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For several years after 2001, fiscal policy in Hungary was characterised by expansion, boosting the economy through several channels. As a consequence, while the global economy slowed down temporarily between 2001 and 2003, economic growth remained stable at high levels in Hungary. Due to fiscal expansion, the picture formed of potential growth in Hungary was artificially biased in an upward direction. The growth rate of Hungary's GDP would have been 1 per cent lower than it actually was between 2001 and 2003, and then between 2004 and 2006 it would have been similar to what was actually recorded. Accordingly, the business cycle would have moved more in conjunction with its European counterpart. The extent of slowdown in future potential growth is likely to have been smaller though.

INTRODUCTION

In our article, we set out to quantify how fiscal policy distorted macro-economic processes in the period from 2001 to 2006. One of the questions is how the size and structure of economic growth would have developed if it had materialised along a sustainable path, i.e. a neutral fiscal path which we have defined. Another issue is the extent to which, along the neutral path, our estimations of potential GDP and the perceived cyclical position of the Hungarian economy would have been modified during the period under review. In other words, to what extent was the slowdown actually 'hidden' by fiscal expansion while maintaining stable growth? The importance of this simulation lies in the fact that estimated potential GDP and its difference from actual GDP (i.e. the so-called output gap) is a key issue for the central bank.

Such a simulation is rendered difficult by the mutually complex relationship between fiscal variables and the business cycle. The fiscal impacts of the cycle (P. Kiss and Vadas, 2007) and the cyclical impacts of the fiscal policy are identified more reliably by means of the MNB's Quarterly Projection Model (NEM), which describes the Hungarian economy and mainly comprises estimated equations. The NEM is capable of capturing the Keynesian impacts typically exerted over the short or medium term. Its fiscal block allows us to study the effect of a number of policy interventions. For a comprehensive description of its fiscal multipliers, see Horváth et al. (2006). However, simulations with the NEM alone cannot grasp the indirect impact of fiscal policy on potential growth. In our study, we seek to answer the question as to how the growth rate of the Hungarian economy would have evolved under an alternative (neutral) fiscal path.

THE ACTUAL MACRO-ECONOMIC PATH

Hungary's GDP grew consistently at an annual rate of approximately four per cent for six years, despite the fact that there was a downturn between 2001 and 2003 in European economies, which constitute the most important export markets for the Hungarian economy. Such cyclical behaviour, diverging from that of the euro area, is surprising at first sight, as studies on the co-movements between business cycles had previously revealed that within the Central and Eastern European (CEE) region it was the Hungarian business cycle that moved most closely with its counterpart in the euro area (Fidrmuc and Korhonen, 2006). The contribution to growth of foreign trade, which better reflects external upswing, was rather low before 2005. The contribution of domestic consumption to growth, however, reveals that it was sustained at high levels. Within domestic consumption, the dynamics of capital investments fell behind the historical average, while consumption grew consistently at an annual rate of more than 8 per cent. In 2001 and 2002, one of the underlying reasons for this was that, in contrast with the earlier 3 to 4 per cent growth, real wages in the private sector rose at a rate of 7 to 8 per cent. One reason for the sharp increase in real wages can be traced back to the disinflation process. After years with inflation stuck at 10 per cent, unexpectedly rapid disinflation occurred, but nominal wage inflation adjusted to this development more slowly. Another reason is likely to have been the impact of the increase in the minimum wage in 2001 and 2002. It is difficult, however, to discern whether this generated additional income (and consumption) or only helped shift wages from the informal economy into the formal sphere. However, one of the contributors to acceleration in consumer demand was undoubtedly fiscal policy.

In respect of the growth effects of fiscal policy, there is general consensus that it is the positive, i.e. neo-Keynesian type impacts, which are dominant in the majority of cases, especially over the short and medium term (Horváth et al. 2006). The period we studied (i.e. 2001–2006) can be regarded as medium term, and thus we can assume that the Keynesian impacts of fiscal expansion were dominant. The dominance of the positive growth impact of fiscal expansion is also underpinned by GDP figures. It is highly likely that the impact of an expansive fiscal policy ‘smoothing’ the global downturn is also reflected in the fact that, based on actual data for the period, the volatility of Hungary’s GDP was expressly low by CEE standards and in comparison with the EU Member States at the time (Benczúr and Rátfai, 2005).

