	388204	410697	96522	100124	100729	103501	103179	103288	105951	102794
Traditional goods . . . . .	157804	170488	39064	40067	41083	42892	43455	43058	44753	43078
Crude oil and natural gas . . . . .	130894	133959	33465	33393	31915	35351	32735	33958	33770	33282
Ships and oil platforms . . . . .	8862	9896	1294	2923	3923	1669	2239	2065	2998	2366
Services . . . . .	90644	96354	22700	23741	23808	23588	24751	24206	24430	24068
Total use of goods and services . . . . .	1302027	1375495	327689	333730	333537	345984	344279	351694	355390	354958
Total imports . . . . .	322470	362209	81047	87600	85924	91642	90932	93712	97892	95486
Traditional goods . . . . .	223147	242355	56827	58261	56866	60551	60802	64136	65915	66444
Crude oil . . . . .	1059	1235	204	461	459	214	314	247	456	264
Ships and oil platforms . . . . .	17010	23179	3534	7519	6557	6713	5536	4374	6451	4206
Services . . . . .	81255	95440	20483	21359	22042	24164	24280	24955	25070	24572
Gross domestic product <sup>4</sup> . . . . .	979557	1013286	246642	246130	247613	254342	253348	257983	257498	259472
Mainland Norway (market prices) . . . . .	822300	853090	206025	206342	208376	212941	214444	217329	216858	220192
Petroleum activities and ocean transport . . . . .	157257	160196	40616	39788	39237	41401	38904	40654	40640	39280
Mainland Norway (basic prices) . . . . .	713616	740206	178758	178795	181166	184600	185935	188505	188644	191077
Mainland Norway ex. general government . . .	561604	584407	140787	140595	142611	145821	146833	149142	148964	151353
Manufacturing and mining . . . . .	115478	119000	29162	28942	29054	29658	29945	30342	30172	30449
Production of other goods . . . . .	76648	80611	18473	18813	19311	20267	20411	20623	20691	20983
Service industries . . . . .	369478	384796	93153	92841	94246	95896	96476	98178	98100	99921
General government . . . . .	152013	155799	37970	38200	38555	38779	39102	39363	39681	39724
Correction items . . . . .	108684	112883	27268	27548	27210	28341	28509	28824	28214	29115



**National accounts: Final expenditure and gross domestic product**

At fixed 1995 prices. Percentage volume change from previous period

	Unadjusted		Seasonally adjusted							
	1996	1997	96.3	96.4	97.1	97.2	97.3	97.4	98.1	98.2
Final consumption exp. of housh. and NPISHs <sup>1</sup>	4.7	3.4	1.6	1.0	0.0	1.9	0.8	0.7	0.4	1.9
Household final consumption expenditure . . .	4.9	3.6	1.7	1.0	0.0	1.9	0.9	0.8	0.4	2.1
Goods . . . . .	6.2	3.6	2.2	1.6	-0.6	1.8	1.7	0.8	0.0	3.6
Services . . . . .	2.9	2.8	0.6	0.3	0.8	1.4	-0.1	0.7	0.7	0.2
Direct purchases abroad by resident househ.	4.7	10.0	4.6	-2.8	4.2	9.1	-1.6	-0.4	2.0	-1.8
-Direct purchases by non-residents . . . . .	0.1	0.9	-1.3	-2.1	4.4	1.9	-1.5	0.1	-1.6	-0.6
Final consumption exp. of NPISHs . . . . .	0.3	0.3	-0.2	-0.0	-0.7	2.2	-0.8	-0.0	-0.6	-0.9
Final consump. exp. of general government . .	3.2	3.0	0.5	0.5	1.5	0.2	0.8	1.1	1.1	0.0
Final consump. exp. of central government . .	3.2	2.4	0.8	0.4	1.4	-0.6	0.9	1.2	1.0	-0.2
Central government, civilian . . . . .	3.3	1.7	0.6	0.6	0.7	-0.8	1.2	1.0	1.5	0.5
Central government, defence . . . . .	3.0	4.4	1.4	-0.3	3.4	0.1	0.1	1.6	-0.4	-2.1
Final consump. exp. of local government . . .	3.2	3.3	0.4	0.6	1.5	0.8	0.7	1.0	1.2	0.1
Gross fixed capital formation . . . . .	9.6	12.6	2.7	8.8	-1.3	5.7	0.2	2.1	2.0	2.1
Petroleum activities . . . . .	1.5	15.5	0.4	26.4	-15.3	18.6	-9.9	9.1	2.4	20.4
Ocean transport . . . . .	63.8	65.6	45.0	41.7	38.6	-25.2	20.9	-27.6	65.4	-49.6
Mainland Norway . . . . .	11.0	9.7	2.2	2.2	1.8	4.0	2.6	1.8	-0.9	-0.3
Mainland Norway ex. general government . .	12.9	9.1	1.3	2.1	0.4	4.4	4.4	2.7	-5.5	0.5
Manufacturing and mining . . . . .	9.4	6.4	4.8	0.4	-4.4	16.1	-10.8	11.5	-7.8	5.9
Production of other goods . . . . .	-3.9	1.8	2.5	4.9	-2.6	-0.2	5.8	-4.5	3.9	-2.8
Dwellings . . . . .	-1.2	9.0	2.7	0.5	3.1	4.9	0.3	0.3	2.6	-1.3
Other services . . . . .	24.7	11.2	-0.3	2.7	1.1	2.3	9.8	2.8	-9.2	0.6
General government . . . . .	3.7	12.1	6.0	2.3	7.2	2.6	-4.0	-1.7	18.3	-3.2
Changes in stocks and stat. discrepancies . .	-19.6	8.5	111.1	-46.7	-20.0	120.7	-39.5	104.9	-14.5	-13.2
Gross capital formation . . . . .	6.0	12.3	9.9	1.7	-2.5	12.0	-4.1	9.1	-0.1	0.4
Final domestic use of goods and services . . .	4.7	5.6	3.4	1.1	-0.3	4.2	-0.6	3.0	0.4	1.1
Final demand from mainland Norway <sup>2</sup> . . .	5.4	4.5	1.5	1.1	0.7	1.9	1.1	1.0	0.3	1.0
Final demand from general government <sup>3</sup> . . .	3.3	4.2	1.2	0.7	2.3	0.6	0.0	0.7	3.5	-0.5
Total exports . . . . .	9.8	5.8	1.6	3.7	0.6	2.8	-0.3	0.1	2.6	-3.0
Traditional goods . . . . .	10.0	8.0	1.4	2.6	2.5	4.4	1.3	-0.9	3.9	-3.7
Crude oil and natural gas . . . . .	15.6	2.3	3.2	-0.2	-4.4	10.8	-7.4	3.7	-0.6	-1.4
Ships and oil platforms . . . . .	-16.2	11.7	-38.7	125.9	34.2	-57.5	34.1	-7.8	45.1	-21.1
Services . . . . .	5.2	6.3	3.4	4.6	0.3	-0.9	4.9	-2.2	0.9	-1.5
Total use of goods and services . . . . .	6.2	5.6	2.9	1.8	-0.1	3.7	-0.5	2.2	1.1	-0.1
Total imports . . . . .	8.3	12.3	7.0	8.1	-1.9	6.7	-0.8	3.1	4.5	-2.5
Traditional goods . . . . .	10.0	8.6	5.3	2.5	-2.4	6.5	0.4	5.5	2.8	0.8
Crude oil . . . . .	-5.5	16.6	2.5	126.2	-0.5	-53.3	46.7	-21.4	84.3	-42.1
Ships and oil platforms . . . . .	31.7	36.3	55.8	112.8	-12.8	2.4	-17.5	-21.0	47.5	-34.8
Services . . . . .	0.6	17.5	6.1	4.3	3.2	9.6	0.5	2.8	0.5	-2.0
Gross domestic product <sup>4</sup> . . . . .	5.5	3.4	1.6	-0.2	0.6	2.7	-0.4	1.8	-0.2	0.8
Mainland Norway (market prices) . . . . .	4.1	3.7	0.9	0.2	1.0	2.2	0.7	1.3	-0.2	1.5
Petroleum activities and ocean transport . . .	13.4	1.9	5.1	-2.0	-1.4	5.5	-6.0	4.5	-0.0	-3.3
Mainland Norway (basic prices) . . . . .	3.1	3.7	0.6	0.0	1.3	1.9	0.7	1.4	0.1	1.3
Mainland Norway ex. general government . .	2.9	4.1	0.7	-0.1	1.4	2.3	0.7	1.6	-0.1	1.6
Manufacturing and mining . . . . .	2.3	3.1	2.8	-0.8	0.4	2.1	1.0	1.3	-0.6	0.9
Production of other goods . . . . .	-1.5	5.2	-2.3	1.8	2.6	4.9	0.7	1.0	0.3	1.4
Service industries . . . . .	4.1	4.1	0.7	-0.3	1.5	1.8	0.6	1.8	-0.1	1.9
General government . . . . .	3.7	2.5	0.2	0.6	0.9	0.6	0.8	0.7	0.8	0.1
Correction items . . . . .	11.3	3.9	2.9	1.0	-1.2	4.2	0.6	1.1	-2.1	3.2

**National accounts: Selected price indices**

1995 = 100

	Unadjusted		Seasonally adjusted							
	1996	1997	96.3	96.4	97.1	97.2	97.3	97.4	98.1	98.2
Final consumption exp. of househ. and NPISHs <sup>1</sup>	101.4	103.9	101.9	102.5	103.3	103.6	104.0	104.6	105.8	106.5
Final consumption exp. of general government	103.0	105.8	103.7	104.7	104.6	105.1	106.7	106.9	107.9	110.0
Gross fixed capital formation	102.6	105.1	102.5	103.7	101.6	106.0	106.4	106.2	107.4	108.2
Mainland Norway	102.4	103.5	102.2	103.5	101.8	103.0	104.3	104.6	105.8	107.3
Final domestic use of goods and services	102.0	104.5	101.2	102.9	105.3	104.2	104.4	104.0	106.1	107.6
Final demand from mainland Norway <sup>2</sup>	102.0	104.3	102.4	103.2	103.3	103.9	104.7	105.2	106.3	107.5
Total exports	106.7	109.0	107.3	111.9	108.0	106.4	111.4	110.1	102.8	100.4
Traditional goods	98.8	99.3	98.1	100.0	96.4	96.9	101.8	101.9	100.8	100.4
Total use of goods and services	103.4	105.8	103.0	105.6	106.1	104.9	106.5	105.8	105.1	105.5
Total imports	101.2	102.4	97.1	103.2	103.1	101.2	103.7	101.7	102.5	103.5
Traditional goods	100.1	99.0	94.6	101.9	102.1	97.1	99.7	97.3	97.8	99.0
Gross domestic product	104.1	107.1	104.9	106.4	107.2	106.2	107.5	107.3	106.1	106.3
Mainland Norway	101.5	104.4	101.9	102.8	103.5	103.9	104.5	105.7	106.9	108.3

**National accounts: Selected price indices**

Percentage change from the previous period

	Unadjusted		Seasonally adjusted							
	1996	1997	96.3	96.4	97.1	97.2	97.3	97.4	98.1	98.2
Final consumption exp. of househ. and NPISHs <sup>1</sup>	1.4	2.5	0.7	0.7	0.7	0.3	0.4	0.6	1.1	0.7
Final consumption exp. of general government	3.0	2.7	1.2	1.0	-0.1	0.5	1.5	0.2	0.9	2.0
Gross fixed capital formation	2.6	2.5	0.3	1.2	-2.0	4.3	0.4	-0.2	1.1	0.8
Mainland Norway	2.4	1.1	0.3	1.2	-1.6	1.1	1.3	0.3	1.1	1.4
Final domestic use of goods and services	2.0	2.4	-1.1	1.6	2.4	-1.0	0.2	-0.4	1.9	1.4
Final demand from mainland Norway <sup>2</sup>	2.0	2.3	0.8	0.8	0.1	0.5	0.8	0.4	1.0	1.1
Total exports	6.7	2.1	2.3	4.3	-3.5	-1.5	4.7	-1.1	-6.7	-2.3
Traditional goods	-1.2	0.5	-0.6	2.0	-3.6	0.5	5.1	0.0	-1.0	-0.5
Total use of goods and services	3.4	2.3	-0.1	2.5	0.5	-1.2	1.6	-0.6	-0.7	0.4
Total imports	1.2	1.2	-5.0	6.2	-0.0	-1.8	2.5	-2.0	0.8	1.0
Traditional goods	0.1	-1.1	-6.8	7.8	0.2	-4.8	2.6	-2.4	0.6	1.2
Gross domestic product	4.1	2.8	1.5	1.4	0.7	-0.9	1.2	-0.2	-1.2	0.2
Mainland Norway	1.5	2.8	0.6	0.9	0.8	0.3	0.6	1.1	1.1	1.3

**Technical comments on the quarterly figures**

Footnotes:

<sup>1</sup> NPISHs: Non-profit institutions serving households.<sup>2</sup> Defined as total final consumption expenditure plus gross fixed capital formation in mainland Norway.<sup>3</sup> Defined as general government final consumption expenditure plus gross fixed capital formation.<sup>4</sup> Gross domestic product is measured at market prices, while value added by industry is measured at basic prices.*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.

# An input-output approach to unpaid household production and consumption in Norway<sup>1</sup>

*Iulie Aslaksen, Trude Fagerli and Hanne A. Gravningsmyhr*

*Measurement of unpaid household work is important in order to achieve more comprehensive estimates of the level of economic activity as well as to model the dependency between the market and non-market sectors of the economy. In this article, we combine data from time budget surveys and consumer expenditure surveys in Norway in order to estimate household production and analyze the connection between consumption expenditure and time use. Through an examination of different methods for allocating consumption expenditure to household activities we study how sensitive the results are for choice of allocation rule, and discuss the need for an international standard.*

## Introduction

Household welfare depends not only on income and consumption of various goods and services, but also on time-use patterns in unpaid household work and leisure. In recent years, the value of unpaid household work has been more explicitly recognized as an economic variable, and shown to be of great significance for the analysis of national income and its distribution. The pioneering research of Margaret Reid (1934, 1947) on valuation of unpaid work has been continued by e.g. Ann Chadeau (1992), Luisella Goldschmidt-Clermont (1993) and Duncan Ironmonger (1996).

Counting household work in the national accounts has a long history in Norway. In 1912, the first estimates of unpaid household work were compiled by A.N. Kiær, then director of Statistics Norway (Kiær 1913). The value of housewives' unpaid work was estimated at 15 per cent of national income, based on census data and wage rates for domestic servants. When after World War II national accounts for the years 1935-43 were compiled, these estimates included the value of unpaid household work (Statistics Norway 1946). For 1943, the value of unpaid household work in Norway was estimated at 15 per cent of net national product, in fact the same percentage as in 1912. The purpose of including the value of unpaid household work in the national accounts was to provide a comprehensive picture of the economic activity in society. In contrast,

the first international standard for national accounts came to be based on a market approach, where only goods and services that were traded or could be traded should be included, and thereby only recognized a limited production within households, such as domestic services buying direct services rendered by other households (United Nations 1953). Concern for internationally comparable national account figures led Norway in 1950 to omit unpaid household work from the national accounts and national budgets.

In the late 1980s Statistics Norway again estimated the value of unpaid household work (see Brathaug 1990), using time budget surveys, which have been conducted three times in Norway, in 1971-72, 1980-81 and 1990-91. Household work included the following activities: housework, maintenance, care, shopping for goods and services, travels related to household work, and other activities (Statistics Norway 1992). The value of unpaid household work has been estimated from the three time budget surveys conducted over the past 20 years. The calculations are based on a "wage rate" for unpaid household work, equal to the wage rate of home helper (home helper is a municipally provided substitute in case of mother's illness or hospitalization). Two alternative valuation methods also tried out are the wage rate of specialized workers (gardener's wage for gardening time, cook's wage for cooking time, etc.), and the opportunity costs corresponding to the individual's wage rate in the labor market (in practice estimated by average wage rates for socio-economic groups). In the national account estimates by Statistics Norway (see Brathaug 1990, Dahle and Kitterød 1992), all three methods have been employed. The results obtained from all three methods are surprisingly similar, yielding a valuation estimate roughly equivalent to the average market wage rate for women. The results show that the value of unpaid household work currently amounts to about 40 per cent of GDP.

