QUARTERLY REPORT ON INFLATION

February
2002

The new Act on the National Bank of Hungary, enacted by Parliament and effective as of 13 July 2001, defines the primary objective of the Bank as the achievement and maintenance of price stability. Using an inflation targeting system, the Bank seeks to attain price stability by implementing a gradual, but firm disinflation programme over the course of several years. In order to provide the public with a clear insight into the operation of central bank policies and enhance transparency, the Bank publishes the "Quarterly Report on Inflation", covering recent and prospective developments in inflation and evaluating the macroeconomic developments determining inflation. This publication summarises the projections and deliberations that underlie the decisions of the Monetary Council.

The Monetary Council, the supreme decision making body of the National Bank of Hungary, carries out a comprehensive review of the expected development of inflation once every three months, in order to establish the monetary conditions that are consistent with achieving the inflation target. The first section of the publication presents the Monetary Council's position and the grounds for its decisions released on 5 of Nov. This is followed by a projection prepared by the analysts at the Bank's Economics Department on the outlook for inflation and the underlying principal macroeconomic developments. The expected path and uncertainty of the exogenous factors used in the projection reflect the opinion of the Monetary Council.

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Boxes and Annexes in the Quarterly Report on Inflation

Statement of the Monetary Council

At its meeting of 18 February 2002, the Monetary Council discussed the latest issue of the *Quarterly Report on Inflation* and approved its publication.

Success in meeting the December 2001 target

Members of the Monetary Council view 2001 as a successful year in terms of the path of inflation. In the two years since mid-1999, prior to changing the monetary policy regime, prices had increased at an annual rate of around 10%. In the wake of widening the forint's exchange rate band and adopting an inflation-targeting system, the rate of inflation started on a downward trend, and at 6.8% in December 2001 it was lower than the target rate of 7%. The 4 percentage-point drop in inflation achieved during a period of six months was partly due to factors outside the control of monetary policy, in particular the fall in the price of unprocessed foodstuffs and the world price for crude oil. At the same time, measures constructed by eliminating one-off effects also clearly reflected the reduction in inflation. The new core inflation index published by the Central Statistical Office fell from 10.5% in June 2001 to 8.1% in December 2001.

Slow adjustments on the cost side

In the judgement of the Council, recent experience suggests that economic agents have been relatively slow in adapting to the designated disinflation path. Changes in nominal wages have not been completely consistent with the decline in inflation. This poses the risk that firms will not be able to maintain their competitiveness over the long run unless they take account of the prospective downward trend in sales prices when projecting nominal costs.

Changes in the exchange rate and interest rates in the period since the previous report

The period since the publication of the previous inflation report has seen a tightening in monetary conditions. There has been an upsurge in global investors' demand for forint investments, resulting in a significant drop in the risk premium. This enabled the Council to reduce the central bank's key rates in several steps, consistent with the fall in inflation expectations. Long-term yields kept pace with the reduction in the key rates, reflecting the rising credibility of the announced disinflation programme in the eyes of market participants. Despite the lower yields, the exchange rate of the forint

Inflation projection based on increasing oil prices
Year-on-year growth rate
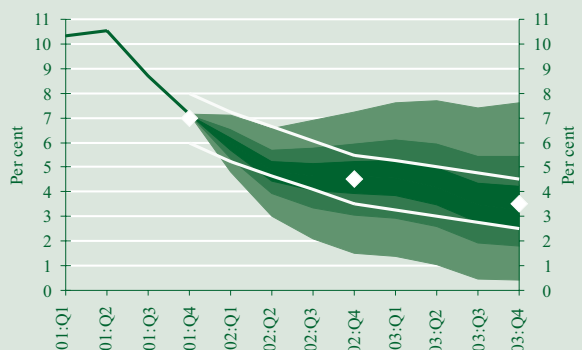
* The fan chart shows the probability distribution of the outcomes around the central projection. The central band with the darkest shading includes the central projection. The entire coloured area covers 90% of all probabilities. Outside the central projection (centred around the mode), the bands represent 15% probability each. The uncertainty intervals have been estimated relying on the Bank's historic forecast errors and the uncertainties perceived by the Monetary Council regarding the current forecast. The two white dots represent the inflation targets (7%, 4.5% and 3,5%); while the straight lines mark the ±1% tolerance intervals on either side of the target rates. The forecast is based on the assumption of increasing Brent oil prices in 2002 (to USD 24 / barrel by the end of the year) followed by constant oil price at that level in 2003.

against the euro has strengthened by roughly 4% over the past quarter, simultaneously with a drop in exchange rate volatility compared with the summer and autumn of 2001, a period plagued by capital market crises.

Corporate managers and analysts are expecting the world economy to recover from its current downturn in the second half of 2002. This means that the Hungarian economy is likely to grow at below its potential growth rate, at least for a couple of months of the year. In the first half, the less favourable world economic environment may dampen firms' investment demand. Household consumption may continue to expand at a robust pace, which, in turn, may slow the further reduction in inflation primarily in the services sector. In the Bank's projection, the expansionary effect of fiscal policy on demand will be more moderate in 2002 than in the previous year.

Disinflation receives support from the macroeconomic environment

There has been a tightening of monetary conditions in the past quarter, assisting the faster reduction in inflation. However, this effect may be offset by the Hungarian economy adjusting to the inflation target at a slower pace than the Bank expected earlier. Based on recent experience, the Monetary Council has decided to take as a starting point a slower exchange rate pass-through in the future, more consistent with economic agents' behaviour so far.

Changes in the inflation forecast

Rising oil prices may be another factor exerting upward pressure on inflation. In the Council's judgement, higher oil prices than the current USD20 per barrel cannot be ruled out in the coming 18 months, as the world economy gathers momentum. Consequently, the Council's inflation projection assumes the likelihood of oil prices returning to around USD24, taking into account international forecasts.

Assuming unchanged oil prices, inflation is expected to proceed along the path outlined in the previous Report. The central projection falls within the lower range of the target band at every horizon. The more conservative estimate, based on rising oil prices, depicts a somewhat less favourable picture. A 4-dollar increase in oil prices will cause inflation to be higher by an additional 0.6 percentage points. The impact on the inflation path depends on the timing of such an increase in prices. The forecast horizon does not include a period when the assumed price increase could push the central projection outside the target range. In the Council's view, the uncertainties arising from the potential rise in oil prices currently do not call for a pre-emptive tightening of monetary conditions, although the resulting inflation risks require constant monitoring.

The central inflation projection continues to be in line with the disinflation target

Developments in regulated prices and excise duties are one of the most important risk factors influencing inflation in 2003. The underlying assumption of the projection is that in 2003 regulated prices will rise at the yearly average inflation rate defined by the disinflation target.

In view of the above considerations, the inflation projection based on the conditions viewed as having the greatest likelihood by the Monetary Council is as follows: following a rapid decline in the first half of 2002, inflation will be virtually stagnant in the second half due to the base effect and the presumed rise in oil prices. The average rate of inflation is expected to be 5.0% in 2002, with the Council expecting the December 2002/December 2001 consumer price index to be 4.8%.

Disinflation is expected to proceed slowly in 2003, at a yearly average rate of 3.9%, with the Council forecasting the December 2003/December 2002 consumer price index to be around 3.3%.

Budapest, February 18, 2002

*Monetary Council
of the National Bank of Hungary*

Summary of forecasts

(Annual change, per cent; if not noted otherwise)

	2001	2002	2003
	Estimate	Forecast	
Consumer prices			
CPI (December)	6.8	4.8	3.3
CPI (annual average)	9.2	5.0	3.9
GDP	3.8–3.9	3.0–4.0	3.5–4.5
of which: Domestic absorption	2.0–2.3	3.5–4.5	3.7–5.2
Household consumption	3.8–3.9	3.5–4.9	2.5–4.5
Gross fixed capital formation	2.5–3.0	(−1.0)–(3.0)	3.0–6.0
Exports	9.0–10.0	3.0–8.0	6.0–12.0
Imports	7.0–8.0	3.5–9.5	7.0–13.5
Current account balance			
as % of GDP	−2.2	(−2.7)–(−1.8)	(−3.5)–(−2.4)
EUR billions	−1.2	(−1.8)–(−1.2)	(−2.5)–(−1.7)
General government			
Impact on demand (% of GDP)	2.5	0.7	−0.6
Labnour market (private sector only)			
Wage inflation	13.0	8.0–10.5	5.0–8.0
Employment	0.6	−1.0–(0.5)	0.5–1.5

I Inflation – the NBH's projection and latest developments
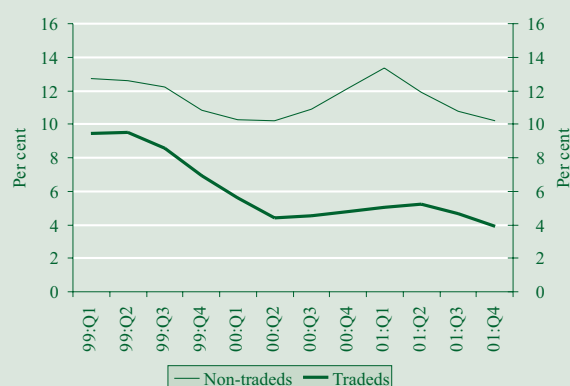
In the second half of 2001, consumer price inflation declined at a rapid rate. The twelve-month rate of inflation dropped to 6.8% in December, in line with the monetary policy target of 7±1% set for December 2001. In contrast with the November Inflation Report's projection of 7.5% inflation for December, this faster-than-expected disinflation was primarily due to the drop in world oil prices and slower inflation in unprocessed food prices. Accordingly, factors with high price volatility which cannot be directly influenced by monetary policy played a key role in this rapid decline in inflation. The Bank's estimates suggest that the appreciation of the forint experienced since May resulted in the price index being roughly 0.8 percentage points lower in 2001 Q4 than it would have been, had the former exchange rate system remained in place. The estimated effect of the monetary regime change is however only a short-term effect, while the full disinflationary effect is expected only in the longer run.

Since forecasts of economic variables in the *Inflation Report* are generally prepared on a quarterly basis, this *Report* does not analyse the latest 6.6% consumer inflation rate of January 2002 in detail. It is however important to note that the new figure shows a somewhat more modest disinflation, as compared to the developments in the fourth quarter of 2001. This can primarily be explained by the temporary inflationary effects of some "noisy" components in the consumer basket (seasonal unprocessed foodstuff and alcoholic drinks). Nevertheless, inflation in market services was lower than expected, while the core inflation index and the inflation measured among components on which monetary policy can have direct influence also show the continuation of the disinflation.

The annual rate of increase in the price of tradables and market services[1] – accounting for about half of the consumer basket – continued to moderate (see Chart I-1). In contrast with the first three quarters of 2001, service price disinflation lost momentum during the fourth quarter, causing the inflation differential to increase relative to tradables prices (see Chart I-2). In the Bank's judgement, the widening of the differential was due to the strong growth in consumer demand and the service sector wage inflation stagnating at a high level in the fourth quarter of the year.[2]

In addition to the disinflation in tradables and market services prices, the fourth-quarter decline in the overall consumer price

Chart I-1 Market services and tradables price inflation
Percentage changes on a year earlier

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[1] The NBH's own CPI classification, which is different from that of the Central Statistical Office and similar to that of the European Central Bank Any inflation data in the Report is presented according to this classification.

[2] For a discussion of the wage-push inflation experienced in the service sector, see the relevant section of Chapter III/2.

index (CPI) was primarily due to two factors, namely the lower rate of food price increases and the plunge in vehicle fuel prices induced by lower world oil prices. In respect of food prices, which account for nearly 20% of the consumer basket, the factors behind the disinflation seen in 2001 H2 included the high base values of a year earlier and actual declines in unprocessed foodstuff prices, which, indirectly, also slowed down the rate at which processed food prices increased (see Chart I-3). The main force behind the fourth-quarter disinflation in unprocessed foodstuff prices was a plunge in the price of pork, which carries the largest weight in the food category.

Monetary policy has the greatest influence on prices that strongly correlate with the exchange rate or which are sensitive to aggregate demand. As the evolution of the CPI in 2001 was shaped to a great extent by factors that are not affected by monetary policy, the Bank's analysts have constructed a special category comprised of goods influentable by monetary policy. This category of "influentable" goods comprises tradables, market services and a specific component of vehicle fuel prices that is dependant on the forint/euro exchange rate (see Chart I-4).[3] The chart clearly illustrates that the higher-than-expected fall in the CPI during the second half of the year can be broadly attributed to disinflation in prices that are not directly affected by monetary control. Similarly, the changes in *core inflation*[4] displayed in the chart suggest that the disinflation for the aggregate, constructed by eliminating high-volatility components (such as unprocessed foodstuffs, petrol, market energy and regulated prices) was smaller than the drop in inflation experienced by the overall consumer basket.

As noted above, factors not affected by the central bank had a marked influence on the path of inflation in 2001. In order to highlight the impact of changes in monetary conditions on inflation in the wake of the exchange rate band widening, a simulation has been carried out. The Bank estimated the probable development of the inflation path, if the narrow-band crawling peg system had remained in place. Under the crawling peg system, it is not only the exchange rate path that would have differed: the simulation also takes account of the fact that the parameter for the exchange rate pass-through was higher under the narrow-band regime (an annual rate of almost 100%). The values used for other variables (such as oil prices, dollar/euro rate, unprocessed food prices, real economic variables) were those observed during the course of the year.

The results of the simulation, shown in Table I-1, indicate that had the former exchange rate regime remained, CPI inflation in 2001 Q4 would have declined to 8%, instead of its actual rate of 7.2%. Accordingly, the rate of disinflation generated by monetary policy could be stated as being 0.8 percentage points, and only one-fourth of the disinflation recorded in the second half of 2001 can be viewed as falling under the direct influence of monetary policy. Nevertheless, over the longer term, monetary policy is expected to make a much greater impact.

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[3] In principle processed food prices are also influenced by monetary policy via its effect on aggregate demand and imported inflation. Food prices, however, are very much shaped by exogenous supply side shocks which are hard to detect. So the "influentable" price index presented in this Report excludes all food prices and accounts for 52.1% of the consumer basket.
[4] The new core inflation index published by the Central Statistical Office in 2002.

Chart I-2 Differential between market services and tradables price inflation
Percentage changes on a year earlier

— Nontraded/traded inflation differential

Chart I-3 Inflation in processed and unprocessed food prices*

— Unprocessed food   — Processed food
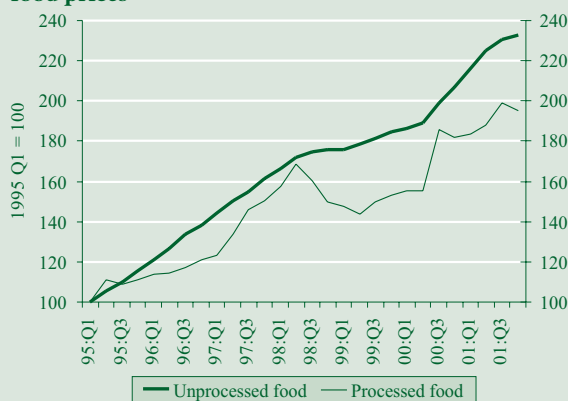
*1995 Q1 = 100, seasonally adjusted price levels.

Chart I-4 CPI, core inflation and "influentable" inflation
Percentage changes on a year earlier

— Headline CPI   ······· Core inflation
— "Influentable" inflation
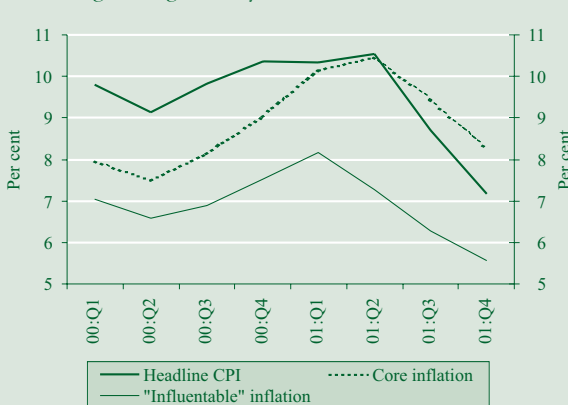
Table I-1 Estimate for the rate of inflation in 2001 Q4 under the narrowband crawling peg regime*
Percentage changes on a year earlier

	Actual data	Simulation	Difference
	2001 Q4		Percentage points
Tradables	3.9	5.1	1.2
Market services	10.2	11.0	0.8
Vehicle fuel	−13.1	−10.6	2.4
CPI	**7.2**	**8.0**	**0.8**

* The monthly rates of devaluation used in the estimation are 0.2% for May to September and 0.1% for October to December 2001.

1 Inflation projection of the previous quarter versus the actual rate

Table I-2 Central inflation projection and actual data in 2001 Q4

Category	Weight	Actual data	November projection	Differ-ence*	Effect of difference on CPI
		Percentage changes on a year earlier			
Food	19.0	11.1	12.7	−1.6	−0.3
Unprocessed	*5.3*	*7.6*	*10.5*	*−2.8*	*−0.2*
Processed	*13.7*	*12.3*	*13.5*	*−1.1*	*−0.2*
Tradables	26.8	3.9	4.0	−0.1	0.0
Market services	20.3	10.2	9.9	0.3	0.1
Market-priced household energy	1.3	1.4	−0.7	2.1	0.0
Vehicle fuel	5.0	−13.1	−6.9	−6.2	−0.3
Alcohol and tobacco	9.1	10.4	10.6	−0.2	0.0
Regulated prices	18.6	8.9	8.7	0.2	0.0
CPI	**100.0**	**7.2**	**7.7**	**−0.5**	**−0.5**

* Difference = actual data minus projection; in percentage points. Rounded values.

Table I-3 Assumption of the November forecast versus actual data in 2001 Q4

Assumption	November forecast	2001 Q4
Forint/euro exchange rate (HUF)	255.9	251.4
Brent crude oil (USD/barrel)	25.5	19.3
Dollar/euro exchange rate (cents)	91.0	90.0
Imported tradables inflation*	0.5	1.7
Unprocessed food price inflation**	10.5	7.6
Including: prices for pork***	*0.0*	*−4.7*
Regulated prices**	8.7	8.9

  * Tradables price inflation in Germany, annualised quarter-on-quarter index.
 ** Annual price index.
*** Average of monthly price increases.

The Q4 inflation projection published in the November 2001 issue of the *Inflation Report* exceeded the actual rate by 0.5 percentage points (see Table I-2). This overestimation was due both to stronger-than-expected disinflation in food and in vehicle fuel prices. On the other hand, the projection underestimated inflation of market service prices.

The difference between the November projection and the actual rates can be attributed to two factors. First, the assumptions for the exogenous developments determining inflation did not correspond to actual developments. Second, the forecast model failed to properly capture the economic mechanisms underlying changes in consumer prices.

In contrast with the assumptions of the November projection, the exogenous factors which determine the inflation forecast tended towards disinflation during Q4, with the exception of the dollar/euro exchange rate imported tradables prices and regulated prices (see Table I-3). In respect of fuel prices, which account for 50 per cent of the discrepancy between the forecast and the actual data, the explanation lies in the special assumptions made regarding the exogenous variables. In projecting the world price for oil, which has the greatest impact on vehicle fuel prices, the technical assumption – applied pursuant to a rule formulated by the Monetary Council – is that prices remain at the average level of the last full month prior to the projection. The plunge in the price of Brent oil relative to this technical assumption and the strengthening of the forint/euro exchange rate account for the difference between the projection and actual vehicle fuel prices.

The difference between the inflation projection for food prices and the actual rate was due to difficulties in forecasting *unprocessed food* prices. Agricultural producer prices governing unprocessed, and, in an indirect way, processed foodstuff prices are highly volatile and relevant projections are surrounded by a great deal of uncertainty. Hence, the November projection did not view the Q3 disinflation in food prices as a lasting trend and assumed that inflation would decline less slowly during the fourth quarter. The main reason that developments in the fourth quarter ran contrary to the assumption was a surprise fall in the price of pork, with a large weight in the unprocessed food category.

In contrast with the November assumption, the *forint/euro exchange rate*, which has a crucial impact on CPI inflation (even though this impact is mainly felt over the longer term), also exerted downward pressure on price increases. In accordance with the rule which assumes that the exchange rate remains constant at the average rate measured during the last full month prior to the date of the projection, the assumption was 255.9 forints per euro. However, the average exchange rate in the fourth quarter was 1.7 per cent higher. A strengthening exchange rate of the forint exerts direct and indirect disinflationary pressure on the price of tradables and other imported goods (including oil and a number of foodstuffs) and prices of market services, respectively. Despite the exchange rate being stronger than the November assumption, tradables price inflation projected for the fourth quarter did in fact correspond to actual rates. This was partly be-

cause the full impact of a strengthening (the exchange rate pass-through) on domestic prices can only unfold gradually, over a longer period of time, and partly because *imported tradables inflation* appeared to exert stronger-than-expected inflationary pressure in the reviewed period (see Table I-3).

As the August projection also underestimated inflation in tradables and market services prices, and the November projection did not overestimate tradables price inflation even in the face of a weaker exchange rate assumption, the Bank staff felt that it was desirable to review the forecasting model used for these two categories. Under the model, *tradables* prices are primarily influenced by the forint/euro exchange rate and imported tradables inflation, while other factors (such as household demand and wage costs) are of lesser importance. The results of the review suggest that even if the Bank had been aware of the actual development of exogenous factors, the inflation of tradables and market services prices would have been systematically underestimated in the second half of 2001. This confirms the assumption that the strengthening of the exchange rate does not cause tradables price inflation to decline at the rate previously assumed, in other words, the exchange rate pass-through is of a smaller magnitude than previously thought. Consequently, the new projection estimates the size of the exchange rate pass-through at a lower rate than in the previous two inflation reports. For more on this revision, see Chapter IV.