THE ACTUAL FISCAL PATH

In determining the fiscal path and making our estimates, we relied on the data defined in accordance with the augmented SNA methodology applied by the MNB. On the one hand, this methodology augments government projects with capital investments made under PPP schemes. Similarly, it augments expenditures with the losses incurred by state-owned companies (e.g. the Hungarian Railways, Budapest Public Transport Company) rather than – similarly to the official accounting treatment – recording them only at the date of subsequent debt assumption.

Most fiscal policy variables were relatively stable between 1997 and 2000. Although the impact of the election year can be identified in 1997 and 1998, except for the effect of the termination of temporary customs surcharges, this could be attributed to the usual pattern in fixed investments prior to elections. Developments in most fiscal variables remained broadly stable between 1997 and 2000. Thus, for instance, an increase in public sector wages was counterbalanced with a reduction in employment and lower tax rates with measures broadening the tax base.

In 2001 and 2002, however, there was a shift in all of the components of fiscal policy towards expansion. Employment and wages in the government sector increased sharply, income tax rates decreased and the tax base narrowed, moreover household transfers in cash and capital expenditure increased simultaneously. As a result, the augmented primary balance deteriorated by 6 per cent of GDP. Because of the full-year effect, public wages continued to rise and income taxes continued to fall in 2003. The increase in cash transfers was steady in 2003 and 2004, which was offset by the drop in capital expenditure, to a lesser extent, the reduction in public employment and the increase in indirect taxes as from 2004. As a result, the primary balance improved by 1 per cent of GDP in 2003–2004. Prior to the general elections,

between 2005 and 2006 Q3, the primary balance deteriorated by 2.3 per cent of GDP. The underlying reason was that both indirect taxes and employer’s contributions were lowered, household transfers in cash increased rapidly and the usual temporary increase in fixed investment occurred again. The only deficit decreasing measure was a reduction in public employment. After the elections, the rates of nearly all taxes and contributions were raised, as a result of which the primary balance improved in the final quarter by 0.6 per cent of annual GDP. Tax bases were also broadened by measures taken against tax evasion, which led to a further decrease in the deficit.

THE NEUTRAL FISCAL PATH

We opted for 2001 as the starting year of the period examined, since on the whole in 2000 fiscal developments still shifted towards a balanced position. Similar to the paper by Ohnsorge-Szabó and Romhányi (2007), we considered the year 2000 as neutral. This does not, however, mean that we find either the deficit-to-GDP ratio or the structure of the general government in 2000 to be an appropriate benchmark; rather, we consider the trends during the temporary period between 1997 and 2000 to be the correct benchmark.

In establishing a neutral fiscal path, we regard the specific fiscal variables of the NEM as our starting point. Based on expert assumptions and technical rules, we define a ‘no policy change’ scenario for these specific variables, i.e. in the case of the fiscal variables which we can model, we define shocks for each variable in a different way. We interpret the individual shocks determining the neutral path as the difference between the neutral path of fiscal variables and their paths that actually evolved. As fiscal expansion was reflected in nearly all instruments, most of the shocks to the neutral path are restrictive fiscal shocks in themselves. Based on the classification adopted by Horváth et al. (2006), fiscal shocks can be classified into four groups.

The first group affects product markets; this consists of purchases of goods and services and fixed investments. In the case of these variables we considered such a hypothetical path to be a neutral one along which real growth rates in variables were identical with their average real growth (with growth in real GDP in the case of fixed investments) experienced in the years prior to 2001. As regards government purchases, from 2002 the neutral path was significantly lower than the actual one, while the corresponding difference regarding government purchases persisted during the period under analysis. As for capital investments by the government, the neutral path only differed from the actual one in 2001 and 2002.