*Iulie Aslaksen*, research fellow in the Division for public economics. E-mail: iulie.aslaksen@ssb.no  
*Trude Fagerli*, senior executive officer in the Division for social welfare statistics. E-mail: trude.fagerli@ssb.no  
*Hanne A. Gravningsmyhr*, senior executive officer in the Division for resource and environmental economics. E-mail: hanne.gravningsmyhr@ssb.no

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The 1993 revision of the System of National Accounts (SNA) comprises a thorough discussion of the production boundary and recommends that unpaid household work is imputed in satellite accounts, i.e. supplementary accounts that are separate from, but consistent with the national accounts framework (United Nations 1993). Satellite accounts of this kind are compiled in several countries, see Goldschmidt-Clermont and Pagnossin-Aligisakis (1995) for a review. Recently, the dependency between the household production sector and the market production sectors of the economy has been analyzed in a series of articles that investigate the role of household production in business cycle fluctuations, see e.g. Benhabib, Rogerson and Wright (1991), Greenwood and Hercowitz (1991), McGrattan, Rogerson and Wright (1997), and Ingram, Kocherlakota and Savin (1997).

An important building block in modelling the relationship between market and non-market production is the reallocation of total consumer expenditure into intermediate goods in household production, which is the main topic of this article. The composition of household production across own-time use and deliveries of intermediate goods from various market sectors can be modelled in a similar framework as an input-output model, see Ironmonger (1989) and Thoen (1993). Placing household production within an input-output framework that is consistent with the national accounts system gives a suitable tool for analyzing the mutual dependencies between the use of purchased goods and time use in household production, just as the mutual dependencies between production sectors are analyzed in conventional input-output tables. This allows household production to be linked to the national accounts system via the development of a satellite account through household consumption expenditures, which are common to both sets of accounts. The complex interdependence between household and market (including public sector) activities can be analyzed within a familiar accounting framework in terms of the raw materials, other intermediate goods and services, or labor inputs required to produce outputs. The impact of macroeconomic policy on the household sector of the economy can be conceptualized in terms of the substitutability of market supplied services for household production, and the household capital/labor ratio and consumer demand can be linked to underlying household activities.

As a first step towards addressing these complex issues, we give in this article a brief review of the framework for developing household production tables, or input-output tables, that show the composition of household production, as divided between time use and commodity inputs. In this context the term household production comprises only unpaid household production. A household production table for Norway in 1990 is presented with a discussion of estimation method. Finally, the need for internationally comparable data and methods is discussed.

## An input-output approach to household production

Household consumption patterns are closely linked to time use patterns both in paid employment, unpaid household work, and in leisure. Many consumption goods are not ready for immediate consumption, but need further work before they can be consumed. An example is groceries in the store that need time input in the form of shopping and cooking before the meal is ready for consumption. In this respect, the household may be seen as a small factory where household members take part in tasks involving transportation, shopping, cooking, cleaning, care etc. Time (and skill) convert "raw materials" into goods ready for consumption. The demand for flour and sugar and the demand for baked goods thus depend on the trade-off between time spent in home baking and time spent in other activities. Similarly, the demand for leisure commodities like videos, books and newspapers depends on the time allocated to leisure activities.

Relations between time use and consumption were modelled thirty years ago as "household production theory" by Becker (1965) and Lancaster (1966). This theory represents a reference point for our analysis. The household production table in this paper may be seen as a simplified version of a linear household production function, and thus as a first step towards a more complex estimation. Household production theory has not yet seen many econometric applications, possibly due to lack of good data. Ironmonger (1989) was the pioneer in developing household production tables, that combine data from time budget and household expenditure surveys and yield estimates of household production and its composition across household production activities. Input-output tables for household production were first developed within the context of satellite accounts for the household sector.

In this article, we use the framework for household production input-output tables as established by Ironmonger and Sonius (1987), Ironmonger (1989, 1994, 1996) and Thoen (1993), with data from time budget surveys and consumer expenditure surveys in Norway. The results build on our previous work (Aslaksen, Fagerli and Gravningsmyhr 1995, 1996). The purpose of household production tables is to give an overview of average time use and consumption patterns in household production activities. The time budget survey gives a detailed overview over how much time different households spend on different activities, and these data may immediately be applied to a household production table. The consumer expenditure survey gives a detailed account of the expenditure on a large number of different goods, but no expenditure data are available for household production activities on a disaggregated level. Hence, total consumption expenditure has to be allocated across the activities with which the commodities are linked. Many consumption goods are used in several of the household production activities, and an allocation method is required for assigning a share of each commodity to the relevant activities.

### Box 1. The TIC method and the time-based method for reallocating consumption expenditures

Both methods are based on time-proportionality in allocating the direct goods. The two allocation methods differ in the way the indirect goods are treated. One method allocates the indirect goods evenly across all activities. If a good is used as both direct and indirect input, e.g. electricity, half of the expenditure is considered direct input, and is allocated to the relevant activities proportionally to the time use in each activity, and half of it is considered indirect input, and is allocated evenly across all activities. This method, applied by Thoen (1993), is characterized by having a time-independent component (TIC) in the commodity allocation, and is denoted by the TIC method.

In our previous work, we found that the time-independent allocation of the indirect goods in the TIC method led to some less intuitive results (see Aslaksen, Fagerli and Gravningsmyhr 1995). Detailed calculations of time use and commodity input in some activities, such as baking bread, suggested that the TIC method overestimated commodity input in household production. A consequence of evenly allocating indirect inputs to all activities, is that activities where little time is spent, are assigned a disproportionately high commodity intensity. Time and commodity intensity are defined as the percentage share of time input and commodity input in each household activity. The allocation of clothing expenditure is a typical example of this bias. In the TIC method, equal amounts of the clothing expenditures (107 kroner per activity) are allocated to all activities, regardless of the actual time use in these activities. Hence, the activity "baking bread" (in which on average 1.73 minutes per day are spent) and the activity "cooking, laying the table and serving" (in which on average 1 hour and 6 minutes per day are spent), receive the same amount of indirect commodity input, and the activity "baking bread" becomes unreasonably commodity intensive as compared to the activity "cooking, laying the table and serving".

As an attempt to overcome this bias, we have in this article supplemented the TIC framework with calculations which allocate both direct and indirect goods proportionally to time use in the activities where these goods are used as inputs. We will refer to this as the "time-based" method. It distributes the indirect expenditures in a way that decreases the commodity intensity of activities that only has a small proportion of total time use. The two methods differ only in the allocation of indirect goods to household activities.

We apply two different approaches (the TIC method and the time-based method, see box 1) to allocating household consumption expenditures to different productive activities in the household. Both methods are based on the distinction made between direct goods and indirect goods. Direct goods are commodities that are used as inputs in household production activities, such as apples in making apple pie. These commodities are allocated to the various production activities in proportion to time spent in each activity where they are inputs. Indirect goods are commodities that are not directly related to any specific activities, such as

clothing, rent, insurance, heating and lighting. Nevertheless, these goods are necessary for household production to take place, so they are classified as indirect goods. Some commodities (electricity is the most obvious example) are both direct and indirect goods, as a direct good used e.g. in the activity "food preparation", and as an indirect good, in residential heating and lighting. The allocation of direct and indirect goods to the various activities yields an estimate for the value of commodity input in household production.

In this framework, total consumption expenditure is allocated across all time use categories, i.e. not only unpaid household work, but also paid work, leisure, education, and personal care. Non-household activities are kept track of in auxiliary accounts to secure adding-up to total consumption expenditure. However, in this article we present the commodity composition of household production activities only. We consider the following categories of household work as applied in time budget surveys: household work, maintenance, shopping, travels in connection with household work, care for children and others (not including own personal care), and other activities. Caretaking is defined as all child care, including reading and helping with school work, as well as care for sick and disabled persons.

### Household production tables for Norway

The organization of work and consumption varies among households with different compositions. Consumption expenditure patterns are different for single men and women, for families with and without children, and for single parents, reflected in different time use patterns, and the combined data provide interesting illustrations of household production and welfare in various household types.

Table 1 shows hours per year, value of time and commodity input in unpaid household work in Norway for selected household types: single women, single men, couples without children, couples with small children (0-6 years), and couples with older children (7-17 years). The data source is the 1990 time budget survey. In order to assign a value to the time spent in unpaid household production, we have used the wage rate for a home helper, which is consistent with the imputation of unpaid household work in the satellite accounts (see Brathaug 1990 and Dahle and Kitterød 1992). This implies that the same wage rate is applied for all persons.

The total value of household production (output) is the sum of the value of time (corresponding to value added in the satellite account) and the value of commodity input (intermediate consumption). For the average household, Table 1 shows that the value of household production is 242 859 kroner (= 164 766 kroner + 78 093 kroner) with the TIC method, and 226 396 kroner (= 164 766 kroner + 61 630 kroner) with the time-based method. When using the time-based method rather than the TIC method, commodity input into household production for the average

**Table 1. Time and commodity input in household production in different household types in Norway. 1990. Kroner and per cent**

	Hours per year	Value of time	TIC method		Time-based method	
			Commodity input	Commodity input, per cent	Commodity input	Commodity input, per cent
Average (1.73 persons)	2275	164766	78093	32.2	61630	27.3
Single women	1179	85359	36833	30.3	29477	25.8
Single men	897	64910	41561	39.1	30528	32.0
Couple without children	2589	187454	77736	29.4	61426	24.7
Couple with small child(ren)	3836	277753	123185	31.6	105980	28.4
Couple with older child(ren)	3027	219132	115720	34.6	95421	30.4

**Table 2. Commodity intensity in different household activities and household types with time independent allocation for indirect goods (TIC method). Per cent**

	House-work	Main-tenance	Care	Shopping	Other household work	Travels
Average	36.4	36.3	26.7	16.0	19.5	35.5
Single women	31.2	45.1	18.4	20.3	27.3	20.4
Single men	43.2	42.9	45.7	17.4	24.5	39.5
Couple, small children	37.4	44.0	16.9	13.9	21.6	43.1
Couple, older children	36.5	43.8	29.3	18.2	19.9	44.0
Couple, no children	30.7	25.5	38.4	18.0	17.0	35.2

**Table 3. Commodity intensity in different household activities and household types with the time dependent method for both direct and indirect goods (Time-based method). Per cent**

	House-work	Main-tenance	Care	Shopping	Other household work	Travels
Average	34.0	25.1	14.5	14.1	16.3	35.4
Single women	28.7	26.4	1.9	18.7	22.4	19.8
Single men	39.5	28.8	10.9	16.1	22.0	37.6
Couple, small children	34.8	29.8	15.6	11.3	16.5	42.8
Couple, older children	35.1	31.8	19.0	15.5	16.4	43.0
Couple, no children	29.0	17.7	9.3	16.6	13.5	35.0

household is reduced by about 16 500 kroner, or about 20 per cent. The commodity intensities, i.e. the percentage share of commodity input in household production, are 32.2 and 27.3, respectively, with corresponding time intensities of 67.8 and 72.7.

Table 1 shows that for all household types, the value of household production (output) is considerably higher with the TIC method than with the time-based method. This is a consequence of the fact that more time is spent in paid work, leisure and personal care than in household work, and these non-household activities thus "receive" a greater share of commodity inputs when all commodity inputs are allocated according to time use. This means for e.g. clothing expenditure, more is allocated to activities like paid work and leisure, and less is allocated to household activities like baking bread, gardening etc., contributing to a lower value of commodity input in household production. Using the time-based allocation method thus decreases the total value of household production as well as the com-

modity intensity in household production. When fewer commodities are allocated as indirect inputs in household activities, household production estimates become less commodity-intensive and more time-intensive.

Both allocation methods show that the household production of single women is higher than of single men. As we can see from the table, single women spend much more time in household work than single men, but single men have higher commodity input, reflecting the fact that average income of men is higher. However, the difference in commodity input between single men and women is much smaller with the time-based method than with the TIC method. The TIC method actually allocates relatively more commodity to household production for single men than for single women. The reason is that when indirect goods are evenly allocated across all activities, activities where little time is spent are assigned a disproportionately high commodity intensity. As single men spend less time than single women in household production activities, the TIC



method seems to overestimate considerably the commodity intensity of their household production.

Couples without children produce less in the household than couples with children, and as expected, couples with children 0-7 years of age produce more than couples with older children.

Tables 2 and 3 illustrate commodity intensity in different household production activities for different household types for each method. This enables us to take a closer look at the difference between the two methods for allocation, as it is easier to interpret and evaluate commodity intensity for separate activities such as care work, shopping and maintenance.

There are significant differences between the commodity intensity in different household activities, and the difference between the two methods is quite large. A striking result is that the commodity intensity for single men in care activities is reduced from 45.7 per cent to 10.9 per cent with the time-based method. For single women the commodity intensity in care activities is reduced from 18.4 per cent to 1.9 per cent with the time-based method. As care is one of the activities one should expect to be relatively labor intensive, the reduction in commodity intensity from the unreasonably high level of 45 per cent to 10 per cent for single men, is in our opinion a clear indication that the time-based method is a considerable improvement over the TIC method. The very high commodity intensity for single men in care work reflects that some of them are divorced fathers, who spend some time in caring for children, implying that a portion of their total commodity expenditure is allocated to this activity. Divorced mothers, on the other hand, will mostly be classified in the category single parents (not shown in the table), while the category single women mostly comprises women without child care responsibilities. This explains why single women have low time use and hence low commodity intensity in child care.

Having children obviously leads to large changes in consumption and time use patterns, and it is important that the allocation methods reflect the high time intensity of child care. The problem with the TIC method is illustrated by the following example. Consider two households with the same income, one with and one without children. The household with children has a higher disposable income than the household without children, because it receives a child benefit and tax reductions. The higher income leads to higher expenditures for indirect inputs, hence the production of all household goods where there are indirect inputs will be higher, and these activities will be more commodity intensive and less labor intensive in the household with the higher income. This again illustrates that the TIC method for allocating consumption expenditure does not yield reasonable estimates, and the labor-intensity of household tasks in families with children is concealed by disproportionately high commodity intensities. Although the time-based method gives more reasonable results than the TIC method, it has not resolved the conceptual diffi-

culty of allocating indirect costs, and it remains to model a better relationship between expenditure and time use.

## Concluding remarks

Along with the compilation of satellite accounts for household production, several countries have analyzed the composition of household production in the form of input-output tables. In preparation for the UNDP Human Development Report 1995, estimates of the value of labor in household production were compiled for various countries by Goldschmidt-Clermont and Pagnossin-Aligisakis (1995). They give a thorough discussion of the different valuation criteria used in previous studies, and give a valuable contribution to a standardization. Work has also started at OECD on satellite accounts for household production in collaboration with Eurostat. However, many countries in the meantime continue to use inconsistent definitions of time use.

Another source of inconsistency is the method of allocating household consumption expenditure across various household production sectors. As we have shown in this paper, estimates of the value of the goods and services produced by the households are rather sensitive to the choice of allocation rule. Studies reallocating parts of household consumption as input into household production include Aslaksen, Fagerli and Gravningsmyhr (1995, 1996), Ironmonger (1994), Statistics Sweden (1995), Federal Statistical Office of Germany (1995), Thoen (1993), and Vihaivainen (1995). In these studies, the time intensity (labor input) amounts to between 61 per cent and 81 per cent of household production, while the commodity intensity varies between 19 per cent and 39 per cent. As we have shown, some of this variation may be due to the choice of allocation method, and reflect different allocation of indirect goods as well as different treatment of time-use activities. Our analysis has shown that the time-based method gives results with a more intuitive interpretation than the TIC method. This may be seen as a first step towards estimating a household production function.

The treatment of capital goods is another difficulty in household production estimates. In the above mentioned estimates of household production in Norway, as well as in this article, capital goods are assumed to be consumed at the time of purchase, i.e. they are treated as intermediate consumption. As more and more capital goods are applied to household production over time, the case is strengthened for including capital goods in imputations of household production. Ironmonger (1996) suggests that in addition to the major items of household equipment, clothing is another item of household goods that could be considered for inclusion as a capital item rather than as an intermediate input. This might actually improve some of the bias caused by the allocation of indirect goods to activities.

Internationally, standardized guidelines for the construction of household production tables could greatly facilitate comparisons across countries and prove useful in many policy contexts, but the data currently available may limit

the possible methods for making input-output tables for household production. In order to facilitate future research and policy discussion, it would be beneficial to have internationally coordinated methods for allocating consumption expenditures, as well as definitions of time use for household production activities.

