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The cut-off date for the Inflation Report was 10 December 1999

# 1 SUMMARY

The period of strong growth that prevailed during the latter part of the 1990s has now been replaced by a period of slower growth. However, there are still strong pressures in parts of the Norwegian economy. The risk of a pronounced downturn has decreased since the September Inflation Report. The forecast for economic growth is thus higher in this report. Mainland GDP growth is estimated at 1% in 1999 and  $\frac{3}{4}$ % in 2000, and is thereafter expected to return to the long-term trend rate of growth in the economy.

The slowdown in growth is characterised by two divergent trends. Growth in public and private consumption will continue to fuel pressures in the labour market for service industries and the public sector. This will be intensified by the resource shortage in these segments of the labour market. On the other hand, profitability in large parts of the manufacturing sector is being squeezed by high cost levels and low international prices. This will primarily be reflected in a fall in fixed investment. Furthermore, petroleum investment will show a marked contraction after several years of record-high investment in the North Sea. As a result, employment in manufacturing industry is set to decline sharply.

Norges Bank expects consumer price inflation to remain at about the current level next year. Consumer prices are projected to rise by  $2\frac{1}{4}$ % in both 1999 and 2000. The projection for next year has been revised upwards by  $\frac{1}{4}$  percentage point, primarily reflecting the Storting's (Norwegian parliament) decision to increase indirect taxes in the budget for 2000. Moderate wage growth is pushing down consumer price inflation. On the other hand, higher international growth is likely to fuel externally generated price impulses. Consumer price inflation is projected to decline to  $1\frac{3}{4}$ % in 2001.

This Inflation Report discusses the medium-term outlook for the Norwegian economy to 2003. In the years after 2001, higher growth and increased demand for labour may again push up wage and price inflation. All in all, wage growth is expected to edge up when growth in the economy picks up. Given the current projections, price inflation may then show a slight increase.

Section 5 of the report discusses the effects of changes in some of the key assumptions underlying the projections. The projections are based on the technical assumptions that the krone exchange rate will remain stable against European currencies and that money market rates will move in line with market expectations, as reflected in forward rates in

December. Forward rates indicate that interest rates are expected to remain approximately unchanged next year. It is assumed that oil prices will gradually decline from today's level to a range of USD 15-17 a barrel.

The projections in this report are based on unchanged wage determination, ie that the contraction in the manufacturing sector has a restraining effect on wage growth in spite of relatively strong pressures in service sectors. Any change in wage formation could result in higher-than-projected wage growth. Wage growth is estimated to be up to 1½ percentage points higher in 2001 if labour market pressures in service industries have a full impact on the wage level.

This year, growth in government budget expenditure has been substantially higher than the level implied by the government budget adopted last autumn. Measured by the cyclically adjusted budget indicator, the total tightening of fiscal policy has been approximately halved compared with the original budget resolution. The estimates are based on a neutral fiscal policy for the years ahead. The assumptions entail approximately unchanged taxes and public spending growth on a par with the trend rate of growth in mainland GDP.

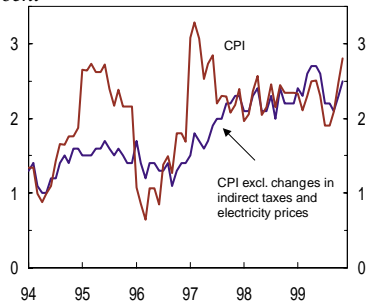
Sharp increases in individual expenditure items, particularly a number of social security items, early retirement schemes and priority areas in the health sector, is likely to put some pressure on fiscal policy. The calculations show that an annual increase in public expenditure equivalent to ½% of mainland GDP could, in the absence of other measures, push up price inflation towards 2½% in 2003. If the increase in expenditure is financed through tax increases, the effects of higher expenditure on consumer price inflation may be curbed. This presupposes, however, that changes in taxes are not compensated by higher growth in nominal wages. If, on the other hand, this financing results in a corresponding rise in wage growth, the effects on consumer prices may be stronger than estimated.

Section 5 also looks more closely at the effects of changes in the interest rate on consumer price inflation. The effect will partly depend on changes in the krone exchange rate. The estimates indicate that a 1 percentage point change in the interest rate over a three-year period will result in a change in the annual rise in consumer prices in the order of ¼-½ percentage point.

## 2

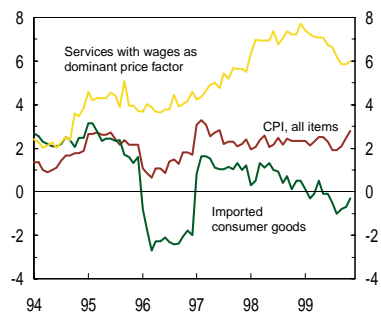
## RECENT DEVELOPMENTS

**Chart 2.1** Consumer prices (CPI). Total and excluding indirect taxes and electricity prices. 12-month rise. Per cent



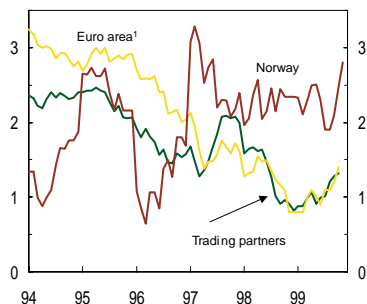
Sources: Statistics Norway and Norges Bank

**Chart 2.2** Consumer prices. All items and by supplier sector. 12-month rise. Per cent



Source: Statistics Norway

**Chart 2.3** Consumer prices in Norway and abroad. 12-month rise. Per cent



<sup>1</sup>Price rise in euro countries measured by the harmonised index of consumer prices.

Sources: Statistics Norway, Eurostat and OECD

## 2.1 Price developments

### *Price inflation somewhat higher than projected*

Price inflation has been slightly higher than expected in recent months. In November, the consumer price index rose by 2.8% compared with the same month one year earlier (Chart 2.1), primarily reflecting the rise in electricity prices. Between August and November electricity prices rose by 18%. The underlying rise in prices, excluding changes in indirect taxes and electricity prices, has exhibited a more stable trend. In November, the underlying rise in prices was 2.5%.

Food prices have shown a far more moderate rise this autumn than one year ago. External trade statistics for the third quarter show that prices for imported food fell by about 10% compared with the same quarter last year, while they rose by 4% the previous year. This may also have influenced the price trend for Norwegian-produced food.

Prices for imported consumer goods have moved on a downward trend since the effects of the Asian crisis were felt in the summer of last year. Service prices, with wages as a dominant cost factor, are still pushing up the year-on-year rise in consumer prices, but the rate of increase is slowing (Chart 2.2).

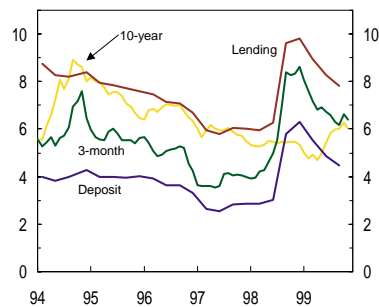
Price inflation among our traditional trading partners was 1.3% in October. Measured by the Harmonised Index of Consumer Prices (HICP), the rate of increase in prices in the euro area was 1.4% in the same month. The surge in oil prices has pushed up consumer price inflation among trading partners, although inflation is still moderate (Chart 2.3). Measured by the HICP, price inflation in Norway was 2.6% in November, against 2.4% one month earlier. The planned broadening of the basis for the HICP will probably entail an increase in price inflation in Norway, measured by this index, to the rate of increase in the traditional consumer price index. The broadening will probably not influence the rate of increase in the HICP in the euro area.

## 2.2 Interest rates, the exchange rate and monetary conditions

### *Stronger exchange rate and transitory rise in interest rates*

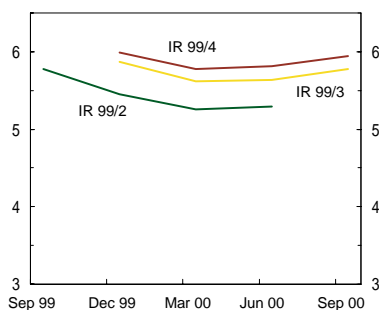
Norges Bank has lowered its key rates by 0.5 percentage point since the September Inflation Report. Since the beginning of the year, key rates have been reduced in five steps by a total of 2.5 percentage points. Internationally, the tendency has

**Chart 2.4** Interest rates in Norway. Banks' average deposit and lending rates, 3-month Euro-krone interest rate and 10-year government bond yield



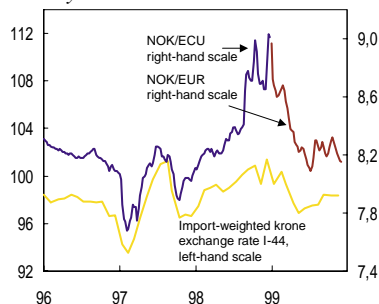
Source: Norges Bank

**Chart 2.5** 3-month forward rates (FRA rates)



Sources: Reuters and Norges Bank

**Chart 2.6** NOK/ECU and NOK/EUR exchange rates (weekly figures) and import-weighted krone exchange rate (monthly figures) against 44 currencies. January 1995=100



Source: Norges Bank

been to increase central bank key rates in recent months. In the euro area, the interest rate increase on 4 November was motivated by high monetary growth and an increase in producer prices, which were viewed as increasing the risk of higher price inflation. Moreover, it was emphasised that the economic framework conditions were now more favourable than in April when key rates were reduced.

In the US, a factor cited as part of the explanation for the increase in the federal funds rate was a tight labour market. The central banks in the UK, Sweden, Denmark, Canada, New Zealand and Australia have also raised their key rates since the September Inflation Report.

Three-month money market rates remain virtually unchanged compared with the level prevailing in September. However, three-month rates have been fairly volatile during the period. During the last days of September, nominal three-month rates rose by about 0.3 percentage point to 6.2%, followed by a gradual increase to mid-October before peaking at 6.5%. Thereafter, three-month rates fell again to 6.0% on 10 December. The increase primarily reflected the uncertainty associated with the year 2000, which has increased the cost of borrowing at the end of the year. This situation was not specific to Norway. In the euro area, the US, the UK, Japan and Sweden, interests rates showed a comparable, if not more marked, increase. The fall in interest rates since mid-October suggests, however, that the uncertainty linked to the year 2000 issue has diminished.

FRA rates now indicate that three-month rates are expected to fall slightly at the beginning of 2000, and then edge up through the year.

Ten-year government bond yields are now at 6.0%, or about the same level as in September. Internationally, bond yields have increased markedly through 1999, and Norwegian bond yields have largely followed this trend. Ten-year yields in Norway have continued to move up since the Inflation Report was presented in September. In mid-October, ten-year yields stood at 6.4%, thereafter moving down by about 0.4 percentage point. This also reflects the movement in international yields. The yield differential against comparable German bonds has hovered around 0.9 percentage point in October and November.

The krone has appreciated slightly against the euro since the September report. On 10 December, the exchange rate was NOK 8.11. In the first half of October, the krone depreciated and stood at 8.37 in mid-October. Since then, the krone has appreciated (Chart 2.6). The krone depreciated during the same period that three-month money market rates increased, and appreciated again when three-month rates fell. This may suggest that the uncertainty surrounding the year 2000 may have influenced the krone exchange rate against the euro. The krone appreciated against USD up to 1 October, but has

## How is the krone exchange rate affected by global exchange rate risk?

Small countries' currencies seem to have a tendency to depreciate when there is considerable uncertainty in the world economy and unrest in international financial markets. An indicator of this type of uncertainty is required in order to study the relationship between the krone exchange rate and uncertainty in global financial markets. The most common indicators of international uncertainty are:

- Swap spread in the US, which corresponds to the difference between yields on US private bonds and government bonds. An increase can indicate a greater focus on credit risk.
- International stock exchange indices. Shares are generally risky investment instruments, and a fall on international stock exchanges can indicate increased global financial risk.
- Historical exchange rate volatility. Increased fluctuations in exchange rates internationally can entail increased uncertainty, and thereby a greater focus on exchange rate risk.

The drawbacks of these indicators is that they either measure factors other than exchange rate risk directly (the first two) or that they do not necessarily measure how market participants assess the exchange rate risk (the third). Prices for currency options (implied volatility) are a more direct measure of market perceptions of exchange rate risk. As described in Eitheim,

Frøyland and Røisland (1999), such options are priced directly in implied volatility, which indicates the expected variation in the exchange rate (measured as annual standard deviation).

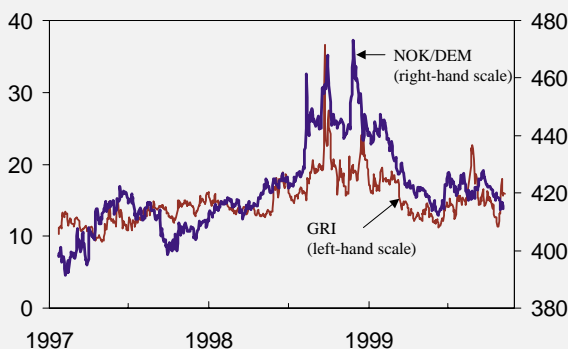
Options exist for a number of currencies. The largest and most liquid markets are for the US dollar (USD), the euro (EUR) and Japanese yen (JPY). Average implied volatility for these currency pairs could, for example, be used to construct an indicator based on these option prices. It appears, however, that this may provide an incorrect result. Brousseau and Scacciavillani (1999) – two researchers at the European Central Bank – have developed a formula for comparing implicit volatility for USD, EUR and JPY. On the basis of this formula, an indicator of global exchange rate risk – GRI (Global Risk Indicator)<sup>1</sup> can be constructed.

Chart 1 shows movements in the GRI since January 1997. We see that international exchange rate risk has varied considerably and that sizeable effects can often be identified by events in international financial markets. The GRI reached a particularly high level in the days around 10 October 1998 when the dollar depreciated sharply against the yen.

Chart 1 shows that there may be a relationship between global exchange rate risk and the level of the krone exchange rate. An increase in global exchange rate risk may in part result in increased uncertainty about the future krone exchange rate, which in turn increases the risk premium for the

<sup>1</sup>Brousseau and Scacciavillani (1999) call the indicator "Global Hazard Index" (GHI).