The second group of shocks affects aggregate demand through households' disposable income. For the purposes of personal income tax, we regarded the effective tax rates fixed at end-2000 to be the neutral path. Relative to the baseline, this means a 2 to 3 percentage point increase in the effective income tax rates and a corresponding decrease in households' disposable income. The neutral path of cash transfers (mainly pensions and unemployment benefits), an important fiscal variable affecting household income was determined on the basis of the results of the model simulation concerning wages, inflation (Swiss indexation) and unemployment (endogenously) rather than by us (exogenously).

A further shock affecting the households' income is the shock of household investments through the government's housing subsidies, which boost not only housing investment, but partly consumption. In addition to preferential housing loans, an expansion in housing investment is likely to have been driven by other factors, e.g. demographic developments, increase in real income and the availability of FX loans with favourable terms. Therefore, we determined the neutral path of household investment by assuming that it would have reached the level of the actual path by end-2005 (by which time all the incentives of housing subsidies had already lost steam at the level of completed investment as well), while setting a steady pace for it, without the temporary increases reflected in the actual data. The housing subsidy scheme, based on the estimates by Kiss and Vadas (2005), increased household consumption by approximately 15 per cent of the increase in housing loans between 2001 and 2003. Therefore, we also supplemented the shock of housing investment with a corresponding negative consumer demand shock.

The third group of shocks is shocks emerging on the supply side of the economy. We determined a neutral path for corporate tax rates, the taxes and contributions payable by employers, the employment in the government sector, the labour supply of the economy and wages in the government sector. For the first two, in determining the neutral path, we opted to fix them at end-2000 levels, for the sake of simplicity and transparency. As regards corporate tax rates, a neutral path would not have meant a significant change compared to the actual path, but in the case of employers' contributions a neutral path with fixed rates would have already exceeded the level of actual taxes and contributions markedly towards the end of the period.

A neutral path for public sector employees means significant reduction in employment compared to actual employment.

We determined this neutral path by assuming that employment would have decreased at a steady pace from end-2000 to end-2006 to the level of January 2007 of 750,000 persons. We created a shock for the labour supply of the economy with the assumption that at least half of the 40,000 increase in employment in the public sector in late 2002 and early 2003 was due to the entry into the labour market of the otherwise economically inactive rather than unemployment or a fall in the number of those employed in the private sector. Accordingly, if the rise in the public employment had not happened, half of the employees concerned would have been left outside the labour force, i.e. a neutral path would have meant lower labour supply during the period.

Finally, we defined a neutral path for wage increases in the public sector conditional upon wage developments in the private sector, i.e. we applied an endogenous solution. Taking as a basis that at the end of the surveyed period nominal public sector wages are approximately 20 per cent higher than those in the private sector, we modelled the convergence of public sector wages to this level along a stable path.¹ Due to this approach, the ratio between public and private wages follows a pre-determined convergence path even in the neutral case, while private sector wages change in accordance with labour market impacts that correspond to a complex fiscal shock.

The fourth group of fiscal shocks includes changes in indirect taxes (VAT, excise duties), which directly affect prices (exchange rates). The factor of the indirect tax content of the CPI was fixed in the neutral path at the end-2000 level, i.e. the most important changes in indirect taxes that occurred during the surveyed period (increases in the VAT rates in early 2004 and in the autumn of 2006 and the decrease in VAT in early 2006) have been excluded from the neutral path. In contrast with all of the previous shocks (fiscal expansion), the non-occurrence of VAT increases (tightening) is not a restrictive shock. Rather, through lower inflation, it boosts demand, and if it is not implemented, it does not contribute to fiscal sustainability.