## References

- Aslaksen, I., T. Fagerli and H.A. Gravningsmyhr (1995): Measuring Household Production in an Input-Output Framework: The Norwegian Experience. *Statistical Journal of the United Nation*, ECE 12(2): 111-131.
- Aslaksen, I., T. Fagerli and H.A. Gravningsmyhr (1996): An Estimation of Time and Commodity Intensity in Unpaid Household Production in Norway. *Feminist Economics* 2, 81-91
- Becker, G. (1965): A Theory of the Allocation of Time. *Economic Journal* 75: 493-517.
- Benhabib, J., R. Rogerson and R. Wright (1991): Home-work in Macroeconomics: Household Production and Aggregate Fluctuations. *Journal of Political Economy* 99, 1166-1187.
- Brathaug, A.-L. (1990): Value added in households (Translated from: Verdiskaping i husholdningene). *Økonomiske analyser* 3/90, Statistics Norway, 19-28.
- Chadeau, A. (1992): What is Households' Non-Market Production Worth? *OECD Economic Studies*, 18, 85-103.
- Dahle, A.B. and H. Kitterød (1992): Time Use Studies in Evaluation of Household Work. The Norwegian Experience, Statistics Norway.
- Federal Statistical Office of Germany (1995): "Value of Household Production in Germany in 1992", presented to the Joint ECE/INSTRAW Work Session on Statistics of Women, Geneva, 6-8 March 1995.
- Goldschmidt-Clermont, L. (1993): Monetary Valuation of Non-Market Productive Time. Methodological Considerations. *Review of Income and Wealth* 39: 419-433.
- Goldschmidt-Clermont, L. and E. Pagnossin-Aligisakis (1995): *Measures of unrecorded economic activities in fourteen countries*. New York: UNDP, United Nations Human Development Report Office, Occasional Paper No. 20.
- Greenwood, J. and Z. Hercowitz (1991): The Allocation of Capital and Time over the Business Cycle. *Journal of Political Economy* 99, 1188-1214.
- Ingram, B.F., N.R. Kocherlakota and N.E. Savin (1997): Using theory for measurement: An analysis of the cyclical behavior of home production. *Journal of Monetary Economics* 40, 435-456.
- Ironmonger, D.S. and E. Sonius (1987): Household Productive Activities. Discussion Paper no. 2, Melbourne: Centre for Applied Research on the Future.
- Ironmonger, D. (1989): *Household Works*. London and Sydney: Allen and Unwin.
- Ironmonger, D. (1994): The value of care and nurture provided by unpaid household work. *Family Matters* 37: 46-51.
- Ironmonger, D. (1996): Counting Outputs, Capital Inputs and Caring Labor: Estimating Gross Household Product. *Feminist Economics* 2, 37-64.
- Kiær, A.N. (1913): Norges nationalindtægt og nationalformue samt kapitalverdien av vort folks arbeidsevne, (National income and national wealth of Norway including capitalized value of the work force). *Statsøkonomisk tidskrift*.
- Lancaster, K.J. (1966): A New Approach to Consumer Theory. *Journal of Political Economy* 74: 132-157.
- McGrattan, E.R., R. Rogerson and R. Wright (1997): An Equilibrium Model of the Business Cycle with Household Production and Fiscal Policy. *International Economic Review* 38, 267-290.
- Reid, M.G. (1934): *Economics of Household Production*. New York: John Wiley and sons.
- Reid, M.G. (1947): The Economic Contribution of Homemakers. *Annals of the American Academy of Political and Social Sciences*. May 1947, 61-69.
- Schaefer, D. and N. Schwarz (1994): Wert der Haushaltsproduktion 1992. *Wirtschaft und Statistik*, 8.
- Statistics Norway (1946): *Nasjonalinntekten i Norge 1935-1943. Realkapitalen 1939 og kapitalreduksjonen under krigen. Okkupasjonskostnadene*. (National income in Norway 1935-1943. Real capital 1939 and capital depreciation during the war. Costs of German occupation), NOS X 102, Statistics Norway.
- Statistics Norway (1992): *Tidsbruk og tidsorganisering 1970-90 (Time Budget Survey 1970-90)*. NOS C 10.
- Statistics Sweden (1995): "A Statistical System on Household Production and Consumption", presented to the Joint ECE/INSTRAW Work Session on Statistics of Women, Geneva, 6-8 March 1995.
- Thoen, M. (1993): The Value of Household Production in Canada 1981, 1986. Statistics Canada. National Accounts and Environment Division.

United Nations (1953): *A System of National Accounts and Supporting Tables*. Statistical Office of the United Nations. New York: Studies in Methods. Series F, no 2.

United Nations, Eurostat, IMF, OECD, World Bank (1993): *System of National Accounts, SNA 1993*. Brussels/Luxembourg, New York, Paris, Washington DC.

Vihavainen, M. (1995): "Calculating the value of household production in Finland in 1990". Statistics Finland, working papers, no.6, presented to the Joint ECE/IN-STRAW Work Session on Statistics of Women, Geneva, 6-8 March 1995.

# Research publications in English

## New titles

### Statistical Analysis

#### **Natural Resources and the Environment 1998**

SA 26, 1998. pp 224.  
ISBN 82-537-4544-3

Statistics Norway compiles statistics on important natural resources and the state of the environment, and develops methods and models for analysing relationships between the environment, natural resource use and economic developments. The annual publication *Natural Resources and the Environment* gives an overview of this work.

Natural Resources and the Environment 1998 contains updated resource accounts for energy and the latest figures for emissions to air. These are followed by articles and updated statistics on transport, waste management, water supplies and waste water treatment, agriculture, forests and forest damage, and fishing, sealing and whaling. New features in this year's edition are figures for land use in urban settlements and results from the surveys of living conditions showing the extent to which people consider themselves to be annoyed by noise and air pollution.

The book also describes results from Statistics Norway's research into resource and environmental economics. The 1998 edition includes articles on the eco-efficiency of various branches of industry, the benefits of voluntary environmental agreements, the environmental costs associated with waste management and various aspects of the Nordic energy market. Finally, the appendix provides more detailed statistics in the form of tables.

### Discussion Papers

*Kjell Arne Brekke and Erling Moxnes:*  
**Do Models Improve Fishery Management? Empirical Evidence from a Experimental Study.**  
DP no. 228, 1998. pp 22.

We have constructed an experiment to test to what extent different types of model improves the management of a two-species fishery. Thus we are not trying to determine what models or tools are the best from a

theoretical point of view. Rather we investigate the usefulness of the models when applied in a practical management task. In particular we compare a simplistic stochastic optimization model with a more complex one species model of the fishery. We find that both models lead to better management, and when applied together they strengthen each other. That is the models are complementary rather than the competing substitutes that theoretical discussions might imply.

*Kjell Arne Brekke and Richard B. Howarth:*

**The Social Contingency of Wants: Implications for Growth and the Environment**  
DP no. 227, 1998. pp 24.

Economic models typically assume that individual wants are determined by forces exogenous to the economic system. Social psychology and consumer research, in contrast, support the view that the perceived benefits of consumption are strongly affected by endogenously determined social norms. This paper presents a selective overview of the literature on the relationship between consumption and well-being, exploring the ways in which informal arguments from the descriptive social sciences might be linked to formal models of economic behavior. We incorporate Sen's (1985) distinction between commodities and functionalities into Nordhaus' (1994) model of climate change and the world economy, showing that optimal paths for greenhouse gas emissions and capital accumulation are highly sensitive to the role of consumption norms in the welfare determination.

*Ingvild Svendsen:*

**Rational Expectations in Price Setting – Tests Based on Norwegian Export Prices**  
DP no. 226, 1998. pp 34.

This paper uses imperfect competition as a basis for modelling the export price for an aggregated commodity produced by the Norwegian private mainland economy. The long run solution is analysed using a cointegration technique. The dynamics are modelled according to two different approaches; a backward looking error correction model and a forward looking model where rational expectations are assumed.

The dynamic structure of the forward looking model is derived from a linear quadratic adjustment cost function under rational expectations, but the empirical results do not support this specification. We cannot reject super-exogeneity to be present in the backward looking error correction model. The empirical evidence are thus not consistent with rational expectations.

*Bjørn H. Vatne and John K. Dagsvik:*  
**Estimation of Generalized Extreme Value Models by a Max-spectral Representation**

DP no. 225, 1998. pp 26.

This paper represents an estimation procedure for the class of generalized extreme value (GEV) models. The point of departure is the max-spectral representation of the GEV model attributed to Dagsvik (1994). In the context of estimation and specification of discrete choice models the max-spectral representation offers an alternative to the nested logit framework. Prototype algorithms for computation of the choice probabilities and their derivatives are developed. These expressions are utilized in a corresponding maximum likelihood algorithm. The performance of these algorithms is tested in an empirical application on individuals' choice among alternative fuel-driven vehicles. The modeling framework investigated here may be an alternative to the multinomial probit model in choice situations where it is desirable to allow for correlation between utilities.

*Erling Holmøy:*

**A General Equilibrium Evaluation of Aggregate Welfare Effects from Improved Sectoral Efficiency. Empirical Evidence for Norway**  
DP no. 224, 1998. pp 38.

This paper discusses and shows how a CGE model can be used to assess welfare effects of structural policy reforms targeting inefficiency problems at micro levels that normally are not captured in operational CGE-models. The CGE approach allows computation of shadow prices which are generally both unobservable due to various price distortions, and endogenous. Moreover, the paper discusses how static measures of sectoral inefficiency can be

implemented in a CGE-model that accounts for real world dynamics. Results from CGE-simulations suggest that general equilibrium effects have substantial influence on welfare, at least when the initial waste of resources is as large as reported in sector studies for Norway. More precisely, compared to the CGE-estimate a partial equilibrium approach overestimates the welfare gain by more than 30 percent.

*Leif Brubakk and John K. Dagsvik:*  
**Consumer Demand and Unobservable Product Attributes**

DP no. 223, 1998. pp 33.

Traditional approaches to consumer demand modelling ignores the problem associated with product heterogeneity where important product characteristics are latent. The point of departure in the present study is a particular framework developed in Dagsvik (1996a,b) and Dagsvik et al. (1998). In this approach the consumer is assumed to make his choice from a discrete set of product variants. The resulting model has the form of a modified conventional demand system, where the modification consists in replacing the standard price indexes by an index which are derived from underlying behavioral assumptions. The empirical application is based on a sample of Norwegian micro data market prices and household consumption.

*John K. Dagsvik:*  
**Nonparametric Identification of Discrete Choice Models**

DP no. 222, 1998. pp 13.

In this paper we give simple proofs of identification results in discrete choice models for the case where neither the deterministic part nor the distribution function of the random parts of the utility function is specified parametrically. The regularity conditions imposed are standard, but differ from conditions applied by other researchers, such as Matzkin (1992, 1993).

*John K. Dagsvik:*  
**Choice among Lotteries when Preferences are Stochastic**

DP no. 221, 1998. pp 24.

This paper discusses the problem of specifying probabilistic models for choices (strategies) with uncertain outcomes. The point of departure is an extension of the axiom system of the von Neumann-Morgenstern Expected utility theory to the case when the preferences are stochastic. This extended axiom system is combined with Luce Choice Axiom; "Independence

from Irrelevant Alternatives", and imply a particular choice model that contains the Luce model as a special case. An additional invariance assumption is subsequently proposed that yields a complete characterization of the mathematical structure of the model.

## Reprints

*Rolf Golombek, Eystein Gjelsvik and Knut Einar Rosendahl:*

**Increased Competition on the Supply Side of the Western European Natural Gas Market**

Reprints no. 121, 1998. pp 18.

Reprint from *The Energy Journal*, Vol. 19, No. 3.

*Knut Einar Rosendahl:*

**Health Effects and Social Costs of Particulate Pollution - A Case Study for Oslo**

Reprints no. 120, 1998. pp 18.

Reprint from *Environmental Modeling & Assessment*, Vol. 3, no. 1 and 2.

*Karine Nyborg:*

**Some Norwegian Politicians' Use of Cost-Benefit Analysis**

Reprints no. 118, 1998. pp 21.

Reprint from *Public Choice*, Vol 95, 1998.

## Documents

*John K. Dagsvik:*

**Probabilistic Models for Qualitative Choice Behavior: An Introduction**

Documents 98/15, 1998. pp 97.

The econometric discipline has been criticized for being too similar to mathematical statistics and only to a limited degree linked to formalized theoretical models. This is particularly the case as regards formulation and specification of the stochastic elements in econometric models. Ragnar Frisch, who is known to be the originator of econometrics, expressed both in theory and practice an opposite ideal; namely econometrics as an almost symbiotic blend of statistical methodology and mathematically formulated theory, cf. Frisch (1926). See also Bjerkholt (1995).

Theory and econometric methodology for qualitative choice behavior is developed in a tradition which I believe is somewhat closer to the ideal of Frisch than much of the traditional textbook approach to econometrics. This stems from the fact that the theory of qualitative choice is rooted in a

tradition where probabilistic concepts and formulations play a key role in contrast to the point of departure in traditional micro theory, which is deterministic. Since probabilistic concepts are integral parts of the theory of qualitative choice this means that the gap between theory and empirical model specification in applications often becomes less wide than is the case in the traditional micro-economic approach.

The present compendium is a revised version of an introductory course in the theory of qualitative choice behavior (often called the theory of discrete choice). Some of the material I present here draws on a Ph.D. course I gave at the Department of Economics, University of Wisconsin, during the Fall semester of 1990.

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Table A1. Final expenditure and gross domestic product. At current prices. Million kroner

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Final consumption exp. of househ. and NPISHs	458 492	486 677	515 747	118 095	125 509	131 995	140 149	125 919	133 251
Household final consumption expenditure . . .	435 247	462 620	490 949	112 011	119 372	125 730	133 836	119 668	126 911
Goods . . . . .	246 431	262 815	279 573	62 460	67 225	69 282	80 607	66 257	72 025
Services . . . . .	185 786	195 547	205 819	48 970	51 125	54 743	50 981	52 391	53 513
Direct purchases abroad by resident househ.	18 004	19 479	21 359	3 758	4 948	7 479	5 174	4 228	5 360
- Direct purchases by non-residents . . . . .	-14 974	-15 221	-15 802	-3 177	-3 926	-5 774	-2 925	-3 207	-3 987
Final consumption exp. of NPISHs 4) . . . . .	23 245	24 058	24 798	6 083	6 137	6 265	6 313	6 251	6 340
Final consumption exp. of general government .	194 525	206 871	218 811	53 437	54 199	55 370	55 804	57 135	58 208
Final consumption exp. of central government.	77 598	82 432	86 585	21 179	21 425	21 874	22 108	22 566	22 903
Central government, civilian . . . . .	56 863	60 364	63 039	15 424	15 599	15 926	16 091	16 540	16 870
Central government, defence . . . . .	20 735	22 068	23 546	5 755	5 826	5 948	6 017	6 025	6 033
Final consumption exp. of local government . .	116 927	124 439	132 225	32 258	32 775	33 496	33 696	34 569	35 305
Gross fixed capital formation . . . . .	192 518	216 502	249 931	54 414	62 134	62 632	70 750	63 696	67 788
Petroleum activities . . . . .	47 940	50 291	61 382	12 798	16 794	15 112	16 678	16 485	20 348
Ocean transport . . . . .	3 733	6 222	11 168	3 172	2 583	3 220	2 193	3 830	1 780
Mainland-Norway . . . . .	140 845	159 990	177 380	38 445	42 757	44 300	51 879	43 381	45 660
Mainland-Norway excl. general government .	110 962	128 252	141 327	29 980	34 213	35 792	41 342	33 358	35 860
Manufacturing and mining . . . . .	15 695	17 431	18 582	3 341	4 828	4 442	5 971	3 748	4 914
Production of other goods . . . . .	13 282	12 938	13 146	2 266	3 645	3 702	3 533	2 467	3 721
Dwelling services . . . . .	26 461	26 921	30 151	6 922	7 331	7 742	8 156	7 833	7 768
Other services . . . . .	55 524	70 962	79 448	17 450	18 410	19 906	23 681	19 310	19 456
General government . . . . .	29 883	31 738	36 053	8 465	8 544	8 508	10 537	10 023	9 801
Changes in stocks and stat. discrepancies . . .	27 438	22 221	23 741	7 696	7 189	4 219	4 637	11 926	6 758
Gross capital formation . . . . .	219 956	238 724	273 672	62 111	69 324	66 850	75 387	75 623	74 546
Final domestic use of goods and services . . . .	872 973	932 272	1 008 230	233 643	249 032	254 215	271 340	258 677	266 005
Final demand from Mainland-Norway 2) . . . . .	793 862	853 539	911 938	209 977	222 465	231 664	247 832	226 435	237 119
Final demand from general government 3) . . . .	224 408	238 609	254 864	61 902	62 743	63 878	66 341	67 158	68 008
Total exports . . . . .	353 426	414 266	447 582	108 757	109 975	114 189	114 660	109 838	102 022
Traditional goods . . . . .	143 424	155 854	169 280	39 355	42 386	42 324	45 214	46 393	42 329
Crude oil and natural gas . . . . .	113 231	156 688	163 674	42 598	38 947	40 220	41 909	34 287	31 048
Ships and oil platforms . . . . .	10 579	9 163	10 761	3 207	2 735	2 482	2 337	3 138	2 538
Services . . . . .	86 192	92 561	103 867	23 597	25 907	29 163	25 200	26 020	26 107
Total use of goods and services . . . . .	1 226 399	1 346 538	1 455 812	342 400	359 007	368 404	386 000	368 515	368 027
Total imports . . . . .	297 654	326 487	371 024	82 019	93 518	96 268	99 219	98 599	98 688
Traditional goods . . . . .	202 858	223 411	239 895	53 371	60 482	59 328	66 714	65 609	66 036
Crude oil . . . . .	1 121	1 445	1 517	436	322	413	346	457	269
Ships and oil platforms . . . . .	12 920	17 656	26 011	7 405	7 146	6 458	5 002	7 337	4 610
Services . . . . .	80 755	83 975	103 601	20 807	25 568	30 069	27 157	25 196	27 773
Gross domestic product 1) . . . . .	928 745	1 020 051	1 084 788	260 381	265 489	272 136	286 781	269 916	269 339
Mainland-Norway (market prices) . . . . .	790 070	834 998	890 883	210 132	218 799	224 977	236 975	228 992	233 119
Petroleum activities and ocean transport . . . . .	138 675	185 053	193 904	50 249	46 690	47 159	49 806	40 924	36 220
Mainland-Norway (basic prices) . . . . .	692 392	726 316	776 750	186 285	190 842	194 484	205 139	201 553	201 841
Mainland-Norway excl. general government . .	545 789	569 150	609 937	145 518	149 616	152 306	162 498	158 243	157 550
Manufacturing and mining . . . . .	112 928	115 414	122 689	29 238	31 812	28 575	33 064	33 309	33 018
Production of other goods . . . . .	77 813	78 993	85 938	21 170	17 527	22 682	24 560	23 447	19 401
Service industries . . . . .	355 048	374 743	401 309	95 110	100 277	101 049	104 874	101 487	105 131
General government . . . . .	146 603	157 165	166 813	40 767	41 226	42 178	42 641	43 310	44 291
Correction items . . . . .	97 678	108 683	114 134	23 847	27 957	30 493	31 836	27 440	31 278