**Chart 1** *Developments in GRI and the krone exchange rate*



krone. An increase in the risk premium will normally result in a depreciation of the krone unless there is a corresponding rise in the interest rate differential.

The GRI measures only part of the risk in global financial markets. Because it contains only three major currencies, USD, EUR and JPY, it does not sufficiently capture flight-to-quality situations where market participants want to sell minor currencies and buy major currencies. It is conceivable that these general flight-to-quality situations have a stronger impact on the krone exchange rate than, for example, an increase in the volatility of the Japanese yen.

## References:

- Brousseau, V. And F. Scaccialvillani (1999): "A Global Hazard Index for the World Foreign Exchange Markets", European Central Bank Working Paper Series No. 1.
- Eitrheim, O., E. Frøyland and Ø. Røisland (1999): "Can the price of currency options provide an indication of market perceptions of the uncertainty attached to the krone exchange rate?", *Economic Bulletin* 1999/3.

depreciated again since mid-October. The exchange rate was NOK 7.99 on 10 December. Measured by the import-weighted exchange rate against 44 countries, the krone depreciated by 0.5% between August and November.

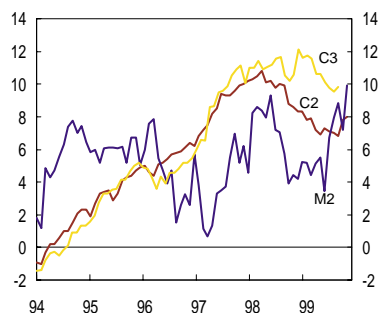
### *Slightly higher credit growth*

After peaking at end-March 1998, year-on-year growth in domestic credit (C2) slowed in the period to end-March 1999. Annual C2 growth then remained at about 7% for the next six months before increasing to around 8% in September and October. The rise in C2 since August primarily reflected higher bank lending. Growth in credit to the enterprise sector has moved on a downward trend through 1999, probably as a result of lower investment activity. On the other hand, growth in credit to the household sector has remained high, probably reflecting the sharp rise in house prices so far this year. The continued relatively high credit growth may also be related to high liquidity demand among the general public in connection with the turn of the year.

The growth in total credit (C3) has shown a downward trend in 1999, and was 9.8% at end-September. The slower growth rate is due to considerably slower growth in foreign debt. Since enterprises account for most foreign borrowing, this is probably related to lower investment activity.

The year-on-year growth in M2 varied between 3.5% and 5.5% in the first five months of 1999 (Chart 2.7). Money supply growth showed a rather pronounced rise in the summer months, probably reflecting the earlier disbursement of tax refunds in 1999 compared with one year earlier. Tax refunds disbursed in June resulted in higher bank deposits from households. From end-September to end-October, the year-on-year growth in M2 picked up further, rising from 7.2% to 9.9%. The high year-on-year growth may be due to higher liquidity demand related to the turn of the year.

**Chart 2.7** Money supply (M2), credit indicator (C2) and total credit to private and local gov't sector (C3). 12-month growth. Per cent



Source: Norges Bank

## Economic effects of Y2K

The transition to the year 2000 (hereafter referred to as Y2K) may have indirect and direct effects on the real economy as well as financial markets. It does not appear, however, that Y2K will have a substantial impact on overall economic developments.

Changes in enterprises' inventory demand may be assumed to influence total demand in 1999 because enterprises may wish to increase inventories to meet any supply problems. In the US, it is estimated that a possible increase in enterprises' inventories may boost GDP by up to 1 percentage point<sup>1</sup>. This effect, however, will be quickly reversed at the beginning of 2000. According to quarterly national accounts for the third quarter, there are some signs that inventories in Norway are increasing.

Furthermore, households may hoard various consumer goods prior to the turn of the year. In a market survey conducted by Norsk Gallup, 75% of the respondents stated that they were not planning to take special precautions in connection with Y2K.<sup>2</sup> However, nearly 400 000 households in Norway will prepare for the new millennium by buying extra quantities of different goods, primarily food and fuel. It is difficult to detect any special effect of this in preliminary statistics on household demand for the third and fourth quarters.

As a result of Y2K, enterprises have probably postponed investments in eg new computer systems this year. No statistics exist on the sale of software and computers to enterprises in Norway. In the UK, however, sales fell by 13% in the third quarter compared with the same quarter last year.<sup>3</sup>

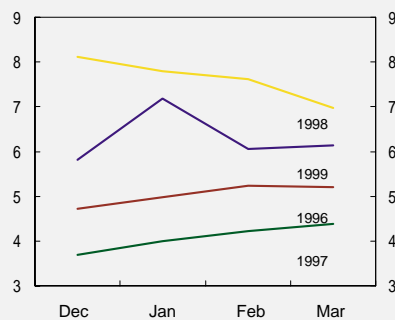
The estimates for the macroeconomic effects of Y2K vary. According to a survey conducted by the Federal Reserve Bank of Philadelphia, 30 forecasters expected Y2K to result in an increase in US growth of 0.1 percentage point in 1999 and a reduction in growth of 0.3 percentage point in 2000.<sup>4</sup> For the Netherlands, Ing Barings has

estimated that GDP will fall by 1.4% in 2000 as a result of Y2K.

Preparations linked to the new millennium draw resources away from other productive activities. In the US, it is estimated that the private sector has used about USD 50bn<sup>5</sup> on Y2K preparations, while the US government has used USD 100bn, according to the US Department of Commerce. Corresponding calculations have not been made for Norway, but an equivalent portion in relation to GDP would come to a little less than NOK 20bn. Globally, it is estimated that Y2K will cost USD 300-600bn (estimate from Gartner Group). These costs have accrued over several years, which means that costs in 1999 are lower than indicated by the figures themselves.

In a survey conducted by Gartner Group, it is estimated that particularly developing countries and Russia can expect problems linked to Y2K in telecommunications, energy and transport.<sup>6</sup> The preparations have been very limited in these countries. On the other hand, the infrastructure in these countries is less dependent on modern computer tools so that the problems will not necessarily be so extensive. In addition, the software is probably of a more recent date, and thereby less sensitive to Y2K. Since Norway has limited trade with these countries, any problems are not likely to have a substantial effect on the Norwegian economy.

**Chart 2. Implied one-month forward rate. Per cent**



Source: Norges Bank

<sup>1</sup>See <http://news.cnet.com/news/0-1009-200-1402160.html?tag=st.ne.1009.thed.1009-200-1402160>.

<sup>2</sup>See <http://www.gallup.no/menu/offentlig/default.htm>.

<sup>3</sup>See <http://news.cnet.com/news/0-1009-200-852359.html>

<sup>4</sup>The survey is referred to in [http://abcnews.go.com/sections/tech/CNET/cnet\\_y2k981124.html](http://abcnews.go.com/sections/tech/CNET/cnet_y2k981124.html).

<sup>5</sup>Cf speech by Greenspan, see <http://www.bog.frb.fed.us/BoardDocs/speeches/1999/19990917.htm>.

<sup>6</sup>See <http://www.sun-sentinel.com/money/y2k/internat.htm>.



Much of the discussion about Y2K has been concentrated on the effect on financial markets. A number of operators fear a shortage of liquidity around the turn of the year, and will therefore attempt to cover this liquidity requirement now. This has resulted in higher interest rates for liquidity to be supplied around the turn of the year both in Norway and internationally. Chart 1 shows Norwegian one-month forward rates<sup>7</sup> calculated before and after the turn of the year for the years 1996-1999. The forward rate for 1999/2000 is more than 1 percentage point higher around the turn of the year than in preceding and subsequent months. For the years 1996-1998, however, there is no equivalent jump in forward rates around the turn of the year. This indicates that the exceptionally high interest rate around the turn of the millennium is due to Y2K. This temporary increase in interest rates will probably have small effects on the real economy.

Extensive preparations have been made to address the Y2K issue in the financial sector.

<sup>7</sup>An implied forward rate is an estimated future interest rate. Under certain assumptions, implied forward rates can be interpreted as the market's interest rate expectations.

When summing up its latest survey of preparations among operators in the financial industry and their computer centres at 30 June 1999, the Banking, Insurance and Securities Commission concluded that the preparations appear to be adequate and that the Commission had little reason to expect considerable problems in connection with Y2K in these areas. Y2K preparations in the financial sector are discussed further in a box in Financial Sector Outlook for the second half of 1999.

Norges Bank has previously issued a statement concerning liquidity policy at the turn of the year. Interest rate movements indicate that fears of unrest in financial markets around the turn of the year have receded compared with earlier. Norges Bank will, however, under all circumstances supply sufficient liquidity and take into account that the redistribution of liquidity between banks may function more poorly than usual. Norges Bank will auction instruments to provide liquidity both prior to the Christmas weekend and between Christmas and New Year's Day with maturity in the second week of January.

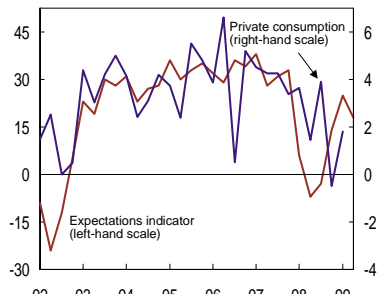
## 2.3 The cyclical situation

### *Growth higher than expected*

Economic indicators published since the September report point to higher-than-expected growth in the Norwegian economy. According to the national accounts, mainland GDP growth in the third quarter was 1.5% higher than in the same quarter one year earlier. Growth was primarily boosted by the consumption of services and fixed investment in service industries and distributive trades. In addition, housing investment has expanded at a higher-than-expected pace.

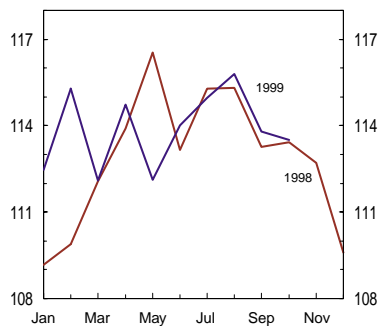
Developments in manufacturing industry nevertheless contributed to curbing overall growth. According to Statistics Norway's general business tendency survey, industrial leaders report that the third quarter was weaker than expected earlier. New orders from the domestic market fell compared with the previous quarter, which was a considerably weaker trend than expected. A pronounced decline in manufacturing investment is pushing down the total level of investment. The national accounts showed a fall in mainland fixed investment of 4.8% in the first nine months of 1999 compared with the same period one year earlier.

**Chart 2.8** Four-quarterly growth in private consumption and expectations indicator



Sources: Statistics Norway and *Økonomisk Rapport*

**Chart 2.9** Retail sales index. Seasonally adjusted volume. 1995=100



Source: Statistics Norway

### *Households optimistic about the future*

So far this year, private consumption has exhibited a moderate trend. The national accounts for the third quarter show an increase of 1.8% from the same quarter last year (Chart 2.8). Goods consumption has risen at a somewhat slower-than-expected pace, while the opposite was the case for the consumption of services. *Økonomisk Rapport's* consumer confidence indicator for August and November shows that households are more optimistic with regard to their personal finances and the country's economy in the period ahead. Historically, there has been some correlation between developments in private consumption and the consumer confidence indicator, which may indicate solid growth in private consumption in the near term. All in all, this means that our projection for private consumption growth of 2¼% remains unchanged. There has, however, been a tendency for the figures on consumption to be revised upwards at a later stage, and it is therefore conceivable that the final growth in consumption will be higher than this.

Public consumption is helping to sustain growth in total demand. The national accounts show that, so far this year, public consumption has expanded by 1.8% compared with the same period last year. This figure may be revised upwards. The final budget bill showed that budget spending in 1999 has been substantially higher than estimated earlier. The estimate for underlying real spending growth in the government budget has increased from 1½% to 2% since the presentation of the government budget for 2000. In the approved budget for 1999 last autumn, this growth was estimated at about ½%. Measured by the cyclically adjusted budget indicator, the estimate for the total tightening of fiscal policy has been reduced from about 1% to about ½% since the government budget was approved last autumn.

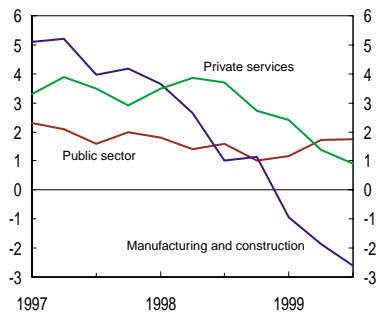
Figures from ECON and the Norwegian Association of Real Estate Agents show that resale home prices increased by a good 10% up to the end of the third quarter compared with the same period last year. This was approximately as expected in the previous report. Figures from OBOS indicate that resale home prices in Oslo stabilised in October and November.

The contraction in investment and slower growth in retail sales are reflected in import statistics. The volume of imports fell by 3.5% in the first three quarters of 1999 compared with the same period in 1998. The fall in imports in the third quarter was greater than expected in the September report.

### *Labour market stabilises and unemployment remains low*

Whereas employment in some manufacturing sectors is falling sharply, employment in the public sector and in some sheltered industries continues to rise. All in all, employment is in the process of stagnating, and in the third quarter was only 0.1% higher than in the same quarter last year, ie approxi-

**Chart 2.10** Numbers employed by sector. Percentage change on same quarter the previous year



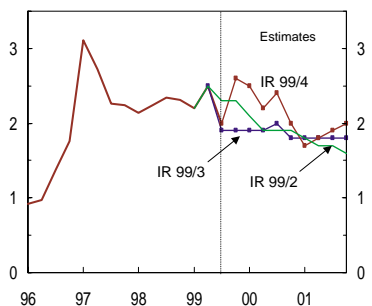
Sources: National Accounts and Statistics Norway

ately as expected. Statistics Norway's Labour Force Survey (LFS) for the third quarter also showed that the labour supply is stagnating.

Registered unemployment remains fairly stable and low. At the beginning of December, the number of registered unemployed stood at 56 500, equivalent to 2.4% of the labour force. The number of vacancies is now falling for industrial and technical occupations. However, as a result of higher demand for labour in construction, commercial activities and education, the number of vacancies has been fairly stable when adjusted for seasonal variations. LFS figures for the third quarter showed a slight increase in unemployment from the same quarter last year for the first time since 1996. Pressures in the labour market are thus still very strong.