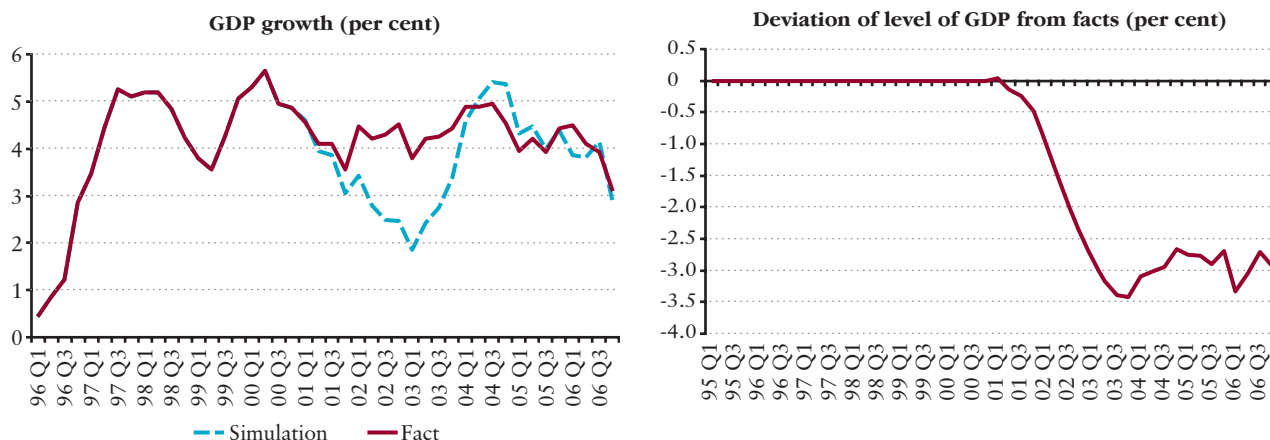
THE MACRO-ECONOMIC PATH IN AN ENVIRONMENT CREATED BY A NEUTRAL FISCAL POLICY

In carrying out the simulation exercise, we assumed an active monetary policy operating in accordance with the Taylor rule estimated on Hungarian data for the period between 2001 and 2005 (Hidi, 2006). We used a forward-looking

¹ The 20 per cent difference disappears or even reverses if we compare white collars. In 2001 the general government sector wages were 25% lower. This difference had shrunk to 15% by 2006.

Chart 1

GDP growth: facts and simulation



Source: CSO and own calculations.

uncovered interest parity to describe the correlation between interest and exchange rates. The applied monetary reaction function does not show an optimal policy, rather – as an estimated rule – it reflects the empirical description of the past decisions of the Hungarian monetary authority.

We also defined a neutral path for the model variable corresponding to the risk premium on the HUF exchange rate. The shock represents a situation where – assuming a sustainable fiscal policy – expected premium on HUF assets would not have increased in 2003 or 2004. On the contrary, in keeping with the process of nominal convergence and with entry into the euro area approaching, a path representing steady moderation would have emerged. Given a neutral path, this indicator of the risk premium – which is, in our model, a simple technical variable derived from the 3-month HUF/EUR interest rate differential – fell to 3 per cent by the end of 2006. If we assume that with a neutral fiscal policy 2008 as the euro adoption date, a target date still valid at the beginning of the period, had been met, then this value would have been identical with the short-term interest rate differentials prevailing in the less advanced EU Member States in the years prior to the adoption of the euro.²

Economic growth

Supposing fiscal policy had been neutral, GDP growth would have been 1 per cent lower in 2001 to 2003, slightly higher in 2004 and roughly identical with actual growth in 2005 and 2006. Such dynamics of economic growth would have been

more in line with external economic conditions: economic growth in Europe slowed down temporarily after 2001, and then picked up gradually. Nevertheless, the level of GDP would have remained permanently lower by approximately 2.5 per cent to 3 per cent at the end of the period than it actually was based on actual data.³