1) Gross domestic product is measured at market prices, while value added by industry is measured at basic prices

2) Defined as total final consumption expenditure plus gross fixed capital formation in Mainland-Norway

3) Defined as final consumption expenditure plus gross fixed capital formation from general government

4) NPISH: Non-profit institutions serving households

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NATIONAL ACCOUNTS FOR NORWAY

Table A2. Final expenditure and gross domestic product. At constant 1995-prices. Million kroner

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Final consumption exp. of househ. and NPISHs	458 492	479 888	496 319	114 458	120 756	127 024	134 080	119 085	124 979
Household final consumption expenditure . . .	435 247	456 574	472 933	108 618	114 938	121 172	128 204	113 273	119 222
Goods . . . . .	246 431	261 607	270 914	60 310	65 220	67 310	78 074	63 289	68 605
Services . . . . .	185 786	191 119	196 411	47 576	48 631	52 318	47 887	48 978	49 317
Direct purchases abroad by resident househ.	18 004	18 844	20 731	3 806	4 810	7 131	4 984	3 986	4 962
- Direct purchases by non-residents . . . . .	-14 974	-14 996	-15 124	-3 073	-3 723	-5 587	-2 741	-2 980	-3 662
Final consumption exp. of NPISHs 4) . . . . .	23 245	23 315	23 386	5 840	5 818	5 851	5 876	5 812	5 757
Final consumption exp. of general government .	194 525	200 797	206 781	51 440	51 475	51 700	52 166	53 216	52 954
Final consumption exp. of central government.	77 598	80 085	82 027	20 429	20 377	20 501	20 720	21 017	20 878
Central government, civilian . . . . .	56 863	58 726	59 735	14 871	14 841	14 947	15 077	15 397	15 375
Central government, defence . . . . .	20 735	21 358	22 292	5 558	5 536	5 554	5 643	5 620	5 502
Final consumption exp. of local government . .	116 927	120 713	124 754	31 011	31 097	31 199	31 447	32 199	32 076
Gross fixed capital formation . . . . .	192 518	211 084	237 777	52 858	59 244	59 060	66 614	59 461	62 535
Petroleum activities . . . . .	47 940	48 667	56 206	12 078	15 442	13 593	15 093	15 074	18 410
Ocean transport . . . . .	3 733	6 113	10 124	2 946	2 405	2 768	2 005	3 316	1 670
Mainland-Norway . . . . .	140 845	156 303	171 447	37 834	41 396	42 699	49 517	41 072	42 455
Mainland-Norway excl. general government .	110 962	125 301	136 709	29 555	33 117	34 533	39 504	31 611	33 376
Manufacturing and mining . . . . .	15 695	17 175	18 270	3 334	4 776	4 369	5 791	3 646	4 694
Production of other goods . . . . .	13 282	12 762	12 995	2 265	3 609	3 641	3 481	2 402	3 533
Dwelling services . . . . .	26 461	26 149	28 497	6 663	6 952	7 278	7 603	7 264	7 070
Other services . . . . .	55 524	69 215	76 946	17 293	17 780	19 245	22 629	18 299	18 079
General government . . . . .	29 883	31 002	34 738	8 280	8 280	8 166	10 013	9 461	9 079
Changes in stocks and stat. discrepancies . . . .	27 438	22 049	23 917	7 759	6 895	4 494	4 769	11 525	6 376
Gross capital formation . . . . .	219 956	233 133	261 693	60 617	66 139	63 554	71 383	70 986	68 911
Final domestic use of goods and services . . . .	872 973	913 818	964 793	226 516	238 370	242 277	257 630	243 287	246 844
Final demand from Mainland-Norway 2) . . . . .	793 862	836 989	874 546	203 733	213 627	221 423	235 763	213 373	220 388
Final demand from general government 3) . . . .	224 408	231 799	241 519	59 720	59 754	59 866	62 179	62 678	62 033
Total exports . . . . .	353 426	388 209	410 702	100 313	103 108	102 850	104 431	107 384	101 478
Traditional goods . . . . .	143 424	157 809	170 493	40 468	43 582	41 824	44 618	46 200	42 335
Crude oil and natural gas . . . . .	113 231	130 894	133 959	33 861	33 300	32 113	34 686	34 298	32 743
Ships and oil platforms . . . . .	10 579	8 862	9 896	3 015	2 575	2 240	2 066	2 998	2 367
Services . . . . .	86 192	90 644	96 354	22 969	23 651	26 673	23 061	23 887	24 035
Total use of goods and services . . . . .	1 226 399	1 302 028	1 375 495	326 829	341 478	345 127	362 061	350 671	348 322
Total imports . . . . .	297 654	322 470	362 209	82 235	92 259	91 594	96 121	95 239	94 870
Traditional goods . . . . .	202 858	223 147	242 355	54 958	61 896	58 549	66 952	65 703	66 032
Crude oil . . . . .	1 121	1 059	1 235	354	285	331	265	474	282
Ships and oil platforms . . . . .	12 920	17 010	23 179	6 846	6 397	5 549	4 388	6 465	4 220
Services . . . . .	80 755	81 255	95 440	20 077	23 682	27 165	24 517	22 597	24 336
Gross domestic product 1) . . . . .	928 745	979 557	1 013 286	244 594	249 218	253 533	265 940	255 431	253 452
Mainland-Norway (market prices) . . . . .	790 070	822 300	853 090	204 011	209 373	215 502	224 204	214 580	214 528
Petroleum activities and ocean transport . . . .	138 675	157 257	160 196	40 584	39 845	38 031	41 736	40 852	38 924
Mainland-Norway (basic prices) . . . . .	692 392	713 616	740 206	178 612	181 689	186 821	193 085	188 334	186 063
Mainland-Norway excl. general government . .	545 789	561 604	584 407	139 923	142 932	147 756	153 796	148 484	146 379
Manufacturing and mining . . . . .	112 928	115 478	119 000	28 974	30 574	28 092	31 360	31 069	30 393
Production of other goods . . . . .	77 813	76 648	80 611	19 375	16 570	22 445	22 221	20 969	17 341
Service industries . . . . .	355 048	369 478	384 796	91 573	95 789	97 219	100 215	96 445	98 646
General government . . . . .	146 603	152 013	155 799	38 689	38 757	39 064	39 289	39 850	39 684
Correction items . . . . .	97 678	108 684	112 883	25 399	27 684	28 681	31 119	26 246	28 465

1) Gross domestic product is measured at market prices, while value added by industry is measured at basic prices

2) Defined as total final consumption expenditure plus gross fixed capital formation in Mainland-Norway

3) Defined as final consumption expenditure plus gross fixed capital formation from general government

4) NPISH: Non-profit institutions serving households

## NATIONAL ACCOUNTS FOR NORWAY

Table A3. Final expenditure and gross domestic product.  
Percentage change in volume from the same period in the previous year

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Final consumption exp. of househ. and NPISHs	3,4	4,7	3,4	0,8	5,3	3,8	3,7	4,0	3,5
Household final consumption expenditure . . .	3,6	4,9	3,6	0,9	5,5	4,0	3,8	4,3	3,7
Goods . . . . .	3,3	6,2	3,6	-1,0	6,3	4,5	4,1	4,9	5,2
Services . . . . .	3,4	2,9	2,8	2,5	3,5	2,5	2,6	2,9	1,4
Direct purchases abroad by resident househ.	0,7	4,7	10,0	8,4	12,5	8,3	11,4	4,7	3,1
- Direct purchases by non-residents . . . . .	-6,9	0,1	0,9	-3,0	1,0	1,2	4,6	-3,0	-1,6
Final consumption exp. of NPISHs 4) . . . . .	0,0	0,3	0,3	-0,5	0,4	0,6	0,7	-0,5	-1,1
Final consumption exp. of general government .	0,3	3,2	3,0	2,5	3,0	2,9	3,5	3,5	2,9
Final consumption exp. of central government .	-1,7	3,2	2,4	2,4	2,4	2,1	2,9	2,9	2,5
Central government, civilian . . . . .	0,2	3,3	1,7	1,6	1,6	1,6	2,0	3,5	3,6
Central government, defence . . . . .	-6,4	3,0	4,4	4,6	4,4	3,3	5,2	1,1	-0,6
Final consumption exp. of local government . .	1,7	3,2	3,3	2,6	3,4	3,5	3,9	3,8	3,1
Gross fixed capital formation . . . . .	3,4	9,6	12,6	13,6	18,5	12,8	7,0	12,5	5,6
Petroleum activities . . . . .	-13,7	1,5	15,5	23,9	30,3	14,6	-0,7	24,8	19,2
Ocean transport . . . . .	-26,2	63,8	65,6	135,0	120,6	77,5	-9,3	12,5	-30,6
Mainland-Norway . . . . .	12,3	11,0	9,7	6,5	11,8	9,7	10,4	8,6	2,6
Mainland-Norway excl. general government .	14,9	12,9	9,1	2,5	9,5	10,7	12,8	7,0	0,8
Manufacturing and mining . . . . .	34,8	9,4	6,4	-2,2	17,7	-1,8	10,2	9,3	-1,7
Production of other goods . . . . .	13,9	-3,9	1,8	-3,8	5,3	6,2	-2,1	6,1	-2,1
Dwelling services . . . . .	9,1	-1,2	9,0	6,0	12,5	9,1	8,5	9,0	1,7
Other services . . . . .	13,2	24,7	11,2	3,0	7,3	15,7	17,8	5,8	1,7
General government . . . . .	3,5	3,7	12,1	24,1	21,9	5,6	2,1	14,3	9,7
Changes in stocks and stat. discrepancies . . .	84,1	-19,6	8,5	-28,5	83,4	-35,7	965,5	48,5	-7,5
Gross capital formation . . . . .	10,0	6,0	12,3	5,6	23,1	7,1	13,9	17,1	4,2
Final domestic use of goods and services . . . .	4,3	4,7	5,6	2,5	9,1	4,5	6,3	7,4	3,6
Final demand from Mainland-Norway 2) . . . . .	4,1	5,4	4,5	2,3	5,9	4,7	5,0	4,7	3,2
Final demand from general government 3) . . . .	0,7	3,3	4,2	5,0	5,2	3,3	3,3	5,0	3,8
Total exports . . . . .	4,3	9,8	5,8	3,3	9,9	6,8	3,4	7,0	-1,6
Traditional goods . . . . .	4,5	10,0	8,0	-1,4	15,5	11,2	7,7	14,2	-2,9
Crude oil and natural gas . . . . .	9,2	15,6	2,3	5,8	3,9	-2,0	1,9	1,3	-1,7
Ships and oil platforms . . . . .	-0,1	-16,2	11,7	19,0	21,9	73,1	-29,3	-0,6	-8,1
Services . . . . .	-1,3	5,2	6,3	6,7	7,9	8,4	2,1	4,0	1,6
Total use of goods and services . . . . .	4,3	6,2	5,6	2,7	9,4	5,2	5,4	7,3	2,0
Total imports . . . . .	5,6	8,3	12,3	8,4	22,4	12,5	7,0	15,8	2,8
Traditional goods . . . . .	8,8	10,0	8,6	2,2	14,9	7,3	9,9	19,6	6,7
Crude oil . . . . .	31,7	-5,5	16,6	83,3	44,6	62,2	-43,0	33,9	-1,1
Ships and oil platforms . . . . .	7,1	31,7	36,3	85,7	182,1	57,0	-41,7	-5,6	-34,0
Services . . . . .	-2,0	0,6	17,5	10,6	24,3	17,5	17,1	12,6	2,8
Gross domestic product 1) . . . . .	3,8	5,5	3,4	0,9	5,2	2,8	4,9	4,4	1,7
Mainland-Norway (market prices) . . . . .	2,9	4,1	3,7	0,0	5,4	4,1	5,4	5,2	2,5
Petroleum activities and ocean transport . . . .	9,3	13,4	1,9	5,6	4,0	-4,1	2,1	0,7	-2,3
Mainland-Norway (basic prices) . . . . .	2,5	3,1	3,7	0,2	5,2	3,9	5,6	5,4	2,4
Mainland-Norway excl. general government . .	3,0	2,9	4,1	-0,2	6,0	4,2	6,3	6,1	2,4
Manufacturing and mining . . . . .	2,1	2,3	3,1	-3,4	7,8	2,9	5,1	7,2	-0,6
Production of other goods . . . . .	6,9	-1,5	5,2	-6,7	9,1	8,7	10,9	8,2	4,7
Service industries . . . . .	2,4	4,1	4,1	2,3	4,9	3,6	5,6	5,3	3,0
General government . . . . .	0,7	3,7	2,5	1,6	2,4	2,9	3,0	3,0	2,4
Correction items . . . . .	5,8	11,3	3,9	-0,8	6,9	4,9	4,3	3,3	2,8

1) Gross domestic product is measured at market prices, while value added by industry is measured at basic prices

2) Defined as total final consumption expenditure plus gross fixed capital formation in Mainland-Norway

3) Defined as final consumption expenditure plus gross fixed capital formation from general government

4) NPISH: Non-profit institutions serving households

## NATIONAL ACCOUNTS FOR NORWAY

Table A4. Final expenditure and gross domestic product.  
Percentage change in prices from the same period in the previous year