## 3 NORGES BANK'S INFLATION PROJECTIONS

**Chart 3.1** *Current and earlier projections for consumer price inflation. Percentage rise on same quarter previous year*



Sources: Statistics Norway and Norges Bank

**Table 3.1** *Technical assumptions*

	1999	2000	2001	2002-2003
3-month money market interest rate (annual average) <sup>1</sup>	6.5	5.7	5.7	6.0
Exchange rate measured against euro <sup>2</sup>	8.33	8.25	8.25	8.25
Real rise in gov't spending	2½	2¼	2¼	2¼
Oil price NOK/barrel <sup>3</sup>	139	164	133	125

<sup>1</sup>Interest rates are assumed to remain aligned with market expectations as reflected in forward rates.

<sup>2</sup>The exchange rate is assumed to be NOK 8.30 per euro from Q4. This corresponds to approx. the average for the past three months

<sup>3</sup>The oil price is assumed to be about USD 20 per barrel in Q4. It is then assumed to gradually return to the range USD 15-17 per barrel.

### 3.1 The inflation outlook the next two years

Norges Bank projects price inflation at 2¼% in 1999, 2¼% in 2000 and 1¾% in 2001. Compared with the September report, the price projection for 2000 has been revised upwards by a quarter percentage point, primarily reflecting the approved increase in indirect taxes in the government budget for 2000.

In the last few years consumer price inflation in Norway has been characterised by a high rise in domestic costs which has pushed up prices for Norwegian-produced goods and services. However, the fall in prices for imported consumer goods has limited the rise in consumer prices to about 2¼%. In the next two years it is projected that a lower rise in wage costs will contribute to a slower rise in prices for Norwegian-produced goods and services, while higher commodity and producer prices internationally will result in a slight increase in import prices.

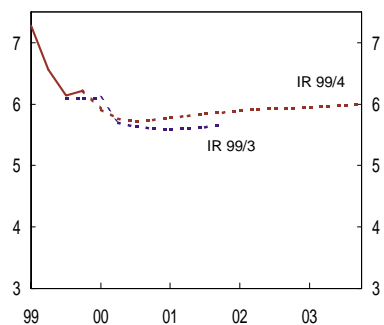
The underlying rise in prices is estimated to be 0.1 percentage point higher than the overall rise in consumer prices this year. This is primarily due to electricity prices which, despite a sharp increase this autumn, have on average fallen so far this year compared with the same period one year earlier. The underlying rise in prices – which excludes indirect taxes and electricity prices – is projected at a little less than 2½% in 1999 and 2% next year. In 2001, the underlying rise in prices is expected to shadow the rise in the total CPI.

In this Inflation Report we also present projections for the Norwegian economy in the period to 2003. The inflation projections for the period ahead and risks to the price outlook are discussed further in section 5.

#### *Interest rate and exchange rate assumptions*

The projections in this Inflation Report are based on the assumption that money market rates will move in line with market expectations, as reflected in forward rates in December. The assumption implies that the money market rate will on average be about 5¾% in 2000 (Chart 3.2). The estimation method is discussed further in a separate box. Key technical assumptions concerning monetary and fiscal policy are shown in Table 3.1. According to these forward rates, the differential against European rates will narrow from the current level of just under 3 percentage points to 1¼ percentage points at the end of 2001. In the calculations, the krone exchange rate is assumed to be NOK 8.25 against the euro throughout the projection period, which approximately corres-

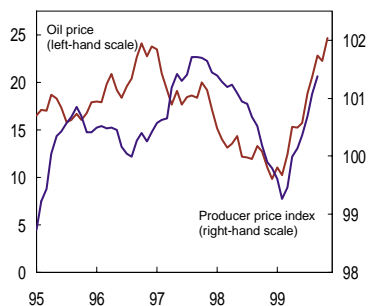
**Chart 3.2** *Technical assumptions concerning short-term money market rates<sup>1</sup>*



<sup>1</sup>Three-month money market rates up to 8 December. The rate is kept unchanged at the level of 8 December through Q4 1999. From Q1 2000: short-term forward rates estimated using four money market rates and five government bond yields with different maturities as observed on 8 December

Source: Norges Bank

**Chart 3.3** *Oil price, USD/barrel and producer price index for trading partners. 1995=100*



Sources: OECD and Norges Bank

**Table 3.2** *Consumer prices. Percentage change from previous year*

	1999	2000	2001
US	2¼	2½	2½
Japan	-½	0	¼
Germany	½	1	1¾
France	½	1	1¾
UK	1½	1¾	1¾
Sweden	2½	2¼	2½
Finland	½	1½	2
Denmark	2½	2½	2¼
Norway's trading partners <sup>1</sup>	1¼	1½	2
Euro area <sup>2</sup>	1	1½	1¾

<sup>1</sup> Weighted by competitiveness weights

<sup>2</sup> Eurostat weights (country's share of euro area's consumption)

Sources: OECD and Norges Bank

ponds to the average so far in the fourth quarter. Due to movements so far in 1999, this means that the krone will appreciate by an average 1¼% from 1998 to 1999. In the calculations, the krone exchange rate against the euro and against the currencies of our trading partners is thereafter assumed to remain constant.

### *Stronger international price impulses*

All in all, prices for imported goods and services are estimated to fall by 1% in 1999 and rise by 1% in both 2000 and 2001.

Most commodity prices have edged up since last summer. Stronger growth in the world economy in the period ahead will generate higher demand for commodities and, in isolation, result in further price increases. On the other hand, production capacity for a number of commodities has risen considerably in recent years, which will curb the price effects of higher demand. Overall, commodity prices, excluding oil, are expected to show a moderate increase the next two years.

The oil price has continued to climb and is now at its highest level since the beginning of 1991. The rise in oil prices must be seen in the light of OPEC's general compliance with the adopted production cuts. As a technical assumption, it is assumed that the average price of oil so far in the fourth quarter, which was close to NOK 190 a barrel, will remain at this level until the end of the next quarter. Moreover, it is assumed that the oil price in the course of one year will return to a level of USD 15-17 (Table 3.1). The estimate for the oil price has been adjusted upwards by NOK 30 a barrel for 2000 and by NOK 13 a barrel for 2001 in relation to the September report.

Following a sharp fall in producer prices among our trading partners in the first quarter, prices rose in the second and third quarter (Chart 3.3). The movements partly reflect changes in oil prices and other commodity prices. The estimate for the change in producer prices among trading partners has been adjusted upwards to -¼% in 1999. These prices are projected to increase by 1½% next year, which partly explains why the fall in prices for imported goods this year is being replaced by rising import prices from the year 2000.

Changes in the krone exchange rate may also have contributed to the fall in prices for imported goods. So far this year the krone has appreciated by 1¼% measured by the import-weighted exchange rate index. As usual, we have assumed in this report that movements in the krone exchange rate will not make an independent contribution to changes in import prices the next few years.

Although the sharp rise in oil prices has pushed up consumer price inflation among our trading partners, price inflation has remained subdued, partly because the indirect tax system in many countries is curbing the impact of oil prices on consumer prices. Furthermore, intensified competition in the product

## Revision of the trade-weighted exchange rate index

With effect from 1 February 2000, Norges Bank will change the construction of the trade-weighted exchange rate index and expand the number of currencies in the index. The trade-weighted index is published daily by Norges Bank on Reuters. The background for the revision is as follows:

- The trade-weighted index is today constructed on the basis of changes in exchange rates in relation to exchange rates prevailing on 18 October 1990 (base rates). The exchange rates for individual currencies are weighted according to current annual trade weights. This method has some drawbacks. Among other things, changes in the weight of a currency that diverges considerably from its base rates will result in fairly substantial changes in the aggregated index.
- Eleven of the currencies in the current basket were replaced by the euro on 1 January 1999.
- Norges Bank's import-weighted exchange rate index for 44 countries illustrates that countries with relatively small weights have a considerable impact on the effective exchange rate through sizeable bilateral exchange rate movements. This problem also exists in the trade-weighted index, where Asia in particular is underrepresented. Whereas 98.5% of trade in manufactures was covered in 1970, the figure had fallen to 89% in 1996.

The trade-weighted index will hereafter be calculated as a chain-linked index, thereby preventing major changes in the index as a result of changes in the weights. The weights will be regularly updated. Through the year the index will be calculated in relation to the exchange rates on the first business day in February (base rates). In February the following year, the base rates will be moved one year ahead and the index will be chained. Further exchange rate movements will be calculated on the basis of the new base rates. The new index will be set at 1990 = 100. By way of comparison, the current index was 99.9 in 1990.

Earlier, expanding the number of currencies in the trade-weighted index was limited, partly due to insufficient data on unit labour costs (ULC). Due to problems in comparing productivity changes

between countries, emphasis is now being placed on changes in relative labour costs as an indicator of changes in competitiveness. Such figures are more readily accessible than figures on ULC.

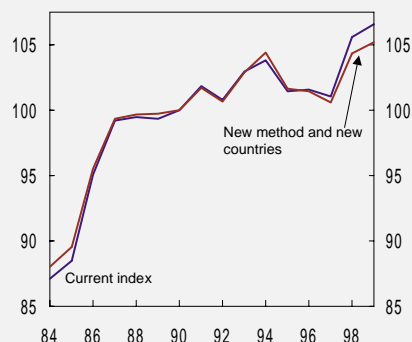
In addition to the existing 18 countries in the index, Singapore, South Korea, Taiwan and Thailand are included from 1984, and Poland, the Czech Republic and Hungary from 1994. Daily exchange rate quotations are available from these dates. The expansion of the index means that about 94% of trade in manufactures is covered by the index in 1996, compared with 89% in the current index. For euro countries, the current exchange rates will be replaced by the euro when the new index is published.

Norges Bank will at regular intervals evaluate whether there is a basis for further expanding the index. Any expansion of the index will take place in connection with the annual change in base rates.

The chart shows the current trade-weighted index along with the new index. Movements in the two indices generally coincide, with the exception of 1986 and 1998. The divergences are primarily due to the inclusion of a greater number of currencies. The Norwegian krone depreciated substantially in both these years. Even though the new currencies constitute a small part of the trade-weighted index, the change in the krone exchange rate is slightly reduced when they are included.

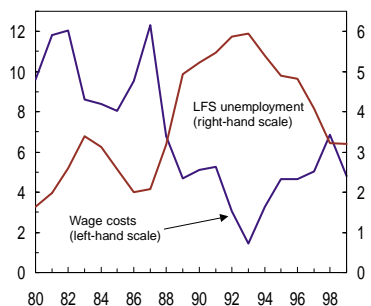
According to the new trade-weighted index, the effective krone exchange rate depreciated by 3.7% from 1997 to 1998, while the current index shows a depreciation of 4.5%.

**Chart 1** *Current and new trade-weighted index. 1990=100*



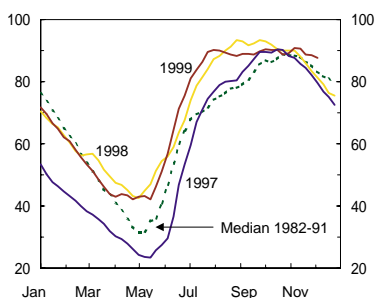
Source: Norges Bank

**Chart 3.4** *Average wage costs, mainland Norway. Annual percentage growth. LFS unemployment. Per cent*



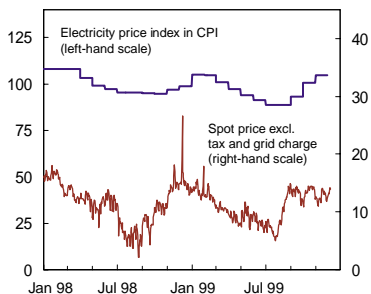
Sources: Statistics Norway and Norges Bank

**Chart 3.5** *Water reservoir levels. Weekly figures*



Source: Statistics Norway

**Chart 3.6** *Electricity prices: spot prices, in øre/kWh*



Sources: Statistics Norway and Nordpool

market in the euro area and continued high productivity growth in the US have restrained price inflation. These processes are expected to curb the stronger price impulses from commodity and producer prices in the period ahead, particularly in EU countries. In the US, a sharper rise in import prices and a tight labour market are nevertheless expected to translate into higher inflation the next few years. All in all, consumer price inflation among trading partners is estimated to rise from 1¼% in 1999 to 2% in 2001 (Table 3.2).

### *Manufacturing pushes down wage growth*

Annual wage growth is estimated at 4¾% in 1999, and is based on the assumption that wage drift will remain approximately in line with last year's level. However, there is still substantial uncertainty associated with wage drift this year. The labour market remains relatively tight, which may have contributed to high local pay increases, particularly in service industries.

Traditionally, manufacturing industry has been a wage leader in the Norwegian economy. This has been based on the notion that profitability in manufacturing should serve as a guideline for wage growth in the economy as a whole. Wage determination in the RIMINI model incorporates this assumption. In the years ahead, wage determination in Norway will be marked by two opposing effects. Manufacturing employment is expected to show a pronounced decline as a result of low profitability and lower fixed investment. This points to lower wage growth the next few years. On the other hand, the labour market in the public sector and some private service industries is expected to remain fairly tight. This implies that there may be upward pressures on wage growth in these sectors.

The projections presented here are based on the assumption that manufacturing will continue to be a wage leader. All in all, lower consumer price inflation and abating pressures in the labour market combined with slightly higher unemployment are expected to curb wage growth the next few years. Wage growth is estimated at about 3¾% in both 2000 and 2001. If there is a change in the traditional system for wage determination, the probability of higher wage growth is greater than the probability of lower wage growth. In section 5 we look more closely at the uncertainties inherent in the wage projections and shed light on possible effects of a change in traditional wage determination.