In terms of the Bank's model, over the long term, the inflation of *market service prices* is determined via the Balassa-Samuelson effect, i.e. the differential relative to tradables price inflation is primarily due to the productivity gap between the two sectors. In addition, market service prices are also influenced by domestic consumer demand over the long term, while, the effects of other factors, such as wages, food and energy prices, are also taken into consideration over the short term. Although the underestimation of market service prices is largely explained by the underestimation of tradables price inflation, the inflation differential between services and tradables was also underestimated. The Bank feels that this underestimation of the inflation differential can be attributed to the rapid rise in domestic consumer demand and the higher than expected end-year inflation in service sector wages. Accordingly, the Bank perceives no need to revise the projection methodology used in the treatment of market services.

II Monetary policy, interest rates and the exchange rate

Chart II-1 Global risk indicators

Spread of risky U.S. corporate bonds (S&P U.S. Industrial Speculative Grade Credit Index)

········· S&P100 index option implied volatility (VIX; right-hand scale)
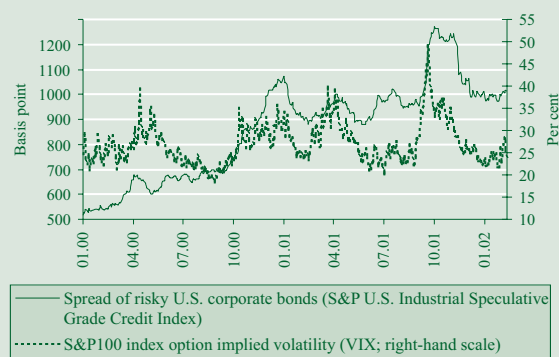
Chart II-2 EMBI spread and the three-year forint yield*

——— 3-year HUF yield ········· EMBI spread (right-hand scale)
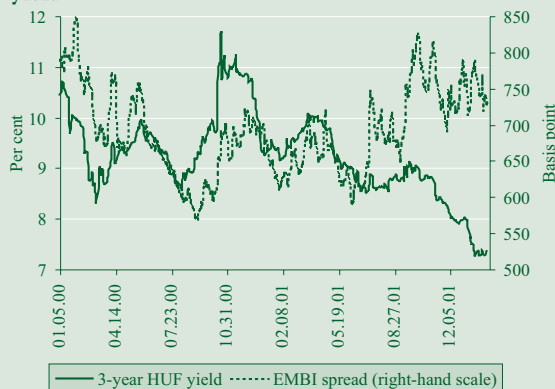
* The weighting applied in the construction of the index was changed by J.P. Morgan, the constructor of EMBI, as of 5 December 2001. The weight assigned to Argentina was reduced considerably, simultaneously with an increase in the weights for several other countries. To ensure comparability, the chart shows the historical values recalculated using the new weights.

1 International economic environment and risk perception

Although widening the exchange rate band has enlarged the central bank's leeway to influence monetary conditions, the timing of interest rate moves and their impact on the forint/euro exchange rate are affected, to a significant degree, by the interest rate changes carried out by the European Central Bank (ECB) and by fluctuations in the risk premium on forint investments.

Changes in yields within the euro area, which are of vital importance to Hungarian monetary policy, have been determined by the ECB's easing of monetary policy. With sluggish growth and falling oil prices having significantly eased inflationary pressures, the European central bank made another 50-basis-point cut in its key rates on 8 November. In 2001, the key rate was reduced by 150 basis points altogether, from 4.75% to 3.25%. Despite an expected decline in inflation and deepening recession in Germany and Italy, market participants do not appear to expect another rate cut in the first quarter of 2002.

The risk perception of Hungarian investments is governed by changes in international investors' appetite for risk. In addition to country-specific factors relating solely to Hungary, risk perception is also influenced by investors' appetite for risk in the region (Central and Eastern Europe), in emerging markets and in developed countries.

The already high uncertainty due to the difficulty in predicting the evolution of the business cycle in developed countries further intensified in the aftermath of the terrorist attack against the USA on 11 September. However, rapid military success in Afghanistan helped to restore market confidence to a certain degree, and by late November, in both the USA and Western Europe indicators of investor appetite for risk had returned to levels seen before the terrorist attacks (see Chart II-1). Nevertheless, there was no considerable improvement in the American markets subsequently, with great uncertainty remaining about the likely date of a recovery starting in the American economy.

Just as that of the developed world, the risk perception of emerging markets did not take long (only until end-November) to recover from the spectacular loss of confidence suffered in the immediate aftermath of the terrorist attacks. However, subsequently there was no improvement, with the EMBI spread – which reflects the risk premia on emerging country sovereign debt – even reflecting some renewed worsening in December (see Chart II-2). This renewed loss of confidence was probably associated with the escalation of the economic and po-

litical crisis in Argentina. One must add however, that for the time being, the size of the deterioration does not suggest serious contagion effects. It seems that after the Argentine default, international investors made a distinction between individual emerging countries. This is in contrast to previous practice, notably the contagion phenomena following the South-East Asian and Russian crises in the late 1990s. Central and Eastern Europe, as an emerging region in particular, experienced no negative effects following the Argentine default.

With respect to the regional risk perception of Central and Eastern Europe, the only available non-Hungarian indicator is the average spread on Polish USD-denominated sovereign bonds. These spreads show that just as in the developed countries, the effect of the loss of confidence in the wake of the terrorist attacks had disappeared in Poland by late November, with no considerable improvement thereafter.

The interest premium on Hungarian deutschmark bonds, Hungary's country-specific indicator of risk, moved broadly in conjunction with the risk indicators for developed countries until late November (see Chart II-3). However, the subsequent period saw the emergence of a number of country-specific effects, which caused the spreads to narrow during the second half of December. By mid-January 2002, this index was back at the low level seen at mid-2001, prior to the flare-up of the Argentine and Turkish economic problems. Meanwhile long-term forint yields fell to a much greater extent, to far below their level at mid-2001. This was predominantly due to the better risk assessment of Central and Eastern Europe, and particularly of Hungary. The rising confidence in Hungarian investments has been predominantly due to country-specific factors, such as the better-than-expected current account[1] and inflation performance in the last quarter of 2001.

2 Short-term interest rates

The central bank's interest rate changes influence monetary conditions partly in a direct and partly in an indirect manner, via the exchange rate. In the judgement of the central bank, exchange rate expectations exert the most direct influence on the path of inflation. Consequently, adjustments to risk premium fluctuations, i.e. smoothing the exchange rate, play a key role in deciding on the interest rate policy to be pursued.

The risk perception of forint investments has improved considerably since the publication of the last Inflation Report. This has enabled the Bank to make several cuts in the base rate, in line with the lower inflation expectations. From October 2001 to end-February 2002, the base rate was reduced by a total of 225 basis points, from 10.75% to 8.5% (see Chart II-4). Despite lower forint rates, the exchange rate volatility typical in the past has also subsided, with the rate strengthening steadily since November.

The forward yields derived from the yield curve and the Reuters' poll provide a good source of information on market participants' expectations of changes in the Hungarian central bank rate. The implied forward yields suggest that at end-

[1] A significant upward correction of the 2001 current account deficit was announced on February 18, 2002.

Chart II-3 Average spread on DEM-denominated Hungarian sovereign bonds
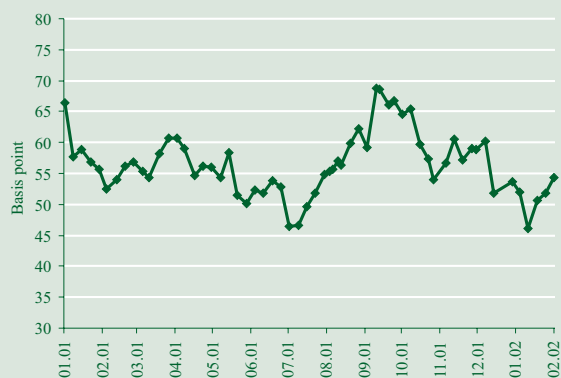
Chart II-4 Official interest rates and short-term market yields

- 3-month HUF yield
- 3-month EUR yield (right-hand scale)
- NBH base rate
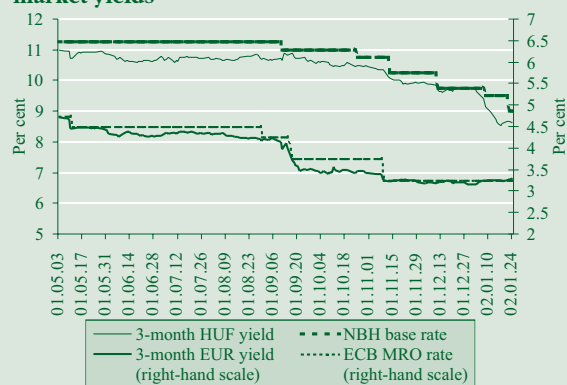- ECB MRO rate (right-hand scale)

**Chart II-5 Central bank base rate expectations:
the yield curve and the Reuters' poll**
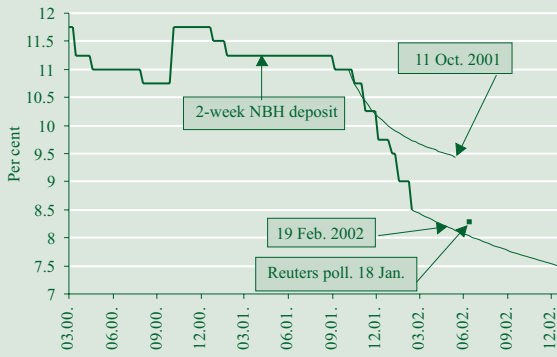
**Chart II-6 Three-month interest rate differential
vis-à-vis the euro area**

3-month interest rate differential vis-á-vis the eurozone
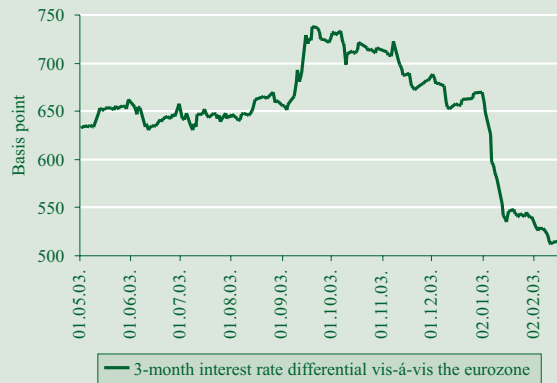
**Chart II-7 Forint exchange rate and analysts'
expectations of future exchange rate movements**

Prompt HUF/Euro
Analysts exchange rate expectations - January Reuters poll
Analysts exchange rate expectations - November Reuters poll
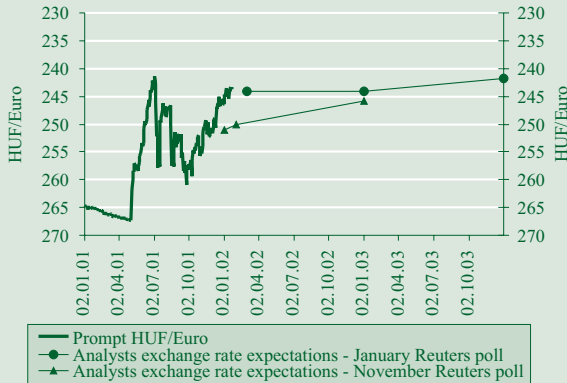
Chart II-8 Exchange rate of the forint

Forint/euro ······· Central parity
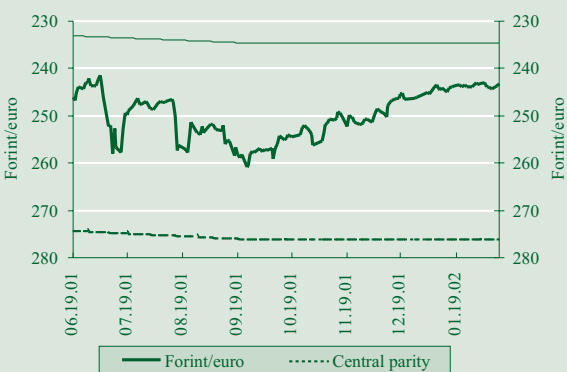
October market participants tended to overestimate the level of interest rates for early 2002, but since then there has been a steady reduction in inflation and, simultaneously, interest rate expectations. Market participants are expecting another 50-basis-point cut in interest rates by June 2002. The Reuters' survey of 18 January reflects higher interest rate expectations than suggested by the yield curve, with the average for analysts' expectations amounting to 8.3% (see Chart II-5).

The steadily lower interest rate expectations caused the three-month forint yield to decline from around 10.5% in early November to 8.5% in late February. As the forint yields fell more than euro yields of a similar maturity over the period under review, the interest rate differential, which had been over 700 basis points in late October, fell to close 500 basis points (see Chart II-6).

3 Capital flows
and the exchange rate

After the effect of the September terrorist attacks tapered off, from October to end-January the exchange rate of the forint appreciated steadily, except for a few days of downturn. As noted above, this strengthening of the exchange rate was due to both country- and region-specific factors.

Analysts expect this strong level of the exchange rate to be lasting. Over the period since the publication of the previous Inflation Report, the Reuters' poll's exchange rate expectations, for the same future dates, have increased month by month. While expectations relating to the end of the year 2002 suggest only a slight appreciation in the exchange rate, those for shorter maturities reflected increasingly stronger expectations parallel to the strengthening of the spot rates indicating that market participants consider the level of the exchange rate seen in January sustainable. This caused the expectations' curve to tilt around the longer horizons, with the segment for the shorter maturities rising upwards. Chart II-7 displays the average of the November 2001 and January 2002 monthly polls (forecasts for the end-2003 exchange rate are requested from December onwards).

Simultaneously with the strengthening of the forint (see Chart II-8) there was a shift in the composition of capital flows. From September to January, the seasonally adjusted current account deficit showed a slightly deteriorating trend. Still, the annual current account deficit was smaller than in 2000. Financing this deficit causes no difficulties, after the temporary downfall in the third quarter, non-interest-sensitive capital picked up again, due primarily to a higher inflow of direct investment (see Table II-1). Available data show that only October witnessed some outflow of equity capital during the reviewed period.

The outflow of interest-sensitive capital first seen in July and August continued until the end of the year. However, from September on, this outflow of funds was due not so much to non-residents' demand for foreign currency: the demand can be attributed to firms' repayment of foreign currency debt to non-residents until November end to the increase in household foreign currency deposits in December. However, the bulk of the increase in household forex deposits was due to the introduction

Table II-1 Components of foreign exchange demand and supply

HUF billions

	2001*						
	Q1	Q2	Q3	Q4	October	November	December
I Central bank intervention	−177.9	−163.0	0	0	0	0	0
II Current account balance	−62.9	−195.1	70.9	−130.7	−18.4	−31.0	−81.3
III Non-interest-rate-sensitive capital flows (1+2)	137.5	168.6	117.0	149.2	54.5	50.5	44.2
1 Net FDI inflow (private sector)	*131.9*	*178.7*	*109.1*	*164.6*	*72.1*	*48.9*	*43.7*
2 Equities securities	*5.7*	*−10.0*	*7.9*	*−15.4*	*−17.6*	*1.6*	*0.6*
IV Interest-rate-sensitive capital flows (1+2+3+4)	42.9	65.5	−192.3	−182.9	−91.8	−66.1	−24.9
1 Non-residents, total (a+b)	*85.2*	*221.0*	*−119.1*	*77.5*	*21.1*	*47.8*	*8.6*
a) Change in non-residents' holdings of government securities**	90.8	195.1	−56.7	113.2	23.4	29.4	60.4
of which: short-term	−2.1	11.2	−61.7	41.3	23.2	6.4	11.6
long-term	92.9	183.9	5.0	71.9	0.2	23.0	48.7
b) Non-residents forint deposits	−5.7	25.9	−62.3	−35.7	−2.3	18.3	−51.8
2 Credit institutions (change in on-balance-sheet open position)	*65.5*	*−12.7*	*−24.1*	*−87.0*	*−47.4*	*2.4*	*−42.1*
3 Corporate sector (a+b)	*−100.0*	*−149.0*	*−41.1*	*−126.1*	*−61.4*	*−106.5*	*41.8*
a) Net change in domestic foreign currency borrowing	−26.1	−15.3	21.7	−76.0	−21.1	−13.9	−41.0
b) Net change in foreign currency borrowing abroad	−74.0	−133.7	−62.8	−50.1	−40.3	−92.6	82.7
4 Household sector	*−7.7*	*6.1*	*−8.0*	*−47.2*	*−4.2*	*−9.8*	*−33.2*
V Other***	60.3	126.1	51.1	204.2	69.6	60.7	73.9
VI Purchases of foreign currency by the central bank in equal daily amounts	0	−2.1	−46.7	−39.8	−13.8	−14.1	−12.0

* Based on the adjusted balance of payments data published on February 18th, 2002.
** The change in non-residents' holdings of government securities may differ from the depository statistics of KELER due to government securities repo transactions with non-residents.
*** The entry 'Other' includes the Bank's and general government's transactions as shown in the current account, other monetary financial institutions' demand for foreign currency and the statistical error.

of euro notes and coins, since households tried to dispose of former eurozone member currency cash partly by placing it on euro bank accounts. According to NBH estimates this effect accounted for a HUF 7,5 billion and HUF 34,7 billion increase in households' forex bank deposits in November and December, respectively. Although included in Table II-1 for technical reasons, these transactions did not affect foreign exchange supply and demand.

The value of corporate sector net foreign currency borrowing from non-residents was negative during the September to November period. It seems likely that the slowdown in the economy and the cutbacks in investment exerted downward pressure on firms' financing demand. This tendency has stopped in December: while redemption of domestic foreign currency debt accelerated, net foreign currency borrowing from non-residents has increased.

Non-residents' government securities holdings continued to decline in September, but the sales of long-term government securities typical of previous months came to an end. Consequently, the downward trend in the average maturity of non-residents' government securities holdings stopped (see Chart II-9). However, from October on, there was an upward shift in the value of both short-term and long-term government securities holdings, primarily due to Hungary's better risk rating and investors' customary portfolio reallocation at the beginning of the year. In the course of December and January, in addition purchases of long-term government securities, non-residents invested strongly in short-term government securities, causing a *temporary* fall in the average maturity of non-residents' government securities holdings.

Until October, banks held nearly closed total foreign exchange positions, which then gradually evolved into long posi-

Chart II-9 Volume and average maturity of non-residents' government securities holdings

Outstanding stock (right-hand-scale) — Average maturity (left-hand-scale)
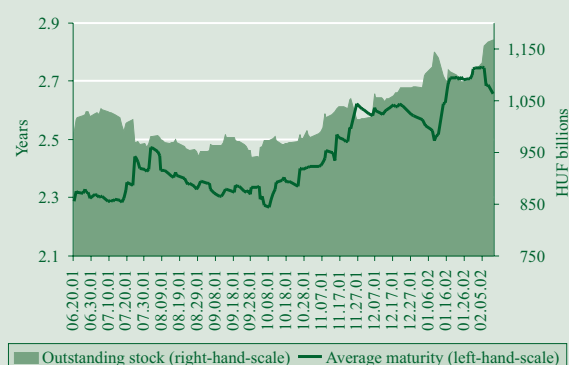
Chart II-10 Commercial banks' open foreign exchange positions (excluding the Hungarian Development Bank)

Total open position (5-day moving average)
Off balance sheet position (5-day moving average)
On balance sheet position (5-day moving average)
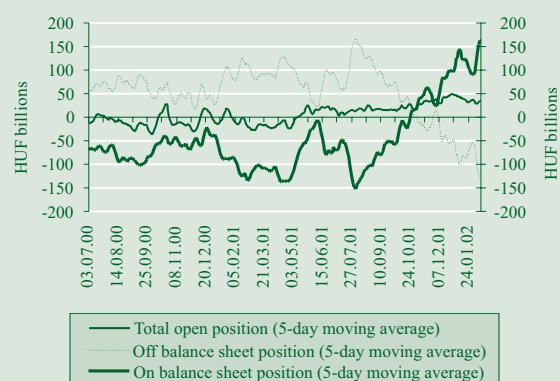
Chart II-11 Zero-coupon yields*
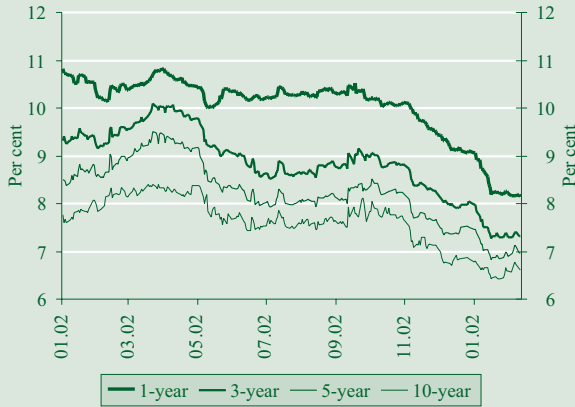
* Estimation of the zero-coupon yield curve has been carried out by means of Svensson specification.