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Final consumption exp. of househ. and NPISHs	2,4	1,4	2,5	3,2	2,8	2,2	1,8	2,5	2,6
Household final consumption expenditure . . .	2,3	1,3	2,5	3,2	2,8	2,2	1,8	2,4	2,5
Goods . . . . .	2,2	0,5	2,7	4,4	3,0	2,2	1,6	1,1	1,9
Services . . . . .	2,6	2,3	2,4	2,1	2,8	2,5	2,3	3,9	3,2
Direct purchases abroad by resident househ.	0,9	3,4	-0,3	-4,1	-0,0	0,7	0,9	7,4	5,0
- Direct purchases by non-residents . . . . .	2,2	1,5	2,9	2,5	3,0	2,9	3,3	4,1	3,3
Final consumption exp. of NPISHs 4) . . . . .	3,0	3,2	2,8	3,1	3,0	2,7	2,3	3,3	4,4
Final consumption exp. of general government .	3,9	3,0	2,7	2,9	2,8	3,0	2,2	3,4	4,4
Final consumption exp. of central government .	3,9	2,9	2,6	2,5	2,6	3,0	2,1	3,6	4,3
Central government, civilian . . . . .	4,4	2,8	2,7	2,7	2,7	2,8	2,4	3,6	4,4
Central government, defence . . . . .	2,5	3,3	2,2	1,9	2,3	3,5	1,3	3,5	4,2
Final consumption exp. of local government . .	4,0	3,1	2,8	3,2	3,0	3,0	2,2	3,2	4,4
Gross fixed capital formation . . . . .	3,8	2,6	2,5	1,3	2,4	3,8	2,4	4,1	3,4
Petroleum activities . . . . .	3,5	3,3	5,7	3,9	5,5	7,3	6,1	3,2	1,6
Ocean transport . . . . .	-3,2	1,8	8,4	8,5	6,7	14,2	5,5	7,3	-0,8
Mainland-Norway . . . . .	4,1	2,4	1,1	0,0	1,1	2,0	1,1	3,9	4,1
Mainland-Norway excl. general government .	4,2	2,4	1,0	-0,1	1,0	2,0	0,9	4,0	4,0
Manufacturing and mining . . . . .	3,6	1,5	0,2	-1,3	0,7	0,2	0,7	2,6	3,6
Production of other goods . . . . .	4,0	1,4	-0,2	-1,2	0,4	0,2	-0,6	2,7	4,3
Dwelling services . . . . .	7,0	3,0	2,8	1,8	2,3	3,1	3,7	3,8	4,2
Other services . . . . .	3,2	2,5	0,7	-0,5	0,7	2,3	0,1	4,6	3,9
General government . . . . .	3,8	2,4	1,4	0,4	1,2	1,8	2,1	3,6	4,6
Changes in stocks and stat. discrepancies . . .	2,8	0,8	-1,5	-2,5	0,1	-5,8	43,9	4,3	1,7
Gross capital formation . . . . .	3,1	2,4	2,1	0,8	2,3	3,2	2,1	4,0	3,2
Final domestic use of goods and services . . . .	2,9	2,0	2,4	2,5	2,7	2,6	2,0	3,1	3,1
Final demand from Mainland-Norway 2) . . . . .	3,1	2,0	2,3	2,5	2,5	2,3	1,7	3,0	3,3
Final demand from general government 3) . . .	3,9	2,9	2,5	2,6	2,6	2,8	2,1	3,4	4,4
Total exports . . . . .	1,7	6,7	2,1	6,0	1,2	3,6	-1,7	-5,7	-5,7
Traditional goods . . . . .	6,8	-1,2	0,5	-1,2	-1,8	3,4	1,6	3,3	2,8
Crude oil and natural gas . . . . .	-2,6	19,7	2,1	16,4	2,1	2,6	-9,3	-20,5	-18,9
Ships and oil platforms . . . . .	-0,0	3,4	5,2	3,5	3,2	5,9	9,1	-1,6	1,0
Services . . . . .	-0,3	2,1	5,6	1,8	6,0	7,3	6,9	6,0	-0,8
Total use of goods and services . . . . .	2,6	3,4	2,3	3,6	2,2	2,9	0,8	0,3	0,5
Total imports . . . . .	0,9	1,2	1,2	-1,0	0,7	4,3	0,6	3,8	2,6
Traditional goods . . . . .	1,1	0,1	-1,1	-3,4	-1,8	2,0	-1,3	2,8	2,3
Crude oil . . . . .	-1,8	36,4	-9,9	9,1	-12,7	-2,4	-14,6	-21,7	-15,6
Ships and oil platforms . . . . .	-3,3	3,8	8,1	5,6	8,2	10,7	9,6	4,9	-2,2
Services . . . . .	1,1	3,3	5,0	2,7	4,4	7,2	5,0	7,6	5,7
Gross domestic product 1) . . . . .	3,1	4,1	2,8	5,1	2,9	2,6	0,9	-0,7	-0,2
Mainland-Norway (market prices) . . . . .	4,3	1,5	2,8	3,0	2,8	2,6	2,8	3,6	4,0
Petroleum activities and ocean transport . . . .	-3,3	17,7	2,9	14,6	3,2	3,4	-7,1	-19,1	-20,6
Mainland-Norway (basic prices) . . . . .	3,6	1,8	3,1	3,9	3,3	2,2	3,1	2,6	3,3
Mainland-Norway excl. general government .	3,3	1,3	3,0	3,8	3,2	1,9	3,1	2,5	2,8
Manufacturing and mining . . . . .	8,3	-0,1	3,2	1,3	2,8	0,6	7,6	6,2	4,4
Production of other goods . . . . .	2,9	3,1	3,4	6,9	3,7	1,1	2,4	2,3	5,8
Service industries . . . . .	1,9	1,4	2,8	3,9	3,3	2,4	1,8	1,3	1,8
General government . . . . .	4,5	3,4	3,6	4,2	3,5	3,3	3,2	3,1	4,9
Correction items . . . . .	9,6	-0,0	1,1	-3,3	-0,1	5,6	1,3	11,4	8,8

1) Gross domestic product is measured at market prices, while value added by industry is measured at basic prices

2) Defined as total final consumption expenditure plus gross fixed capital formation in Mainland-Norway

3) Defined as final consumption expenditure plus gross fixed capital formation from general government

4) NPISH: Non-profit institutions serving households



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NATIONAL ACCOUNTS FOR NORWAY

Table A5. Gross domestic product and value added by industry.  
At current prices. Million kroner

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Gross domestic product 1) . . . . .	928 745	1 020 051	1 084 788	260 381	265 489	272 136	286 781	269 916	269 339
Agriculture and hunting . . . . .	11 794	11 930	11 462	2 327	25	6 122	2 987	2 189	163
Forestry and logging . . . . .	3 370	2 634	2 303	901	570	197	635	889	557
Fishing and fish farming . . . . .	7 944	7 588	7 896	1 851	1 705	2 074	2 266	2 261	2 388
Oil and gas extraction incl. services . . . . .	109 647	154 431	161 280	42 354	38 063	39 134	41 729	32 639	28 965
Oil and gas extraction . . . . .	106 617	150 145	155 420	40 918	36 528	37 924	40 049	31 209	27 675
Service act. incidental to oil and gas ext. . . . .	3 030	4 286	5 860	1 436	1 534	1 210	1 680	1 430	1 290
Mining and quarrying . . . . .	1 856	1 886	2 052	426	540	532	555	522	583
Manufacturing . . . . .	111 072	113 528	120 638	28 812	31 272	28 044	32 509	32 787	32 435
Food products, beverages and tobacco . . . . .	18 218	19 536	20 499	5 001	5 321	4 947	5 231	5 020	5 288
Textiles, wearing apparel, leather . . . . .	2 035	2 090	1 959	503	573	407	476	483	468
Wood and wood products . . . . .	4 242	4 408	5 578	1 255	1 378	1 360	1 585	1 531	1 415
Pulp, paper and paper products . . . . .	7 223	5 263	4 184	1 008	1 007	979	1 191	1 237	1 184
Publishing, printing, reproduction . . . . .	11 898	13 420	14 211	3 499	3 468	3 433	3 811	3 718	3 654
Refined petroleum products . . . . .	839	200	883	184	272	210	217	549	423
Basic chemicals . . . . .	7 267	6 445	6 743	1 554	1 729	1 721	1 739	1 837	1 804
Chemical and mineral products . . . . .	9 703	10 243	10 340	2 498	2 893	2 421	2 527	2 460	2 389
Basic metals . . . . .	9 858	7 907	7 482	1 559	2 122	1 607	2 193	2 330	2 384
Machinery and other equipment n.e.c. . . . .	25 430	28 568	31 916	7 817	8 175	6 981	8 942	8 866	8 761
Building of ships, oil platforms and moduls. . . . .	10 804	11 731	12 735	2 997	3 259	3 060	3 418	3 600	3 613
Furniture and other manufacturing n.e.c. . . . .	3 555	3 717	4 108	937	1 074	917	1 180	1 157	1 052
Electricity and gas supply . . . . .	22 905	21 048	23 384	6 779	5 315	4 036	7 254	7 309	4 648
Construction . . . . .	31 800	35 794	40 893	9 311	9 912	10 252	11 418	10 799	11 645
Service industries excluded general government . . . . .	384 076	405 365	433 934	103 006	108 904	109 074	112 951	109 772	112 386
Wholesale and retail trade . . . . .	87 947	91 553	98 556	22 836	23 984	24 036	27 700	23 851	24 469
Hotels and restaurants . . . . .	11 263	11 876	12 918	2 806	3 389	3 463	3 260	2 924	3 461
Transport via pipelines . . . . .	11 955	14 269	14 823	3 835	3 603	3 422	3 962	3 747	3 463
Water transport . . . . .	19 072	18 379	20 119	4 553	5 649	5 245	4 672	5 116	4 498
Ocean transport . . . . .	17 073	16 353	17 801	4 061	5 024	4 602	4 115	4 538	3 792
Inland water and costal transport . . . . .	1 999	2 025	2 318	493	626	643	557	578	706
Other transport industries . . . . .	38 335	41 774	45 315	10 432	12 151	11 998	10 733	10 912	12 188
Post and telecommunications . . . . .	17 675	18 464	19 318	4 600	4 787	4 541	5 390	4 823	4 905
Financial intermediation . . . . .	36 823	37 530	37 375	8 484	10 045	8 892	9 954	9 238	9 939
Dwelling services . . . . .	63 033	64 827	67 078	16 469	16 679	16 884	17 047	17 138	17 313
Business services etc. . . . .	50 624	56 686	64 251	15 226	15 847	16 378	16 800	17 002	18 102
Personal services . . . . .	47 349	50 007	54 181	13 765	12 768	14 215	13 433	15 021	14 048
General government . . . . .	146 603	157 165	166 813	40 767	41 226	42 178	42 641	43 310	44 291
Central government . . . . .	43 376	46 062	48 567	11 864	12 016	12 274	12 414	12 528	12 757
Civilian central government . . . . .	32 331	34 454	36 447	8 907	9 017	9 211	9 311	9 385	9 579
Defence . . . . .	11 045	11 608	12 121	2 957	2 998	3 063	3 103	3 143	3 178
Local government . . . . .	103 227	111 103	118 245	28 903	29 211	29 904	30 227	30 782	31 534
FISIM 2) . . . . .	-29 432	-30 277	-30 190	-7 419	-7 740	-7 731	-7 300	-7 452	-7 756
Value added tax and investment levy . . . . .	89 309	96 474	102 878	23 168	25 094	26 340	28 277	24 973	26 799
Other taxes on products, net . . . . .	37 801	42 562	45 159	8 973	11 632	12 630	11 924	10 317	12 946
Statistical discrepancy . . . . .	0	-76	-3 713	-875	-1 029	-745	-1 065	-399	-711
Mainland-Norway (basic prices) . . . . .	692 392	726 316	776 750	186 285	190 842	194 484	205 139	201 553	201 841
Market producers . . . . .	607 985	675 306	721 985	175 765	176 084	178 660	191 477	178 281	172 628
Non-market producers . . . . .	223 082	236 063	248 669	60 769	61 448	62 983	63 469	64 195	65 433
Education . . . . .	39 323	41 897	44 216	10 793	10 863	11 173	11 388	11 507	11 796
Health and social work . . . . .	70 182	76 197	81 591	19 954	20 182	20 628	20 827	21 499	22 068

1) Gross domestic product is measured at market prices, while value added by industry is measured at basic prices  
2) Financial intermediation services indirectly measured

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Table A6. Gross domestic product and value added by industry.  
Percentage change in volume from the same period in the previous year

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Gross domestic product 1) . . . . .	3,8	5,5	3,4	0,9	5,2	2,8	4,9	4,4	1,7
Agriculture and hunting . . . . .	4,8	4,8	-4,3	-4,5	35,4	-3,3	-7,1	0,8	271,0
Forestry and logging . . . . .	10,6	-14,3	-	-	-	-	-	-2,5	-2,5
Fishing and fish farming . . . . .	14,6	4,8	4,4	-12,1	17,4	7,1	9,6	2,6	-4,1
Oil and gas extraction incl. services . . . . .	9,1	14,6	1,1	4,8	3,0	-5,3	2,2	0,5	-2,4
Oil and gas extraction . . . . .	9,0	14,2	0,9	3,8	2,2	-4,8	2,6	0,7	-2,2
Service act. incidental to oil and gas ext. . . . .	12,6	28,4	7,7	45,1	31,3	-20,3	-9,1	-6,1	-8,9
Mining and quarrying . . . . .	4,1	1,8	2,5	-4,5	5,8	9,8	-0,8	5,4	-3,4
Manufacturing . . . . .	2,1	2,3	3,1	-3,3	7,8	2,8	5,2	7,3	-0,5
Food products, beverages and tobacco . . . . .	5,4	2,0	0,4	0,1	-0,8	1,0	1,3	0,7	-4,5
Textiles, wearing apparel, leather . . . . .	-7,6	1,4	-1,7	-4,6	14,3	-7,2	-8,5	2,8	-11,3
Wood and wood products . . . . .	0,9	1,4	7,4	-2,5	3,7	14,7	14,0	18,1	6,7
Pulp, paper and paper products . . . . .	3,5	-6,9	4,2	-4,7	9,1	4,7	8,5	6,8	-1,5
Publishing, printing, reproduction . . . . .	1,9	2,1	-0,1	-4,8	-0,6	2,5	2,5	4,1	0,6
Refined petroleum products . . . . .	-48,1	10,5	2,8	8,7	6,6	-1,4	-1,7	-5,3	-14,0
Basic chemicals . . . . .	-3,5	-0,3	2,7	-2,8	15,6	-3,5	3,1	7,8	7,2
Chemical and mineral products . . . . .	7,4	3,1	3,0	-3,2	13,8	2,5	-0,6	-0,1	-10,9
Basic metals . . . . .	-11,8	3,5	3,3	1,4	6,7	0,2	4,7	2,7	0,3
Machinery and other equipment n.e.c. . . . .	6,3	4,8	5,4	-2,7	12,8	4,6	7,3	11,4	2,3
Building of ships, oil platforms and moduls. . . . .	5,9	2,6	1,2	-13,0	6,0	2,0	12,3	15,4	4,5
Furniture and other manufacturing n.e.c. . . . .	2,6	2,5	11,5	-3,7	26,1	14,7	11,7	22,1	-3,9
Electricity and gas supply . . . . .	9,4	-14,9	6,6	-24,9	9,4	37,8	27,4	17,6	-0,7
Construction . . . . .	3,7	5,6	8,5	9,3	7,7	7,1	9,8	7,4	7,5
Service industries excluded general government	3,0	4,4	4,2	2,8	5,2	3,4	5,3	5,0	2,6
Wholesale and retail trade . . . . .	2,0	6,8	4,8	-0,8	8,0	6,5	5,5	8,7	3,8
Hotels and restaurants . . . . .	-0,2	4,3	5,6	3,5	6,1	7,2	5,3	-1,0	1,1
Transport via pipelines . . . . .	16,2	19,4	5,3	12,2	6,7	-2,5	5,3	0,8	-1,4
Water transport . . . . .	4,9	1,9	4,5	5,9	8,8	3,6	0,1	2,7	-1,2
Ocean transport . . . . .	5,1	1,7	4,2	5,8	8,9	3,2	-0,7	1,9	-2,4
Inland water and costal transport . . . . .	2,5	3,8	7,1	6,6	7,9	6,7	7,0	9,5	8,3
Other transport industries . . . . .	9,0	8,0	6,5	5,6	12,0	3,6	4,8	3,7	-2,7
Post and telecommunications . . . . .	-1,2	2,3	5,6	2,9	6,6	5,9	6,9	5,9	6,3
Financial intermediation . . . . .	-2,3	-3,0	-2,3	-1,4	-6,6	-9,2	9,2	5,8	1,7
Dwelling services . . . . .	1,5	1,0	1,0	0,9	1,0	1,0	1,1	1,0	1,1
Business services etc. . . . .	5,3	7,7	9,0	8,9	7,4	8,8	10,7	7,9	8,5
Personal services . . . . .	2,8	2,2	3,3	2,4	3,5	3,5	3,9	3,9	2,4
General government . . . . .	0,7	3,7	2,5	1,6	2,4	2,9	3,0	3,0	2,4
Central government . . . . .	-0,1	2,8	1,9	1,3	1,9	2,1	2,3	2,2	1,3
Civilian central government . . . . .	0,5	3,3	2,4	1,8	2,4	2,6	2,8	2,1	1,4
Defence . . . . .	-2,0	1,2	0,4	-0,2	0,4	0,5	0,7	2,6	1,1
Local government . . . . .	1,0	4,1	2,7	1,8	2,6	3,3	3,3	3,3	2,8
FISIM 2) . . . . .	0,5	-0,6	-2,1	-0,9	-2,1	-2,8	-2,5	6,0	2,6
Value added tax and investment levy . . . . .	4,5	5,8	4,9	2,4	7,1	5,3	4,8	4,5	3,5
Other taxes on products, net . . . . .	11,8	9,5	2,3	-3,2	5,3	3,6	3,5	2,5	1,2
Statistical discrepancy . . . . .	-100,0	.	-97,1	-97,2	-96,9	-97,1	-97,0	17,1	9,1
Mainland-Norway (basic prices) . . . . .	2,5	3,1	3,7	0,2	5,2	3,9	5,6	5,4	2,4
Market producers . . . . .	4,7	5,5	3,8	1,0	6,1	2,5	5,8	5,3	1,4
Non-market producers . . . . .	0,9	2,9	2,1	1,5	2,1	2,4	2,5	2,4	2,0
Education . . . . .	0,8	3,2	2,1	1,1	1,7	2,6	2,8	3,3	3,5
Health and social work . . . . .	2,0	5,0	3,4	2,6	3,5	3,7	3,7	3,6	3,0