### *Electricity prices curb price inflation this year*

In spite of a sharp rise in prices this autumn, electricity prices have fallen by a little less than 3% so far this year compared with the same period in 1998. In addition to the strong competition in the power market, the high reservoir levels this summer contributed to reducing electricity prices in the period to August (Chart 3.5). Electricity prices will contribute to

**Table 3.3** Various institutions' projections for consumer price inflation in Norway in 1999 and 2000<sup>1</sup>.

Percentage change from previous year

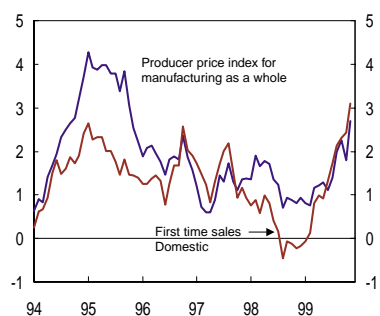
	1999	2000
Ministry of Finance	2.2	2.0
Statistics Norway	2.3	2.1
OECD <sup>2</sup>	2.3	2.1
IMF	2.3	2.3
Consensus Forecasts <sup>3</sup>		
Highest estimate	2.3	2.1
Average	2.3	2.0
Lowest estimate	2.2	1.9

<sup>1</sup>Latest official projections from the various institutions.

<sup>2</sup>Consumption deflator

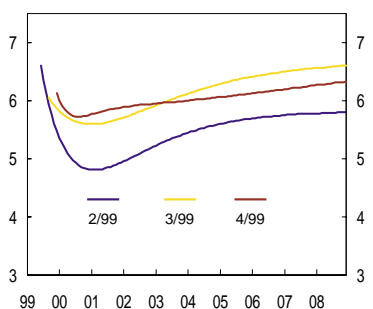
<sup>3</sup>August 1999

**Chart 3.7** Price index for first-time sales and producer prices. 12-month rise. Per cent



Source: Statistics Norway

**Chart 3.8** Norwegian forward rates. Expected short-term rates. Per cent



Source: Norges Bank

pushing down the overall rise in consumer prices by roughly 0.1 percentage point this year. In 2000, the increase in the electricity tax, with a full feed-through to consumers, will push up electricity prices by 6-7%. In 2001, electricity prices are assumed to rise in pace with the CPI.

### Local government fees push up house rents

The sub-index for house rents rose by 3.1% in November compared with the same month one year earlier. The contribution to consumer price inflation has increased since June this year, when the year-on-year rise was 2.6%. House rents will contribute to pushing up the rise in the CPI this year. The increase in the index for house rents must partly be seen in connection with the increase in local government fees. Local government fees for dwellings are one of the components in the sub-index for rents. In the National Budget for 2000, local government fees are estimated to increase by 7.9% in 1999 and 4.6% next year. We assume that house rents will contribute to pushing up the rise in the CPI again in 2000.

## 3.2 Inflation expectations

Consensus Forecasts' December projections for the Norwegian economy show that a selection of market observers expect the CPI to rise by 2.3% in 1999 and 2.0% in 2000 (Table 3.3). On average, the forecasts for 1999 and 2000 have been revised downwards by 0.1 percentage point since August. It is uncertain to what extent the decision to raise indirect taxes is reflected in the estimates. The same observers expect a somewhat less pronounced turnaround in the economy than implied by our estimates.

In recent months developments in producer and wholesale prices have been heavily influenced by changes in oil prices. Experience shows that an increase in oil prices has only a minor impact on the CPI (see box in June Inflation Report). In November, the year-on-year rise in the producer price index came to 5.8%. Producer prices for manufacturing rose by 2.7% in the twelve months to November (Chart 3.7). The twelve-month rise in the wholesale price index moved up from 2.1% in August to 3.1% in November, primarily as a result of the rise in oil prices.

Information on market participants' price and interest rate expectations is provided by the yield curve in the money and bond markets. Using the yield curve, forward rates, which are implied rates between two future points in time, can be calculated. Chart 3.8 shows movements in the shortest forward rates, converted to three-month rates, since the June Inflation Report. Under certain assumptions, these forward rate curves can be interpreted as an indication of market expectations of changes in the three-month rate in the years ahead. The calculations are discussed further in a separate box.



## The calculation of forward rates in the inflation reports

Since the publication of Inflation Report 1998/4, Norges Bank has based the assumption concerning interest rate movements on the forward rate curve, which can be computed on the basis of observed market rates. Forward rates can be interpreted as market expectations of future interest rates. The assumption is of a technical nature and is not based on discretionary evaluations by Norges Bank concerning interest rate changes.<sup>1</sup>

Forward rates can also be interpreted as an indicator of market confidence in economic policy. The difference between forward rates in Norway and in euro countries far into the future can be interpreted as the expected inflation rate differential in the long term plus a risk premium. Substantial changes in this forward rate differential can be interpreted as changes in the market's confidence that inflation in Norway will over time be on a par with inflation in the euro area. Smaller differences in long-term forward rates may be due to various types of risk premium or temporary and random effects.

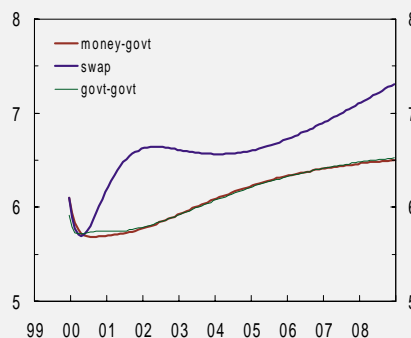
In order to calculate forward rates, Norges Bank uses a method developed by Nelson and Siegel (1987), developed further by Svensson (1994). The method presupposes a specific type of function for the forward rate curve. The function is, among other things, characterised by convergence towards a constant interest rate level in the long term. The function is estimated on the basis of observed interest rates in the market with the help of probability maximisation. Forward rates are calculated for very short maturities for all future dates. In Inflation Report 1999/4 and in future reports, forward rates are calculated as moving three-month averages so that they can be interpreted as expected three-month rates.

In the calculations, Norges Bank uses observations of four money market rates with maturities from one to twelve months and yields on five

government bonds with a residual maturity from about 1½ to 9½ years. These interest rates were selected because they are assumed to come from the most liquid markets in the various maturity segments. Furthermore, it is relatively easy to find comparable interest rates for other countries, which is necessary in order to calculate forward rate differentials.

It is not certain that the combination of money market rates and government bond yields provide the best indication of expected future money market rates. Different credit risk premia for government paper and money market instruments can influence the estimated forward rates. If the credit risk diminishes considerably in the transition from money market rates to bond yields, this may mean that the forward rate curve falls more – or rises less – than implied by interest rate expectations in the area 1-2 years ahead.

**Chart 1.** Forward rates based on various interest rates. 1 December 1999



Source: Norges Bank

The difference in credit risk can be eliminated by replacing money market rates with Treasury bill yields. This has been done in the green curve in the chart below. Alternatively, government bond yields can be replaced by long-term private bond yields<sup>2</sup>, as shown in the blue curve in the chart. The red curve is estimated on the basis of money market rates and bond yields, ie applying the observations Norges Bank normally uses in calculating forward rates.

<sup>1</sup>See the leader in Inflation Report 1999/2 for further comments.

<sup>2</sup>The fixed-rate component in interest rate swaps with maturities from two to ten years.

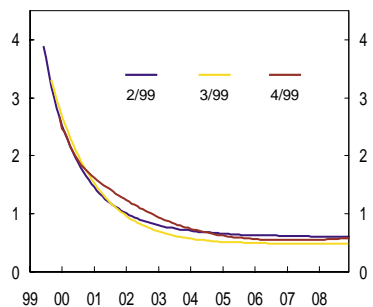
The difference between the red and green curve is marginal. This indicates that differences in credit risk in the first part of the curve were of little importance when this calculation was made. However, in periods of greater market uncertainty, the two approaches may provide quite different results. The blue curve, which is based on private bond yields for all maturities, moves on a fairly unsteady path and does not flatten out in the course of the next ten-year period. It is also considerably higher than the other two. This primarily reflects the higher credit risk on long-term private bonds compared with equivalent government bonds. The credit risk premium may rise in step with the maturity, and is not constant over time. A deviation thus arises between the forward rate and the expected interest rate, implying that forward rates in the blue curve only reflect actual interest rate expectations to a limited extent. On the other hand, forward rates that are based on long-term government yields are slightly lower than the expected money market rate. However, measured as the average difference between money market rates and Treasury bill yields, this difference is fairly small.

Forward rates that are used in the inflation reports cannot be interpreted as a precise measure of interest rate expectations. However, it seems likely that they are a good approximation of actual expectations. There may be some random variations in forward rate curves over time, but the effects are rather small and are of minimal importance to projections for economic developments. Norges Bank will revert to this and provide a further analysis of forward rates in the next edition of Economic Bulletin.

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- Nelson, C.R. and A.F. Siegel (1987): "Parsimonious Modeling of Yield Curves", *Journal of Business*, 60.
- Svensson, L.E.O. (1994): "Estimating and Interpreting Forward Interest Rates: Sweden 1992-94", CEPR Discussion Paper Series, No. 1051, October.

**Chart 3.9** *Differential between expected short-term rates in Norway and Germany. Percentage points*



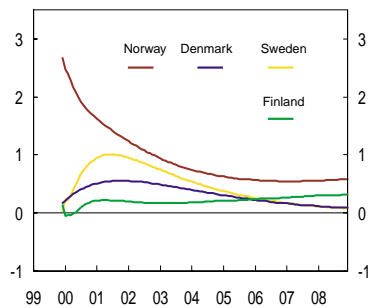
Source: Norges Bank

In the short and medium term, forward rates reflect market expectations concerning cyclical developments and the monetary policy stance. Forward rates with maturities far into the future provide more information concerning the market's confidence that the overall economic policy will result in low inflation over time, while also reflecting long-term global interest rates.

Chart 3.8 shows that forward rates in Norway are approximately unchanged since the September report. The forward rates indicate that interest rates are expected to remain virtually unchanged the next few years. Chart 3.9 shows the differential between Norwegian and German forward rates now and in the previous two inflation reports. The long-term forward rate differential may be seen as an indicator of the market's confidence that inflation in Norway will over time be on a par with the level of inflation in the euro area. This differential is about 0.6 percentage point, approximately the same as in the September report.

Chart 3.10 shows a comparison of forward rate differentials against Germany for Norway, Sweden, Denmark and Finland. The chart illustrates that short-term rates are currently higher in Norway than in the other countries, but that the spread is

**Chart 3.10** *Forward rate differentials against Germany 8 December 1999. Percentage points*



Source: Norges Bank

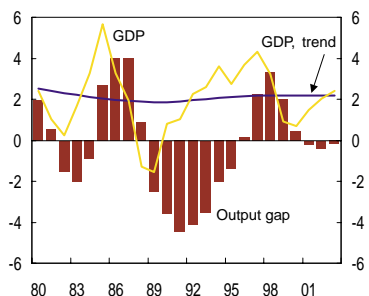
expected to narrow in the years ahead. In Sweden, market participants appear to expect a substantial increase in short-term rates the next few years. In the long term, Norway has a slightly higher forward rate differential against Germany than Sweden, Denmark and Finland.

**Table 4.1** Key aggregates for Norway, 1999-2001. Percentage change from previous year unless otherwise indicated

	1999	2000	2001	2002-2003
Mainland demand	¾	1	1¾	2½
Private consumption	2¼	2	2	2¾
Public consumption	2¼	2¼	2	2
Fixed investment	-5½	-3½	½	2¼
Traditional exports	1½	3¾	5½	5¼
Traditional imports	-2¾	-1	3½	5
GDP	¾	2¼	1¾	2
Mainland GDP	1	¾	1½	2¼
Employment	½	-½	0	1
Unemployment, LFS	3¼	3¾	4	4
Consumer prices	2¼	2¼	1¾	2
Annual wages	4¾	3¾	3¾	3¾

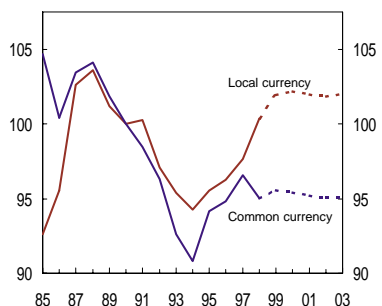
Source: Norges Bank

**Chart 4.1** Real mainland GDP growth, trend GDP growth and output gap



Sources: Statistics Norway and Norges Bank

**Chart 4.2** Wage costs in Norway relative to trading partners'. Index 1990=100



Source: Statistics Norway, the Technical Reporting Committee on Income Settlements and Norges Bank

## 4 MEDIUM-TERM PROJECTIONS FOR THE NORWEGIAN ECONOMY TO 2003

### 4.1 Main features

A long period of expansion is now behind us, and the Norwegian economy is experiencing a period of slow growth, although labour force participation is still at a record level with strong pressures in some parts of the labour market. However, the slowdown in 1999 and 2000 shows signs of being less pronounced than expected. Mainland GDP growth is estimated at ¾% in 2000 and 1½% in 2001. Thereafter, growth is expected to return to trend. Employment growth will then move back to a rate slightly higher than the demographic growth in the labour force.

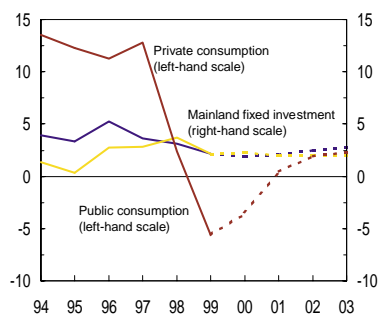
Demand for labour in the public sector and in service industries is expected to continue to rise. It looks as though the downturn will be limited to manufacturing, partly as a result of a deterioration in profitability and competitiveness, but also as a result of a sustained decline in petroleum investment. The downturn implies considerable restructuring in the shipbuilding industry and sectors of the engineering industry. The effects of the downturn on overall activity will depend in part on the adaptability of the enterprises that are affected.

For the past few years, supply-side factors, first and foremost the tightness of the labour market, have made it increasingly difficult to combine high production growth with low domestic cost inflation. All in all, productivity growth in the Norwegian business sector has been declining, with consequences for the exposed sector in particular. Since 1994, wage growth in Norwegian manufacturing has been 8 percentage points higher than among trading partners (Chart 4.2). The Asian crisis resulted in falling commodity prices, low international demand and hence poor profitability in Norwegian manufacturing industry. In addition, petroleum investment is falling this year, and will fall even more sharply in 2000.

The business sector's first measure will be to reduce investment. This will probably happen in all segments. In manufacturing, cost reductions will be achieved fairly quickly by adjustments to the workforce. The effect on total production will probably be slightly less than the reduction in employment, in part because average productivity is expected to rise.