The 1 per cent lower economic growth on average in the neutral fiscal path in the first half of the period (2001–2003) is attributable to a major extent to an average 1.8 per cent decrease in consumer spending. Such fall in consumption would have occurred because of household transfers in cash, on the one part, and slower growth in households' wage income, on the other. The underlying reason for that is the combined effect of lower wage dynamics and employment in both the public and private sectors. The impact of the negative shock on households' disposable income is further aggravated by the fact that, given the neutral path, the cut in the effective rates at which income is taxed would not have occurred. Meanwhile, household transfers in cash would have risen at the beginning of the period due to an increased amount of taxes and contributions attributable to higher unemployment. Naturally, in accordance with the shocks to the neutral path, other contributors to growth, such as household and government capital investments and government spending, would also have generated more modest growth. However, at the same time slower growth could have been counteracted somewhat by better net exports through lower import demand which was due to subdued internal demand. Accordingly, the real economic balance would have

² See Csajbók–Rezessy (2005), p. 20.

³ The MNB carried out a similar study on the macro impacts of fiscal expansion in the first years of the expansion. The simulation at that time was performed with the NiGem model and, obviously, could take account only of the trends in 2001 and 2002. The test for these two years shows an increase very similar to the one presented here (impact of 0.5 per cent of the GDP in 2001 and 1.4 per cent of the GDP in 2003). See 'The macro-economic effects of fiscal policy – model calculations' in the Quarterly Report on Inflation, February 2003.

Table 1**Impact of a neutral path on the main macro-economic indicators**

	Fact					
	GDP (per cent)	Household consumption (per cent)	Investments (per cent)	Net export contribution to GDP	CPI (per cent)	Change in balance of goods and services (per cent of GDP)
2001	4.1	6.3	5.2	1.8	9.2	2.3
2002	4.4	10.6	10.2	-2.2	5.3	-0.7
2003	4.2	8.3	2.2	-2.1	4.7	-1.9
2004	4.8	2.5	7.6	0.8	6.8	0.7
2005	4.1	3.4	5.3	2.8	3.6	1.7
2006	3.9	1.9	-2.8	2.8	3.9	2.3
2001–2003	4.2	8.4	5.8	-0.8	6.4	-0.1
2004–2006	4.3	2.6	3.4	2.1	4.8	1.6

	Simulation					
	GDP (per cent)	Household consumption (per cent)	Investments (per cent)	Net export contribution to GDP	CPI (per cent)	Change in balance of goods and services (per cent of GDP)
2001	3.9	5.9	2.8	2.2	9.4	2.7
2002	2.8	8.6	5.3	-1.3	5.5	0
2003	2.6	5.3	6.1	-2.3	4.4	-2.1
2004	5.1	4.4	5.7	0.5	4.7	0.8
2005	4.3	3.5	7.2	2.5	2.2	1.6
2006	3.8	0.9	-0.4	2.5	3.5	2.3
2001–2003	3.1	6.6	4.7	-0.5	6.4	0.2
2004–2006	4.4	2.9	4.2	1.8	3.5	1.6

Source: CSO and own calculations.

deteriorated more slowly, at a rate corresponding to 0.3 per cent of GDP on average, i.e. as a third factor, lower GDP would have put a brake on the real economic balance.

Maintaining our assumption of a neutral fiscal path, we can see a completely different picture when we look at the second half of the period (2004–2006). From 2004 onwards, the negative effect of the neutral path on the pace of growth began to wear off, although GDP remained consistently lower than it actually was. Between 2004 and 2006 the growth rate would have been similar: as there was no increase in VAT rates in 2004, the increase in households' real income and consumer demand would have been higher; furthermore, in the absence of an expansion in housing investment similar to the one seen in earlier years, a fall in capital investments similar to the one experienced later would not have emerged either. In 2006 there would have been practically no difference in growth. However, its

structure would have been very different: against a background of lower consumer spending, there would have been a rise in capital investments and government consumption. Nevertheless, the growth rate of expenditure and capital investments is very low even if we assume a neutral path, which suggests that our simulation may not have filtered all the impacts of fiscal policy. In 2006 circumstances could have been ripe for another, indirectly adverse impact on economic growth to evolve. We will address this issue below.

Labour market

A dominant part of the growth effect originates from changes in households' disposable income. Lower income is mainly due to a fall in wage type income, thus, it is mainly an analysis of labour market trends which can best capture its underlying reasons.