Chart II-12 Inflation expectations for one month ahead versus the actual rate of inflation
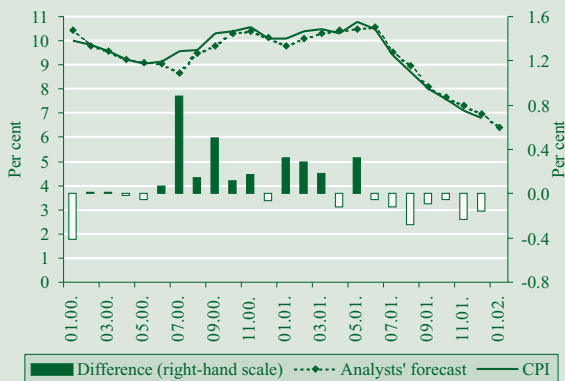
Chart II-13 One-year implied* forint forward yield curves and changes in the forint and euro forward differential over the last quarter
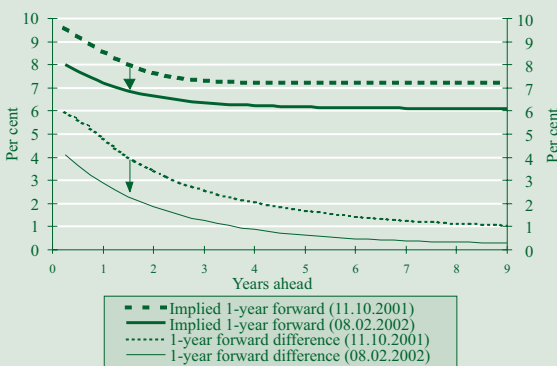
* Estimation of the zero-coupon yield curve has been carried out by means of Svensson specification.

tions (see Chart II-10 on the Page 19). From mid-December, there were changes in the signs of the on-balance-sheet and off-balance-sheet positions. By mid-January banks had significantly increased their on-balance-sheet long positions in foreign exchange (assets), by over HUF 150 billion. This signalled a break with the long-standing practice of maintaining some measure of short position on the balance sheet. Although they had changed into short positions, derivative positions could not keep pace with the rate at which the long positions on the balance sheet increased.

The large on-balance-sheet long foreign exchange positions can be attributed to non-residents' government securities purchases, firms' repayment of foreign currency loans and the increases in households' foreign currency deposits. The combined effect of these factors boosted demand for the forint and the supply of foreign currency, to which adjustment can take place only over the longer term by banks reducing their long foreign exchange positions.

4 Yield movements

Yields of government securities have declined substantially since the November 2001 *Inflation Report* (see Chart II-11). This downturn in yields took place in phases, occurring in three major steps. In the first half of November, the investors sentiment regarding Hungarian investments improved in tandem with international risk indicators (see Section II/2). In December 2001 and early January 2002, it was not so much global appetite for risk but rather the medium-term prospects of the Central and Eastern European countries, and in particular Hungary, that generated substantial capital inflows into this area. Investor optimism was further fuelled by favourable domestic macroeconomic indicators.

Inflation also declined somewhat more quickly than expected (see Chart II-12). This unexpectedly rapid disinflation exerted pressure on expectations of an interest rate reduction in 2002: compared to the October Reuters' poll, for the year-end analysts now forecast a nearly one-percentage-point lower base rate and yield on one-year government securities.[2]

This sharp fall in interest rate expectations and the interest premium is also reflected in a shift in the zero-coupon yield curve. There was a downward move in implied forward yields at all maturities, relative to October 2002. This shift in the forward yield curve occurred virtually in parallel. Simultaneously, the euro forward curve flattened, implying that the maturity path of the forward differential projects a faster convergence of spot yields over the next two years (see Chart II-13).

Monthly forecasts for inflation at end-2002 ranged between 5.3% and 5.5% each month in the period from June to December, and fell to 5.1% in January. The shape of the forward differential curve has remained virtually unchanged since the introduction of the inflation targeting regime, suggesting that *yield movements are primarily governed by the risk premium, and that inflation*

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[2] The difference between the averages of the two surveys is statistically significant.

expectations have been much more stable, causing only smaller shifts in the yield curve over the last six months.

Since December, analysts' inflation expectations have also become available for end-2003. Although just as for end-2002, expectations for 2003, they are without exception in the upper half of the ±1% range of tolerance surrounding the target set by the NBH and the Government.[3]

The fall in yields was larger than could be accounted for by changes in the global appetite for risk. Given that inflation and exchange rate expectations[4] remained virtually unchanged, they could not have caused the yield curve to shift either (see Chart II-14). The easing of the inflation uncertainty may have been a key contributing factor in the decline of the country-specific portion of the risk premium required from the yields on Hungarian government securities.

Non-resident investors' increased activity, which is dominant in the evolution of yields on Hungarian government securities, implies that the factor at work in the large-scale purchases seen over the past few months has been the fall in the risk premium and the intention to take advantage of interest rate convergence. In terms of government securities held by non-residents, the weight of bonds maturing after 2002 increased, while at the same time there was a fall of almost HUF 70 billion in short-term securities holdings. In contrast to the period prior to September 11, when currency swap transactions were primarily governed by non-residents' speculation on an appreciation of the forint, they have since started to concentrate on hedging the exchange rate risk of their government securities purchases and holdings.

The increase in the average maturity and the elimination of the exchange rate risk combined sggest that non-resident investors assign greater probability to an early entry into EMU (in 2006 or 2007), and their purchases are primarily governed by expectations of convergence rather than by short-term exchange rate expectations. Changes in the one-year forward differential priced for 2006 shows that *in 2006 the one-year spot rate differential between Hungary and the euro area may fall below one percentage point at the one-year maturity* (see Chart II-15). This gap has never been so narrow, with its previous low of 1.5% recorded in June 2001.

Chart II-14 Reuters' survey of inflation expectations for end-2001, end-2002 and end-2003
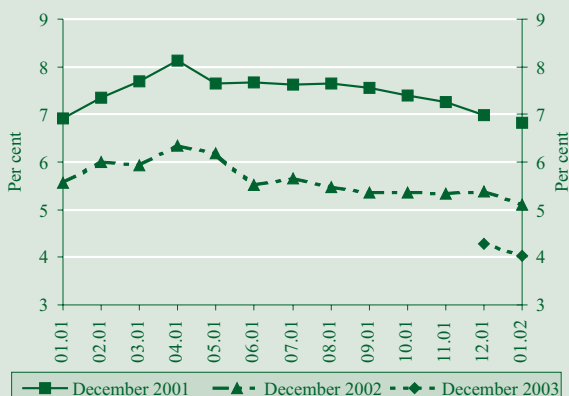
Chart II-15 Forint and euro implied forward differential* for 2006 versus inflation uncertainty
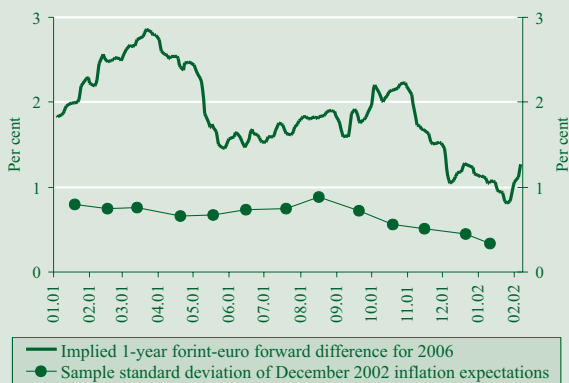
* Estimation of zero-coupon yield curve has been carried out by means of Svensson specification.

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[3] See Chart IV-6.
[4] The Reuters' survey shows that the exchange rate expected for end-2002 changed to a much lesser degree than that expected for end-2001.

III Determinants of inflation

Chart III-1 Quarter-on-quarter GDP growth
Annualised rate based on seasonally adjusted data
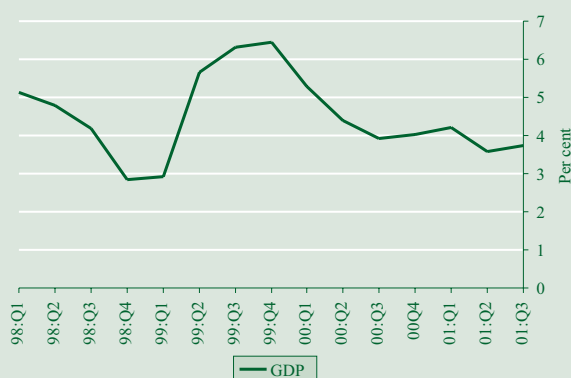
1 Demand

Over the first nine months of 2001, the Hungarian economy grew by 4% in a year-on-year comparison, up by 3.7% in the third quarter. In terms of seasonally adjusted quarter-on-quarter growth rates, which give a better picture of cyclical developments, the economy grew at a stable pace, reflected in annualised rates of around 4% last year (see Chart III-1).

A supply-side analysis of economic growth reveals that the level of industrial production has remained virtually flat since end-2000, in line with the evolution of external demand, while the service sector continued to expand at a steady pace. Developments on the demand side indicate that growth was driven by an increase in households' consumption expenditure. At the same time, the investment growth rate declined and gross capital formation *exerted* downward pressure on economic growth as a result of destocking. The subsequent plunge in import growth has dampened the negative GDP effect of the investment slowdown, by causing a temporary rise in net exports.

The slowdown in investment growth in the third quarter seems to have corresponded to the trends outlined in the November *Report*. Export growth declined to the extent projected. The slowdown in import growth was even stronger due to large reductions in stocks, in addition to weaker investment. Economic growth in 2001 is estimated at 3.8–3.9% for the year as a whole.

In the current projection, the forecast for external demand, one of the exogenous factors affecting the real economy, has been revised significantly downwards. Taking into account some newly available information, the Bank puts the turning point of external demand increase further ahead in time. Accordingly, recovery will only be perceived from the second half of 2002, i.e. the economy is expected to regain its footing slowly and gradually. Thus, the outlook for 2002 is even weaker than that put forth by the "pessimistic" scenario of the November *Report*. The current *Report* is the first to publish projections for the whole of 2003, forecasting a pick-up in the demand for imports of Hungary's trading partners.

In the Bank's projection, economic growth slows even further in 2002. The decline in Hungary's main trading partners' demand for imports in 2001 continues to have an effect on Hungarian exports. Furthermore, export growth is further hampered by the delayed impact of last year's real appreciation. Due to flat external demand during the first six months, firms' investment volume is expected to decline in 2002. Whole economy investment growth moderates relative to the previous year, as the Bank as-

sumes that the State's investment policy is not capable of fully off-setting the decline in private sector investment growth. At the same time, domestic absorption remains high as households step up their consumption faster than expected, thanks to higher household disposable income consistent with higher real wages. On the supply side, the labour market's slower and less flexible nominal adjustment hampers GDP growth and worsens manufacturing competitiveness. The wide ranges of the projection reflect the central bank's cautious approach.

In 2001, the labour market was affected by two nominal shocks, namely the appreciation of the exchange rate in nominal terms and faster-than-expected disinflation. Due to the uncertainty about the labour market's ability to adjust to these shocks, the Bank has drawn up two additional scenarios: one based on the assumption of forward-looking wage formation and another based on backward-looking wage formation. Under *forward-looking* wage formation the economic growth in 2002 is 0.2 per cent higher compared to the central projection. The effect of the acceleration of exports caused by lower real appreciation is not offset by a slowdown in consumption. The alternative scenario, assuming *backward-looking* wage formation, has a reverse outcome, resulting in a growth rate 0.2 per cent lower than the central projection.

In 2003, consumer demand is expected to follow a downward trend, due to weaker growth in real earnings within the private sector and slower growth in public sector wages. Investment growth is projected to pick up simultaneously with the cyclical recovery. Due to stronger investment activity by the corporate sector, the share of gross capital formation within domestic absorption will grow, which is expected to exert downward pressure on net exports.

The "Final domestic sales" category is used to eliminate the extreme volatility of the "Domestic absorption" category, which also includes changes in inventories and other unspecified use. It is final domestic sales and that portion of net exports that excludes the import requirement resulting from changes in inventories that can be related to the external and domestic cyclical factors and forecast with a reasonably reliable outcome.

Note that in the inflation projection of the NBH it is not total GDP nor domestic absorption, but rather only changes in household consumption demand that have a direct impact on consumer prices. In 2002, the pick-up in consumer demand hampers disinflation early in the year. In 2003, more modest growth in household consumption may have a slightly disinflationary effect.

In 2001, changes in the terms of trade are not expected to have reduced real gross domestic income (GDI) at the whole economy level. The terms of trade are assumed to improve by roughly 1 per cent in 2002, a projection also supported by international forecasters. In 2002, domestic absorption may grow faster than GDP, thanks to better terms of trade. The Bank's projection for 2003 expects the effect of the terms of trade to be neutral for Hungary's foreign trade. Thus, the terms of trade are not expected to modify GDI and GDP growth. The fact that domestic absorption is to grow faster than GDP is projected to cause a worsening in the external equilibrium position (see Table III-1 on the Page 24).

The current account deficit is estimated to amount to EUR 1.2–1.8 billion in 2002 and EUR 1.7–2.5 billion in 2003. The

Table III-1 Annual GDP growth rate and its components – projection
Percentage changes on a year earlier

Per cent

	Actual data*	Projection		
	2000	2001	2002	2003
Household consumption	4.1	3.8–3.9	3.5–4.9	2.5–4.5
Household final consumption expenditure	4.3	4.4–4.6	4.1–5.5	3.0–5.0
Social transfers in kind	*3.4*	*1.3*	*2.3*	*1.9*
Public consumption	*2.9*	*1.4*	*1.9*	*1.7*
Gross fixed capital formation	7.7	2.5–3	(−1.0) – (+3.0)	3.0– 6.0
"Final domestic sales"*	4.9	3.3–3.5	3.2–4.0	3.5–4.5
Inventory investment**	9.2	(−15.0)–(−20.0)	5.0–15.0	5.0–15.0
Domestic absorption	5.1	2.0–2.3	3.5–4.5	3. 7– 5.2
Exports	21.8	9.0–10.0	3.0–8.0	6.0–12.0
Imports	21.1	7.0–8.0	3.5–9.5	7.0–13.5
GDP [1]	*5.2*	*3.8–3.9*	*3.0–4.0*	*3.5–4.5*

* Final domestic sales = household consumption plus public consumption plus gross fixed capital formation.
** And other non-specified use.

Table III-2 Current account deficit and the financing capacity/requirement of sectors
As a percentage of GDP

Per cent

	2000	2001	2002		2003	
	Actual data		Projection			
I General government*	−3.5	−5.5	−5.5	−4.9	−4.5	−3.7
II Private sector (1+2)	1.3	3.9	2.6	4.0	0.5	2.6
1 Households	5.1	4.9	4.1	4.6	3.5	4.3
2 Corporate sector**	−3.8	−1.0	−1.5	−0.6	−3.0	−1.7
External financing requirement (I+II)***	**−2.3**	**−1.6**	**−2.2**	**−1.3**	**−3.0**	**−1.9**
Current account balance	**−2.9**	**−2.2**	**−2.7**	**−1.8**	**−3.5**	**−2.4**
In EUR billions	*−1.4*	*−1.2*	*−1.8*	*−1.2*	*−2.5*	*−1.7*

* Consolidated general government (including the NBH).
** Financial and non-financial enterprises, total.
*** On cash flow basis. The external financing requirement includes both the current account deficit and the capital account balance.

year-on-year improvement on the current account in 2001 is due to the fact that the private sector increased its financing capacity at a high rate as a proportion of GDP. The corporate sector did not take long to adapt to the sluggish external activity, cutting down on investment expenditure. Macroeconomic statistics for 2001 did not yet reflect the loss of profitability suffered by firms because of the real appreciation. The improvement in the balance of payments data is of special interest as the sharp fall in world oil prices did not yet improve the year-on-year balance in 2001, with the energy account showing roughly EUR 100 million higher expenditure.[2]

The current account deficit in 2001 supports the assumption that recovery from the economic slowdown will be a prolonged process (see Table III-2). Weaker growth in imports suggests that whole-economy investment growth declined to a greater extent than expected. Corporate sector investment is likely to have lost momentum in the fourth quarter, compared with the same period a year earlier. Furthermore, a trend of destocking and postpon-

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[1] Growth in social benefits in kind and public consumption, the estimation and interpretation of which carry higher-than-average uncertainty, is projected based on a simple rule of averaging the growth rates of the previous 8 quarters. Due to the Central Statistical Office's data revisions, the risks to these estimates are mainly on the upside. The implications of these revisions are described at more length in the section on Special Topics.

[2] Savings of about EUR 200 million from lower crude oil prices are compared with excess spending of over EUR 300 million due to the deferred pricing rule relating to gas.

ing investment decisions by firms seems to reinforce the assumption that the Hungarian economy, with particular regard to exports and corporate investment, may turn up again from the latter half of the year.

In the central projection for 2002, the external financing requirement of the economy is expected to increase slightly. The fall in the general government's financing requirement will not offset the decline in private sector financing capacity. Household consumption and investments will increase relative to GDP faster than their disposable income. Enterprises are expected to continue their last year's practice in the first half of the year, reducing their capital accumulation to a larger extent than is the decline in their disposable income. This tendency will reverse in the second half of the year when corporate profitability and investment will pick up, due to accelerating foreign demand. In the central projection, the financing requirement of enterprises increases slightly at an annual level.

However, it is possible that business investment will expand only at a modest pace in 2002, and that the enterprise sector financing requirement remains at its previous year's low (with the current account deficit in nominal terms expected at EUR 1.2 billion).

In 2003, associated with the cyclical business position, firms are expected to step up investment, thanks to a recovery in external activity. As a result, there will be upward pressure on their financing requirement for the year as a whole. The net financing requirement of general government is assumed to fall sharply according to the Bank's projection for the fiscal profile. However, this decline will be of a smaller size than the fall in the private sector financing capacity, which will cause the external financing requirement to increase.

1.1 External demand and net exports

Last year's weaker external demand and real exchange rate appreciation following the widening of the flotation band caused both export and import growth to decline in 2001. The reaction of imports to slowing external demand was faster than that of exports: through low investment growth and destocking its growth rate exhibited a sharp decline. The growth rate of exports also began to moderate early in 2001, but the annual growth remained relatively high compared to imports, as exports responded to external demand with a lag and real appreciation did not yet have a significant impact in 2001. From 2002, however, the latter effect will have a more marked impact, implying a relatively slow recovery in export growth.

External demand
In 2001 Q3, external demand fell off much more strongly than analysts' had expected.[3] This means that there was no easing in the uncertainty about the date of a projected upturn in external economic activity. Leading indicators and some key confidence indices for euro-area countries suggest that the recovery will only unfold from the latter half of 2002. In view of the prevailing high de-

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[3] External demand denotes imports by Hungary's 11 main trading partners weighted by the Hungarian export structure.

	2000	2001		2002		2003
	actual data	latest	previous	latest	previous	latest
GDP growth of Hungary's trading partners						
NBH central projection	3.3	1.1	–*	1.2	–*	2.9
NBH estimation range		*1.1–1.2*	*1.1–1.3*	*0.7–1.5*	*1.2–1.8*	*2.1–3.4*
OECD		1.2	1.3	1.2	1.4	2.9
IMF		1.0	1.8**	1.0	2.2**	–
Economist Poll		1.5**	1.6**	1.0**	1.5**	–
JP Morgan		1.1	1.2	0.7	1.2	2.4
Effective external demand (import demand of Hungary's main trading partners)						
NBH central projection	10.9	1.7	–*	1.8	–*	6.5
NBH estimation range		*1.5–1.8*	*3.1–3.5*	*0.7–2.4*	*3.5–6.0*	*3.3–8.1*
OECD		2.6	2.6	2.9	3.2	6.9
IMF**		1.6	2.6	1.5	2.9	7.5

* In November, the Bank only gave a central projection (the higher index) and a projection based on a pessimistic scenario. These are reflected in the estimation range.
** The forecast relates to the EMU-12 region. OECD: Economic Outlook, Developments in Individual OECD Countries (Nov. 2001/Oct. 2001. IMF: World Economic Outlook (Dec. 2001/Oct. 2001) JP Morgan: World Financial Markets (2002 Q1/2001 Q4).

Chart III-2 **Projection for external demand**
Percentage changes on a year earlier

Legend: Central path ——— Upper path ········ Lower path –·–·–
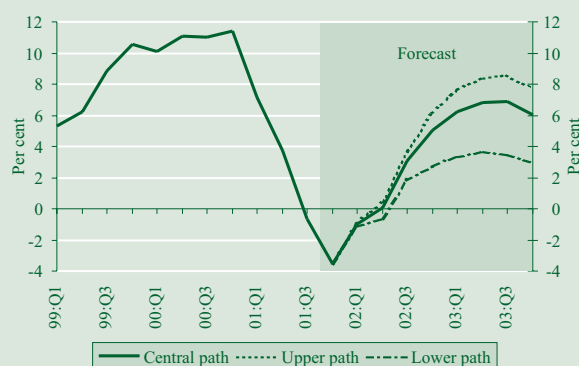
gree of uncertainty, in projecting external demand, the Bank has become more conservative, adapting the evolution of the recession of 1992–94, which was similar in shape but slightly more severe, to the current situation. Consequently, the central projections are not different from those provided by other international research institutes. Nevertheless, the estimation band is rather wide, reflecting the aforementioned uncertainty (see Table III-3).