Some manufacturing and construction sectors are part of an international and flexible labour market, with a component of foreign labour. Some enterprises will also be able to shift to new activities once resources have been released from other activities. Flexibility and adaptability will restrain the increase in unemployment. At the same time, it is estimated that

**Chart 4.3** Demand components, mainland Norway. Annual percentage growth



Sources: Statistics Norway and Norges Bank

employment growth in the sheltered sector will be slightly higher than previously expected. This will help to stabilise total employment.

A high degree of adaptability in the business sector may lead to a less pronounced decline in manufacturing employment than estimated. On the other hand, profitability in the business sector is weak. The enterprise sector, including the petroleum industry, has had substantial net borrowing in both 1998 and 1999. It is uncertain whether our estimates of lower investment and a decline in employment will result in a sufficient improvement in enterprises' financial situation. This may point to a more pronounced downturn.

There is also considerable uncertainty associated with other estimates, including household saving. Demographic factors indicate that household saving will show underlying growth, partly as a result of an increase in private pension saving. At the same time, household financial wealth is at an historic high. Household real income is expected to increase by 1½% in 2000, nearing 3% at the end of the medium-term period. The outlook for household income and wealth implies a possibility that household demand will increase at a faster pace than forecast.

The medium-term projections are contingent on our assumptions about fiscal policy, interest and exchange rates and wage determination. Substantial deviations from these assumptions will result in different developments from those outlined here. Developments over the past few years may indicate that fiscal policy and wage determination, in particular, may differ from the assumptions underlying our projections. Among other things, rising social security spending and increased demand for public services may fuel pressures for a more expansionary fiscal policy. Labour shortages in parts of the public sector and private services may imply that service industries will become wage leaders, particularly in the event of an increase in public transfers to squeezed sectors.

The uncertainty associated with the calculations, and the effects of changes in key assumptions are discussed in detail in section 5.

**Table 4.2** GDP estimates. Percentage change from previous year

	1998	1999	2000
US	4	3½	3
Japan	¾	¾	1½
Germany	1¼	2½	2½
France	2¾	3	2¾
UK	1¼	2¼	2½
Sweden	1¾	2¾	2¾
Finland	3½	3½	3
Denmark	1½	1¾	2¼
Norway's trading partners <sup>1</sup>	2½	2¾	2¾
Euro area <sup>2</sup>	2¼	2¾	2¾

<sup>1</sup> Weighted by export weights

<sup>2</sup> Weighted by the IMF's GDP weights corrected for purchasing power

Sources: OECD and Norges Bank

## 4.2 The international environment

### Growth picks up

The economic outlook is now far brighter than it was at the beginning of 1999. Global economic growth is expected to be about 3% this year, rising to 3½% in 2000. Since the September Inflation Report, the growth estimate for our trading partners has been revised up by ¼% this year and in 2000.

The countries hit by the Asian crisis appear to be recovering rapidly, and are all expected to achieve positive growth rates

in 1999. So far, Brazil's devaluation in January 1999 only appears to have caused a minor setback to economic growth in Latin America, but has resulted in increased trade policy tensions among the countries in the region. In Russia, economic developments have been less negative than feared, and a slight upturn is expected in 1999. Economic growth in most central and eastern European countries dipped slightly in 1999, reflecting difficult financing conditions and the effect of the crisis in Russia in 1998.

Revised national accounts figures for the US reveal that between 1992 and 1998 average GDP growth rose from 3.2%

### A comparison of the projections in the December 1998 Inflation Report

The risk of a pronounced turnaround in the Norwegian economy has been reduced over the past year. This is illustrated by comparing the projections in the Inflation Report with the projections in the December 1998 Inflation Report.

The turnaround this year has had less of an impact on output and employment than could be feared. The composition of the supply of goods and services has changed through 1999. Norwegian-produced goods and services accounted for a higher-than-expected share of demand. This is reflected in the upward revision of the projection for mainland GDP growth (Chart 1) and the downward revision in the projection for imports. Productivity

growth is now also expected to be higher than forecast one year ago.

Total mainland demand will probably be higher the next two years than expected in December 1998. Public consumption has been considerably higher than projected in both 1998 and 1999 (Chart 2). The profile of petroleum investment has also changed since last year. Whereas petroleum investment was projected to fall by 15% in 1999 and 2000, the decline is now estimated at 10% and 25% respectively in these two years.

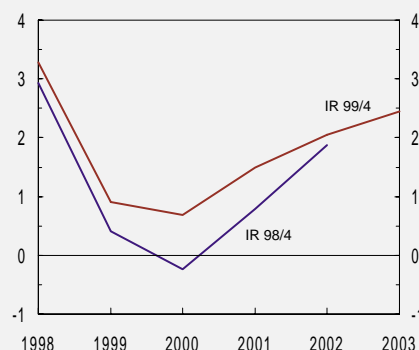
In December 1998, we projected a sharper increase in unemployment and a stronger deceleration in wage growth in 2001 and 2002. Chart 3 shows expected changes in employment. The projections for 1999 and 2000 show little change, but have been revised upwards from 2001.

The underlying rise in wages and prices is now expected to be lower in 1999 and 2000 than was

**Table 1.** Estimates for some key macroeconomic aggregates for 1999. Percentage change from previous year unless otherwise indicated

	IR 1999/4	IR 1998/4
Mainland demand	¾	- ¼
Private consumption	2¼	1¾
Public consumption	2¼	1
Gross fixed investment	- 5½	- 8
Fixed investment, petroleum activities	- 10	- 15
Exports, traditional goods	1½	2¼
Exports, crude oil and gas	0	6½
Imports, traditional goods	- 2¾	- 2
GDP	¾	1¼
Mainland	1	½
Employment	½	½
Labour force, LFS	¼	¾
Unemployment, LFS	3¼	3½
Consumer prices	2¼	2½
Annual wages	4¾	6
Current account balance (NOK bn)	34	17

**Chart 1** Mainland GDP. Annual percentage growth

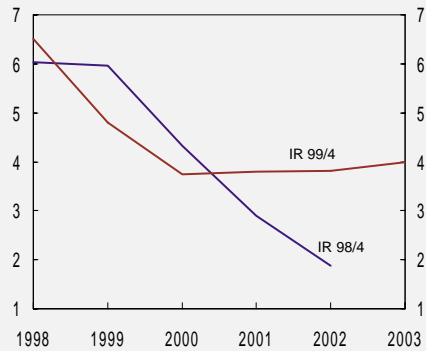


Sources: Statistics Norway and Norges Bank

projected one year ago (Charts 4 and 5). Imported price inflation has been considerably lower than expected. This is the main reason for the downward adjustment in consumer price inflation in spite of stronger growth in demand. However, as a result of our current projection of faster growth towards the end of the period, wage growth is expected to be slightly higher in 2000 and subsequent years (Chart 4). Similarly, the estimate for the consumer price index has been revised up towards the end of the projection period.

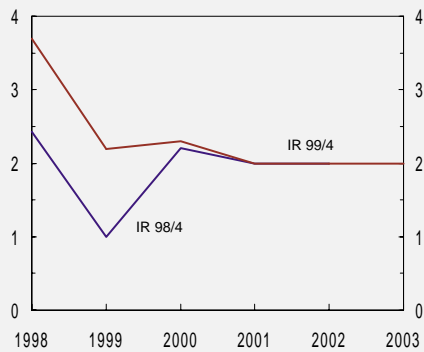
The estimate for the oil price has been adjusted upwards considerably compared with last year. The rise in oil prices helps to explain the sharp upward revision of the projections for the current account balance in the years ahead (Chart 6).

**Chart 4 Annual wages. Annual percentage growth**



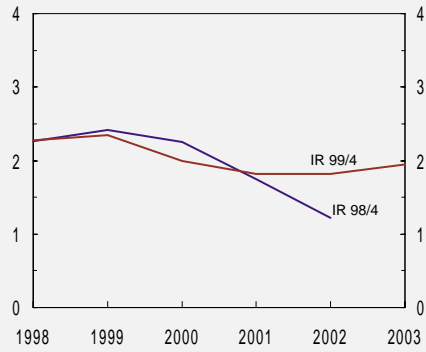
Sources: Statistics Norway and Norges Bank

**Chart 2 Public consumption. Annual percentage growth**



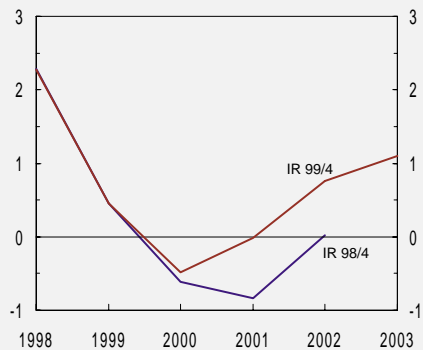
Sources: Statistics Norway and Norges Bank

**Chart 5 Annual underlying consumer price inflation**



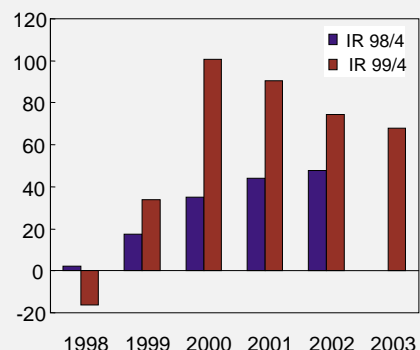
Sources: Statistics Norway and Norges Bank

**Chart 3 Numbers employed. Annual percentage growth**



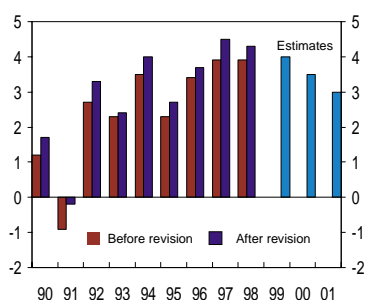
Sources: Statistics Norway and Norges Bank

**Chart 6 Current account balance. In billions of NOK**



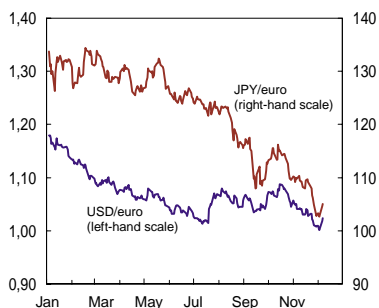
Sources: Statistics Norway and Norges Bank

**Chart 4.4** *GDP growth in the US.*  
Annual growth



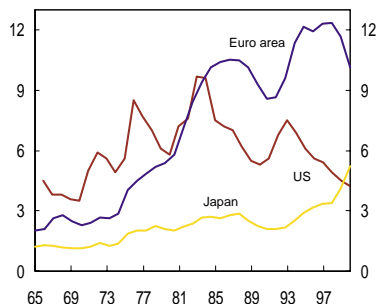
Sources: Bureau of Economic Analysis and Norges Bank

**Chart 4.5** *Exchange rates*



Source: Datastream

**Chart 4.6** *Unemployment as a percentage of the labour force in the US, Japan and the euro area*



Sources: OECD and Datastream

to 3.6%. In 1998, growth was revised up by 0.5 percentage point, to 4.3%. A levelling off of asset values, coupled with slightly higher interest rates, is expected to result in lower growth in private consumption in 2000 and the years thereafter. The same factors, along with lower earnings, will lead to weaker growth in investment.

Economic developments in Japan were unexpectedly strong in the first half of 1999. Growth was primarily fuelled by public investment, the result of an economic stimulus package adopted in 1998. Private consumption was also unexpectedly strong, but this situation changed as expected in the third quarter. Growth in the German economy in 1999 has been revised downwards, largely as a result of a revision of national accounts statistics. Lower-than-expected growth in the second quarter also contributed, however. In France and many of the smaller countries in the euro area, growth appears to be stronger than previously expected. Among other things, low interest rates and a sharp increase in house prices have contributed to a strong increase in private consumption in a number of the euro countries. The improvement in the world economy has resulted in considerably more favourable export prospects for Continental Europe. Coupled with increased domestic demand, this is expected to contribute to higher growth in the next few years. Sweden is enjoying solid growth, and we have revised upwards the growth estimate for the UK for 1999 and 2000.

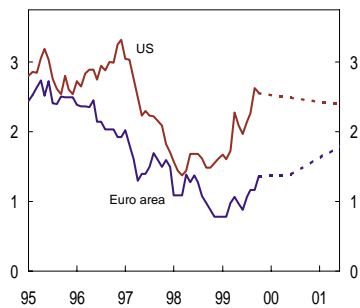
#### *Greater optimism, but there are still some risks*

Growth in the US has remained robust for a long time without resulting in rising price and cost pressures. Norges Bank's projections indicate a soft landing for the US and continued solid growth without serious inflation problems. However, there are a number of risk factors that may lead to a weaker trend in the US, with possible negative consequences for the world economy as a whole. So far, the strengthening of the dollar and falling commodity prices have helped to dampen price pressures in the US. A sharp depreciation of the dollar, for example as a result of the sizeable current account deficits, may lead to higher price inflation in the US. The effect of higher import prices, measured in USD, will be greater than previously, as imports now account for a considerably larger share of US demand. In the current situation with a tight labour market, higher import prices may lead to rising price and cost pressures and monetary policy tightening. Private sector debt accumulation and developments in the equity market are other risk factors for the US economy. The rise in equity prices has accounted for a substantial share of the increase in household wealth to date. If equity prices should fall significantly, private demand may be lower than estimated.