One component of the labour market effect is the direct effect of the increase in public employment and wages against the background of a neutral fiscal path. A steady lowering of employment in the public sector and the gradual convergence of public sector wages with those in the private sector would have raised the public wage bill to a much lower extent.

However, private sector processes would also have generated less growth in household wage income. During the two years immediately following 2001, the slowdown caused by economic downturn would have caused a drop in employment and a lower real wage increase in the private sector as well. Although the nominal wage increase was lower during the entire span of the simulation period, from 2004 onwards, lower inflation would, in part, have restored the real value of wage income. Overall, given a neutral fiscal path, a tight labour market would have eased considerably and the unemployment rate would have stabilised at around 8 to 9 per cent in 2005 and 2006 after a paced increase.

In 2006, it was stagnating income that curbed consumption. The underlying reason for this was that the increase in wage income was offset by a fall in non-wage type (mixed) income. Measures taken to curb tax evasion may have played a role in this, but our simulation cannot account for their impact. Therefore, we adjusted our results for 2006 for the estimated effect of the steps engineered to eliminate the informal economy (Eppich and Lőrincz, 2007; Krekó and P. Kiss, 2008).

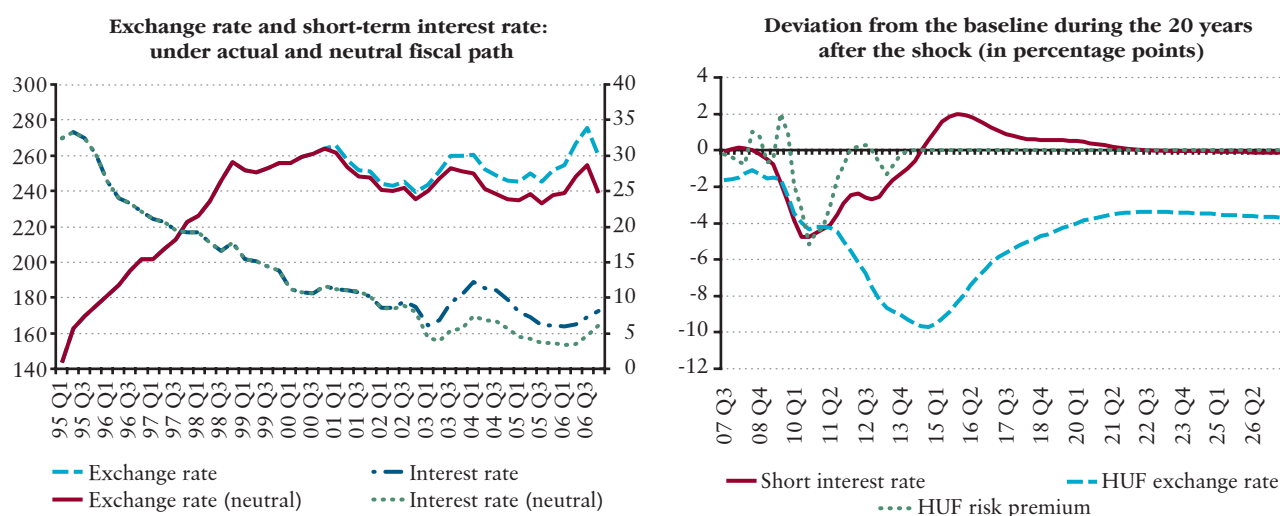
Inflation and monetary conditions

A neutral fiscal path influenced inflation even if monetary conditions are left unchanged, especially after 2004. Had a neutral fiscal path been available, inflation would have been one or two percentage points lower in 2004 and subsequently than it actually was. This would have been attributed, in part, to the disinflation impact of much more subdued domestic demand caused by the neutral path, with the disinflation impact felt a year or two later, and, in part, to the non-occurrence of the 2004 VAT increase with a strong inflationary impact.