According to the Bank's projection, external demand will embark on a modest upward path as early as the first half of 2002. Nevertheless, signs of more robust growth will only occur from the middle of the year. Based on the lessons of the previous projections, the projection range is not symmetrical with the central path, the balance of risks being on the downside (see Chart III-2).

Real exchange rate
Under the current projection, in addition to external demand, the real exchange rate influences developments in trade. Of the potential measures of the real exchange rate, the real effective exchange rate based on unit labour costs in manufacturing is chosen for two main reasons. First, this enables the most direct assessment of changes in the profitability of manufacturing producers (as using various price-based real effective exchange rate indicators requires the introduction of other additional assumptions to allow direct assessment). Second, this measure can also be viewed as being a relatively good quality index from a statistical point of view.[4] Under the central projection, the size of the real appreciation in 2001 and 2002 based on unit labour costs in manufacturing will exceed 15% (see section 2.2), a measure, that has not been seen since 1991.

External trade
As noted above, in addition to the slowdown in external demand, export growth has been affected by a sharp loss of competitiveness. However, these effects will only appear with a lag, as previously concluded contracts are not affected by changes in the real exchange rate and firms have been able to temporarily stabilise their income positions by cutting investment and reducing inventories. Compared to the previous year, the decline in the growth rate of exports in 2002 is half explained by real appreciation and another half by lower growth in external demand.

In 2001, goods imports growth declined more quickly than export growth. Firms' adjustment to weak external demand and to the appreciation of the forint led to a slowdown in domestic absorption. Moreover, there was a structural shift towards items with a smaller import requirement. In 2002, the portion of import demand stimulated by final domestic demand growth will only increase at a modest rate, but the rebuilding of inventories due to the pick-up in external activity is expected to generate an additional need for imports. Subject to the external recovery, the share of gross fixed capital formation within domestic absorption is expected to increase from 2003 on, giving further impetus to import growth.

[4] For more on this, see NBH Working Papers, 8/1998.

Developments in the service sector were similar to those in goods trade, i.e. receipts increased faster than expenditures in 2001. This is expected to remain so in 2002 in respect of services other than travel, while travel receipts[5] are projected to grow slower than travel expenditures, governed by a faster growing household consumption. From 2003, within the travel category it is receipts and within services other than travel it is expenditures that are expected to increase at a faster pace.

In 2002, total goods and services exports will drop considerably in terms of average annual growth with external demand increasing at broadly the same rate as in 2001. The reason for this is that the factors delaying the slowdown of exports in 2001 are no longer at work, and the effects of the real appreciation will be felt to a larger extent this year. In 2003, external demand will exert an upward pull on export growth, however real appreciation lingering on from 2002 still has an adverse effect. The net effect of these two factors points to higher growth for 2003, but the projection band is wider. Imports will grow somewhat faster than exports, as rebuilding inventories will take place before export sales can start to pick up. Consequently, the contribution of net exports to GDP will be negative in 2002, and investment growth boosted by the pick-up in external activity is expected to have a similar impact in 2003 (see Chart III-3). Thus, the negative figures for net exports projected for 2002 and 2003, reflecting a deterioration of the external balance, appear to be a natural concomitant of cyclical recovery.

1.2 Household consumption

In 2002, household consumption expenditure is expected to be higher than previously projected. This is primarily because of the slower-than-expected nominal wage adjustment and high public-sector earnings growth. Consumption growth is projected to slow down in 2003, as the these effects of 2001–2002 fade away (see Chart III.4).

Household consumption expenditure is estimated to have risen by 4.5% in 2001. The slow adjustment of private sector nominal wages to disinflation and higher-than-expected public sector wage payments contributed 0.2 percentage points to consumption growth, relative to the projection of the November *Inflation Report*. The projection for 2001 was also modified in a technical sense by the revision of the data on 2000 (see Special topics: Impact of the revision of GDP data on the projection), which, other things remaining equal, would have generated a 0.5- percentage-point lower volume index in 2001 than the previous projection.

Chart III-3 Projections for exports and imports
Percentage changes on a year earlier, sesonally adjusted data
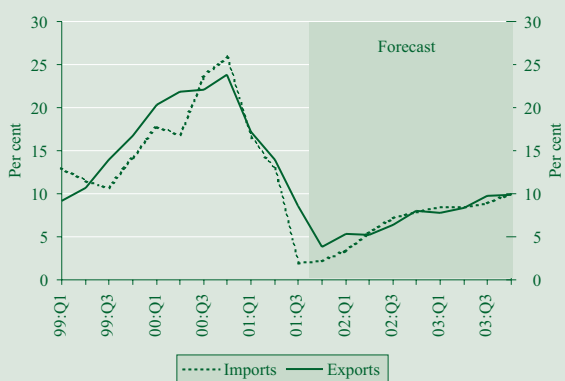
Chart III-4 Projected growth in household consumption expenditure
Percentage changes on a year earlier
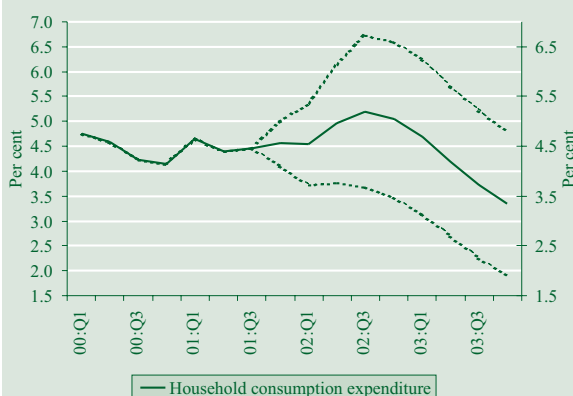
* Quarterly growth rates of the seasonally adjusted series. The confidence interval has been constructed using past forecasting errors. Thus, there is a 68% probability that the future consumption will fall in the specified interval.

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[5] According to our preliminary calculations the volume index of travel exports decelerated in the fourth quarter of 2001, which was mainly caused by decreasing foreign demand and changes in relative prices. The Bank's analysis suggests that travel figures have not been significantly affected by the terrorist attacks of 11 September 2001. Conversion of euro-area national currencies at end-2001 necessitated a correction in the data on travel receipts, so travel data carry no individual effect that would significantly influence its trend (see the November 2001 issue of the Bank's Monthly Report).

Consumption expenditure in 2002 is projected at 4.9%, higher than the corresponding rate of the November projection. The central projection for consumption growth in 2003 amounts to 4.0%. The key determinant of household consumption expenditure is real earnings growth. The following section looks at incomes earned in two sectors (the private and the public).

In the current projection, the private sector's nominal adjustment to disinflation is relatively faster in 2002 (in other words, wage rises are more consistent with future inflation expectations), which is expected to exert downward pressure on real earnings growth in the sector. The public sector's real earnings are projected to rise at a significantly faster pace than the private sector wage bill in 2002. Thus, the fiscal spillover effects represent a crucial factor in consumption expenditure growth in 2002, in addition to the expansive wage policy of the fiscal sector this year. The Bank's estimates[6] suggest that this effect by itself will contribute 0.7 percentage points to consumption expenditure growth in 2002, which will be only partly offset by the private sector's lower earnings growth relative to 2001.

In 2003, earnings growth in both the private and the public sectors are expected to lose momentum, but incomes in the public sector will continue to rise faster than in the private sector. On balance, a slowdown in real earnings growth for the economy as a whole will cause consumption growth to decline in 2003.

The two main uncertainties surrounding the projection arise from the labour market's response to last year's nominal shocks and a potential change in households' propensity to save.

The speed at which the private sector adjusts its nominal wages to faster-than-expected disinflation (i.e. the ratio of forward-looking and backward-looking wage formation) affects household consumption expenditure via the evolution of real earnings. "Immediate" nominal adjustment (forward-looking wage formation), discussed in the section on the labour market, will cause the volume of consumption expenditure in 2002 to be 0.1 percentage point lower than the central projection. Should private sector nominal wages not be adjusted to the lower inflation rate (backward-looking wage formation), the volume of consumption expenditures will be 0.2 percentage points higher in 2002 than the central value. It should be noted, however, that slow nominal adjsutment only entails stronger consumer demand over the short term, as due to worsening competitiveness, rising real wages will lead to major output loss and decline in employment, which are likely to exert downward pressure on consumption over the medium term.

The uncertainty surrounding households' saving behaviour is due to the increase in the sector's net financing capacity seen in November and December 2001. Sufficient information is currently not yet available to tell whether the rise in the saving rate is the result of a temporary accumulation of savings from higher year-end wage payments in 2001 or the beginning of a sustained upward trend in the saving rate. On the other hand, as a result of

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[6] See Special topics: The effects of fiscal policy on Hungary's economic growth and external balance in 2001–02, in the November 2001 issue of the Inflation Report.

the decreasing liquidity constraint, the household saving rate seems to be simultaneously following a downward trend over the longer term, which may represent an offsetting factor. On the balance of short- and long-term trends, the Bank expects the household propensity to save to remain unchanged in the central projection, carrying a symmetrical balance of risks.

1.3 Investment

Investment growth continued to moderate in 2001 Q3. This was primarily because manufacturing firms responded to worsening production and sales prospects by cutting back on investment. The service sector also experienced a decline in investment growth during the first nine months. By contrast, both the public and household sectors increased investment at a rapid pace. The nearly 10% growth achieved in the area of transport and communications indicates that motorway construction projects already affected the aggregate data on this quarter. The rate of home-building projects remains high, with the real estate activities sector maintaining its rate of growth of roughly 25%.

The Bank's current projection assumes moderate investment activity in the *corporate sector*. This assumption seems to be supported by several factors. For the past few months the confidence index of the Economic Research Institute (GKI) has indicated a deterioration of business expectations, in line with mounting difficulties relating to external and domestic sales prospects. Imports of investment goods have been on a downward trend for the past nine months, simultaneously with a significant fall in capacity utilisation,[7] which is crucial to investment decisions, as suggested by the data on the past two quarters. Firms consider their capacities to be excessive not only in relation to current output but also orders for the next twelve months (see Charts III-5, III-6 and III-7).

As the decline in corporate investment seems to be related to a prolonged external recession, the demand side is only expected to stimulate investment activity from the latter half of 2002. On the other hand, the high proportion of unutilised capacities makes it difficult to forecast the time lag the pick-up in investment may be subject to following an upturn in global activity. On balance, the level of corporate sector investment is projected to decline slightly during 2001, and fall sharply in the 0%-5% range during 2002. The projection for business investment is an expansion in the 3–5% range during 2003, consistent with stronger economic activity.

The decline in corporate investment projected for 2001–2002 and the likely extent of the decline is consistent with global experience, which suggests that, over the long term, investment activity is much more volatile than GDP growth. Moreover, during a period of recession investment activity tends to weaken much more strongly than GDP growth. There is evidence from a number of countries that fluctuations in the business cycle are primarily dominated by changes in investment (and the level of stocks). In less advanced EU member countries (such as Greece, Ireland,

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[7] The investment goods imports indicator is an estimation of National Bank of Hungary for forecasting purposes. The Bank's estimate has been revised downwards since the November 2001 Report.

Chart III-5 **Investment and its leading indicators**
GKI business confidence index
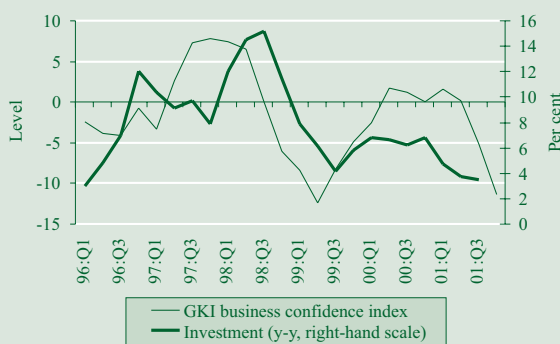
Chart III-6 **Capital goods imports***
Percentage changes on a year earlier
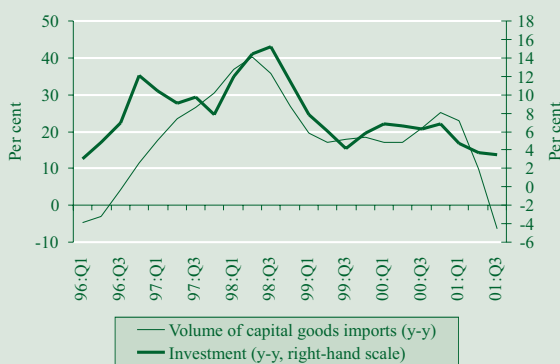
* Estimation of National Bank of Hungary. Seasonally adjusted data. The chart represents investment growth in terms of percentage changes on a year earlier, and changes in the level of the GKI index.

Chart III-7 **Current and projected capacity utilisation in manufacturing***
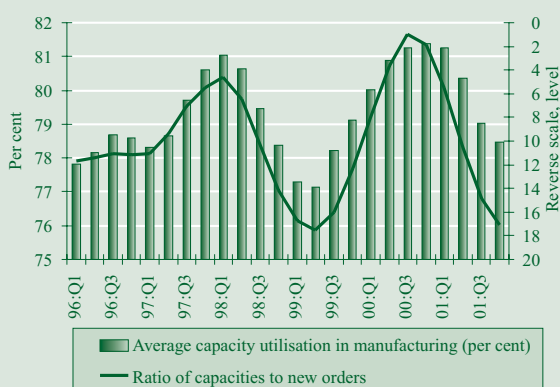
* Assessment of prospective capacities: firms have been asked if they see their current level of capacities as high or low in relation to prospective orders. The chart shows the balance of "high" and "low" responses to the question. Seasonally adjusted data. Source of data: Kopint Datorg Rt. The survey typically represents enterprises owned by Hungarian residents.

Portugal and Spain), for example, the downturn in business activity during 1992–93 involved an average fall of 3.3% in the level of investment over the two years, compared with 4.7% growth in the preceding years. On average, it took two years to bring investment growth back in the positive range.

Public investment forecast is also surrounded by a great deal of uncertainty. It seems probable that volume growth in this sector last year was higher than the 8–10% projection in the November *Report*. While the effect of the motorway investment projects seems to have appeared in the statistics, institutional investment[8] expanded at a faster-than-expected rate over the final months of the year. The investment profile projected for this year also exceeds 10%, taking account of the spillover effects of the motorway construction and local government authorities' expenditures on the rental housing programme. In the Bank's hypothetical fiscal projection (see below), public sector investment will slow down in 2003.

Stronger *household investment* is due to a pick-up in residential property invenstment activity. The number of house completions rose by 30% in 2001, and the number of building permits issued indicates a 25% rise in the number of homes completed in 2002 (assuming completion time being in the 1–1.5-year range). Accordingly, the projection for household investment growth is around 15% in 2001 and roughly 10% in 2002. Household investment is also expected to slow during 2003.

On the whole, total investment volume is projected to be at 2.6% in 2001, in the –1%–3% and 3–6% range in 2002 and 2003, respectively. In respect of public and household investment, the uncertainty surrounding investment growth seems to be more on the upside, while the risk of a prolonged external recession may cause the volume of investment to be lower in the corporate sector during 2003. Accordingly, the balance of risks surrounding the central projection seems to be on the upside this year and on the downside in 2003.

1.4 The fiscal stance

The previous projection for the general government's effect on demand has remained virtually unchanged.[9] Based on preliminary data, the size of the direct contribution to demand growth amounts to 2.5% of GDP in 2001 and 0.7% of GDP in 2002. In 2003, the projection assumes a 0.6% tightening of demand, consistent with a hypothetical path which can be derived from the requirements of a 2006 EMU entry (see Table III-4).

While the previous projection for fiscal expansion in 2001 appears to have been correct, the underlying factors followed a diverging path. On the one hand, excess receipts due to real economic developments were higher by 0.3% of GDP than projected, due to firms' higher taxes. On the other hand, the expenditures were also higher than projected due to the fiscal

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[8] Institutional investment denotes central government (non-priority) investment projects that are typically of a smaller size.

[9] The GFS primary balance in 2001, underlying the estimation of the demand effect, can be effectively viewed as actual data. In addition, the evolution of other demand factors is also known, with the exception of the activity of the Hungarian Development Bank (MFB) and credit-financed road construction. In the absence of new information, the previous projections are retained for these two items.

Table III-4 General government's impact on demand (As a percentage of GDP)

Per cent (The "+" sign denotes an expansion in demand, and the "–" sign denotes contraction)

	1999	2000	2001	2002	2003
	Actual data		Preliminary	Projection	Assumed path
1 Change in SNA operational deficit (2 + 3)	−1.0	−0.9	2.2	0.8	−0.7
2 Indirect demand impact (change in real interest expenditures*)	−0.4	−0.3	−0.3	0.1	−0.1
3 Direct impact (4 + 5)	−0.6	−0.6	2.5	0.7	−0.6
4 Change in GFS primary balance	−1.3	1.1	0.5	0.7	***
5 Change in other factors (SNA corrections)**	0.7	−1.8	2.0	0.0	***

   * Calculation of the operational deficit is based on the assumption that neither the inflation compensation incorporated into interest rates nor its yearly volatility affects demand. Accordingly, real interest rates are smoothed by moving averages.
   ** Other factors represent those channels of demand tightening or expanding that are not reflected in the official primary balance. These factors include the effects on demand of the Hungarian Development Bank, the State Privatisation Agency and the National Motorway Company.
   *** The assumption pertains to the impact on demand in general, and not to the specific details.

developmoents[10] and the additional fiscal policy decisions. In other words, on the whole, unexpended budget appropriations were smaller than assumed due to the fact that fiscal institutions used up a greater portion of investment funds carried over from previous years, and staff reductions occurred on a smaller scale than assumed. The latest fiscal decisions mainly raised spending for health care.[11]

The earlier projection assumed that - in addition to last year's excess receipts - there would be further excess receipts in 2002, now only amounting to 0.3% of GDP, but even in the beginning it was thought that these would be used up due to the carry-over effect of 2001 fiscal policy decisions and the granting of additional tax allowances. Fiscal developments were no longer assumed to generate savings this year, with projections of substantial increases in both local government expenditures and the spending on specific projects of the budget, which would have expanded demand by 0.5% of GDP. By contrast, the projection based on the latest information assumes expansion to be 0.7%, because – in contrast with the 0.4% increase in health care expenditures – the excess receipts due to firms' taxes in 2001 are assumed in part to be temporary.

The projection for 2003 is based on the assumption that the primary SNA balance will improve by 0.6% as a proportion of GDP. This improvement is derived from a hypothetical path, with its endpoint corresponding to the fulfilment of the Maastricht convergence criteria in 2004 in order to join EMU in 2006. In the light of stronger economic activity, tightening the fiscal stance can be viewed as anti-cyclical. Such an improvement in the primary balance should not be seen as exceptional, as it corresponds to the extent of the fiscal tightening on demand seen in 1999 and 2000.

The public-sector wage bill increased at a higher-than-projected rate of 22.0% in 2001 due to the layoff rate amounting only to 0. 4% instead of 1.3%.[12] In 2002, the projection for wage bill

[10] Fiscal developments include local authority decisions, since they are made autonomously, i.e. independently of fiscal policy, as well as decisions by fiscal institutions and chapters, in addition to objective circumstances (such as delay in competitions), which result in the non-fulfilment of budget appropriations and the existence of carry-over across the years.

[11] This has no significant impact in 2001, but the full-year impact amounts to 0.4% of GDP in 2002.

[12] As a result, the index calculated from cash-flow general government payments using a methodology published in a previous Report rose from 17.3% to 18.5% in 2001. By contrast, the index based on the Central Statistical Office data on average wages and the number of employed people stood at 22.0%. The two categories differ not only on account of the cash-flow approach, but also a number of other considerations. For example, the Statistical Office uses a shorter list of expenditures, not including, for instance, dismissal wages within payments received on a regular basis. Thus, the genuine impact on demand may be somewhere in between the two categories.

Chart III-8 Manufacturing output in volume terms
1992 = 100

Legend:
— Level of manufacturing production, seasonally adjusted
— Level of manufacturing production, original data

Chart III-9 Manufacturing output and external demand
Same period of previous year = 100

Legend:
— Manufacturing value added — Foreign demand
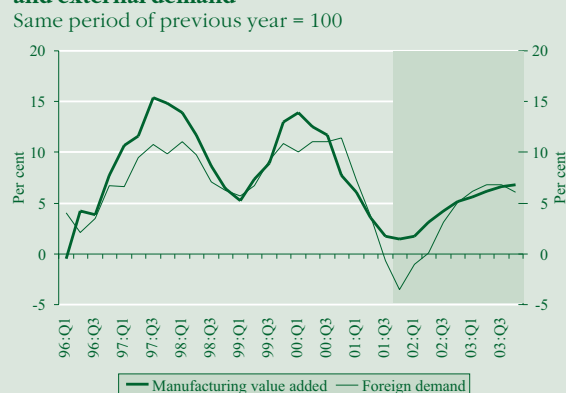
Chart III-10 Output stocks and input stocks in the manufacturing sector
Previous quarter = 100

Legend:
— Purchased stocks in manufacturing
— Own produced stocks in manufacturing
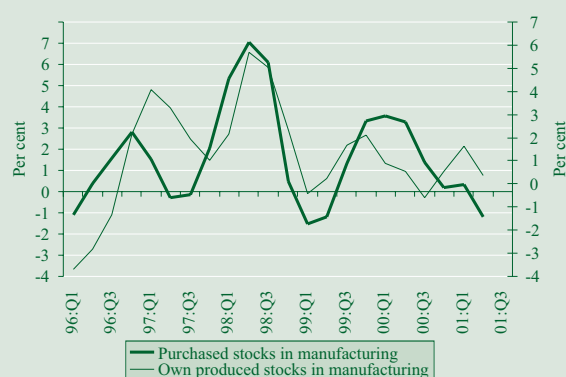
* CSO inventories at current prices, deflated by the manufacturing price index. Seasonally adjusted, smoothed using a trinomial moving average.

growth has been revised down to 19.0%, taking account of the impact of last year's measures, simultaneously with an upward revision in the projection for the number of employed people, with the layoff rate estimated to amount to only 0.2% this year. The projection for earnings growth in 2003 is slightly above the 10%, while employment is assumed to remain unchanged, based on commitments so far (a new system of remuneration for civil servants) and assumed sectoral measures (for instance, in health care).