Desynchronised cyclical trends represent a risk factor for the euro area. Growth remains weak in Germany and Italy, while Ireland, the Netherlands, Portugal and Spain are showing signs of overheating. The ECB's monetary policy is determined by

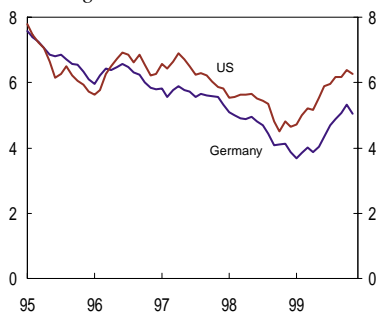


**Chart 4.7** Price inflation in the US and the euro area. 12-month rise. Per cent



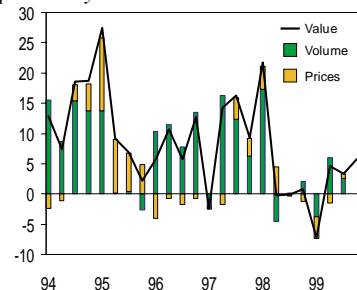
Sources: Eurostat and Datastream

**Chart 4.8** Yield on 10-year US and German government bonds



Source: Norges Bank

**Chart 4.9** Traditional merchandise exports according to External Trade Statistics. Volume, price and value. Percentage growth on same quarter previous year



Source: Statistics Norway

developments in the euro area as a whole, and countries with slow growth like Germany and Italy will have limited scope for remedying this with a more expansionary fiscal policy.

In Japan, there is still substantial uncertainty concerning future economic developments. Because of declining income and increased job uncertainty, household confidence in Japan remains at a low ebb. The business sector, particularly the sheltered segment, still has a substantial debt burden and surplus capacity. Public investment fell sharply in the third quarter, and will probably not pick up before the fiscal policy stimulus packages take effect in the second half of 2000. Exports picked up in the third quarter, and the upturn in the rest of Asia may also make a positive contribution. However, the strengthening of the Japanese yen could limit the export sector's contribution to growth.

### *Higher price inflation internationally*

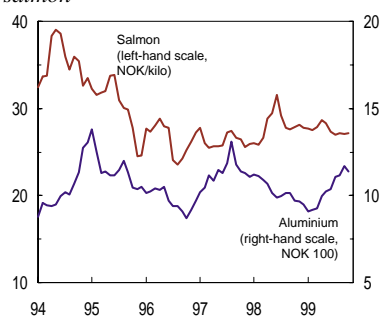
Norway's trading partners recorded a rise in consumer prices of 1.3% in 1998, and price inflation is set to be about the same this year. The main factors behind low price inflation last year were falling commodity and energy prices along with moderate nominal wage growth. In addition, the currencies of our trading partners strengthened substantially against the currencies of a number of developing countries and transition economies. Since the beginning of 1999, the oil price has risen sharply and a number of commodity prices are moving up. This has led to an increase in inflation this autumn. Several central banks have raised interest rates in recent months, which will have a restraining effect on price inflation in the period ahead. Price inflation among trading partners is expected to be moderate in 2000.

There has been an increase in both long- and short-term interest rates in 1999. The increase in long-term rates is partly a reversal of the decline in interest rates in the US and Europe in the wake of the crisis in emerging economies. Short-term money market rates in the euro area and in the US have increased in recent months. The increase is due both to a tightening of monetary policy and increased demand for liquidity in connection with the transition to the year 2000. We therefore expect international money market rates to edge down early in 2000. However, the orientation of monetary policy will probably be less expansionary in 2000 in order to prevent stronger price inflation internationally.

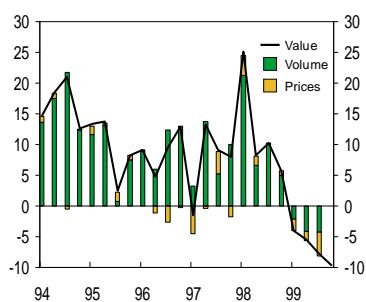
## **4.3 The balance of payments**

### *The current account surplus increases*

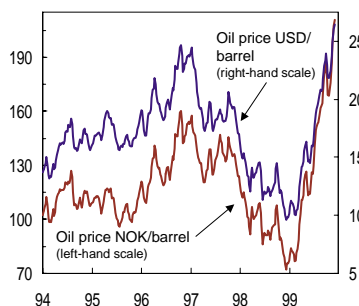
At the end of previous cyclical upturns, the Norwegian economy usually developed considerable external account imbalances. This is not the case now. Increased petroleum revenues will contribute to large surpluses the next few years.

**Chart 4.10** Prices for aluminium and salmon

Sources: Statistics Norway and Financial Times

**Chart 4.11** Traditional merchandise imports according to External Trade Statistics. Volume, price and value. % rise on same quarter previous year

Source: Statistics Norway

**Chart 4.12** Oil prices in NOK and USD

Source: Norges Bank

Nevertheless, developments in the traditional trade balance will be decisive for the current account in the longer term, and will also influence Norway's ability to cope with an unexpected fall in petroleum revenues.

At the beginning of 2000, Norwegian export industries are in a situation where a strong rise in costs has eroded cost competitiveness. At the same time, record-high petroleum investment has led to a very high level of activity in some manufacturing segments. Norway's export performance over the next few years will largely depend on whether manufacturing industry is successful in curbing cost increases. Although Norwegian exports are to a large extent determined by domestic factors, such as costs and production capacity, the prospects for growth abroad will also be of importance to exports in the period ahead. Developments in exports will also be influenced by factors specific to individual industries, for example the extent to which petroleum-dependent manufacturing manages to shift activities towards exports when petroleum sector demand declines. The framework conditions for fisheries exports, both access and trade conditions, will also play an important part. Exports of services, first and foremost tourism, may also contribute to growth in exports over the next few years.

In 1999, growth in traditional merchandise exports is estimated at 1½%. Next year, increased investment demand in Europe is expected to push up growth to 3¾%. In subsequent years, it is estimated that lower cost inflation and restructuring in petroleum-related manufacturing sectors will further boost export growth.

Prices for traditional merchandise exports have shown a sluggish trend in 1999. The stronger krone and a weak trend in commodity prices led to a decline in export prices in the first half of the year. Chart 4.10 shows that the price of aluminium has increased substantially through the year, and this is expected to contribute to a 2¼% rise in export prices in 2000. In 1999, we expect prices for traditional merchandise exports to edge down ½%. In the period 2001-2003, export prices are expected to rise by around 1¼%.

So far in 1999, traditional merchandise imports have shown weaker growth than previously estimated, as a result of slower growth in private consumption and a sharper-than-expected decline in investment. Traditional merchandise imports are now estimated to fall by 2¾% this year. In 2000, both mainland fixed investment and petroleum sector investment are expected to continue to fall sharply, leading to a further decline in import volumes. Thereafter, growth in traditional merchandise imports will pick up.

The current account surplus for 1999 is estimated at about NOK 34bn. During the year there has been an appreciable weakening of the balance of services, partly as a result of an increase in direct purchases abroad by Norwegians residents.

Oil revenue estimates are important for developments in the current account ahead. Oil prices are assumed to average NOK 164 in 2000, dropping towards NOK 125 in the second half of 2001. Oil production and exports are estimated to increase by 10% in 2000. Traditional merchandise exports are also expected to improve next year. Overall, it is anticipated that the current account balance may come to over NOK 100 billion in 2000. Surpluses for subsequent years are expected to decline gradually to a little less than NOK 70 billion in 2003. The surpluses will to a large extent be reflected in high outflows of capital through the Government Petroleum Fund.

## 4.4 Domestic demand

### *Household saving remains high*

Norges Bank's projections indicate a continued relatively high level of saving over the next four years, with private consumption rising approximately in pace with real income.

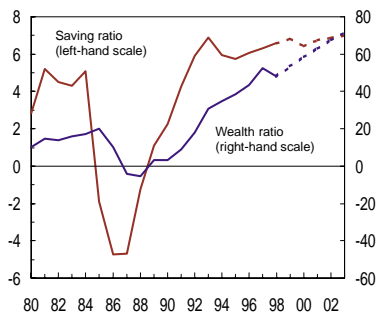
Developments in private consumption in 1999 appear to be roughly as forecast in the September Inflation Report, but consumption of services is higher than expected, and consumption of goods lower than expected. The estimated annual growth is 2¼%. This implies a rise in the saving ratio from 6.6% in 1998 to 6¾% this year (Chart 4.13).

Household income has increased markedly through most of the 1990s, as a result of both high growth in wages and employment and moderate inflation. The growth in household real income for the current year appears to be 2½%, a decline compared with 1998. Real income growth is expected to decline further in 2000, before picking up again in the period 2001-2003. Income growth will be relatively high compared with the previous economic downturn, despite moderate wage growth. At the same time, inflation is stable and will gradually decline. The relatively high income growth over the next four years will contribute to maintaining the saving ratio at approximately the current level.

Growth in private consumption is estimated at 2% in 2000, and is expected to edge up towards the end of the projection period. Households have substantial financial leeway to smooth consumption over the business cycle. This may be reflected in higher private consumption than our estimates indicate.

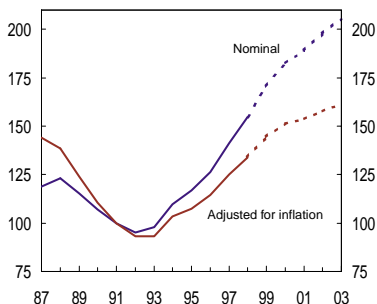
The trend increase in the saving ratio in the 1990s has occurred despite the fact that a number of underlying factors indicated the contrary. Total household wealth has increased sharply through the 1990s, in excess of the level implied by traditional saving patterns. This is due both to the sharp rise in house prices and to financial gains. Dwellings account for a large share of Norwegian household wealth. Historically, a rise in house prices therefore induces households to save a

**Chart 4.13** Household saving and net financial wealth. Percentage of disposable income



Sources: Statistics Norway and Norges Bank

**Chart 4.14** Resale home prices. Nominal and adjusted for inflation. 1991=100



Sources: Statistics Norway, ECON and Norges Bank

smaller share of their current income. This will normally boost consumer demand during a cyclical upturn. Since the trough in 1992-1993, house prices have almost doubled. Figures from ECON and the Norwegian Association of Real Estate Agents<sup>1</sup> show that house prices rose by a good 10% in the first three quarters of the year compared with the same period in 1998. The increase was as forecast in the September Inflation Report.

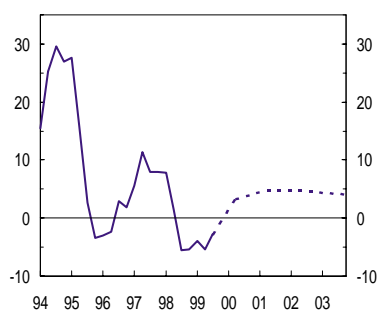
For the next four years, we expect house prices to rise less on average than in the past six years, partly because of lower employment and income growth. The projected increase in residential construction later in the projection period will also increase the supply of dwellings and have a dampening effect on prices. Compared with the last half of the 1990s, this will have a dampening effect on private consumption and stimulate saving.

In addition to housing wealth, household financial wealth has grown sharply in 1999 and contributed to the sound financial position of households (see also Norges Bank's report, Financial Sector Outlook, for the second half of 1999). Following the stock exchange fall in 1998, households lost a good NOK 23 billion as a result of valuation changes through 1998. In the first half of 1999, households had aggregate capital gains on their financial assets of about NOK 25bn. This consisted mainly of gains on equities, securities funds and insurance claims. Coupled with high net financial investments during the same period, this has resulted in substantial wealth gains compared with 1998. In principle, the effect is the same as an increase in housing wealth. However, capital gains may be concentrated among households with a relatively low marginal propensity to consume.

The high saving ratio may also reflect the demographic situation. The percentage of the population between the age of 45 and 66 has increased and will continue to increase up to 2010, while the percentage of elderly will remain stable or decline. It is normally the middle-aged segment of the population that has the highest saving ratio. Another factor that may contribute to continued high saving is possible uncertainty associated with government pension schemes. The National Budget for 2000 discusses major pension policy challenges. The Norwegian National Insurance Scheme's pension payments are projected to increase from 8% of GDP in 1995 to 15% in 2030. This may mean that public saving may not be sufficiently high to prevent tax increases or reduced pension payments in the future. Such expectations might encourage a high level of private saving. In addition, the desire for higher

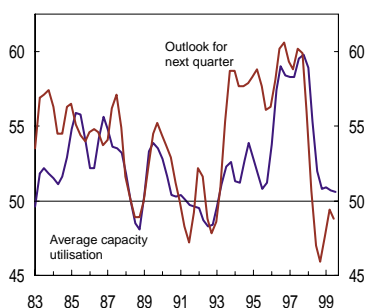
<sup>1</sup>Norges Bank weights the figures so that large towns are assigned slightly lower weights than those in the price statistics of ECON and the Norwegian Association of Real Estate Agents. This provides a more accurate picture of the rise in house prices in the country as a whole.

**Chart 4.15** *Housing investment. Four-quarterly growth. Per cent*



Sources: Statistics Norway and Norges Bank

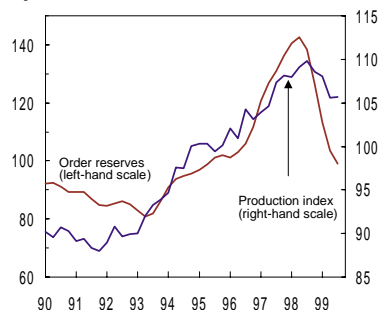
**Chart 4.16** *Explanatory factors for manufacturing investment. General business tendency survey. Diffusion indices<sup>1</sup>. Smoothed*



<sup>1</sup> A common interpretation of diffusion indices is that a value of 50 indicates that approximately the same number expect growth as expect a decline for the feature.

Source: Statistics Norway

**Chart 4.17** *Order reserves (value) and production index (volume) for manufacturing. 1995=100. Seasonally adjusted*



Source: Statistics Norway

pension payments than those provided by public pension schemes is expected to contribute to higher private pension saving and lower consumption among the economically active population.

### *Housing investment picks up again*

During the past two years housing investment has been relatively low, despite the sharp rise in house prices and shortage of houses in Oslo and other large cities. National accounts figures for the first three quarters of 1999 show that housing investment so far this year is 4.2% lower than in the same period in 1998. Overall, housing investment is estimated to fall by 3% in 1999.

A number of factors indicate that housing investment will rise in the years ahead, including a marked rise in housing starts so far this year. In recent years, resale home prices have also risen more sharply than prices for new dwellings. This factor, in isolation, makes it more attractive for households to build new homes rather than to buy resale homes.