1) Gross domestic product is measured at market prices, while value added by industry is measured at basic prices

2) Financial intermediation services indirectly measured

## NATIONAL ACCOUNTS FOR NORWAY

Table A7. Household final consumption expenditure. At current prices. Million kroner

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Household final consumption expenditure . . . .	435 247	462 620	490 949	112 011	119 372	125 730	133 836	119 668	126 911
Food, beverages and tobacco . . . . .	91 327	94 770	99 652	21 884	24 288	26 071	27 410	22 825	26 552
Clothing and footwear . . . . .	26 995	27 757	28 987	5 744	7 223	6 735	9 285	6 049	7 532
Housing, water, electr., gas and other fuels . . .	100 183	104 232	108 396	28 493	26 057	25 095	28 752	29 292	26 750
Furnishings, household equipment etc. . . . .	28 143	29 383	31 696	6 795	6 908	7 777	10 216	7 715	7 640
Health . . . . .	11 155	12 075	13 101	3 067	3 266	3 301	3 465	3 528	3 714
Transport . . . . .	69 068	79 053	84 230	18 622	22 534	22 719	20 355	19 839	22 831
Leisure, entertainment and culture . . . . .	41 565	43 689	47 107	10 892	10 083	12 838	13 294	12 155	11 255
Education . . . . .	2 018	2 107	2 290	528	492	620	650	561	520
Hotels, cafes and restaurants . . . . .	25 134	26 765	28 973	6 047	7 309	8 647	6 969	6 390	7 842
Miscellaneous goods and services . . . . .	36 629	38 531	40 960	9 358	10 189	10 222	11 191	10 293	10 903
Direct purchases abroad by resident househ. . .	18 004	19 479	21 359	3 758	4 948	7 479	5 174	4 228	5 360
- Direct purchases by non-residents . . . . .	-14 974	-15 221	-15 802	-3 177	-3 926	-5 774	-2 925	-3 207	-3 987
Goods . . . . .	246 431	262 815	279 573	62 460	67 225	69 282	80 607	66 257	72 025
Services . . . . .	185 786	195 547	205 819	48 970	51 125	54 743	50 981	52 391	53 513
Services, dwellings . . . . .	81 528	83 896	86 966	21 244	21 685	21 851	22 187	22 149	22 552
Other services . . . . .	104 258	111 650	118 853	27 727	29 441	32 892	28 794	30 242	30 961

Table A8. Household final consumption expenditure.

Percentage change in volume from the same period in the previous year

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Household final consumption expenditure . . . .	3,6	4,9	3,6	0,9	5,5	4,0	3,8	4,3	3,7
Food, beverages and tobacco . . . . .	1,5	1,9	0,9	-1,0	-0,6	3,1	1,6	-1,2	3,5
Clothing and footwear . . . . .	0,8	6,4	4,7	-1,0	9,3	4,3	5,5	9,4	5,9
Housing, water, electr., gas and other fuels . . .	1,2	1,4	0,9	-0,8	1,3	0,5	2,6	2,7	1,6
Furnishings, household equipment etc. . . . .	5,0	3,3	7,2	0,5	13,5	7,7	7,6	13,2	10,0
Health . . . . .	2,5	4,2	6,3	3,9	8,0	6,4	6,7	7,2	5,3
Transport . . . . .	3,7	14,5	3,1	1,3	9,6	1,5	-0,2	3,0	-0,6
Leisure, entertainment and culture . . . . .	7,2	5,0	6,1	-0,2	10,4	6,9	7,9	10,3	9,6
Education . . . . .	2,2	-0,2	5,2	1,9	5,8	5,7	6,9	2,6	1,3
Hotels, cafes and restaurants . . . . .	7,8	4,3	5,6	5,7	4,0	6,9	5,2	0,3	3,2
Miscellaneous goods and services . . . . .	6,9	3,1	5,4	4,0	6,1	5,9	5,5	6,2	5,6
Direct purchases abroad by resident househ. . .	0,7	4,7	10,0	8,4	12,5	8,3	11,4	4,7	3,1
- Direct purchases by non-residents . . . . .	-6,9	0,1	0,9	-3,0	1,0	1,2	4,6	-3,0	-1,6
Goods . . . . .	3,3	6,2	3,6	-1,0	6,3	4,5	4,1	4,9	5,2
Services . . . . .	3,4	2,9	2,8	2,5	3,5	2,5	2,6	2,9	1,4
Services, dwellings . . . . .	1,6	0,8	0,9	0,9	0,9	0,6	1,1	1,0	1,2
Other services . . . . .	4,8	4,5	4,2	3,7	5,5	3,7	3,9	4,4	1,6

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Table A9. Gross fixed capital formation by type of capital goods and by industry.  
At current prices. Million kroner

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Gross fixed capital formation . . . . .	192 518	216 502	249 931	54 414	62 134	62 632	70 750	63 696	67 788
Buildings and structures . . . . .	78 385	87 705	98 595	21 715	23 318	24 661	28 902	25 222	25 453
Oil exploration, drilling, pipelines . . . . .	17 816	20 354	28 045	5 372	7 079	7 593	8 001	7 580	8 699
Oil platforms etc. . . . .	26 029	27 456	31 783	7 218	9 438	7 194	7 933	8 114	10 315
Ships and boats . . . . .	5 342	7 518	12 808	3 640	2 938	3 639	2 591	4 327	2 098
Other transport equipment . . . . .	17 283	22 738	23 691	5 066	6 013	5 885	6 727	5 206	6 145
Machinery and equipment . . . . .	47 663	50 732	55 009	11 404	13 349	13 659	16 597	13 248	15 076
Agriculture and hunting . . . . .	5 590	5 852	5 917	982	1 805	1 714	1 416	999	1 810
Forestry and logging . . . . .	550	559	564	140	140	140	143	144	146
Fishing and fish farming . . . . .	1 099	715	853	258	195	231	169	201	171
Oil and gas extraction, incl. services . . . . .	41 853	44 299	53 214	11 700	14 666	12 524	14 324	14 477	18 235
Oil and gas extraction . . . . .	41 804	41 431	53 777	11 527	15 139	12 842	14 269	14 391	18 136
Service act. incidental to oil and gas ext. . . . .	49	2 868	-563	173	-473	-318	55	86	99
Mining and quarrying . . . . .	379	353	261	31	69	68	92	37	83
Manufacturing . . . . .	15 316	17 078	18 321	3 310	4 759	4 374	5 879	3 710	4 831
Food products, beverages and tobacco . . . . .	2 713	2 663	3 162	600	788	805	970	647	804
Textiles, wearing apparel, leather . . . . .	222	237	276	66	61	63	85	35	71
Wood and wood products . . . . .	756	1 161	833	247	196	207	184	85	144
Pulp, paper and paper products . . . . .	1 482	1 152	1 473	179	381	366	547	307	557
Publishing, printing, reproduction . . . . .	1 267	1 409	2 009	309	630	395	674	575	490
Refined petroleum products . . . . .	477	351	455	30	69	220	136	101	135
Basic chemicals . . . . .	2 538	2 090	1 273	342	319	257	354	173	265
Chemical and mineral products . . . . .	1 431	1 964	2 185	366	537	548	733	517	520
Basic metals . . . . .	1 125	2 493	2 866	559	910	576	821	406	575
Machinery and other equipment n.e.c. . . . .	2 257	2 362	2 513	421	545	622	926	562	860
Building of ships, oil platforms and moduls. . . . .	687	742	839	131	209	187	313	208	259
Furniture and other manufacturing n.e.c. . . . .	361	454	437	60	114	127	136	94	151
Electricity and gas supply . . . . .	5 106	4 817	4 682	630	1 216	1 336	1 501	830	1 281
Construction . . . . .	937	995	1 129	256	288	281	305	293	313
Service industries excl. general government . . . . .	91 805	110 096	128 936	28 643	30 452	33 456	36 385	32 981	31 117
Wholesale and retail trade . . . . .	18 388	21 344	22 887	5 135	5 613	5 580	6 559	5 995	6 082
Hotels and restaurants . . . . .	1 792	1 895	2 344	465	493	687	699	611	662
Transport via pipelines . . . . .	6 087	5 992	8 168	1 098	2 128	2 588	2 354	2 008	2 113
Water transport . . . . .	4 406	6 929	12 257	3 515	2 829	3 504	2 409	4 227	1 971
Ocean transport . . . . .	3 733	6 222	11 168	3 172	2 583	3 220	2 193	3 830	1 780
Inland water and costal transport . . . . .	673	707	1 088	343	246	284	216	397	191
Other transport industries . . . . .	10 223	18 568	21 794	4 562	4 858	5 452	6 923	4 367	4 714
Post and telecommunications . . . . .	6 626	7 202	7 955	1 326	1 463	2 086	3 081	1 461	1 614
Financial intermediation . . . . .	4 510	5 609	6 312	1 476	1 518	1 582	1 736	1 765	1 540
Dwelling services . . . . .	26 461	26 921	30 151	6 922	7 331	7 742	8 156	7 833	7 768
Business services etc. . . . .	7 159	8 927	9 819	2 302	2 480	2 442	2 595	2 603	2 735
Personal services . . . . .	6 153	6 710	7 249	1 841	1 740	1 794	1 874	2 113	1 918
General government . . . . .	29 883	31 738	36 053	8 465	8 544	8 508	10 537	10 023	9 801
Central government . . . . .	13 982	14 934	15 104	3 350	3 274	3 661	4 820	4 750	4 456
Civilian central government . . . . .	10 228	10 710	10 983	2 429	2 391	2 750	3 414	3 772	3 544
Defence . . . . .	3 754	4 224	4 121	921	883	911	1 406	978	912
Local government . . . . .	15 901	16 804	20 949	5 115	5 270	4 847	5 717	5 273	5 345
Mainland-Norway . . . . .	140 845	159 990	177 380	38 445	42 757	44 300	51 879	43 381	45 660
Education . . . . .	5 269	5 884	8 562	2 670	2 705	1 557	1 630	2 418	2 409
Health and social work . . . . .	6 626	7 471	8 587	1 923	1 923	2 125	2 615	2 039	1 975

## NATIONAL ACCOUNTS FOR NORWAY

Table A10. Gross fixed capital formation by type of capital goods and by industry.  
Percentage change in volume from the same period in the previous year

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Gross fixed capital formation . . . . .	3,4	9,6	12,6	13,6	18,5	12,8	7,0	12,5	5,6
Buildings and structures . . . . .	13,2	8,6	9,2	3,5	9,0	10,6	13,1	11,8	4,6
Oil exploration, drilling, pipelines . . . . .	-20,3	10,0	27,5	23,5	34,0	18,2	34,7	37,4	22,0
Oil platforms etc. . . . .	-4,9	2,3	11,5	40,6	40,3	9,2	-21,6	8,3	6,3
Ships and boats. . . . .	-17,7	38,2	57,3	111,3	108,7	66,1	-8,5	11,0	-28,0
Other transport equipment. . . . .	6,9	25,5	3,4	-2,6	1,6	8,0	6,5	-8,4	-2,3
Machinery and equipment. . . . .	7,3	6,3	10,7	9,8	15,1	10,1	8,4	15,1	8,8
Agriculture and hunting . . . . .	16,2	3,2	1,0	2,4	0,2	0,6	1,4	-1,0	-3,7
Forestry and logging . . . . .	5,2	-0,3	-	-	-	-	-	-0,1	-0,0
Fishing and fish farming . . . . .	45,1	-34,9	21,5	43,5	68,1	6,3	-8,7	-22,5	-16,8
Oil and gas extraction, incl. services . . . . .	-9,9	2,3	13,4	29,0	30,4	11,6	-7,4	19,9	22,6
Oil and gas extraction . . . . .	-11,1	-4,2	22,6	23,7	33,2	15,0	18,7	21,0	17,8
Service act. incidental to oil and gas ext. . . . .					242,4		-98,3	-52,0	
Mining and quarrying. . . . .	38,2	-9,0	-25,9	-54,4	8,1	-42,7	-7,1	13,1	16,9
Manufacturing. . . . .	34,7	9,9	7,0	-1,1	17,8	-0,7	10,5	9,3	-2,0
Food products, beverages and tobacco . . . . .	-3,3	-3,6	18,1	13,1	35,8	27,3	3,6	4,7	-2,2
Textiles, wearing apparel, leather . . . . .	8,0	5,6	17,3	39,2	26,1	-4,8	17,0	-46,9	12,5
Wood and wood products . . . . .	-4,0	52,5	-27,5	56,7	-25,5	-56,6	-28,0	-66,9	-30,0
Pulp, paper and paper products . . . . .	129,4	-23,6	26,2	-38,6	40,1	66,1	44,9	64,7	44,1
Publishing, printing, reproduction . . . . .	24,2	9,7	41,4	5,3	92,7	18,7	44,8	80,8	-24,9
Refined petroleum products . . . . .	76,0	-28,8	31,0	-64,6	42,2	137,9	13,5	231,4	91,0
Basic chemicals . . . . .	220,2	-18,6	-38,4	-33,8	-39,8	-52,0	-26,3	-49,2	-19,9
Chemical and mineral products . . . . .	14,7	34,9	10,8	-7,2	24,8	10,9	12,6	36,5	-6,6
Basic metals . . . . .	20,2	117,2	14,2	76,5	53,2	-9,7	-15,1	-29,0	-39,1
Machinery and other equipment n.e.c. . . . .	36,4	3,9	6,9	-13,4	-3,4	0,1	37,0	31,0	51,3
Building of ships, oil platforms and moduls. . . . .	-4,1	6,4	13,3	-13,4	-10,7	16,7	62,0	54,6	18,4
Furniture and other manufacturing n.e.c. . . . .	25,2	24,4	-3,0	-19,5	-13,9	5,8	10,6	53,8	26,5
Electricity and gas supply . . . . .	6,1	-6,7	-2,3	-25,7	6,3	12,9	-7,2	29,3	0,9
Construction. . . . .	23,4	3,3	13,7	11,9	10,9	16,2	15,7	8,1	4,1
Service industries excl. general government . . . . .	4,9	16,9	14,8	9,4	14,8	18,7	15,9	9,9	-1,3
Wholesale and retail trade . . . . .	13,4	13,2	7,2	1,9	10,7	8,0	8,2	11,5	3,7
Hotels and restaurants . . . . .	11,0	3,1	22,3	-6,0	1,6	41,4	56,7	25,1	27,8
Transport via pipelines . . . . .	-33,3	-3,5	30,6	-12,5	29,6	31,3	72,5	75,7	-3,5
Water transtort. . . . .	-24,2	54,2	63,1	124,7	116,1	75,3	-9,2	12,2	-29,8
Ocean transport . . . . .	-26,2	63,8	65,6	135,0	120,6	77,5	-9,3	12,5	-30,6
Inland water and costal transport . . . . .	-10,1	1,4	41,2	59,2	77,2	53,5	-7,7	8,9	-20,9
Other transport industries . . . . .	21,0	76,1	15,7	-4,9	-1,9	33,0	39,9	-9,4	-5,8
Post and telecommunications . . . . .	6,1	7,6	11,6	12,7	10,2	11,4	12,0	8,2	6,1
Financial intermediation . . . . .	30,4	21,2	10,6	8,8	12,2	10,7	10,8	14,3	-3,2
Dwelling services . . . . .	9,1	-1,2	9,0	6,0	12,5	9,1	8,5	9,0	1,7
Business services etc. . . . .	14,4	21,3	9,4	8,1	10,9	8,2	10,4	8,0	5,8
Personal services . . . . .	1,8	6,9	7,3	6,4	8,4	6,4	8,2	11,0	5,6
General government . . . . .	3,5	3,7	12,1	24,1	21,9	5,6	2,1	14,3	9,7
Central government. . . . .	0,6	4,4	-0,3	-0,3	-0,9	-0,0	-0,2	36,2	29,9
Civilian central government. . . . .	-0,2	2,3	0,6	-0,3	0,3	0,1	1,9	49,3	41,2
Defence. . . . .	-2,8	10,2	-2,6	-0,3	-3,8	-0,4	-4,8	2,3	-0,3
Local government. . . . .	6,2	3,2	23,1	47,8	42,1	10,3	4,1	-0,1	-2,9
Mainland-Norway. . . . .	12,3	11,0	9,7	6,5	11,8	9,7	10,4	8,6	2,6
Education . . . . .	4,5	9,3	45,3	111,1	102,0	10,0	-13,8	-11,9	-14,4
Health and social work. . . . .	7,8	10,8	13,8	14,6	13,5	13,6	13,5	3,4	-1,2