2 Supply side factors

2.1 Business cycle developments on the supply side

For the first time in the history of the Report the Bank's staff have attempted to assess publicly and systematicly the supply-side cyclical position as well. Thus, the section below will deal with matters of supply only in the area of manufacturing and services, but there are plans to gradually cover the other sectors as well. The objective of this analysis is to provide an additional test of the Bank's projections for the real economy, derived from demand side factors, by assessing certain supply-side developments and making assumptions on the level of inventories. This procedure is hoped to considerably enhance the consistency of the Bank's projections.

Manufacturing output has been flat since the final quarter of 2000, reflecting the slowdown in external activity (see Chart III-8). This fact, added to the downward trend in export sales experienced since end-2000, implies that the cyclical fluctuations of industry have been primarily due to weaker external demand. According to the Bank's estimates, the impact of the real appreciation will only unfold this year.[13] Research findings indicate that manufacturing output is greatly influenced by changes in external demand (see Chart III-9).

The assessment of current trends is being assisted by examining the level of manufacturing inventories. On the one hand, modest growth in output stocks indicates that firms responded to the external demand shock unfolding from 2000 Q2 by quickly curtailing production. The current level of output stocks falls far short of that recorded during the Russian crisis, which is assumed to be due to the fact that Hungarian firms were not caught by surprise by the current recession, unlike at the time of the Russian crisis. On the other hand, the substantial reductions in input stocks seen since mid-2000 reflects a gradual deterioration in firms' output expectations and the resulting shift to a lower level of output (see Chart III-10).

Flat domestic sales can also be associated with weaker external demand. The assessment of developments in the manufacturing sector indicate that volatility in the sector's domestic sales can be basically attributed to fluctuations in suppliers' activity, implying that manufacturing sales are much more vulnerable to external demand effects than to the domestic market, determined by household consumption.

Due to the key importance of export demand, manufacturing output is only projected to pick up during the second half of 2002, consistent with the projection for external demand. The

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[13] According to the Bank's estimates the real appreciation lowers the industrial production growth rate by 1,5–2 per cent in 2002.

need for the accumulation of low level inventories may cause industrial production to pick up in parallel with the external demand one quarter before the turning point in exports takes place. In the projection, growth in value added by manufacturing amounts to 3.2% in 2001, approximately 3.5% in 2002 and a robust 6.3% in 2003. Firms' nominal adjustment to the appreciating exchange rate and faster-than-expected disinflation introduces a high degree of uncertainty into assessing developments in 2002 and 2003. In addition to the central projection, the section on the labour market also discusses the two extreme scenarios of nominal adjustment. If firms predominantly choose to adjust to the nominal shock by reducing the number of employed people ("backward-looking/high inflation expectations scenario"), then manufacturing value added may be lower by as much as 0.5 percentage points in 2002. If the "forward-looking/unbiased inflation expectations" scenario occurs, then the change will be of a similar magnitude but with a positive sign. As the projection for external demand carries a negative risk, the uncertainty of the forecast for manufacturing value added is on the downside.

Service sector output appeared considerably less volatile than manufacturing output, exerting a smoothing effect on GDP. Consistent with the rise in household consumption, the projection for growth in value added is also around 4% in 2001 and 2002. In 2003, the corresponding rate is expected to drop somewhat. The service sector will also be subject to some degree of uncertainty in 2002 and 2003, due to the speed at which firms adjust wages paid, but this uncertainty will be less pronounced than in manufacturing.

Based on the above factors, the projection for growth in the market supply side of GDP (comprised of manufacturing, market services and imports) falls short of the projected volume of market demand in 2001 and exceeds it from mid-2002 (see Chart III-11). This means that the level of inventories is forecast to decline in 2001 and turn up markedly during 2002 and 2003. This path for the level of inventories is consistent with international experience relating to cyclical correlation of inventories (see Special topics: Can inventory assessment play a role in cyclical analysis?).

2.2 The labour market

Hungarian labour market developments have been shaped by adjustment to four new factors in 2001–03.[14] These new influences on the labour market can basically be categorised into two groups: (1) the cyclical slowdown in external markets and the minimum wage increases appear as real economic effects, and (2) forint appreciation following the move to widen the intervention band and rapid disinflation appear as nominal effects.

Flexible adjustment to nominal effects, i.e. forward-looking formation of wages based on inflation expectations in line with the disinflation process, is especially important from the central bank's perspective, as labour market developments tend to determine the real economic costs of foreign exchange-based disinflation on the forecast horizon. With inflexible wage contracts, formed in a retrospective manner or based on excessively high inflation expectations, exchange rate appreciation and the fall in inflation tend to weaken the profitability of businesses in terms

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[14] Throughout the analysis, by 'labour market' refers exclusively to the private sector; wage and employment developments in the public sector are treated as part of the effect of fiscal policy on demand.

Chart III-11 Annual growth in market demand and supply
Sama period of previous year
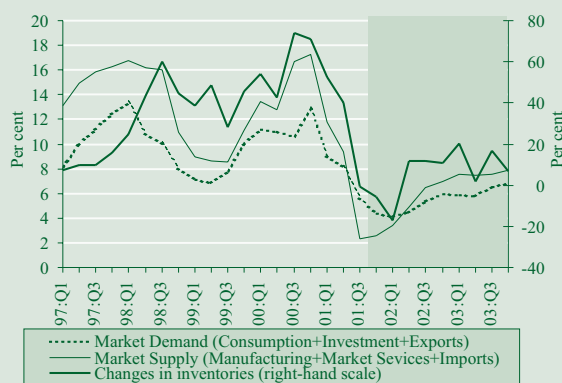
- .... Market Demand (Consumption+Investment+Exports)
- ——— Market Supply (Manufacturing+Market Sevices+Imports)
- ——— Changes in inventories (right-hand scale)

* Market demand = (consumption + investment + exports); market supply = (manufacturing + market services + imports). Seasonally adjusted data; changes in stocks according to GDP are smoothed..

of both revenues and costs. This leads to a deterioration in competitiveness and a decrease in employment. In the case of flexible nominal adjustment, when wages are formed in a forward-looking manner and based on inflation expectations in line with the disinflation process, businesses are capable of cushioning the unfavourable effects on their profitability, which, in turn, reduces the potential negative influences on employment.

Looking at the data of the second half of the year, in 2001 wage adjustment to forint appreciation and rapid disinflation was a bit slower than the Bank presumed at the time of preparing the previous *Inflation Report*.[15] Delayed wage adjustment entails real economic costs. This, in addition to the cyclical effects, may have contributed to employment falling in the final months of the year.

Considering the 2001 year's events, the Bank continues to base its central projection on the labour market adjustment mechanism (wage formation) assumed in the preceding projection, but, contrary to previous expectations, the Bank expects a slight delay – in 2002 the spillover effects of forint appreciation, the rapid disinflation from end-2001 and the slower-than-expected recovery of external demand will force businesses to pursue more cautious wages policies. Due to the delay of the nominal adjustment there may be slightly negative effects on private sector employment. The fall in employment may cause the proportion of unemployed or that of inactive people to rise. It is expected that firms will continue adjusting in 2003.

The Hungarian government raised the amount of whole-economy minimum wages by 57% in 2001 and by another 25% in January 2002. This has been a factor influencing labour market developments recently. Based on economic considerations, at this moment the Bank feels that the authorities' decision to raise the minimum wage in 2001 has not been coupled with a real increase in wage levels in the larger part of the economy, and thus has had a smaller impact on the increase in both labour costs and households' disposable income than might be thought based on official statistics.[16] Therefore, the statistically distorting effect of the minimum wage increase in 2001 has been eliminated from the wage inflation data. By contrast, raising the minimum wage in 2002 may cause a real increase in pay across a wider spectrum. This, in turn, may unleash inflationary pressures on the cost side through higher labour costs, and on the demand side through a higher wage bill. However, companies may choose to react to an increase in the costs of lower-wage/lower-productivity labour with staff reductions.[17]

At the moment, it is difficult to quantify the effects of adjusting to the Government's policy measure. Therefore, in the Bank's central projection for 2002 a labour market path has been postulated which ignores the minimum wage increase, and takes into account the possible effects as one of the uncertainty factors.

Labour use and reserves
In 2001, the Hungarian labour market was characterised by a flat or slightly rising employment ratio (see Chart III-12). Although a

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[15] However, the wage inflation data for December, published after the Bank has completed this forecasting round, suggest that the adjusment is underway.

[16] The August Inflation Report and the Chapter on Wage Inflation in our current analysis, present those reasons in detail for the need to adjust the officially published average wage index downwards.

[17] Although laying off low-wage employees would increase the average wage level statistically, wage increases related to such changes in the composition of labour does not constitute a cost inflation pressure.

considerable decline in unemployment had not been expected due to its relatively low level, the data showed that the fall in the proportion of unemployed people slowed in 2001, with the unemployment rate remaining level for most of the year. However, in contrast with earlier years, the activity ratio also fell and the proportion of inactive people rose. This can be explained partly by certain demographic processes and partly by existing regulations on employee retirement.[18] The delay in wage adjustment to nominal shocks may also have aggravated the trends noted above.

Export-oriented firms and manufacturers have been particularly keenly affected by the cyclical downturn in external markets. As expected, the signs of adjustment to changes in external demand first appeared in the slackening of labour use intensity – the weekly average number of hours worked by manual workers began to stagnate as early as the beginning of 2000, and then embarked on a downward trend. (Chart III-13) In the Bank's view, one sign of wide-spread adjsutment to external cyclical changes is that the number of people employed in manufacturing remained level in early 2001,[19] but then began to fall throughout the remaining part of the year.[20] By contrast, employment in services continued to rise in 2001, owing to the expansion of domestic demand (see Chart III-14).

It cannot be ruled out that the increase in the minimum wage at the start of the year has had a negative impact on employment in the low-wage bracket of employees.[21] Several indicators appear to reinforce this view – there was a perceptible rise in Q1 in the proportion within the unemployed of unskilled labour; and the number of people affected by layoff announcements increased in early 2001 (see Chart III-15). However, the larger aggregates showed no evidence of a negative employment reaction.

Employment may experience negative shocks in 2002 from a number of sources. Owing to the delay in the cyclical upturn of external business activity, the number of people employed in manufacturing will likely continue to fall at firts. However, a tentative rise may begin in the second half of the year, in line with the expected recovery of external demand. This slightly upward trend may continue in 2003. The number of people employed in services may increase at a modest pace in both years, fuelled by the uninterrupted rise in domestic demand. The 2002 minimum wage increase, affecting a wider range of employees than in the previous year, may have a negative impact on employment even at the aggregate level among low-productivity groups of employees, firms and sectors. The Bank, however, is unable to quantify this, and thus its impact must be taken into account as one of the

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[18] According to the legal regulations, those in the age-groups affected by the increase in the retirement age may choose to retire biannually. This may add to the number of economically inactive people in 2001 and 2003.

[19] Institutional labour statistics; full-time employees. The data released by the CSO for 2001 show that the number of part-time employees jumped by some 23%. This may have been a form of circumventing the mandatory minimum wage increase, which presumably will not change the actual conditions of employment. Therefore, we have adjusted the 2001 data accordingly.

[20] In October 2001, the CSO revised the data for earlier months of the year, which originally showed robust growth both in manufacturing and services.

[21] Köllő, János: Hozzászólás az elmaradt minimálbérvitához (Contribution to the minimum wage debate), Közgazdasági Szemle (Economic review), December 2001.

Chart III-12 Labour market indicators*
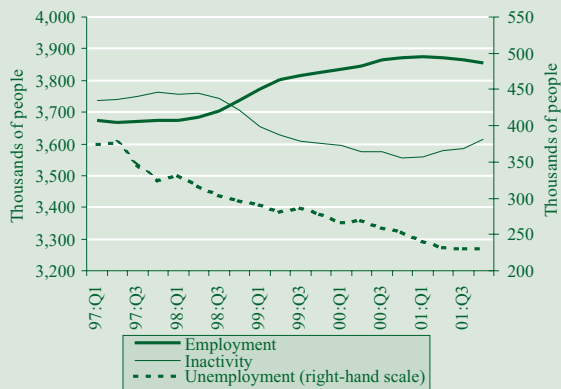
* Labour Market Survey of the Central Statistical Office. Derived from seasonally adjusted data.

Chart III-13 Average weekly number of hours worked by manual workers in manufacturing*
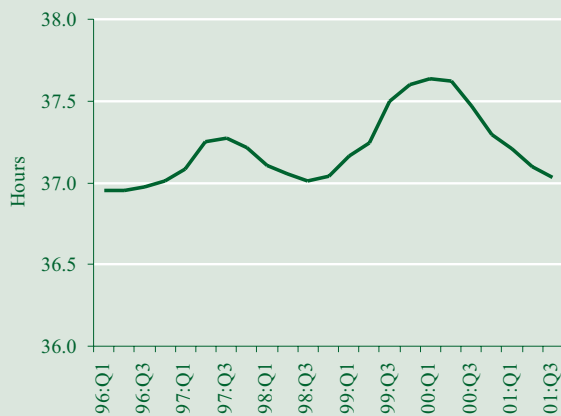
* Seasonally adjusted data, recalculated statistically for businesses employing over five people.

Chart III-14 Employment*
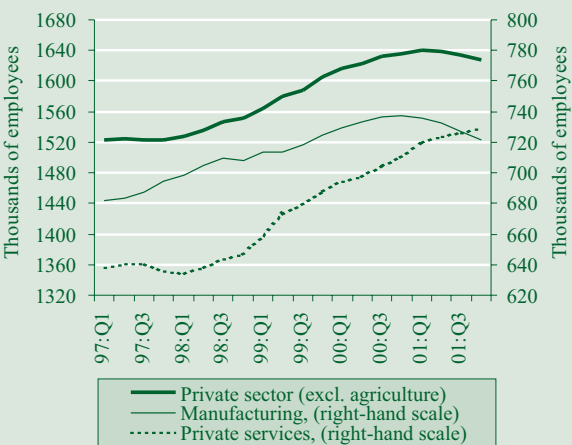
* Institutional labour statistics. Recalculated statistically for businesses employing over five people. Full-time employees, but adjusted for the staff index of those employed in 2001. Seasonally adjusted data.

Chart III-15 Numbers of reported vacancies and collective layoffs*

--- Reported collective redundancies
······· Number of reported vacancies (right-hand scale)

* Reported data received in the given month smoothed using a trinomial moving average. Employment Office data.

Chart III-16 Wage inflation in the private sector*
Percentage changes on a year earlier

—— Corrected   ∎ ∎ ∎ Non-corrected

* Year-on-year change recalculated using a statistical method for businesses employing over five people. The adjusted indicator reflects wage inflation after eliminating the minimum wage increase and seasonal influences.

uncertainties. Wage formation, proving less forward-looking than expected, or formation based on too high inflation expectations, may also cause negative pressures.

The Bank forecasts employment in the private sector to stagnate over the course of 2002 and to rise slightly in 2003. The balance of risks is on the downside in 2002, while risks are largely symmetrically distributed in 2003.

As a result of the real economic and nominal effects on the labour market, slight shifts in the indicators underlying the staff levels of the labour market are expected. This, along with the further fall in employment, suggests rises either in unemployment or inactivity in 2002.

Taking into view the fact that even the 2001 labour market developments cannot be clearly judged at the moment, constantly monitoring firms' adjustment efforts remains a priority. Flow-type labour market indicators, which, by their nature, provide early signs of trend reversals even if these are not reflected in the staff indicators, may facilitate this work. An indicator of this type may be the numbers of announced vacancies or collective layoffs (see Chart III-15). These indicators suggest that labour market demand further declined in the second half of 2002.
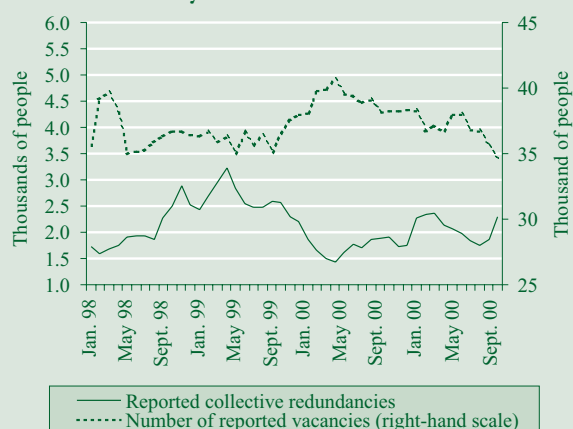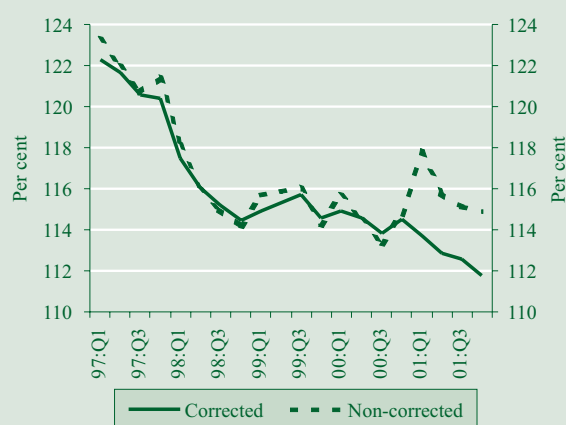
Wage inflation

According to statistical data for 2001, average wages in the private sector rose by 16% relative to the previous year. The wage inflation indicator, which eliminates the statistically distoring effect of the minimal wage increase,[22] showed a slightly lower outcome of around 13%. Wage inflation decreased gradually in 2001, but the wage adjustment to nominal shocks in the second half of the year was slower than the Bank expected in the previous Inflation Report. (Chart III-16) However, the wage inflation data for December which was published after the Bank has completed this forecasting round suggest that the adjustment is underway.

The wage inflation indices of manufacturing decreased gradually in 2001, but when preparing the previous forecast, the Bank substantially underestimated those for the second half of the year. Wage inflation in market services developed largely in line with the forecast; wage growth stagnated or sligthly decreased in the most of the year. Comparing the actual inflation data for the end of the year with the forecast, the underestimation of market services price inflation may have been attributable to a higher wage inflation pressure than the one suggested by the model. The Bank has eliminated from its calculations the statistically distorting effect of the minimum wage increase in 2001, meaning that the minimum wage increase in 2001 has not directly influenced average wage levels. This approach, however, carries the risk that the CSO gross average wage index has been overcorrected, and that the projection shows lower services sector wage growth than the actual increase in the cost of labour.

There are economic arguments, reinforced by the Bank's statistical estimates, which underline the need to adjust the minimum wage increase. The published gross wage index jumped by some 3 percentage points in 2001 Q1 relative to the final quarter

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[22] Wage inflation eliminates from the data released by the CSO the effects of sectoral and compositional changes in labour as well as those of working day variations, so it actually provides a picture of rises in the cost of labour.

of 2000. In the Bank's view, there were no changes in macroeconomic developments in the period which could provide an explanation for the increasing rate of wage payments. While inflation and the rate of economic growth remained virtually stable, there was a noticeable slowdown in external demand, and the unit labour cost-based real exchange rate appreciated. However, it can be seen based on statistical considerations that the minimum wage increase necessarily causes a certain distortion, through 'whitewashing' the income of employees who are reported to work at the HUF 25,500 monthly rate but presumably receive higher compensation overall. Therefore, the Bank considered it to be necessary to adjust for the minimum wage using mathematical-statistical methods.

In terms of forecasting inflation, essentially, whether the Bank is making a greater forecasting error by using the unadjusted or the adjusted wage indices will decide if this adjustment is justified or not. As wages play a greater role in the forecasting mechanism for projecting consumption, an obvious choice is to solve the problem by forecasting household consumption. Therefore, the Bank has examined the consistency of the unadjusted and the adjusted wage inflation indicators with developments in consumption.[23] Based on the findings, the conclusion was reached that by applying the adjustment less disturbance to an accurate evaluation of developments would be caused than by using the officially published average wage indices (total wage growth, calculated using the unadjusted average wage indices, generated an around 0.6 percentage point higher consumption growth on average for the first three quarters of 2001). Therefore, the Bank will continue to use this method in the calculations. Nevertheless, the stronger-than-implied average wage increase in market services must be taken into account as an uncertainty factor.

In the current projection, the Bank expects that the downward pressure on firms' nominal wage growth in 2002 will be stronger than in the previous year. With external cyclical conditions worsening, the currency appreciating and disinflation proceeding faster than expected, firms basically registered an overall net saving position in 2001, due primarily to subdued investment activity, which may have delayed adjustment through wages.