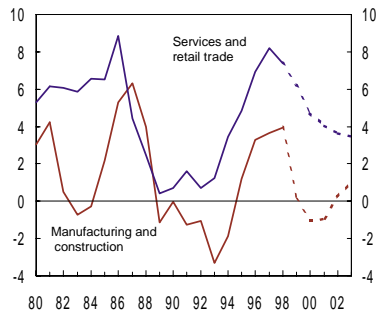
### *Substantial decline in investment*

Mainland business fixed investment is expected to fall by 6¾% in 1999. Weak import figures from External Trade Statistics up to October underscore this scenario. Investment in manufacturing and construction shows a particularly strong decline. Up to the third quarter of 1999, manufacturing investment fell by 25% compared with the same period in 1998. According to Statistics Norway's investment intentions survey for the third quarter, half of all enterprises reported that weak demand or intensified competition in the Norwegian market was limiting production. Investment in services and distributive trades has declined less than expected, partly as a result of a continued high level of activity in both the public and private sector.

The decline in mainland investment will probably continue next year, primarily as a result of the fall in manufacturing investment. A sluggish trend in the order backlog for manufacturing in the third quarter indicates that prospects for profitability are poor in many manufacturing enterprises. Statistics Norway's investment intentions survey of manufacturing industry for 2000 supports this scenario. A 25% decline in petroleum-related investment in 2000 will also contribute to lowering production in the shipyard industry and parts of the engineering industry. For mainland enterprises as a whole, a 6¼% decline in investment is expected in 2000. However, there is no indication of a large surplus capacity in the business sector.

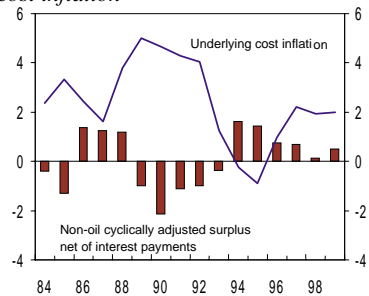
Following a considerable decline up to the end of 2000, fixed investment is expected to pick up again. Moderate wage growth and higher productivity growth will improve manufacturing profitability. In addition, experience indicates that a higher level of activity will increase business investment.

**Chart 4.18** *Net fixed investment rate. Investment less capital consumption as a percentage of value added*



Sources: Statistics Norway and Norges Bank

**Chart 4.19** *Non-oil cyclically adjusted government surplus and real underlying cost inflation*



The surplus is change on previous year, expressed as a percentage of mainland GDP. Cost inflation is percentage change from the previous year.  
Source: Ministry of Finance

The decline in investment will be less marked than previously estimated in services and distributive trades, and the investment rate in this sector will be relatively high at the end of 2003 (Chart 4.18). We thus envisage that capacity in this sector will continue to expand. Projections for the overall level of mainland business fixed investment in 2003 indicate that it will be slightly lower than the level in 1999.

### *Strong growth in public spending*

In recent years, the orientation of fiscal policy has been considerably more expansionary than the fiscal policy programme approved at the beginning of the year. For example, growth in public consumption in the 1990s has been 1.6 percentage point higher, on average, than the estimate in the National Budget the previous autumn. It even proves difficult to estimate growth in consumption half way through the year, and on average this has been 0.8 percentage point higher than that forecast in the Revised National Budget in May the same year. In 1999, there has also been substantial fiscal slippage, largely due to higher growth in local government revenues and expenditure than anticipated in the National Budget for 1999. Growth in public consumption is now estimated at 2¼%.

For next year, emphasis has been placed on the fiscal policy programme outlined in the National Budget for 2000 and the budget compromise in the Storting. Real growth in public consumption is estimated at 2¼% in 2000, while public fixed investment is expected to decline slightly. High growth in government transfers next year will help to sustain the growth in general government expenditure. Following real growth in government expenditure of 2½% in 1999, our assumptions imply a growth rate of around 2¼% in 2000.

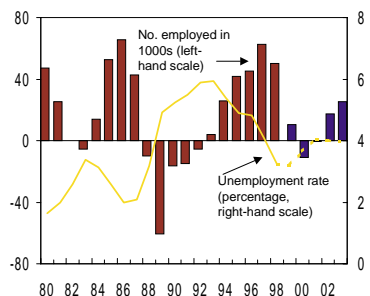
Later in the period a substantial increase in some expenditure items is expected as a result of already approved spending decisions. This applies particularly to expenditure on early retirement pensions and old age and disability pensions. However, in the baseline scenario we have assumed an overall growth in public expenditure in line with trend GDP. This means that an extraordinary increase in certain expenditure items is expected to be covered through lower growth in other expenditure items. Section 5 discusses the possible effects of higher growth in general government expenditure.

## **4.5 The labour market**

### *Employment growth stagnates*

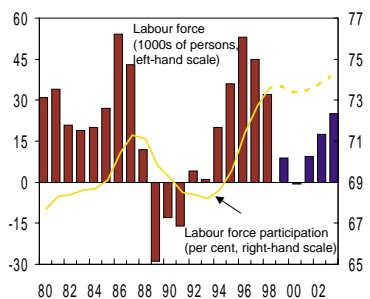
Following a rise in employment figures equivalent to almost 250 000 over the past 7 years, growth is now stagnating. However, there are major differences between the various labour market segments. In manufacturing, employment has dropped by 10 000 since last autumn, whereas employment in the public sector and in service industries in the private sector

**Chart 4.20** Change in numbers employed from previous year. LFS unemployment rate



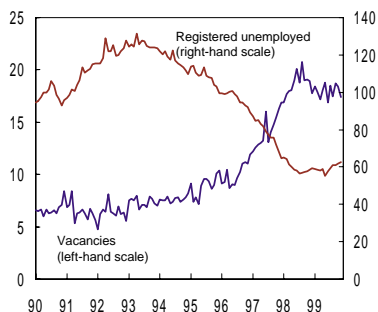
Sources : Statistics Norway and Norges Bank

**Chart 4.21** Change in labour force from previous year and labour force as a percentage of working age population (labour force participation)



Sources : Statistics Norway and Norges Bank

**Chart 4.22** Number of registered unemployed and vacancies, in 1000s. Seasonally adjusted



Source: Directorate of Labour

is still rising. Growth in employment in private service industries and in distributive trades has been somewhat stronger than expected. Total employment growth in the current year is projected at  $\frac{1}{2}\%$ .

Continued low corporate profitability, lower fixed investment and generally weaker growth in domestic demand are expected in the period ahead. This will dampen the demand for labour, particularly in manufacturing and construction. The sharp fall in petroleum sector investment will affect employment in the shipyard industry in western Norway in particular. High cost inflation in recent years may have reduced the restructuring capacity of the internationally exposed sector, although it is uncertain to what extent. The decline in employment in manufacturing and construction may come to 8-10% over the next two years. At the same time, it appears that employment growth in service industries may be slightly higher than previously assumed. This will stabilise employment. Total employment is expected to edge down by  $\frac{1}{2}\%$  in 2000 and remain unchanged in 2001. Towards the end of the projection period the demand for labour is expected to pick up as a result of an increase in production and profitability in the enterprise sector.

The labour force is at a high level, but growth appears to have stagnated. Coupled with high labour force participation, this indicates that labour reserves are virtually exhausted. Labour force growth is estimated at  $\frac{1}{4}\%$  in 1999. In the period ahead, less favourable labour market prospects may lead to fewer labour force entrants. In addition, improved prospects in other Nordic labour markets may make it more difficult for Norway to retain workers from neighbouring countries. The labour force is expected to remain more or less unchanged in 2000, before rising slightly in 2001 again. Over the next few years, labour force growth is expected to be slightly lower than demographic conditions alone would imply, resulting in a decline in labour force participation. Towards the end of the projection period, the labour force is expected to increase at a rate slightly higher than implied by demographic trends.

Overall, labour market pressures remain strong. However, the number of vacancies indicates that this pressure is beginning to subside in some labour market segments. According to the Directorate of Labour, the number of vacancies in a number of occupations is now falling, particularly for manufacturing and technical occupations. On the other hand, increased demand for labour in construction, commercial activities and education have helped to keep the total stock of vacancies relatively stable when adjusted for seasonal variations.

Registered unemployment remains low. At the beginning of December, the number of registered unemployed at employment offices was 56 500, corresponding to 2.4% of the labour force. LFS figures for the third quarter revealed a slight rise in

unemployment for the first time in 1999. Average LFS unemployment is expected to be more or less unchanged from last year, at 3¼%.

For the past 15-20 years there have been signs of a permanently higher level of unemployment. For example, the current labour market is regarded as very tight, whereas the same unemployment rate in 1983 was considered to be high. In isolation, this may suggest that a given unemployment level indicates a tighter labour market than in the past. The increase in unemployment may mean that the economy must show greater adaptability, which has contributed to higher frictional unemployment. The increased specialisation of employees reinforces this. Record-high labour force participation and a high number of vacancies indicate that there are no available resources in the economy at the moment.

During the next two years, employment is expected to decline at a faster pace than the labour force, with an associated rise in unemployment from the current level. LFS unemployment is expected to increase to about 3¾% in 2000 before levelling off at around 4% in the period 2001-2003.



## 5 RISKS AND CHALLENGES

### 5.1 Risks to the inflation outlook

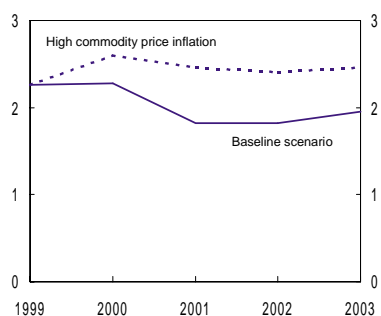
The projections in the Inflation Report are considered to represent the most likely path given key assumptions concerning interest rates, the exchange rate and fiscal policy. We have also assumed that no structural changes will take place in household saving and income determination. The forecasts are shrouded in uncertainty, particularly in the long term. Normally the uncertainty will be distributed symmetrically around the estimates. This means that the probability of a substantially different outcome is distributed more or less equally on the upside and downside. From time to time, however, the risks may be asymmetrically distributed.

The experience of recent years indicates that forecast errors with respect to economic developments have been largely associated with certain key assumptions, for example about fiscal policy. An evaluation of the Bank's forecasts is discussed in a separate box in this report. An article on the same topic will appear in *Economic Bulletin* 2000/1.

Norges Bank began producing detailed forecasts of economic developments in 1993, and in six of the eight years since then, consumer price inflation has been lower than estimated in December the previous year. The deviations have generally been small. Consumer price inflation has been up to half a percentage point lower and nearly a quarter percentage point higher than estimated. In 1996, when price inflation was particularly low compared with the forecast figure, the deviation was due to exceptional circumstances associated with a reduction in car taxes. Deviations may illustrate the uncertainty inherent in projections for consumer price inflation. At the same time, historical deviations alone may result in an underestimation of the uncertainty in the projections.

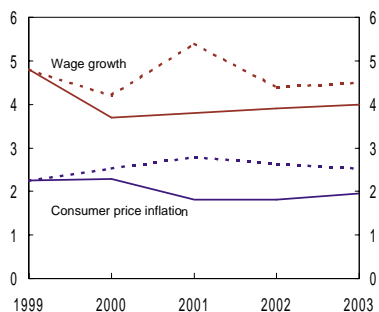
In recent years, we have overestimated external price impulses. International producer prices rose relatively strongly in the 1980s and slightly less in the early 1990s, but levelled off in 1995. The stagnation in international prices is partly attributable to the orientation of monetary policy in important areas but also increased international competition and relatively high productivity growth, perhaps particularly in the US economy. The Asian crisis and the long recession in Japan also led to lower prices for international commodities and consumer goods. The impact of the sharp depreciation of several Asian currencies in 1998 was also underestimated for a long time (see the March 1999 Inflation Report).

**Chart 5.1** Consumer price inflation with strong rise in commodity prices in 2000 and 2001



Source: Norges Bank

**Chart 5.2** Wage and price inflation with a change in wage determination. Solid lines are baseline scenarios



Source: Norges Bank

Growth prospects for the international economy are fairly favourable, both in Europe and in parts of Asia. Increased international competition is expected to continue to moderate price inflation. New agreements under the auspices of the World Trade Organisation may contribute to continued deregulation and lower prices.

There is probably a high level of available production capacity in Europe. For a period at least, Europe may experience an upturn without significant inflationary pressures, as we have seen in the US.

Commodity prices, with the exception of food and agricultural products, have edged up recently. However, prices remain very low in an historical context. In both 1986 and 1994, when prices were equally low, they rose relatively fast and sharply. It is now assumed that increased commodity production capacity will make prices less sensitive to increased demand. Consequently, a moderate rise in non-oil commodity prices is expected in the period ahead. In the event of a different outcome, a stronger increase in prices is more probable than a corresponding fall.

In order to quantify the risks more precisely, we have looked by way of illustration at the effects of a rise in commodity prices and international producer prices in line with those seen in 1986 and 1994. In both cases, producer prices rose by almost 4% annually in the two subsequent years. Should this recur, consumer price inflation may rise to 2½% in 2000 and 2001 (Chart 5.1).

Domestic uncertainty is associated with the restructuring of the economy shown in the baseline scenario. Employment in manufacturing and construction may drop by almost 40 000 in the next few years. However, there is considerable uncertainty attached to this estimate, and the employees and enterprises in these industries may succeed in shifting to other activities. At the same time, employment in service industries and the public sector is on the increase. Traditionally, manufacturing has been the wage leader. This means that wage growth slackens when manufacturing profitability declines. The possibility cannot be excluded that the situation for manufacturing may prompt lower wage growth than assumed in the baseline scenario if traditional wage determination remains unchanged. However, it is uncertain how wage formation will function in a situation with large shifts between sectors in the economy. The tension between the different sectors and segments may lead to higher wage growth in some sectors and industries even with relatively high overall unemployment.

Chart 5.2 illustrates one possible scenario, where wage growth in the economy is not affected by the decline in manufacturing employment. This implies a change in wage determination, with manufacturing no longer functioning as a wage leader. The estimates are calculated based on the exclusion from the model of the effect of a decline in

## Evaluation of Norges Bank's forecasts for 1998<sup>1</sup>

Norges Bank attaches considerable importance to the transparency and availability of its forecasting work. Identifying earlier errors is an important prerequisite for making better and more accurate forecasts through improvements to the model and the way the model is used. Moreover, a systematic evaluation places greater demands on the forecasts presented in the Inflation Report and ensures consistency between the projections published at different times.