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NATIONAL ACCOUNTS FOR NORWAY

Table A11. Exports of goods and services. At current prices. Million kroner

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Total exports . . . . .	353 426	414 266	447 582	108 757	109 975	114 189	114 660	109 838	102 022
Goods . . . . .	267 234	321 705	343 715	85 160	84 068	85 026	89 460	83 818	75 915
Crude oil and natural gas. . . . .	113 231	156 688	163 674	42 598	38 947	40 220	41 909	34 287	31 048
Ships, new . . . . .	4 138	4 257	5 267	1 513	1 307	1 121	1 326	2 727	1 537
Ships, second-hand. . . . .	5 791	3 765	4 126	1 627	831	723	945	339	888
Oil platforms and modules, new. . . . .	63	59	231	22	5	195	9	18	37
Oil platforms, second-hand . . . . .	491	956	1 005	9	558	412	26	25	40
Direct exports related to petroleum act. . . . .	96	126	132	36	34	31	31	29	36
Other goods . . . . .	143 424	155 854	169 280	39 355	42 386	42 324	45 214	46 393	42 329
Agriculture, forestry and fishing . . . . .	6 767	7 035	7 711	1 863	1 888	1 779	2 181	2 206	2 105
Mining and quarrying . . . . .	2 271	2 342	2 284	479	617	595	593	561	579
Manufacturing products . . . . .	133 142	145 489	158 673	36 965	39 791	39 698	42 218	43 552	39 583
Food products, beverages and tobacco . . . . .	17 164	19 528	21 437	4 989	4 771	5 008	6 669	6 188	5 301
Textiles, wearing apparel, leather . . . . .	2 138	2 207	2 351	550	594	575	632	597	594
Wood products . . . . .	3 003	2 864	2 923	717	795	699	712	657	688
Pulp, paper and paper products . . . . .	12 864	11 593	10 811	2 556	2 683	2 748	2 824	3 041	2 954
Printing and publishing . . . . .	378	559	493	118	121	119	135	147	134
Refined petroleum products. . . . .	12 996	17 147	20 637	5 474	4 888	5 385	4 890	4 857	3 070
Basic chemicals . . . . .	12 019	12 107	12 963	2 939	3 450	3 336	3 238	3 762	3 434
Chemical and mineral products. . . . .	8 923	9 597	10 627	2 392	2 709	2 789	2 737	2 691	2 870
Basic metals . . . . .	29 798	30 756	33 792	7 591	8 626	8 808	8 767	9 657	8 739
Machinery and other equipment n.e.c. . . . .	31 065	35 975	39 121	8 823	10 295	9 402	10 600	11 052	10 914
Furniture and other manufacturing products . . . . .	2 794	3 156	3 518	816	859	829	1 014	903	885
Electricity . . . . .	1 244	988	612	48	90	252	222	74	62
Services . . . . .	86 192	92 561	103 867	23 597	25 907	29 163	25 200	26 020	26 107
Gross receipts, shipping . . . . .	45 204	46 641	52 787	12 165	13 759	13 688	13 175	13 482	12 945
Petroleum activities, various services. . . . .	576	714	752	186	188	185	193	192	184
Oil drilling etc. . . . .	1 405	1 543	1 925	429	451	534	511	518	493
Pipeline transport . . . . .	2 245	3 424	3 987	1 076	890	848	1 173	1 076	890
Travel. . . . .	14 974	15 221	15 802	3 177	3 926	5 774	2 925	3 207	3 987
Other services. . . . .	21 788	25 018	28 614	6 564	6 693	8 134	7 223	7 545	7 608
Transport, post and telecommunication. . . . .	7 714	8 675	8 781	1 895	2 063	2 940	1 883	2 177	2 553
Financial and business services . . . . .	10 590	12 836	15 694	3 693	3 550	4 237	4 214	4 365	4 021
Services n.e.c. . . . .	3 484	3 507	4 139	976	1 080	957	1 126	1 003	1 034

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NATIONAL ACCOUNTS FOR NORWAY

Table A12. Exports of goods and services.  
Percentage change in volume from the same period in the previous year

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Total exports . . . . .	4,3	9,8	5,8	3,3	9,9	6,8	3,4	7,0	-1,6
Goods . . . . .	6,3	11,3	5,6	2,3	10,5	6,3	3,8	8,0	-2,5
Crude oil and natural gas . . . . .	9,2	15,6	2,3	5,8	3,9	-2,0	1,9	1,3	-1,7
Ships, new . . . . .	-10,5	2,0	22,8	136,7	4,5	82,0	-26,1	75,6	13,6
Ships, second-hand . . . . .	14,0	-39,5	-3,7	-5,0	3,1	-10,0	-1,8	-80,9	15,0
Oil platforms and modules, new . . . . .	448,7	-9,0	275,4	93,6	-59,8	650,1	-21,0	-21,2	609,1
Oil platforms, second-hand . . . . .	-44,0	94,7	5,1	-97,4	224,4	776,6	-93,4	177,8	-92,8
Direct exports related to petroleum act. . . . .	52,5	25,7	-4,4	41,3	28,8	-9,5	-41,4	-21,7	7,5
Other goods . . . . .	4,5	10,0	8,0	-1,4	15,5	11,2	7,7	14,2	-2,9
Agriculture, forestry and fishing . . . . .	14,5	14,2	7,0	10,4	7,9	-4,9	14,6	18,4	-3,4
Mining and quarrying . . . . .	-2,3	2,3	-2,1	-20,1	6,6	4,7	2,7	1,8	-15,4
Manufacturing products . . . . .	3,6	10,5	8,4	-0,8	16,2	12,1	7,0	14,1	-2,6
Food products, beverages and tobacco . . . . .	2,7	11,8	6,7	-4,0	13,0	1,9	16,7	13,0	-2,8
Textiles, wearing apparel, leather . . . . .	-3,9	1,9	10,6	1,4	15,2	12,3	13,8	11,6	8,0
Wood products . . . . .	-4,3	1,0	-3,2	3,5	3,4	-8,5	-10,8	-10,4	-11,4
Pulp, paper and paper products . . . . .	4,6	3,6	6,4	-1,9	10,6	5,9	11,5	11,5	0,8
Printing and publishing . . . . .	-15,9	56,6	-18,4	-24,0	-25,4	-14,5	-6,5	-0,7	-3,4
Refined petroleum products . . . . .	-0,3	9,9	12,5	9,3	19,8	17,3	4,4	8,5	-24,7
Basic chemicals . . . . .	0,0	6,5	4,8	-9,0	24,5	1,9	5,5	22,8	0,9
Chemical and mineral products . . . . .	8,6	8,6	14,7	9,1	25,3	10,8	14,4	5,5	6,3
Basic metals . . . . .	-4,7	13,2	9,8	4,5	15,6	17,2	3,0	13,0	-2,3
Machinery and other equipment n.e.c. . . . .	15,2	13,3	8,0	-7,5	15,8	21,1	5,1	22,5	1,2
Furniture and other manufacturing products . . . . .	8,1	11,0	8,1	6,2	16,8	4,2	6,1	3,5	-2,9
Electricity . . . . .	80,6	-49,9	-24,8	-88,6	-49,6	90,0	272,9	12,3	-12,9
Services . . . . .	-1,3	5,2	6,3	6,7	7,9	8,4	2,1	4,0	1,6
Gross receipts, shipping . . . . .	3,9	1,7	4,2	5,8	8,9	3,2	-0,7	1,9	-2,4
Petroleum activities, various services . . . . .	-12,2	20,6	1,6	1,7	2,5	-1,2	3,5	-0,6	-6,2
Oil drilling etc. . . . .	-23,3	2,4	7,4	9,7	11,6	6,8	2,6	15,3	13,0
Pipeline transport . . . . .	20,1	49,1	19,1	43,3	24,9	2,4	11,8	6,9	5,4
Travel . . . . .	-6,9	0,1	0,9	-3,0	1,0	1,2	4,6	-3,0	-1,6
Other services . . . . .	-7,8	11,1	11,9	9,1	8,1	26,1	4,5	10,2	10,6
Transport, post and telecommunication . . . . .	4,7	8,4	0,0	-0,3	-8,6	26,4	-17,8	12,8	21,2
Financial and business services . . . . .	-6,7	16,8	19,0	19,2	13,3	29,5	13,9	11,0	9,7
Services n.e.c. . . . .	-29,0	-0,1	15,3	-5,0	34,4	12,3	24,1	1,8	-6,5

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NATIONAL ACCOUNTS FOR NORWAY

Table A13. Imports of goods and services. At current prices. Million kroner

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Total imports . . . . .	297 654	326 487	371 024	82 019	93 518	96 268	99 219	98 599	98 688
Goods . . . . .	216 899	242 512	267 423	61 212	67 950	66 199	72 062	73 403	70 915
Ships . . . . .	6 324	6 325	14 041	5 388	2 818	3 784	2 051	3 791	1 761
Oil platforms and modules . . . . .	359	3 648	2 241	36	1 846	305	54	984	116
Direct imports related to petroleum activities . . . . .	6 237	7 683	9 729	1 981	2 482	2 369	2 897	2 562	2 733
Other goods . . . . .	203 979	224 856	241 412	53 807	60 804	59 741	67 060	66 066	66 305
Agriculture, forestry and fishing . . . . .	7 890	8 088	8 323	1 935	2 321	1 828	2 239	2 881	2 170
Crude oil . . . . .	1 121	1 445	1 517	436	322	413	346	457	269
Mining and quarrying . . . . .	2 802	2 906	3 397	728	881	923	865	982	908
Manufacturing products . . . . .	191 918	209 072	226 855	49 921	57 032	56 514	63 388	61 415	62 690
Food products, beverages and tobacco . . . . .	8 928	9 493	10 669	2 228	2 596	2 966	2 879	2 745	2 950
Textiles, wearing apparel, leather . . . . .	15 201	15 344	16 738	4 159	3 473	5 129	3 977	4 831	3 586
Wood products . . . . .	3 883	4 104	4 869	1 007	1 286	1 225	1 351	1 305	1 373
Pulp, paper and paper products . . . . .	6 469	6 370	6 487	1 532	1 614	1 588	1 753	1 697	1 617
Printing and publishing . . . . .	2 799	3 386	3 706	823	842	966	1 075	984	891
Refined petroleum products . . . . .	8 750	10 160	11 743	2 681	2 824	2 969	3 269	2 533	2 488
Basic chemicals . . . . .	9 449	9 070	9 621	2 166	2 556	2 425	2 474	2 481	2 453
Chemical and mineral products . . . . .	20 551	21 757	23 529	5 171	6 167	5 875	6 316	6 266	6 506
Basic metals . . . . .	21 043	22 701	23 925	5 439	5 641	5 656	7 189	6 628	6 604
Machinery and other equipment n.e.c. . . . .	77 813	83 343	91 570	19 591	23 435	22 095	26 449	25 900	26 850
Furniture and other manufacturing products . . . . .	6 587	7 049	8 169	1 771	1 979	1 964	2 455	2 259	2 115
Non-competitive imports . . . . .	10 445	16 295	15 829	3 353	4 619	3 656	4 201	3 786	5 257
Electricity . . . . .	248	3 345	1 320	787	248	63	222	331	268
Services . . . . .	80 755	83 975	103 601	20 807	25 568	30 069	27 157	25 196	27 773
Operating costs shipping, excl. bunkers . . . . .	18 905	19 957	24 085	5 441	5 987	6 388	6 269	6 367	6 522
Operating costs oil drilling, excl. bunkers . . . . .	643	1 228	1 602	215	394	512	481	594	852
Petroleum activities, various services . . . . .	3 963	4 140	5 685	799	2 235	1 613	1 038	916	820
Travel . . . . .	26 923	29 129	31 940	5 620	7 399	11 184	7 737	6 322	8 015
Other services . . . . .	30 321	29 521	40 289	8 732	9 553	10 372	11 632	10 997	11 564
Transport, post and telecommunication . . . . .	3 437	2 862	3 427	862	799	841	925	963	1 018
Financial and business services . . . . .	15 125	14 220	19 386	4 391	4 645	4 749	5 601	5 586	5 182
Services n.e.c. . . . .	11 759	12 439	17 476	3 479	4 109	4 782	5 106	4 448	5 364



## NATIONAL ACCOUNTS FOR NORWAY

Table A14. Imports of goods and services.