According to the projection, private sector wage inflation will slow from 13% in the previous year to 8%–10.5% in 2002 (the central path: 9,2%). In 2003 the rate of total wage growth is expected to slow less than in 2002 (the central path: 6.4%).

The inflationary effects of the 2002 minimum wage increase on the demand side may be reflected directly in higher wages of those affected by the minimum wage increase and indirectly in corrections to changes made in wage proportions (i.e. the degree to which the difference between low-wage and high-wage labour is maintained). On the supply side, these inflationary effects may arise in firms' raising prices to compensate. However, the strength of this effect will largely depend on how firms are able react to the increase in the costs of low-wage (and low-productivity) labour. At the moment it is difficult to judge these effects; therefore, in the current forecast the Bank does not quan-

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[23] For an account of modelling consumption, see NBH Background Studies, 1/2001.
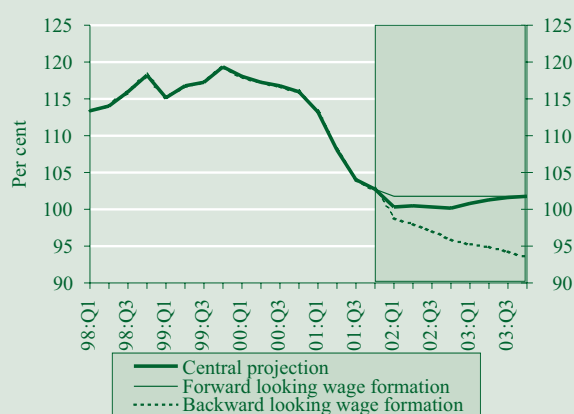
tify the effect of the minimum wage increase in terms of causing an increase in wage levels.[24]

Owing to the pressing need to adjust to the nominal effects, the Bank projects symmetrical uncertainties for both years. The forecast for private sector wage inflation has been increased slightly relative to the forecast published in November. This can be explained mostly by the higher-than-expected wage increase in 2001 and in accordance with that by the assumption a sligthly slower wage adjustment; although a change in the method of estimating wages has also been a contributing factor.

Labour market adjustment and the real exchange rate
At the request of the Monetary Council, the Bank's analysts examined the consequences of nominal wages being less flexibly adjusted to nominal shocks. In order to provide a more detailed picture, two extreme scenarios were formulated. One is based on firms' inflexible nominal adjustment, i.e. where wage formation is retrospective or is based on high inflation expectations. The other assumes extremely flexible adjustment, i.e. when wage formation is totally forward-looking and is based on inflation expectations corresponding closely to the disinflation process. The concept for manufacturing was developed in more detail, as the pressure on manufacturing firms to adjust to currency appreciation is strongest.[25] These labour market adjustment scenarios have been developed using the unit labour cost-based real exchange rate as this is a directly interpretable indicator of competitiveness (see Chart III.17).

Nearly constant nominal wage inflation was assumed over the path of a backward-looking or high inflation expectations-based wage increase. In this case, the real economic costs of exchange rate-based disinflation are reflected in a quite significant fall in employment and a marked deterioration in competitiveness. Over the forward-looking wage formation path corresponding to the disinflation process, employment changes in accordance with the ups and downs in the business cycle. Exchange rate appreciation is expected to stop from the first quarter of 2002, hence the profitability of manufacturing firms is expected to not deteriorate any further. In this case, unchanged competitiveness along the assumed inflation path sets the limits to rate of wage growth.

On the whole, the Bank has prepared the central forecast of labour market developments based on a competitiveness scenario which postulates marked nominal wage adjustment from mid-

Chart III-17 Real exchange rate outcomes in various labour market adjustments*

* On the basis of unit labour costs in manufacturing; 1995 = 100. A decline implies real exchange rate appreciation.

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[24] There is a vast amount of literature on the possible effects of the minimum wage increase; however, it is not conclusive taking into accounts its results. In certain countries, the effect on inflation may depend on the relative level of minimum wage, the rate at which the labour costs of those affected increase, the extent of tensions caused to the wage profile, the degree of labour market monopsony, willingness to comply with the law, substitution flexibility between employee groups and between capital and labour, and opportunities which firms may choose to exploit in order to prevent the cost of labour from rising (e.g. registering employees as non-full-time employees, including non-basic wage components in the basic wage, etc.). As far as Hungary is concerned, there is no reliable information on these factors. In addition, there is no available source of data based on actual payments which could provide a realistic starting point for the calculations. According to estimations based on offical wage data the minimal wage increase in 2002 may concern nearly a quarter of employees (some 488 thousand people) in the private sector (incl. agriculture) (estimation of the Ministry of Economic Affairs).
[25] The Bank has calculated the possible alternative growth paths of the wage bill in private services too, in order to be able to analyse the spillover effects.

2002. In this case, it is assumed that firms' profitability will have reached 2001 Q1 levels by end-2003, as a result of a reduction in the rate of wage growth. The path of the current central projection, therefore, assumes a more conservative nominal wage adjustment process than that presented in the previous *Inflation Report*, accompanied by a real exchange rate appreciation over the course of 2002. Thus, the forecast calls for the exchange rate to appreciate by around 15% in real terms over the course of 2001–02, but competitiveness is expected to improve slightly in 2003 relative to the previous year. This change in competitiveness will have an influence on supply and exports.

3 Imported inflation

In 2001 Q3–Q4, the decline in crude oil prices and the appreciation of the euro lessened imported inflationary pressure, while the German industrial goods price inflation put upward pressure on this factor.

The earlier significant fall in demand for crude oil and the additional dampening effect of the September terrorist attacks coupled with the debate over the reduction in Russian output, led to a considerable fall in prices in the final months of the year – the price of North Sea Brent was $25.3 per barrel on average in the third quarter and only $19.3 per barrel in the fourth quarter.

It is difficult to provide a reliable forecast of the future price of oil. Information can be derived from various sources, including the current price of oil in the market, futures prices, forecasts by international institutions and investment banks, the demand and supply relationships of the oil market, in order to prepare a forecast of oil prices. In the earlier forecasts the average price of the last calendar month was projected six quarters forward. This approach is justified, as, similar to other commodities, the spot price of crude oil existing incorporates all available information. Thus the "staff projections" are usually based on the assumption of constans oil prices. Forecasting institutions are divided over the direction of developments in the oil market in 2002. Nevertheless, they uniformly expect the price of oil to rise in 2003, due to the expected pick-up in external demand (see Table III-5).

In the current forecasting round the Bank has based its central inflation projection not only on flat oil prices but also on-assuming rising oil prices, as the Monetary Council attach such high a probability to a rise in oil prices (compared to the low January prices level) that they treat this risk in the baseline forecast (see Chapter IV). An oil price derived from the average of Goldman Sachs' and JP Morgan's forecasts (a yearly average of $21.7 per barrel and $23.9 per barrel from the fourth quarter) has been taken in the calculations. Justifying their use is the fact that – according to our knowledge – only these two institutions provide regularly actualized forecasts of quarterly Brent prices for the coming one year[26] (see Chart III-18). The forecast of rising oil prices is consistent with the gradual pick-up in external demand suggested by international forecasts.

The euro strengthened by 1.9% against the US dollar in 2001 Q3 and by 0.7% in Q4. Forecasts by the large international investment

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[26] The Bank's analysts relied on the most up-to-date forecasts available as of early February: JP Morgan: World Financial Markets, First Quarter 2002; Goldman Sachs: The International Economics Analyst, January/February 2002.

Table III-5 **Various oil price forecasts, US$ per barrel**

	2002	2003
European Commission**	22.3	24.8
OECD*,**	21.4	24.8
Merril Lynch**	17.5	n.a.
Goldman Sachs	18.8	24
JP Morgan	24.6	n.a.

*Relates to effective import prices, which has been calculated into the forecast of Brent prices.
** Forecasts prior to OPEC's December decision to restrict supply..

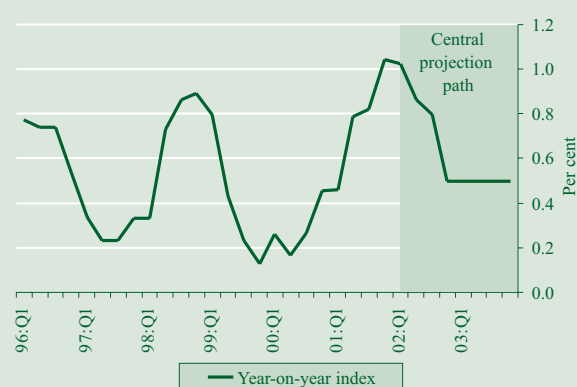*Chart III-18* **Oil price scenarios**

Table III-6 Market forecasts of the dollar/euro exchange rate*

USD-cent

Time of forecast	Forecast horizon		
	3 months	6 months	12 months
October 2001	0.96	0.95	0.93
December 2001	0.92	0.92	0.91
January 2002	0.92	0.92	0.91

* Arithmetic average of forecasts by 11 large investment banks.

Chart III-19 German tradables price index*

* Annual inflation under the assumption of unchanged quarter-on-quarter inflation from January 2002.

banks for three, six and twelve months ahead expect a further appreciation of the euro (see Table III-6). The inflation forecast of the Bank, however, is based on constant EUR exchange rate (fixed at its January 2002 average of 88,4 cents), see Chapter IV.

German tradables price inflation is viewed as relevant import price index for Hungarian tradable goods in the Bank's inflation forecast (see Chapter IV). In contrast to the forecasted decline presented in the November *Inflation Report*, price inflation in German tradable goods rose in the final quarter of 2001, with the November and December twelve month rates exceeding 1%. The twelwe month indices derived from the long-term trend of German tradables price changes continue to slightly rise up to March 2002, then gradually fall up to year-end, leading to a 0.5 per cent rate of inflation from December 2002 (see Chart III-19).

4 Effect of regulation and extraordinary factors

In terms of regulated prices, which account for one-fifth of consumption expenditure, the Bank forecasts prices to rise by 6.4% on average in 2002. These calculations take into account all regulatory decisions on prices, including those approved in the Budget Acts for 2001 and 2002 as well as those reached up to the end of January.

According to the forecast, household energy prices will rise by an average 8.5% in 2002. Electricity costs are up 5% from January and this higher price will remain in force for the rest of the year. The price of piped gas will change in July. The earlier regulatory system went out of effect at the end of 2001, and preparation of the new system is underway. As currently there is no information available regarding expected decisions, the Bank is pursuing a 'conservative' standpoint: it does not expect prices to increase more than they have in the past. Accordingly, a 12% increase in household piped gas prices has been assumed in the central projection. The price of gas accounts for around 2% in the overall consumer basket, so, for example, a 10% higher hike in household gas prices would cause an additional 0.2% inflation.

In the field of services, the 3.5% increase in centrally regulated prices will be modest in 2002, while increases in prices administered by the local authorities, at 8.5%, are projected to be higher. In forecasting the former, it has been taken into account that generally a 5% price increase is used as a guideline (tariffs are expected to increase by 5.4% in public transport and by 5.3% in postal services). However, in telephone services the price cap provides for a 4% upper limit to increase in centrally regulated services prices (only subscription fees will be raised, by 4%, in February; from July, subscription fees may rise further by maximum 3%, and the increase in the price of local calls may not exceed 5%), which will be mitigated considerably by the development of competition in the provision of long distance and international call services. Strong increases in fees administered by the local authorities are expected – the costs of housing and communal services will likely increase at a rate above average inflation.

The increase in excise taxes, affecting 14% of goods in the consumer basket, will add 3.5% on average to the prices of these goods in 2002. The excise tax on motor fuel will be changed from

HUF 93 to HUF 103.5 as of July, contributing around 6% to the consumer price. The excise tax on alcoholic beverages will likely increase retail prices by 1%–2%. Tobacco excise taxes specified in HUF will increase by 13%, the percentage tax rate continuing to be 17% of the retail price.

In regulated prices, including the application of tax regulations, the Bank forecasts a 5% average increase in consumer prices (6.4% is accounted for by regulated prices and around 3.5% is the reflection of tax revaluation in consumer prices).

For the time being, there are no concrete government plans to increase prices in 2003, therefore, the central path reflects the simple assumption that the prices of the majority of centrally regulated goods and services (energy, public transport, postal services, etc.) will rise by the yearly average rate of around 4%, as defined by the inflation target. Telephone services prices are forecast to increase much more modestly. The reason for this is the new regulation taking effect at the start of this year – according to a Decree,[27] the price cap allows a yearly average increase of around 1% in general. As regards the household sector, centrally regulated prices may increase by a larger amount than the price cap, but, due to competitive pressures, long-distance and international call rates are actually expected to fall. Within pharmaceuticals prices, the Bank has taken into account indexing with 70% of inflation for subsidised products, while for unsubsidised products the average rate of inflation has been taken as a basis. A higher-than-inflation increase of around 5.5%–6% is expected in housing services prices (house rents and communal services).

As a basic scenario for 2003, the Bank forecasts an increase in excises levied on alcoholic beverages and motor fuel in line with the path provided by the disinflation target. The up to 4% increase in taxes will likely contribute 1% to prices of alcoholic beverages and around 2.5% to motor fuel prices. A 16% increase in the excise tax on tobacco is projected, which is slightly higher than the 15% increase in 2000–01 and the 13% increase this year. This may be in line with the disinflation target, but it does nothing to solve the problem that the increase in taxes is approaching the tax content corresponding to EU standards too slowly. As Hungary has not applied for a derogation in this area, the tax content of tobacco prices will have to rise from the current 42% to 57% by the time of accession to the EU.

Within regulated prices, including tax regulations as well, the Bank has forecast average consumer price inflation to be 3.2% in 2003 (increases in regulated prices 3.7% and tax revaluation contributing and around 2%–2.5%, respectively, to consumer prices).

Weighing the various risks, the Bank believes that the outcome of factors points to higher inflation in 2003. Increases in household energy prices and the excise tax on tobacco may be biased to the upside relative to the central projection for 2003. For example, assuming that household energy prices rise by 8% on average in 2003 and the excise tax levied on tobacco products is increased by 30% in contrast to our forecast of a 16% increase, this would represent a risk of contributing around 0.5 percentage

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[27] MeHVM Decree No. 3/2002 on Telephone Call Rates (21 January). Approximately 4% consumer price inflation in 2003 minus 3% efficiency factor, setting separate limits for the various types of services (individual subscription fees are allowed to rise by less than 10% and local call rates by maximum 6%)

points to inflation, as compared with the forecast of centrally regulated prices for next year built into the Bank's central projection.

There was a shift towards disinflation in the trend of agricultural producer prices, traceable to exogenous shocks from the perspective of monetary policy in the final quarter of 2001. This price correction, pointing in the direction of a fall in inflation, may be explained by very good harvest results and price agreements facilitating price smoothing. However, prices in the final two months of the year fell more strongly than analysts expected. This may have been one reason why the Bank overestimated the prices of both unprocessed and processed foods (see Chapter I).

For example, the price of pork, which plays an important role in domestic consumption, fell by a larger measure in November–December than the estimate, due to flagging exports, which unexpectedly fed through to surplus supply in the Hungarian market. Owing to the high stock data and forecasts of lower fodder prices, analysts expect pigs for slaughter prices to continue to fall up to mid-2002.[28]

Agricultural producer prices generally are very volatile. They largely depend on temporary shocks and are difficult to forecast. Movements in the prices of unprocessed foods included in the consumer price index generally follow changes in agricultural prices immediately or with a short time lag. However, the Bank has chosen to not project over the forecast horizon the spillover effects of large swings and surprise movements in prices. Experience has shown that the retail price of meat does not fully reflect surprise and salient rises in producer prices. Therefore, in the central projection the Bank expects the retail price of meat, excluding the effects of seasonal patterns, to be broadly stable throughout 2002, and expects prices to rise from early 2003. Although the producer price of pigs for slaughter may continue to decline up to the middle of the year, it is not thought to be a change in the overall trend. Hungarian pigs for slaughter prices went near to, and even exceeded, those of the European Union in 2001[29] (See Chart III-20). Lacking other reliable information and assuming a constant price level in the European Union, the Bank expects domestic producer prices to fluctuate around EU prices, aside from some minor deviations.

The assumption for future movements in agricultural prices and the more smoothed consumer price shocks which follow them carry a certain amount of uncertainty. Within-year consumer and producer price fluctuations, namely a strong fall early in the year, followed by a rise, comparably wider than those in the forecast, cannot be ruled out.

Chart III-20 **Hungarian and EU pork prices**
HUF/kilo
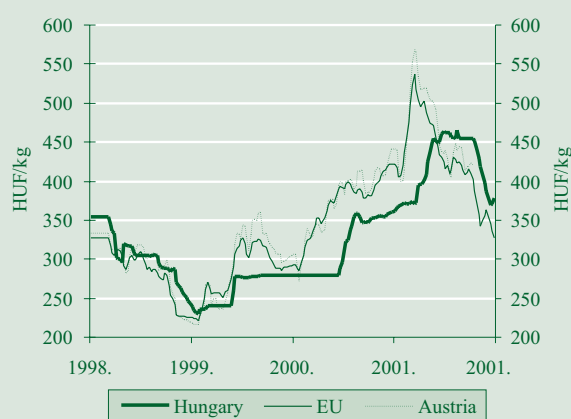
* Research and Information Institute for Agricultural Economics (AKII) Market Reports

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[28] The Bank held consultative meetings with analysts of Research and Information Institute for Agricultural Economics (AKII) who prepare analyses and forecasts of the agricultural market, and have relied on AKII's publication: 'Éves gabona-, hús-, tej-, és zöldség-gyümölcs piaci jelentés' (Annual grain, meat, milk and vegetables market report), 16 January 2001.

[29] Ferenczi, Barnabás et al., 'Van-e inflációs feszültség a hazai élelmiszer árakban? Az EU-csatlakozás várható hatása' (Do domestic food prices carry inflationary pressures? The expected implications of accession to the EU), NBH Background Studies 1/2002.

IV Forecast of the consumer price index and risk assessment

The Bank's inflation projection is based on the Monetary Council's vision of the future and anticipation of uncertainty. The economic policy conclusions drawn by the Council from the forecasts are summed up in a statement issued on 18 February, and are also published at the beginning of this Report. The projection is conditional, seeking to pinpoint the future path of inflation under unchanged monetary policy, i. e. assuming constant exchange rate for the forint (fixed at the January average of HUF 244 per euro).

In the central projection, over the 2002–2003 horizon the CPI is expected to fall within the inflation target range defined by the December targets of 7% last year, 4.5% this December and 3.5% in 2003 with the addition of the tolerance limits of ±1% (see Chart IV-1).

The evolution of the price of oil is crucial to the Bank's projection. Our forecasts are generally based on constant oil prices (i.e. fixed at the latest observed value), this being regarded as the most efficient projection (given that oil is a widely traded commodity and all the information bearing on future prices is also reflected in the current price level). Consequently, the inflation projection prepared by the Bank's Economics Department is always based on assuming constant oil prices.

However, the evolution of the world oil price is currently surrounded by a great deal of upside risks, as global economic activity is anticipated to pick up sooner or later. The Monetary Council views the likelihood of oil prices rising above January's USD 20 per barrel price as being so great that it justifies, as a precaution, the use of a higher oil price scenario in the central inflation projection. Accordingly, the final inflation projection of the NBH is based on the assumption of higher oil prices in 2002 than the January average (see Chapter III/3). Thus, in the following, the higher-oil-price scenario is taken as our central projection, unless otherwise indicated.