The chart shows forecasts for 1998 for some key variables, published in December 1996 and December 1997.

All in all, the forecast errors for 1998, published in autumn 1997, were smaller than the forecast errors for earlier years. One would basically expect the forecast errors in the estimates presented in December 1996 to be greater than the errors in the estimates presented in December 1997. This is confirmed for important real variables. The forecast errors for wage and price inflation, however, are smallest in the earliest estimate.

The forecasts for 1998 show a larger forecast error in the estimate for consumer price inflation than was the case in projections for earlier years, primarily as a result of lower-than-expected imported price inflation. Towards the end of 1998 it was clear that consumer price inflation would be lower than could be expected as a result of exchange rate movements. In 1999, Norges Bank began to use an expanded import-weighted exchange rate index, which among other things includes the currencies of a number of countries in Asia. The forecast error is largely ascribable to the incorrect evaluation of the effects of the Asian crisis in two ways. First, the crisis had a surprisingly strong impact on international prices. Second, the depreciation of Asian currencies contributed to a stronger

<sup>1</sup>In an article in the next issue of Economic Bulletin, Norges Bank evaluates its forecasts for 1998, published in December 1996 and December 1997 respectively. This represents an expansion of earlier analyses of forecast errors, published in Economic Bulletin 1998/1 and 1999/2.

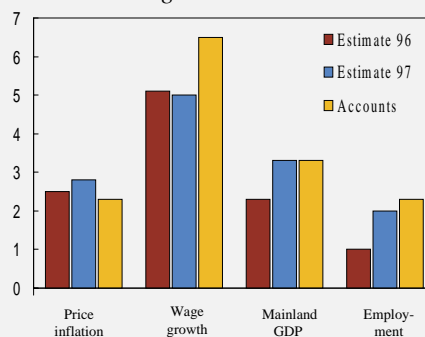
effective krone exchange rate than implied by the traditional exchange rate indices.

We assumed that the tight labour market would make it difficult to achieve moderate wage growth in the years ahead. The labour market proved to be even tighter than implied by our forecasts, and wage growth was higher in 1998 than assumed. The underlying material for the projections indicates that the forecast error for wage growth in manufacturing industry was considerably smaller than the forecast error for wage growth in public and private services. It is uncertain whether this is due to random deviations or a change in the relationship between wage determination in manufacturing and service industries.

The chart shows that economic growth in 1998 was underestimated in the December 1996 Inflation Report. Mainland GDP growth was projected at 2¼%, while actual growth was 3.1%. Private and public consumption and mainland fixed investment were underpredicted. Assumptions concerning growth in public sector demand and petroleum investment were an important source of the forecast errors. At the end of 1996, we projected that petroleum investment would expand by 12% over the next two years, while growth turned out to be more than 50%. Unemployment was half a percentage point lower than predicted.

The forecasts for 1998, published in December 1997, were more accurate in predicting economic developments in mainland Norway

**Chart 1** Estimates for some main variables for 1998, made at various times. Annual growth. Per cent

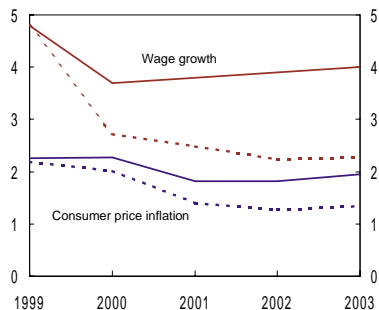


Sources: Statistics Norway and Norges Bank

than the forecasts from the previous year. In contrast to earlier years, the projection for employment growth was fairly close to the mark. This may to some extent be seen in connection with the experience of earlier years. In the

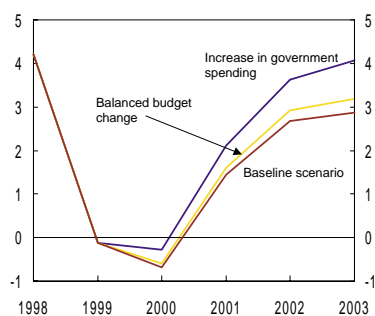
forecasting work in autumn 1997 it was taken into account that, earlier, we had more or less systematically underpredicted employment growth through the cyclical upturn.

**Chart 5.3** Wage and price inflation with a catch-up of cost-competitiveness. Solid lines are baseline scenarios



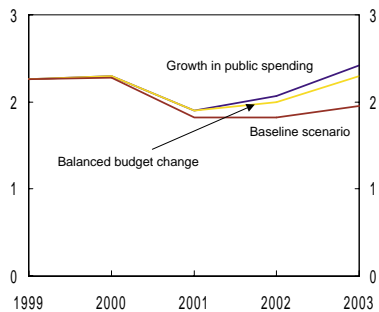
Source: Norges Bank

**Chart 5.4** Growth in domestic demand for various fiscal policy stances



Source: Norges Bank

**Chart 5.5** Consumer price inflation for various fiscal policy stances



Source: Norges Bank

manufacturing employment on wages. The chart shows that consumer price inflation may then rise to 2¾% in 2001 and 2002.

Such a development would imply a continued substantial deterioration in the cost competitiveness of manufacturing. In the past six years, the increase in wages in Norway has been a little more than 5% higher than among trading partners, adjusted for changes in the exchange rate. If we assume that manufacturing will regain its lost competitiveness over the next four years, this would imply wage growth of around 2½% annually up to 2003. As shown in Chart 5.3, this would relatively rapidly be reflected in consumer price inflation. In isolation, such low wage growth would imply that, in the absence of other measures, consumer price inflation might fall to 1½% in 2001 and further to 1¼% in subsequent years.

## 5.2 Effects of changes in assumptions

### *Effects of increased public expenditure*

Over the past few years, and perhaps particularly in 1999, there has been a definite tendency for growth in public expenditure to be substantially higher than that originally adopted during the budget deliberations. This is an indication of relatively strong underlying spending pressures. There is therefore a possibility that growth in public spending in the future may be higher than assumed in the baseline scenario. For example, there is reason to expect substantial increases in the National Insurance Scheme's expenditure on early retirement, old-age and disability pensions. There are also plans for the continuation and expansion of reforms, in the health sector, among others. Unless these increases in expenditure are covered through slower growth in other expenditure, spending growth may be higher than assumed.

Using the RIMINI model, we have outlined in Charts 5.4 and 5.5 the effect on domestic demand and consumer price inflation of an increase in public expenditure equivalent to ½% of mainland GDP in each year in the projection period from 2000 onwards. This corresponds to an extra annual increase in expenditure of about NOK 5 billion in addition to the expenditure growth in the baseline scenario. In 2003, public expenditure as a share of GDP is therefore 2 percentage points higher than in the baseline scenario. In our calculations,

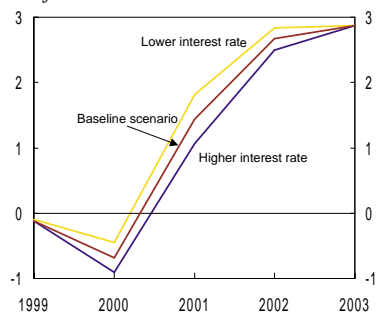
the change has been distributed equally between public consumption, public investment and changes in benefits. Over time, this policy would entail a transfer of real resources from the exposed to the sheltered sector.

Increased public expenditure has a direct impact on domestic demand. Assuming an increase in spending as outlined above, the overall activity level will remain high throughout the period, with growing pressures in the labour market. The effects will increasingly be reflected in wage and price inflation. In isolation, this growth in expenditure will push up price inflation to about 2% in 2001 with a continued rise in subsequent years.

It may be reasonable to assume that the higher growth in expenditure would be covered through increased direct and indirect taxes. Charts 5.4 and 5.5 illustrate the effect on domestic demand and consumer price inflation of such a balanced budget change. It is assumed that household saving is not influenced. Calculations show that increased taxes have a tightening effect, but do not fully counteract the effect of increased expenditure. This illustrates that the overall effect of a balanced budget change is expansionary. According to the RIMINI model, increased taxes will contribute to dampening price and wage inflation. It is conceivable, however, that tax increases may give rise to demands for wage compensation. This would lead to higher wage and price inflation than has been forecast here. If an increase in expenditure is financed through higher indirect taxes, this would also directly contribute to higher price inflation.

However, there is always some uncertainty as to how fast wage growth translates into higher prices. In the RIMINI model, price inflation is influenced by the average wage level in the economy. However, in private services and the sheltered sector, the feed-through from wages to prices probably occurs fastest. The public sector does not price its services in the market to the same extent. The feed-through from wages to prices will therefore probably come primarily by way of the effects on total demand and employment. The effects via the labour market are strong in RIMINI. As a result, the difference in wage growth in the scenarios with and without tightening is fairly small.

**Chart 5.6** *Growth in domestic demand for 1 percentage point higher interest rate from 2000 to 2002. Per cent*

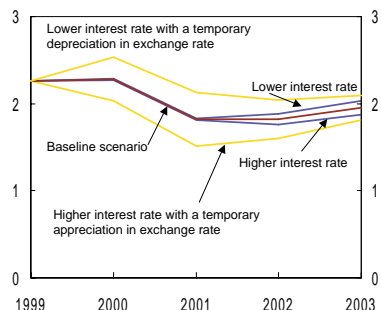


Source: Norges Bank

### *Changes in interest rates*

Whereas changes in fiscal policy have a direct effect on aggregate demand, interest rates can influence demand through the enterprise sector's investment decisions and household saving behaviour. The effect on demand will normally take longer to feed through than the effect of fiscal policy. Charts 5.6 and 5.7 illustrate the effect on domestic demand and consumer price inflation of a change in short-term money market interest rates of 1 percentage point in relation to the baseline scenario for three years.

**Chart 5.7** Consumer price inflation for 1 percentage point higher interest rate in 2000, 2001 and 2002.



With temporary exchange rate appreciation, the exchange rate is expected to strengthen by 3% and then gradually depreciate back to the initial level in 2003. The opposite applies for depreciation.

Source: Norges Bank

In the RIMINI model, it takes time before a change in interest rates affects price inflation, if changes in the exchange rate are disregarded. Chart 5.6 shows that after 2-3 years, an interest rate increase of 1 percentage point will contribute to reducing domestic demand by almost 1%. Chart 5.7 illustrates how this contributes to dampening consumer price inflation slightly towards the end of the projection period. Similarly, a decline in interest rates will contribute to slightly higher price pressures.

It may be unreasonable to look at the effects of a change in the interest rate without discussing possible effects on the exchange rate. Of course, it is not easy to quantify the relationship between the interest rate and the exchange rate. In Chart 5.7, by way of illustration, we have assumed that a higher NOK interest rate is countered by an immediate appreciation and thereafter steady depreciation, so that the expected return on NOK position remains unchanged (an effect known as uncovered interest parity). For example, a temporary interest rate increase of 1 percentage point over three years will result in an immediate 3% appreciation of the krone exchange rate, followed by a gradual depreciation to the initial level in 2003. As Chart 5.7 shows, the rise in interest rates will thus contribute to changing price inflation by half a percentage point in 2001.

As mentioned previously, the relationship between interest rates and the exchange rate is uncertain. Monetary policy probably also influences price expectations of market participants in a different way today in relation to the underlying historical material in the RIMINI model. Among other things, monetary policy was aimed at maintaining a completely fixed exchange rate until December 1992. Under this monetary policy regime, it is natural that inflation expectations are closely linked to the exchange rate. Today, inflation expectations are influenced probably just as directly by interest rates. This may mean that a change in interest rates without any effect on the exchange rate may have a greater impact on consumer price inflation than indicated by the RIMINI model. At the same time, it is possible that the model overestimates the effects of temporary exchange rate fluctuations on consumer prices.

## MAIN MACROECONOMIC AGGREGATES NOKbn

<i>Mrd.</i>	<i>Mrd.</i> (1996 prices)		<i>Percentage change from previous year, unless otherwise indicated</i>			
	1998	1999	2000	2001	2002- 2003 <sup>1</sup>	
<b>Real economy</b>						
Private consumption	524.2		3.1	2¼	2	2¾
Public consumption	220.4		3.7	2¼	2¼	2
Total gross investment	269.0		8.1	-7½	-9	-¾
- Petroleum activities	74.6		25.7	-10	-25	-5
- Mainland Norway	183.5		2.4	-5½	-3½	½
Enterprises	115.6		2.8	-6¾	-6¼	-1¼
Dwellings	29.3		-0.6	-3	3½	4¾
Gen. government	38.6		3.4	-4¼	-1½	2
Mainland demand <sup>1</sup>	928.1		3.1	¾	1	1¾
Exports	440.2		0.5	¼	5¾	4
- Crude oil and natural gas	153.9		-3.8	0	10	3
- Traditional goods	174.0		3.4	1½	3¾	5½
Imports	399.9		9.1	-3¼	-1	3½
- Traditional goods	264.3		9.6	-2¾	-1	3½
GDP	1082.5		2.1	¾	2¼	1¾
- Mainland Norway	898.2		3.3	1	¾	1½
<b>Labour market</b>						
Employment			2.3	½	-½	0
Labour force, LFS			1.4	¼	0	½
Unemployment, LFS			3.2	3¼	3¾	4
<b>Prices and wages</b>						
Consumer prices			2.3	2¼	2¼	1¾
Annual wages			6.5	4¾	3¾	3¾
Import prices, traditional goods			1.3	-2¼	1	1
Export prices, traditional goods			1.0	-½	2¼	1¼
Crude oil price, NOK			96	139	164	133
Resale home prices			9.5	10¼	7¼	3¼
<b>External account<sup>2</sup></b>						
Trade surplus, NOKbn (level)			2.5	56	120	98
Current account surplus, NOKbn (level)			-16.3	34	101	90
Current account surplus, % of GDP			-1.5	2¾	8	7¼
<b>Memorandum</b>						
Household saving ratio			6.6	6¾	6½	6¾

<sup>1</sup>Average annual growth

<sup>2</sup>Private and public consumption and mainland gross fixed investment

<sup>3</sup>Current prices

Sources: Statistics Norway and Norges Bank