Percentage change in volume from the same period in the previous year

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Total imports . . . . .	5,6	8,3	12,3	8,4	22,4	12,5	7,0	15,8	2,8
Goods . . . . .	8,8	11,2	10,6	7,8	21,7	10,5	4,0	16,9	2,9
Ships . . . . .	-13,2	-5,5	101,7	184,5	290,7	122,5	-25,7	-34,2	-31,7
Oil platforms and modules . . . . .	58,9	892,2	-43,8	10,6	.	38,3	-98,5	.	-93,4
Direct imports related to petroleum activities . . . . .	42,1	19,8	22,1	-1,3	44,7	12,3	36,1	24,6	5,5
Other goods . . . . .	8,9	9,9	8,6	2,5	15,0	7,5	9,5	19,6	6,6
Agriculture, forestry and fishing . . . . .	6,7	3,3	-2,8	-14,4	15,1	-7,6	-2,6	33,3	-9,0
Crude oil . . . . .	31,7	-5,5	16,6	83,3	44,6	62,2	-43,0	33,9	-1,1
Mining and quarrying . . . . .	2,1	0,6	8,6	-16,0	27,5	17,6	11,1	45,4	-1,7
Manufacturing products . . . . .	9,3	9,1	9,8	1,6	15,7	9,8	11,7	20,2	7,1
Food products, beverages and tobacco . . . . .	4,0	4,5	9,2	6,5	12,5	9,7	7,9	8,9	1,9
Textiles, wearing apparel, leather . . . . .	1,6	-1,3	5,7	2,1	14,2	6,9	0,9	10,0	-0,1
Wood products . . . . .	3,2	8,2	18,3	6,6	28,5	19,4	18,2	25,2	2,8
Pulp, paper and paper products . . . . .	5,9	1,5	9,5	2,2	14,0	12,1	9,9	9,9	-3,0
Printing and publishing . . . . .	7,6	12,6	17,0	5,8	26,1	17,8	19,0	19,0	8,7
Refined petroleum products . . . . .	12,8	0,9	14,3	10,7	25,9	3,7	18,3	9,6	-4,2
Basic chemicals . . . . .	8,1	2,5	6,6	-9,1	9,1	8,5	18,7	17,0	-0,6
Chemical and mineral products . . . . .	9,8	9,6	7,2	-2,5	11,9	11,2	8,1	16,5	3,5
Basic metals . . . . .	0,8	13,9	3,3	1,4	1,6	-4,8	13,9	14,0	16,0
Machinery and other equipment n.e.c. . . . .	16,6	7,8	14,8	1,3	20,5	17,9	18,8	31,3	9,3
Furniture and other manufacturing products . . . . .	6,8	3,4	15,5	6,5	25,8	16,0	14,6	20,1	5,2
Non-competitive imports . . . . .	-3,7	48,1	-6,1	4,4	10,7	-13,1	-20,2	1,5	14,1
Electricity . . . . .	-54,5	.	-45,1	489,7	-66,0	-95,1	-69,2	-59,7	84,0
Services . . . . .	-2,0	0,6	17,5	10,6	24,3	17,5	17,1	12,6	2,8
Operating costs shipping, excl. bunkers . . . . .	8,1	1,7	4,2	5,8	8,9	3,2	-0,7	1,9	-2,4
Operating costs oil drilling, excl. bunkers . . . . .	-30,2	85,8	26,9	-41,6	33,1	63,0	72,6	167,7	109,0
Petroleum activities, various services . . . . .	-41,7	1,5	32,7	-2,7	97,5	41,7	-13,5	10,4	-64,8
Travel . . . . .	1,8	4,7	10,0	8,4	12,5	8,3	11,4	4,7	3,1
Other services . . . . .	-2,0	-5,5	31,1	19,4	34,5	34,6	35,6	20,4	17,1
Transport, post and telecommunication . . . . .	-11,7	-19,3	17,3	23,9	10,1	3,6	33,9	8,8	22,6
Financial and business services . . . . .	-8,1	-9,4	32,7	29,0	38,6	34,1	30,0	19,6	7,6
Services n.e.c. . . . .	11,0	3,4	32,5	7,9	35,9	43,3	42,7	24,4	26,7

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Table A15. Balance of payments. Summary. At current prices. Million kroner

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Total exports . . . . .	353 426	414 266	447 582	108 757	109 975	114 189	114 660	109 838	102 022
Goods . . . . .	267 234	321 705	343 715	85 160	84 068	85 026	89 460	83 818	75 915
Services . . . . .	86 192	92 561	103 867	23 597	25 907	29 163	25 200	26 020	26 107
Total imports . . . . .	297 654	326 487	371 024	82 019	93 518	96 268	99 219	98 599	98 688
Goods . . . . .	216 899	242 512	267 423	61 212	67 950	66 199	72 062	73 403	70 915
Services . . . . .	80 755	83 975	103 601	20 807	25 568	30 069	27 157	25 196	27 773
Balance of goods and services . . . . .	55 772	87 779	76 558	26 738	16 457	17 921	15 441	11 239	3 334
Primary income and transfers from abroad . . . . .	36 850	39 967	45 636	10 599	12 215	10 962	11 860	14 511	15 379
Compensation of employees . . . . .	1 200	1 200	1 200	300	300	300	300	300	300
Interest . . . . .	21 860	23 113	28 775	6 254	7 977	6 797	7 747	10 004	11 008
Dividends etc. . . . .	1 700	2 052	3 377	241	1 126	1 060	950	765	1 388
Reinvested earnings . . . . .	4 003	4 478	2 984	1 377	454	511	642	870	323
Current transfers . . . . .	8 087	9 124	9 300	2 427	2 358	2 294	2 221	2 572	2 360
Primary income and transfers to abroad . . . . .	61 770	59 179	65 418	15 997	17 337	14 522	17 562	17 522	19 055
Compensation of employees . . . . .	3 201	3 443	3 910	893	976	1 040	1 001	1 025	1 053
Interest . . . . .	24 285	22 927	28 324	7 436	7 946	5 646	7 296	8 278	8 565
Dividends etc. . . . .	8 045	11 063	10 183	2 984	4 859	954	1 386	4 554	6 461
Reinvested earnings . . . . .	5 101	2 951	3 606	340	-932	2 300	1 898	-1 283	-2 087
Current transfers from general government . . . . .	7 932	7 200	7 474	1 318	1 569	1 635	2 952	1 710	2 122
Other current transfers . . . . .	13 206	11 615	11 921	3 026	2 919	2 947	3 029	3 238	2 941
Primary income and transfers from abroad, net . . . . .	-24 920	-19 212	-19 782	-5 398	-5 122	-3 560	-5 702	-3 011	-3 676
Current external balance . . . . .	30 852	68 567	56 776	21 340	11 335	14 361	9 739	8 228	-342
Capital transfers, net . . . . .	-1 067	-820	-1 277	-416	-279	-298	-284	-63	-289
Net lending . . . . .	29 785	67 747	55 499	20 924	11 056	14 063	9 455	8 165	-631
Revaluations, net . . . . .	7 966	-5 056	-15 080	-6 927	-1 533	-5 786	-834	-2 146	1 592
Increase in Norway's net assets . . . . .	37 751	62 691	40 419	13 997	9 523	8 277	8 621	6 019	961

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Table A16. Employed persons, employees by industry and total. 1000

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Total employees . . . . .	1 914,0	1 970,4	2 036,0	2 009,7	2 034,0	2 052,1	2 047,4	2 066,2	2 086,5
Agriculture and hunting . . . . .	16,7	17,1	16,4	16,6	16,4	16,4	16,0	15,8	16,4
Forestry and logging . . . . .	3,6	3,5	3,5	3,5	3,5	3,7	3,5	3,3	3,5
Fishing and fish farming . . . . .	8,1	7,9	8,3	8,2	8,4	8,4	8,3	7,9	8,5
Oil and gas extraction incl. services . . . . .	21,2	21,6	22,3	21,9	22,1	22,6	22,4	22,9	22,8
Oil and gas extraction . . . . .	17,2	16,5	16,4	16,3	16,2	16,6	16,4	16,4	16,6
Service act. incidental to oil and gas ext. . . . .	4,0	5,1	5,9	5,6	5,9	6,0	6,1	6,5	6,3
Mining and quarrying . . . . .	4,5	4,4	4,3	4,2	4,3	4,4	4,2	4,1	4,2
Manufacturing . . . . .	291,3	297,4	306,0	301,6	307,0	310,3	304,9	307,6	309,6
Food products, beverages and tobacco . . . . .	53,4	54,5	55,9	55,7	56,0	56,5	55,5	56,2	55,3
Textiles, wearing apparel, leather . . . . .	8,4	8,3	7,8	7,8	7,9	7,9	7,7	7,7	7,8
Wood and wood products . . . . .	15,3	15,4	16,2	15,6	16,2	16,5	16,3	16,1	16,2
Pulp, paper and paper products . . . . .	11,3	11,1	11,5	11,3	11,6	11,7	11,4	10,8	11,4
Publishing, printing, reproduction . . . . .	38,5	39,1	40,8	40,5	41,2	41,0	40,6	40,6	41,0
Refined petroleum products . . . . .	1,9	1,9	2,1	1,9	2,2	2,3	2,1	1,8	2,0
Basic chemicals . . . . .	9,3	9,6	9,5	9,3	9,5	9,6	9,4	9,6	9,7
Chemical and mineral products . . . . .	20,3	21,1	21,5	21,3	21,4	22,0	21,3	21,9	21,7
Basic metals . . . . .	16,6	17,0	17,2	16,7	17,3	17,8	16,9	16,6	17,3
Machinery and other equipment n.e.c. . . . .	70,8	72,6	75,1	73,8	75,2	76,4	75,1	76,3	76,6
Building of ships, oil platforms and moduls. . . . .	33,0	33,9	34,5	34,2	34,7	34,9	34,4	35,5	36,4
Furniture and other manufacturing n.e.c. . . . .	12,4	12,9	13,8	13,5	13,8	13,9	14,1	14,4	14,3
Electricity and gas supply . . . . .	19,9	19,8	19,8	19,7	19,9	20,1	19,6	18,9	18,9
Construction . . . . .	83,8	86,9	95,7	91,0	94,5	98,6	98,4	99,5	103,6
Service industries excluded general government	815,2	844,3	878,7	867,0	878,5	884,5	884,6	896,3	908,0
Wholesale and retail trade . . . . .	269,4	284,8	301,6	298,4	302,3	300,1	305,5	311,6	314,9
Hotels and restaurants . . . . .	54,0	56,4	58,6	56,5	58,6	60,4	58,9	58,2	60,1
Transport via pipelines . . . . .	0,4	0,2	0,2	0,1	0,2	0,2	0,2	0,1	0,2
Water transport . . . . .	49,0	48,6	48,7	48,3	48,2	49,7	48,4	47,8	48,0
Ocean transport . . . . .	40,9	40,2	40,2	40,0	39,7	40,9	40,2	39,9	39,7
Inland water and costal transport . . . . .	8,1	8,4	8,5	8,3	8,5	8,8	8,2	8,0	8,4
Other transport industries . . . . .	72,5	74,3	77,1	75,0	77,3	78,5	77,4	77,4	78,6
Post and telecommunications . . . . .	50,9	50,4	49,2	50,8	50,0	48,4	47,6	48,4	48,5
Financial intermediation . . . . .	50,8	50,3	49,5	49,8	49,5	49,5	49,0	48,6	48,5
Dwelling services . . . . .	1,2	1,2	1,2	1,3	1,3	1,3	1,0	1,3	1,3
Business services etc. . . . .	112,1	120,4	131,3	126,6	130,7	133,6	134,3	137,2	142,5
Personal services . . . . .	154,8	157,8	161,4	160,2	160,4	162,8	162,3	165,7	165,4
General government . . . . .	649,9	667,3	681,0	676,0	679,4	683,1	685,4	689,9	691,0
Central government . . . . .	149,9	152,1	152,5	152,6	152,2	152,0	153,1	153,5	152,3
Civilian central government . . . . .	104,6	106,7	108,8	108,9	108,7	108,4	109,2	109,5	109,3
Defence . . . . .	45,3	45,4	43,7	43,7	43,5	43,6	43,9	43,9	43,0
Local government . . . . .	500,0	515,2	528,5	523,4	527,2	531,1	532,4	536,4	538,7
Mainland-Norway . . . . .	1 851,5	1 908,3	1 973,3	1 947,7	1 972,1	1 988,4	1 984,6	2 003,3	2 023,8
Total employees and self-employed . . . . .	2 105,7	2 158,2	2 220,3	2 188,7	2 221,2	2 241,3	2 229,4	2 252,1	2 278,4

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Table A17. Employed persons, employees by industry and total.  
Percentage change from the same period in the previous year

	1995	1996	1997	97:1	97:2	97:3	97:4	98:1	98:2
Total employees . . . . .	2,5	2,9	3,3	3,9	3,6	3,0	2,8	2,8	2,6
Agriculture and hunting . . . . .	0,8	3,0	-4,5	-2,3	-5,7	-5,4	-4,5	-5,0	-0,2
Forestry and logging . . . . .	1,1	-0,6	0,0	1,7	-2,9	1,0	0,3	-4,6	-0,6
Fishing and fish farming . . . . .	2,7	-1,7	4,9	7,7	7,1	4,0	1,2	-3,3	2,1
Oil and gas extraction incl. services . . . . .	-1,1	2,1	3,0	2,0	2,9	3,9	3,2	4,8	3,5
Oil and gas extraction . . . . .	-1,2	-3,6	-1,0	-2,0	-1,5	-0,0	-0,6	0,7	2,2
Service act. incidental to oil and gas ext. . . . .	-0,5	26,2	16,2	16,1	17,5	16,2	15,1	16,8	6,8
Mining and quarrying . . . . .	-0,2	-0,5	-4,3	-5,8	-5,8	-4,3	-0,9	-3,1	-3,4
Manufacturing . . . . .	2,7	2,1	2,9	4,0	3,5	2,6	1,5	2,0	0,8
Food products, beverages and tobacco . . . . .	1,3	2,1	2,6	6,3	3,3	1,1	0,1	0,9	-1,3
Textiles, wearing apparel, leather . . . . .	-2,5	-1,1	-5,9	-5,3	-7,2	-6,2	-4,8	-1,1	-0,9
Wood and wood products . . . . .	2,5	0,5	5,2	5,6	6,2	4,7	4,4	3,0	-0,1
Pulp, paper and paper products . . . . .	3,9	-2,1	3,5	0,4	2,4	1,0	10,9	-4,0	-1,6
Publishing, printing, reproduction . . . . .	0,9	1,7	4,4	3,1	4,7	4,8	4,9	0,3	-0,6
Refined petroleum products . . . . .	-4,0	-0,0	9,4	10,6	9,5	8,7	9,0	-2,5	-9,2
Basic chemicals . . . . .	2,5	3,0	-1,2	-1,1	-1,6	-0,9	-1,3	2,7	2,5
Chemical and mineral products . . . . .	2,5	3,9	1,9	4,9	2,4	1,9	-1,4	2,5	1,3
Basic metals . . . . .	1,4	2,0	1,3	1,6	0,9	1,3	1,4	-0,7	-0,2
Machinery and other equipment n.e.c. . . . .	4,6	2,5	3,5	4,5	4,4	4,2	1,0	3,4	1,9
Building of ships, oil platforms and moduls. . . . .	3,8	2,8	1,8	3,6	3,4	1,2	-0,7	3,9	4,7
Furniture and other manufacturing n.e.c. . . . .	6,4	4,1	6,9	8,3	8,2	6,3	4,9	6,6	3,8
Electricity and gas supply . . . . .	0,6	-0,1	-0,0	1,7	0,1	-0,8	-0,9	-4,2	-5,0
Construction . . . . .	6,2	3,6	10,1	11,0	9,8	9,5	10,2	9,4	9,6
Service industries excluded general government	2,9	3,6	4,1	5,4	4,5	3,3	3,2	3,4	3,4
Wholesale and retail trade . . . . .	5,3	5,7	5,9	7,3	6,3	4,1	5,9	4,4	4,2
Hotels and restaurants . . . . .	1,2	4,4	3,9	5,7	4,4	2,6	3,0	3,1	2,6
Transport via pipelines . . . . .	-2,0	-41,7	-16,5	-48,7	2,6	-23,1	2,6	-8,3	-8,3
Water transport . . . . .	-1,3	-1,0	0,2	2,7	-0,3	0,1	-1,6	-0,9	-0,3
Ocean transport . . . . .	-1,9	-1,8	-0,0	1,8	-0,7	0,3	-1,4	-0,4	0,1
Inland water and costal transport . . . . .	1,7	2,9	1,4	7,3	1,8	-0,6	-2,1	-3,7	-1,9
Other transport industries . . . . .	0,5	2,6	3,7	4,6	4,6	3,0	2,6	3,2	1,6
Post and telecommunications . . . . .	1,7	-1,1	-2,3	1,0	-1,5	-4,5	-4,2	-4,9	-2,9
Financial intermediation . . . . .	0,1	-1,0	-1,6	-0,2	-1,6	-2,3	-2,4	-2,5	-2,0
Dwelling services . . . . .	2,6	2,5	-0,0	7,0	3,0	0,4	-11,7	-0,5	-0,3
Business services etc. . . . .	5,2	7,3	9,1	10,3	10,0	9,3	6,9	8,4	9,0
Personal services . . . . .	1,7	1,9	2,3	2,5	2,3	3,0	1,4	3,4	3,1
General government . . . . .	1,6	2,7	2,1	1,6	2,1	2,4	2,2	2,0	1,7
Central government . . . . .	-0,7	1,5	0,2	0,2	0,2	0,0	0,5	0,6	0,1
Civilian central government . . . . .	0,7	2,0	1,9	2,0	1,9	1,6	2,2	0,6	0,6
Defence . . . . .	-3,7	0,1	-3,8	-4,2	-3,7	-3,7	-3,4	0,6	-1,2
Local government . . . . .	2,3	3,0	2,6	2,0	2,6	3,1	2,7	2,5	2,2
Mainland-Norway . . . . .	2,6	3,1	3,4	4,0	3,7	3,1	2,9	2,9	2,6
Total employees and self-employed . . . . .	2,1	2,5	2,9	2,8	3,1	2,8	2,8	2,9	2,6



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Returadresse:  
Statistisk sentralbyrå  
Postboks 8131 Dep.  
N-0033 Oslo

Statistisk sentralbyrå

Statistics Norway  
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