The roughly 4-dollar rise in oil prices, used in the final forecast, will cause the projection for the end-2002 CPI to be 0.6% higher than the alternative rate derived from the constant January oil price. Despite the higher price assumption, the CPI projection will remain within the target range: near the middle of the range at end-2002, the fourth-quarter average being 4.7% (with the average annual rise being 5.0%). The central projection for inflation at end-2003 is around the middle of the target range at 3.3%. The evolution of inflation over the forecast horizon can be divided into three phases: the first half of 2002 is characterised by rapid disinflation, followed by a flat period until 2003, when disinflation starts again. It is important to note that the quarterly projections show no acceleration in the price index in the second half of

Chart IV-1 Changes in the CPI, assuming constant versus rising oil prices in 2002
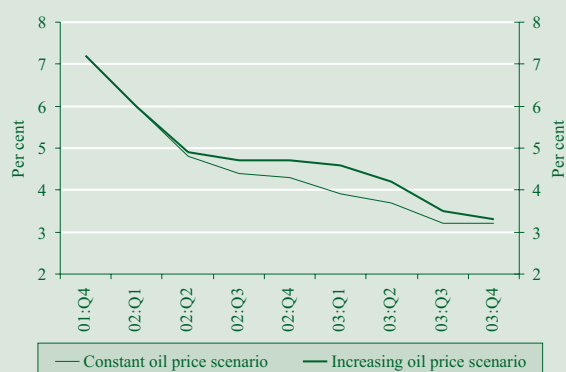Percentage changes on a year earlier

Table IV-1 Central projection for the CPI Percentage changes on a year earlier

Per cent

| | Weights | 2001 | 2002 | | | | | 2003 | | | | |
| | | Actual data | Projection | | | | | Projection | | | | |
		Q4	Q1	Q2	Q3	Q4	December	Q1	Q2	Q3	Q4	December
Food	19.0	11.1	7.9	4.9	3.3	3.4	3.7	3.5	3.7	3.7	3.8	3.8
Unprocessed	(5.4)	7.6	5.5	1.3	0.6	1.4	1.9	1.4	3.1	3.3	3.4	3.6
Processed	(13.6)	12.3	8.9	6.4	4.5	4.3	4.4	4.4	4.0	3.9	3.9	4.0
Tradables	26.0	3.9	3.0	1.7	0.8	0.0	−0.2	−0.3	−0.3	−0.3	−0.1	−0.1
Market services	20.4	10.2	9.4	9.1	8.0	6.8	6.3	6.0	5.4	5.3	5.2	5.2
Market priced energy	1.5	1.4	−1.1	3.1	6.0	7.0	8.0	8.9	6.4	2.4	0.2	0.2
Vehicle fuels	5.2	−13.1	−7.5	−7.4	5.4	13.9	16.0	16.8	12.6	4.2	3.4	3.5
Alohol and tobacco	9.1	10.4	8.3	7.1	7.0	7.2	7.3	7.3	7.4	7.2	6.9	6.8
Regulated prices	18.9	8.9	7.6	7.2	6.4	6.4	6.4	5.8	5.5	4.6	3.8	3.7
CPI	**100**	**7.2**	**6.0**	**4.9**	**4.7**	**4.7**	**4.8**	**4.6**	**4.2**	**3.5**	**3.3**	**3.3**
Core inflation estimate	65.3	8.2	6.5	5.3	4.3	3.7	3.6	3.4	3.2	3.1	3.1	3.3
Annual average	–	9.2	5.0					3.9				

Chart IV-2 Inflation projection based on increasing oil prices*
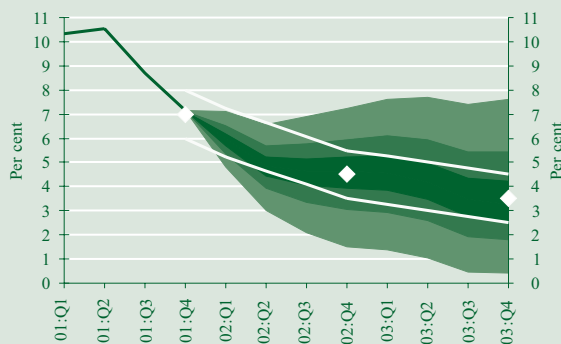
Year-on-year growth rate

* The fan chart shows the probability distribution of the outcomes around the central projection. The central band with the darkest shading includes the central projection. The entire coloured area covers 90% of all probabilities. Outside the central projection (centred around the mode), the bands represent 15% probability each. The uncertainty intervals have been estimated relying on the Bank's historic forecast errors and the uncertainties perceived by the Monetary Council regarding the current forecast. The three dots at Q4 each year represent the December inflation targets (7%, 4.5% and 3.5%), while the straight lines around them mark the ±1% tolerance bands.

Chart IV-3 Measures of inflation

Percentage changes on a year earlier

CPI — Influentable inflation — Core inflation

2002, i.e. there is no "U"-shape in the projection, in contrast with some market analysts' monthly inflation forecasts.

In the Economics Department's "staff projection", based on constant oil prices, the CPI falls within the lower half of the target range for inflation in 2002–2003. In 2002 Q4, the CPI drops to 4.3% from 7.2% in 2001 Q4 and the 2002 average annual projection is 4.9%. Inflation follows a steady downward trend until the final quarter of 2003, and then it remains flat. The CPI forecast stands at 3.3% in 2003 Q4.

The uncertainty surrounding the central projection for inflation has been stated using the Monetary Council's assessment, as displayed in the fan Chart IV-2. The risks are broadly balanced in 2002, with virtually equal probability that the CPI will be higher or lower than the upper or lower limits of the target range, respectively.[1] In 2003, it is more likely that the CPI exceeds the upper tolerance limit of the inflation target range. This is essentially due to the risks surrounding regulated prices such as a faster-than-projected rise in the price of piped gas at mid-2003 and a higher increase in the excise duty on tobacco (see Table IV-1).

Due to one-off shocks and price volatility, the information conveyed by inflation developments often remains disguised. In order to capture medium-term inflation trends in a more accurate way, the Bank also constructs alternative inflation indicators in addition to the CPI, displayed in Chart IV-3. The Bank has made estimates for the CSO's core inflation index, which eliminates the effects of the factors concealing the trend.[2] Core inflation indicates that disinflation will continue over the next six quarters, but the downward trend flattens from the second half of 2003.

In this Report there is also a description of inflation of prices that can be directly influenced by monetary policy (for the definition of this "influentable" price index, see Chapter I). Inflation in terms of the consumer basket categories that are under the direct influence of monetary policy falls steadily during the period between the introduction of the new exchange rate regime in 2001 and mid-2003, and the rate stabilizes around 2% in the subsequent period. This is consistent with the earlier expectation that the disinflationary impact of the band widening in May 2001 will unfold not at once but gradually, mostly during 2002 and 2003. As a result, the index of "influentable" prices will drop to a low level.

[1] As the projection is based on a higher oil price, the uncertainty of the oil price assumption is also symmetrical.

[2] The CSO publishes its new core inflation index since 2002. The Bank's measure of core inflation, which comprises of processed foodstuffs, tradables, market services, as well as alcohol and tobacco, is an approximation of the CSO's official core index.
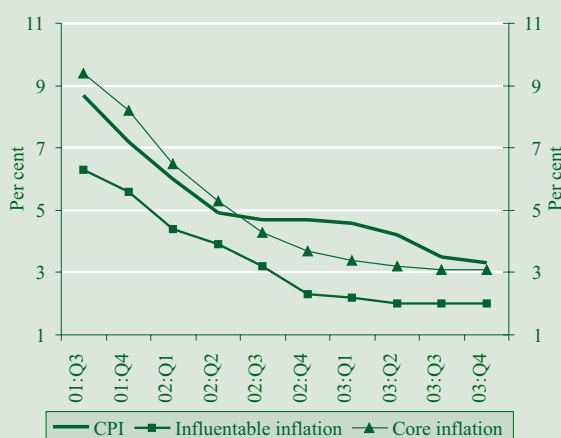
1 Assumptions
of the central projection

There have been significant revisions to four assumptions underlying the November 2001 projection. First, the central projection is based on the assumption of a higher world oil price, due to the Monetary Council's decision. Second, an analysis of actual data necessitated a reduction to be made in the rate of the exchange rate pass-through. Third, there has been a revision to the assessment of labour market developments. Finally, the disinflation of unprocessed food prices, first seen in 2001, is expected to continue in 2002 (see Table IV-2).

Of the developments bearing on the path of inflation, changes in the forint's exchange rate and unprocessed food prices have started to exert downward pressure on inflation since the November projection.[3] Factors hampering disinflation are the reduced rate of the exchange rate pass-through and stronger household consumption in 2002. Oil prices are expected to exert disinflationary pressure for the greater part of 2002, being lower than a year earlier, but in the final quarter this impact is expected to reverse and become inflationary.

The strengthening of the forint's exchange rate is most directly reflected in lower tradables price inflation. In our forecasting model, tradable prices are governed primarily by import prices and the exchange rate of the forint, in addition to other cost factors (such as wage costs, energy costs, transport, etc.), but the latter play a lesser role. Therefore, tradables prices are sensitive to an appreciation of the forint, more specifically to how fast it feeds through to and how much of it gets incorporated in prices. Previously, as there was no domestic information available on the impact of the new exchange rate system on inflation, the Bank had to draw on international experience. The resulting assumption was that a given permanent change in the forint's exchange rate would pass through to the price level of tradable goods to a 50% extent in the course of one year and 75% over two years. To test this hypothesis the Economics Department used actual data to simulate the projections for the past six months (see Chapter I). Using the actual data available on the exchange rate and tradables price indices, they have "estimated" the size of the "actual" exchange rate pass-through. Then, due to the uncertainty of the calculation, the average of these "actual" parameters and the earlier assumptions for the exchange rate pass-through parameters was taken (for each individual time horizon). The results of the simulation suggest that the underestimation of inflation in

Table IV-2 Assumptions for the central projection for inflation

Assumption	Where does it play a role?	In November 2001 projection	In current projection	
		2002	2002	2003
Forint exchange rate	Tradables, petrol, market-priced energy, certain foodstuffs	255.9	244.0	
Price of Brent crude (USD)	Petrol and market-priced energy	25.5	21.7	23.9
USD/EUR exchange rate (cent)	Petrol, market-priced energy and certain foodstuffs	91.0	88.4	
Imported tradables price inflation	Tradables	0.5	0.5	0.5
Change in manufacturing productivity	Market services	6.6	5.0	5.9
Wage growth*	Processed food and market services	9.1	9.2	7.5
Consumption growth**	Processed food and market services	4.3	4.9	4.0

* Changes in the gross wage bill in manufacturing and market services.
** Volume of household purchased consumption expenditure (seasonally adjusted)..

[3] There may be some temporary noise in certain months, such as the higher indexes for vegetable and fruit prices in January, for instance.

Chart IV-4 Exchange rate pass-through to tradables prices based on the earlier versus the revised assumption
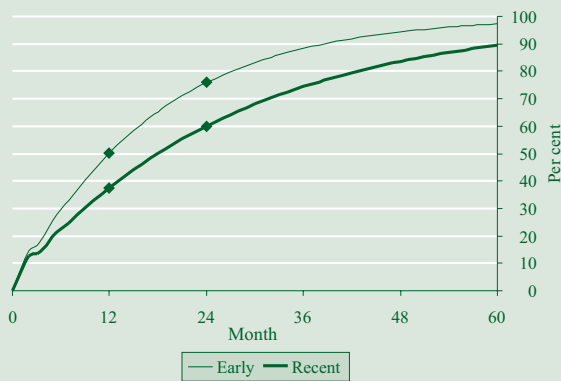
Note: The chart shows changes in the price level of tradable goods over a five-year period following a 1% constant weakening of the exchange rate of the forint..

tradables and market service prices was due to the fact that the strengthening of the exchange rate had a smaller impact than expected. This implies that the impact of the strengthening will only pass through to prices to the extent assumed by the Bank over the longer run. Accordingly, the current model is based on a lower degree of exchange rate pass-through. Thus, the impact of a permanent change in the exchange rate is assumed to pass through to tradables prices to an extent of 37.5% and 60% in the course of one and two years respectively(see Chart IV-4).

The highly volatile unprocessed foodstuff prices are regarded as exogenous. The expected low level of price increases will exert disinflationary pressure throughout 2002. Instead of assuming robust disinflation – or sometimes deflation – arising from agricultural developments, the assumptions for the expected feed-through to consumer prices are moderate in the current projection as well. This caution seems to be justified as past information suggests that consumer prices tend to be slower in following the deflation of producer prices than in price increases.

Consistent with the global economic outlook, the assumption for oil prices is not the average January price (of USD 19.55 per barrel), but is based on international oil price forecasts. Accordingly, the projection assumes a steadily rising price for Brent oil in 2002, with an annual average of USD 21.7 per barrel. Over the first nine months, the price of oil falls short of the level for a year earlier, but the USD 23.9 per barrel projection for the end of the year is nearly 30% higher than the level at end-2001 (the December average price being USD 18.6). Due to steadily rising global energy prices, market-priced energy and fuel prices are expected to rise at a much faster rate than projected in November. This base effect is expected to exert upward pressure on inflation. As the Bank has no projections for oil prices in 2003, the price assumed in the forecast for 2003 as a whole equals the constant end-2002 price of USD 23.9 per barrel.

2 Details of the central projection

The Bank's forecast of a nearly 4-percentage-point drop in inflation towards end-2003 mainly reflects developments in product and services prices which monetary policy is able to control and in food prices – disinflation of tradables and market services prices reduces the consumer price index by 2 percentage points, food price disinflation contributing another 1.4 percentage points. Higher oil prices, adding 0.8 percentage points, constitute risks to inflation on the upside.

In the central projection, the tradables price index, accounting for one-quarter of the consumer basket, falls gradually; then, from end-2002, prices remain broadly stagnant. Disinflation has been revised down by nearly half a percentage point relative to the November forecast. Explanation for this is the weaker exchange rate pass-through. Reducing the parameters for the exchange rate effect means that the disinflation effect of exchange rate appreciation materialises only over the longer run. In 2003, therefore, the prices of these goods remain nearly unchanged.

Compared with the November forecast, market services inflation in 2002 has also been revised up by 0.7 percentage points. On the supply side, the slower wage adjustment process is more present in the services sector than in manufacturing (see Chapter III). Higher household consumption may be another factor add-

ing upward pressure on inflation. From 2003, however, the combination of a more sluggish expansion of household consumption and a slower rise in costs, such as wage costs and energy prices, constitutes a disinflationary factor.

The differential between tradables and market services inflation will not narrow considerably in the coming two years. By contrast, it will widen temporarily in 2002, rising above the 7 per cent mark around mid-year. This is a natural companion to exchange rate-based disinflation, given that forint appreciation lowers tradables prices first, and it is reflected in services prices with a time lag, its effect being indirect.

In the Bank's inflation forecast, projection of the market component, i.e. the 'net price', of vehicle fuel prices is determined by a constant forint/euro exchange rate path, the exchange rate of the euro vis-à-vis the dollar and the world market price of oil. According to the current forecast, the price of oil at end-2002 is nearly 30% higher than in December 2001. In addition, the HUF 10.5 increase in excise duties adds approximately 6% to the consumer price of petrol in 2002. Due to the base effect of the price of petrol undergoing hectic movements in 2001 and falling by 13% in the final quarter, the outlook for the December 2002 price index is higher by roughly 2 percentage points than in the fourth quarter. It has been assumed (see Chapter III) that taxes will be increased in January. Accordingly, higher basic materials prices and the tax increase combined cause a 17% price increase in early 2003. Rising motor fuel prices represent a significant upward pressure on inflation in the period end-2002–mid-2003; however, their effect on inflation will be neutral by end-2003, due to the assumption of largely unchanged import prices projected for the year as a whole (see Chart IV-5).

The outlook for movements in market energy prices has been revised up relative to the previous forecast, due to expectations of rising world market prices; however, because energy accounts for a small weight within the consumer basket, its inflationary effects are insignificant.

The fall in processed food price inflation in 2002 reflects a relatively modest increase in unprocessed foods prices (see Chapter III). In the long run, price setting depends primarily on the purchase prices of basic materials, which are forecast to hardly rise at all, remaining mostly static. (Cereals prices provide the only exception, which will likely rise during the year, causing a larger increase in floury product prices.) From 2003, however, a tentative rise in unprocessed foodstuff prices may slow the fall in processed food price inflation. However, the Bank expects grain market prices to increase more modestly, or nearly to stagnate, in 2003 relative to this year. Rises in other costs are expected to be more subdued than this year, due to the slowdown in wage inflation and the rise in energy cost at sub-inflation rates; and household consumption, expanding at a more modest pace, will likely move processed food prices toward slower inflation.

Looking at the other categories making up the consumer basket, there has been no material change in the Bank's November central projection. The effect on inflation of movements in regulated prices has been assumed to be broadly neutral in 2003, in line with the assumptions presented in Chapter III – the assumption for the majority of centrally regulated prices, including those of energy, transport, postal services etc., is an around 4% increase on average, as derived from the inflation target. (Increases

Chart IV-5 Forecast of motor fuel price index
Percentage changes over the same period of previous year
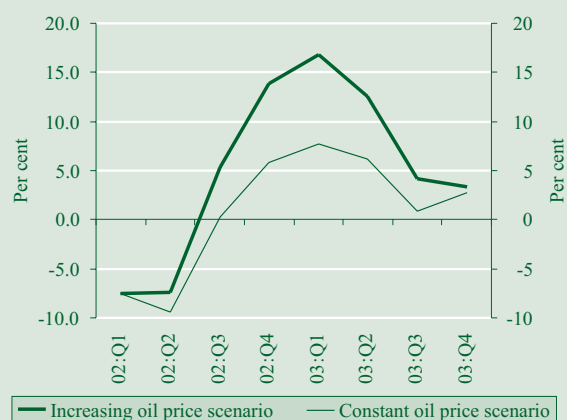
in prices administered by the local government authorities are expected to be stronger, those in prices falling within the competence of other regulatory authorities are expected to be less strong.) Accordingly, movements in the regulated prices of goods and services are expected to support the fall in inflation. Generally, the hike in excise duties will have a neutral impact on inflation. However, the increase in taxes in 2003 will cause a double-digit inflation of tobacco products.

3 Uncertainty in the central projection

At its meeting on 21 January, the Monetary Council identified the main factors of risk to the current inflation projection. Then, at its 4 February meeting, the Council formed a judgement on the expected distribution of those risks. This was the basis for constructing the fan chart of the inflation forecast. Members approved the values suggested by the Economics Department for the assumptions underlying the central projection (see Table IV-2). In the Council's view, the uncertainty of a possible deviation from the forecast in 2002 was nearly symmetrical, and the likely outcome of the risks to inflation in 2003 was on the upside.

The Council also formed its judgement on the expected trends in four factors viewed as relevant for developments in domestic inflation. These were (i) the extent of exchange rate pass-through, (ii) the rise in wage costs, (iii) expected increases in regulated prices (including changes to taxes, in addition to the prices of goods and services administered by the central government and the local authorities), and (iv) the future movements in the world market price of oil.

In the Council's view, the uncertainties surrounding the world market price of oil are now symmetrical, given that the forecast reflects rising oil prices in 2002. According to the Council's view on labour market adjustment, the probabilities of wage costs rising above or below the central path are equal.

In terms of the exchange rate pass-through, the Council has approved the use of lower values than those included in the November projection. In the members' view, however, the uncertainties surrounding this factor are more likely to represent a downward risk to inflation.

In the Council's assessment, the uncertainties of movements in the regulated prices of goods and services are insignificant in 2002, as in a number of areas price setting is determined by decisions already known. However, currently no final measures are available for 2003. Therefore, changes in regulated prices are in line with the inflation target. This, however, includes upward risks, due mainly to the uncertainties surrounding developments in piped gas and tobacco prices. Assuming piped gas prices were increased by 10 percentage points more than the forecast for 2003, this would add 0.2 percentage points to inflation; and a 10 percentage points higher increase in the tobacco excise duty would raise end-2003 inflation by 0.1 percentage point.

The distribution of uncertainties (see Chart IV-2) in 2002 is nearly symmetrical. The probability of inflation overshooting or undershooting the target band, i.e. rising above 5.5% or falling below 3.5% respectively, is approximately 30 per cent. In 2003, the uncertainty is higher – the interval with a 30% probability in the central projection more or less covers the inflation target

band. However, the likelihood of inflation rising above the upper boundary of the target band, i.e. being higher than 4.5%, in the fourth quarter is about 40%, due to the risks inherent in movements in regulated prices. On the downside, the likelihood of the consumer price index falling below the lower edge of the band is around 25% (see Chart IV-6).

4 Inflation expectations

According to the January Reuters' poll, analysts' inflation expectations for end-2002 fell by 0.2 percentage points, to 5.1 per cent relative to the October 2001 survey. The average of forecasts by 10 analysts, who have contributed their projections to both surveys, shows the same magnitude of change. The volatility of expectations has been falling gradually, as a trend, since August 2001 (see Chart II-5). Whereas at the end of the summer nearly one-third of analysts did not expect inflation to be positioned in the target band towards end-2002, only one of the 13 respondents of the January survey expected inflation to be above the target band (5.6%). Furthermore, expectations in January of inflation in December 2003 are within the ±1% inflation target band.
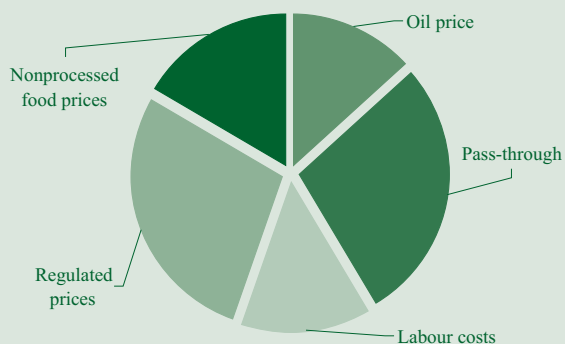
The path of inflation, derived from expectations, fluctuates in a probability band of 30% along the Bank's central projection.[4] There is no significant difference between the two paths projected for 2002 H1. Analysts' expectations are mostly in the upper range of the Bank's projection of the most probable outcome in the period 2002 Q3–December 2003. Three out of the 13 analysts expect inflation to be below, or equal to, the Bank's 4.8% central projection for end-2002.

A key variable in the Bank's disinflation strategy is the exchange rate and its pass-through into consumer prices. Analysts' exchange rate expectations for end-2002 have been little changed in the past three months. According to a number of market reports, the feed-through of the 2001 exchange rate appreciation into consumer prices has been slower than expected earlier, with many expecting the bulk of it materialising in 2002.

Observers explain the expected further rapid decline in inflation and the U-shape of the inflation path by several other factors, in addition to the exchange rate effect. Beyond the base effect, being the most frequently cited cause, there is a broad-based consensus that food prices may fall further. A few analysts base their forecast of a rapid fall in inflation in the first half on the continued downward drift in oil prices. They often refer to a pick-up in external demand, a rise in oil prices on account of global cyclical conditions and an expansion of consumer demand fuelled by high real wages as the causes of static, or probably slightly rising, inflation in the second half. Increases in regulated prices, particularly in those of natural gas and electricity, are expected to take place in 2002 H2 or early 2003. These are seen by observers as exerting a considerable upward pressure on inflation.

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[4] When comparing the Banks' forecast with inflation expectations, it should be taken into account that the former is a conditional projection, as it has been based on the assumption of a constant nominal exchange rate. Market expectations, in contrast, include analysts' view on future monetary policy actions as well as movements in the exchange rate.

Chart IV-6 **Major risks to the projection for 2003***

* The weights of the individual factors has been derived by multiplying their standard deviation and 'unit' effect on inflation.

Chart IV-7 **Paths for analysts' inflation expectations October 2001–January 2002***

* The path of analysts' outlook for inflation has been based on the curve that best fits inflation expectations in the Reuters' poll (December, annual average, the month of poll).

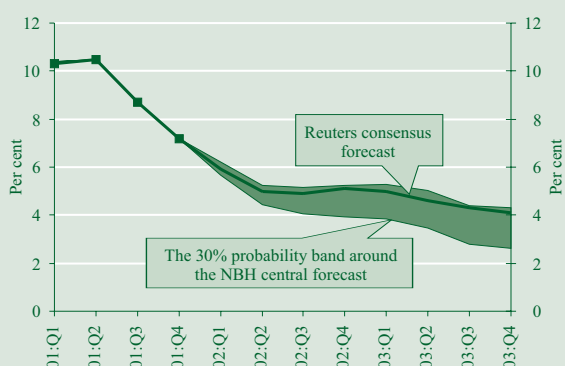*Chart IV-8* **Comparing analysts' expectations with the Bank's forecast**

Special topics

1 The effect of the revision of GDP data on the Bank's forecasts

In line with international practice, the Hungarian Central Statistical Office (CSO) published revised GDP data for 2000 based on available information, simultaneously with publication of third-quarter data for 2001. The revision affected both the production and final use approaches of GDP. Currently, the Bank prepares its forecasts in the *Report* in more detailed for final uses approach. Therefore, below a brief outline of the revision to final uses data is presented, along with its quantitative effects on the projections. The retrospective revision to data for 2000 primarily altered the Bank's forecast for household consumption.

The data revision thoroughly changed certain components of domestic use; however, it left the whole of domestic use both in nominal and volume terms unchanged. Foreign trade data for 2000 was not affected by the revision, except minor changes in the actual data for 2001 Q1–Q2.

Table 1 **Contribution of GDP to growth**

Per cent

	1999	2000 original	2000 revised
Household final consumption expenditure	2.6	1.9	2.2
Social transfers in kind	0.2	0.2	0.4
Actual final consumption of households	**2.8**	**2.1**	**2.6**
Actual final consumption of government	0.2	0.2	0.3
Actual final consumption, fotal	**3.0**	**2.2**	**2.9**
Gross fixed capital formation	1.4	1.6	1.9
Changes in inventories*	−0.3	1.3	0.5
Gross capital formation, total	**1.1**	**2.9**	**2.3**
Domestic use, total	**4.1**	**5.1**	**5.2**
Exports	6.9	12.0	12.0
Imports	6.9	12.0	12.0
External balance of goods and services	**0.1**	**0.0**	**0.0**
GDP, total	**4.2**	**5.2**	**5.2**

* And non-specified use.

Table 2 **Volume indices of domestic use based on the original and revised data**
Same period of previous year; at 1998 prices*

	2000				2000	2001	
	Q1	Q2	Q3	Q4		Q1	Q2*
Actual final consumption of households							
Previous original	*1.030*	*1.034*	*1.034*	*1.035*	*1.033*	*1.045*	*1.040*
Previous seasonally adjusted	*1.046*	*1.035*	*1.033*	*1.032*		*1.030*	*1.041*
Revised original	1.040	1.043	1.041	1.041	1.041	1.042	1.038
Revised seasonally adjusted	1.041	1.043	1.041	1.041		1.041	1.038
Households final consumption expenditure							
Previous original	*1.037*	*1.038*	*1.037*	*1.040*	*1.038*	*1.054*	*1.048*
Previous seasonally adjusted	*1.045*	*1.043*	*1.039*	*1.044*		*1.050*	*1.046*
Revised original	1.046	1.046	1.040	1.041	1.043	1.049	1.044
Revised seasonally adjusted	1.048	1.046	1.042	1.041		1.046	1.044
Actual consumption of government							
Previous original	*1.010*	*1.011*	*1.020*	*1.020*	*1.016*	*1.012*	*1.021*
Previous seasonally adjusted	*1.010*	*1.012*	*1.014*	*1.019*		*1.017*	*1.022*
Revised original	1.032	1.039	1.014	1.033	1.029	1.003	1.018
Revised seasonally adjusted	1.028	1.034	1.016	1.031		1.008	1.018
Gross fixed capital formation							
Previous original	*1.077*	*1.062*	*1.029*	*1.091*	*1.066*	*1.053*	*1.036*
Previous seasonally adjusted	*1.073*	*1.067*	*1.059*	*1.067*		*1.048*	*1.043*
Revised original	1.087	1.072	1.039	1.102	1.077	1.041	1.024
Revised seasonally adjusted	1.089	1.078	1.061	1.079		1.041	1.032
Gross capital formation							
Previous original	*1.145*	*1.042*	*1.095*	*1.119*	*1.099*	*1.048*	*1.029*
Previous seasonally adjusted	*1.102*	*1.070*	*1.109*	*1.096*		*1.044*	*1.052*
Revised original	1.113	1.019	1.083	1.106	1.079	1.058	1.030
Revised seasonally adjusted	1.079	1.051	1.096	1.082		1.048	1.052
Changes in inventories and non specified use							
Previous original	*1.227*	*0.992*	*1.474*	*0.644*	*1.243*	*1.042*	*1.013*
Previous seasonally adjusted	*1.236*	*1.082*	*1.353*	*1.220*		*1.029*	*1.088*
Revised original	1.143	0.884	1.334	1.024	1.092	1.077	1.047
Revised seasonally adjusted	1.037	0.938	1.275	1.095		1.081	1.152

* The seasonally adjusted data, back to 1995, reflect National Bank calculations. The CSO has not published data for 1995–97 underlying the 1998 price base. Therefore, the data for the period are our estimates.

As Table 1 shows, the data revision affected household consumption and fixed capital formation significantly. The contribution of changes in inventories and non-specified use to growth was revised down to 0.5 per cent. Based on the revised data, the contribution of the individual components of GDP to growth was largely comparable in 2000 with the previous year's outcome. The one per cent higher growth rate was the result of upward revisions to fixed capital formation and inventory accumulation, on the uses side.

Final consumption of households is the sum of their consumption expenditure and social transfers in kind they receive. The CSO revised up the volume indices for both. The annual volume index of households' consumption expenditure in 2000, thus, increased from 103.8% to 104.3%. The Bank has based its forecast published in this *Report* on the latter aggregate. The data revision affected the within-year data and the seasonal components significantly as well. As a result of the revision, the forecast for 2001 shows a half per cent lower volume increase.

Consumption arising from social transfers in kind accounts for one-fifth of households' final consumption. The volume index of social transfers in kind for 2000 has been revised up from the earlier 101.3 per cent to 103.4 per cent. Explanation for this significant difference is that the index is derived using indirect estimates within the year, and is calculated taking into account the final budget outcomes. In the *Report*, the Bank forecasts the index using the average of the previous 8 quarters. The data revision caused the forecast for 2001 and 2002 to change from 100.9% to 101.3% and from 101.1% to 102.3%, respectively.

Looking at Chart 1, which plots households' final consumption, developments in household consumption growth were at higher levels and more even, taking into account the revised data. The quarter-on-quarter, calculated on the basis of trend, are now significantly more stable.

Similarly to social transfers in kind, the CSO estimates consumption of government within the year indirectly, using labour market statistics. The data, calculated taking into account the final budget outcomes, show a significantly higher expenditure – the volume index for 2000 was revised up from the previous 101.6% to 102.9%. In the *Report*, the Bank forecasts the index using the moving average of the previous 8 quarters, similar to the treatment of social transfers in kind. Taking into account the revision to data, for 2002 the Bank projects a 0.4% higher growth rate of 101.9 per cent than in the previous *Report*.

Gross capital formation is currently at a lower level due to the downward revision of inventory accumulation and non specified use. The volume index of gross capital formation was revised down by 2 per cent year on year, owing to the change in inventories. Quarterly growth rates have been decreased proportionately (see Chart 2).

Examining year-on-year growth in fixed investment, the trend has fallen more strongly from the beginning of 2000, taking into account the revised data. The quarter-on-quarter growth rate, derived from annualised percentage changes, fell strongly in 2000, then stabilised at 3 per cent in 2001 Q1–Q2 (see Chart 3).

Chart 1   Final consumption of households
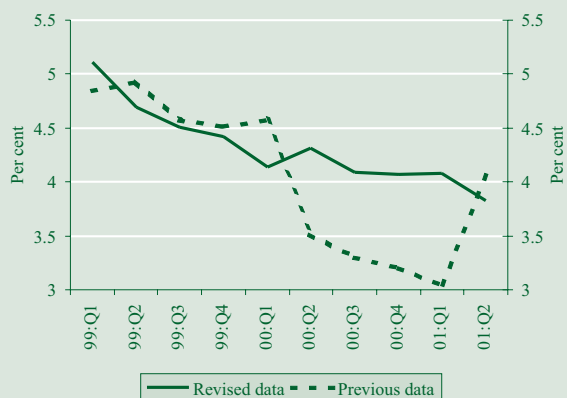Year-on-year growth; seasonally adjusted data

Chart 2   Gross capital formation
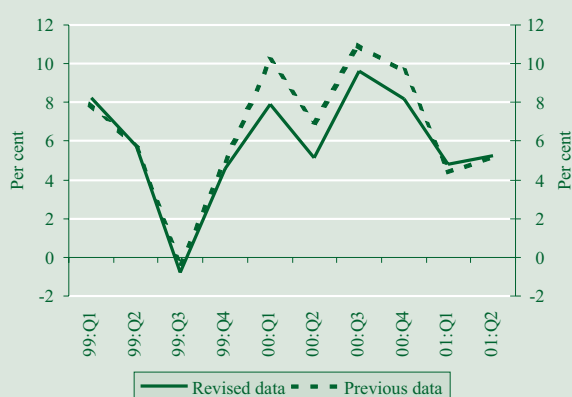Year-on-year growth; seasonally adjusted data

Chart 3   Trend of gross capital formation
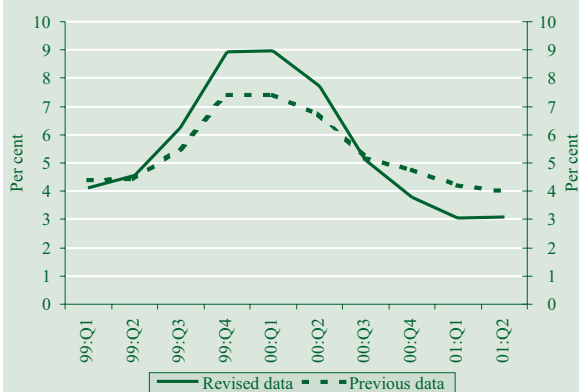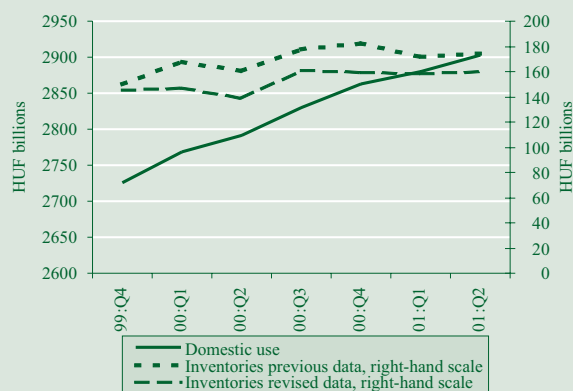Annualised quarter-on-quarter indices

Chart 4 **Domestic use and changes in inventories**
At 1998 prices, seasonally adjusted data

The level and growth rate of domestic absorption did not change as a result of the data revision. Changes in inventories and non specified use were at a lower level and more even. The even developments in domestic absorption have left the level of inventories unchanged since the rise in 2000 Q3 (see Chart 4).

Evaluating the revision to GDP data from the perspective of the inflation forecast, it is important to note that the forecast for consumption growth for 2001 is now 0.5 per cent higher due to the data revision. Consequently, the strong disinflation in 2001 occurred together with higher consumption demand than that projected in the previous *Report*. The revision has a less marked effect for 2002. Nevertheless, the Bank's projection takes into account smaller consumption demand than previously assumed. The revision to fixed investment data has caused the forecast of the growth rate for 2001 to be lower.

2 Method for projecting unprocessed food prices

As one of the most uncertain elements of the inflation projection is forecasting the inflation profile for unprocessed foodstuffs, the following presents a brief description of the methods used by the National Bank.

Changes in the consumer prices of unprocessed foodstuffs are essentially determined by *the development of agricultural producer prices* (approximately 85 percent), with other cost-side price changes and factors of supply and demand having a relatively small weight. Agricultural producer prices are significantly influenced by supply shocks arising from weather conditions and other surprise events (such as animal health-related restrictions, for instance). Accurate projection is hampered by high price volatility, with monthly agricultural goods prices adjusted for seasonal effects fluctuating in as wide a range as ±10–15%.[1]

In view of the high element of risk in the projection, there is great emphasis placed on *agricultural experts' opinions,* especially with regard to short-term meat and grain market prospects.[2] The Bank's projection also draws on operative market information, product cycle analyses and short-term forecasts prepared by the Market Information Department of the Research and Information Institute for Agricultural Economics (AKII).[3] These approximately semi-annual forecasts for producer prices do not usually provide specific figures, and are used as reference for the calculations published in this report. Another set of information incorporated into the Bank's estimates comes from the economic policy decisions with a direct influence over prices, as long as their direct impact can be measured. Furthermore, *daily contract prices for wheat* at the Budapest Commod-

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[1] Even shifts of ±30% in vegetables and fruit prices are not rare.

[2] These include the prospective impact of the biological cycle, the outlook for crops and exports, etc.

[3] http://www.akii.hu/INFORMATIKA/PIACI_INFO/!piaci_informaciok.htm.

ity Exchange are also taken account of as an instrument applicable for short-term forecasting.[4]

Unprocessed foodstuff prices are also affected by other factors in addition to changes in agricultural raw material prices. These include prospective *increases in wage costs,* prices of transport and storage-related energy, with special regard to *petrol and natural gas,* the effect of the *exchange rate* in connection with imported goods (roughly 4% of unprocessed foodstuffs) and inflation inertia. Nevertheless, these factors are shown to have much smaller effects on unprocessed food prices than on other categories of consumer goods (see Table 3).

The inflation of unprocessed foodstuff prices, accounting for roughly 5.4% of the consumer basket, primarily follows changes in agricultural prices (see Chart 5). Nevertheless, fluctuations in producer prices do not always fully feed through to consumer prices, which tend to ignore outliers in producer prices, regarding them as temporary by the consumer market. Nominal price inelasticity may be due to several factors, such as market competition and the retail market structure with respect to food products.

The price fluctuations arising from demand or supply problems in the agricultural goods market are controlled by central intervention in the form of state subsidies in Hungary as well. Alongside the relative higher domestic inflation the applied intervention can not moderate efficiently the amplitude of prices and those remain marked. The price volatility of unprocessed foodstuffs three times higher to Germany and Austrian average one (difference of meat is fourfold). Therefore, there is great risk in the price projection of these products due to the possibility of surprise shocks.

3 What do we know about inventories in Hungary?

Empirical testing and the projection of inventory investment are rarely in the focus of Hungarian economic research. Nevertheless, international experience suggests that the high volatility in changes of the inventory level is moving closely aligned with the economy's cyclical movements, accounting for nearly 40 per cent of the variance in the final output.[5] Hence, projecting the level of inventories may have an important role in the forecast of business cycle.
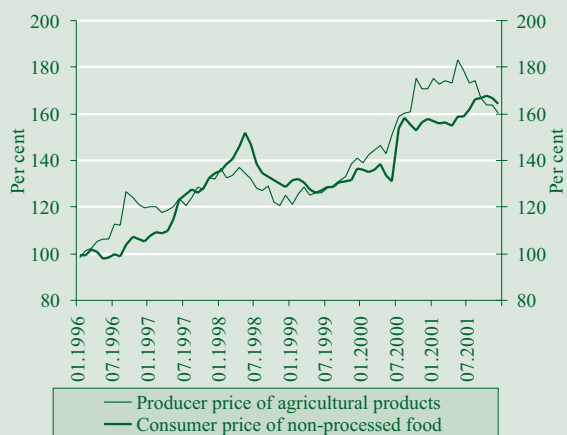
In terms of the Bank's projection framework, the link between projections for demand and supply side developments is provided by the assumptions made on changes in the inventory level (see Chapter III). The projections are consistent, when the inventory level derived as the difference between the demand

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[4] From the aspect of economic theory it would be expedient to assess other cost-side effects (such as the price for crude oil, for instance) and demand-side effects when projecting agricultural producer prices, as they are crucial to the inflation process. However, there is no information in sufficient detail for this purpose. This may be one of the factors to be overestimated in 2001 of unprocessed food prices of recent months.

[5] Blinder made estimates for the American economy for the period 1959-79. See Blinder A.S (1991) "The Resurgence of Inventory Research", NBER Working Papers, No.3408

Table 3 Effect of changes in factors other than agricultural producer prices on consumer prices of unprocessed foodstuffs

Per cent

	Change costs	Impact on unprocessed food prices
Labour costs	2	0.1
Petrol and gas prices	10	0.3
Exchange rate	10	0.3–0.4

Chart 5 Consumer prices for unprocessed foodstuffs versus agricultural producer prices
January 1996 = 100; seasonally adjusted

— Producer price of agricultural products
— Consumer price of non-processed food

and supply side forecasts are harmonised with projected cyclical developments. The question is what is the assumed relationship between changes in inventories and the business cycle.

From a theoretical point of view, the link between inventories and the business cycle cannot be stated unequivocally. In economic theory, there are basically two fundamental approaches, which work with mutually opposing lines of reasoning. If firms use their inventories to build up a defence against changes in demand and to smooth production, then worsening sales prospects will lead to building up inventories and, alternatively, improved conditions will entail reductions in inventories. In other words, inventories move in an opposite direction than the business cycle. By contrast, macroeconomic experience implies that changes in inventories basically move in correlation with the business cycle. This is explained by the fact that companies place new orders (engage in production) only when the inventory level falls below a critical value. Hence, sales and inventories follow the same course until inventories drop to the critical lower limit. When the lower limit is reached, there is a sudden adjustment in production, and as a result, volatility in production exceeds that in sales.

In Hungary, research into the relationship between inventories and cyclical fluctuations is hampered by inadequacies in the available inventory statistics. The Statistical Office publishes two sets of series about inventories: changes in inventories based on the national account and the level of inventories at current prices published in a sectoral breakdown. As the national-account-based data also include the statistical error[6] resulting from the discrepancy between the demand and supply side of GDP, it is not a "clean" indicator in its content. Nevertheless, fluctuations in this indicator (assuming that the statistical error has a stable rate relative to GDP) gives a reliable illustration of the directions of the changes in whole-economy inventories.

One of the challenges of using current-prices-based data concerns the elimination of price effects, in other words, there are no statistics available on value changes due to the revaluation of inventories. Another difficulty is that current-prices-based series for the whole economy are only available from 1999. Hence, the Bank uses in its analyses manufacturing inventories, accounting for approximately 70% of whole-economy inventories.[7] Another argument in favour of using data on manufacturing inventories is that this sector is the most subject to cyclical fluctuations.

A comparison of the series based on GDP and on manufacturing inventory changes reveals that despite all the differences in content, these statistics point to a similar outcome (see Chart 6). Accordingly, changes in domestic inventories appear to be procyclical, in consistence with international experience. This implies that during a period of recovery firms tend to enlarge inventories, and during a recession they will reduce their inventories as a means of adjusting to lower output levels. Although over the short term, there may be divergences from this trend subject to the predictability of demand shocks (as noted in the compara-

Chart 6 Indicators of inventory changes

Changes in GDP inventories, cyclical component (left-hand scale)
Changes in manufacturing inventories (constant price)
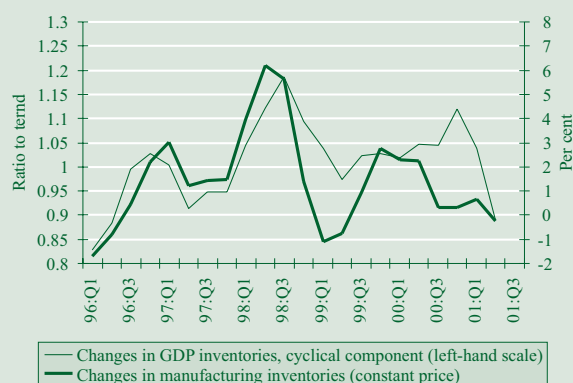
Note: The data on manufacturing inventories is constructed by deflating the level of inventories with the manufacturing producer price index. The GDP-based series is adjusted for the trend. The data aare seasonally adjusted and smoothed by a three-term moving average.

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[6] Non specified use.

[7] The series for manufacturing inventories at current prices is deflated with the manufacturing producer price index.

tive discussion of the current and the Russian crises in Chapter III), over the long term, inventories are assumed to correlate with the business cycle.

In conclusion, despite the noted practical difficulties it is ascertainable, that domestic inventory statistics successfully reflect the development of the business cycle. Hence, a projection method, which also lays emphasis on inventory assessment, is likely to produce more reliable results.