A neutral fiscal path would also have changed monetary conditions. Had the neutral path that we defined for the risk premia on HUF instruments (HUF risk premium shock) materialised, the HUF/EUR exchange rate would have been 8 per cent to 10 per cent higher at the end of the surveyed period. A stronger exchange rate would have enabled the central bank to lower the base rate without endangering achievement of the inflation target, in order to somewhat counteract the slowdown in the global economy in 2001–2002. Ultimately, the exchange rate would have remained consistently stronger and short-term interest rates lower along the simulation path. In 2005, when the beneficial effects of global disinflation were felt the most, inflation would have dropped to 2.2 per cent, only to start to edge up again in response to a less benign inflation environment in 2006 (end of global disinflation, increasing food and regulated energy prices).

Chart 2

Monetary conditions



Source: MNB.

Table 2**Estimates of potential GDP growth**

	1996–2006		2001–2006	
Average annual increase (per cent)	Fact	Simulated	Fact	Simulated
Actual data	4.1	3.9	4.2	3.7
HP-trend	4.3	4.0	4.3	3.8
BP-trend	4.2	3.9	4.3	3.8
Production function-based trend	4.1	3.8	4.2	3.7

Exchange rate and short-term interest rate: under actual and neutral fiscal path Deviation from the baseline during the 20 years after the shock (in percentage points)

Potential growth

Estimates for potential GDP between 1996 and 2006 have been around 4 per cent in recent years (see the updated estimates by Benk et al. [2005] in Analysis of the Convergence Process, December 2006).

Assuming a neutral fiscal path, we used the NEM to obtain a production function-based assessment of potential growth witnessed in the past. Furthermore, in order to be able to grasp the upward trend in GDP, we also used straightforward trend filtering techniques (Hodrick-Prescott and Band-Pass filters), which, on the whole, yielded robust results.

In this paper we only seek to estimate the extent to which our perception and estimates of potential growth were distorted by the fact that fiscal policy was expansive for nearly half of the assessment sample. Our calculations reveal that, without fiscal expansion, the very fact that fiscal policy was expansive between 2001 and 2006 would have led to an approximately 0.2 to 0.3 percentage point measurement error. The estimate for the upward trend would have been much lower, and, within that, our forecast would have been 0.4 percentage point lower during the period of fiscal expansion (2001–2006).⁴

However, amongst other things, the impact of fiscal policy on potential growth depends on the distortions caused by the tax system as well as the structure and efficiency of expenses. As our simulation did not exclude these effects, fiscal expansion may also have curbed potential growth through other channels even further. Based on unfavourable trends in production factors, our projections predict lower potential

growth in the future. The underlying reason for this is that, with the factors of production taken into account, signs suggesting a slowdown are reflected in the rate of employment, which will not grow, the fall in capital investments experienced since 2005 and the lower growth of corporate-level total factor productivity (TFP) since 2000.⁵

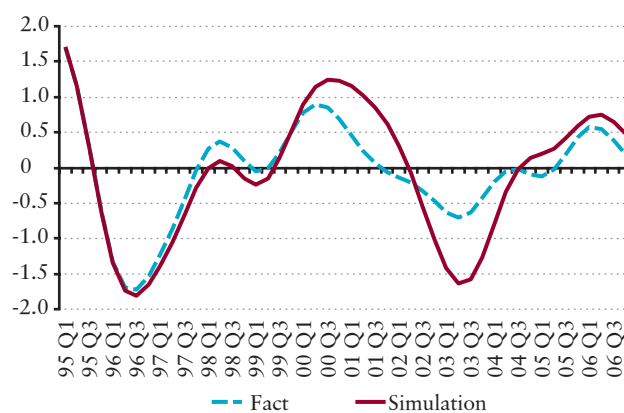
SUMMARY OF RESULTS: THE OUTPUT GAP

As shown, against a background of a fiscal path neutral prior to 2006 the growth rate would have been 1 per cent lower compared to the 2001–2003 average, and subsequently, it would have edged up slightly. This means that the measure of the output gap, i.e. the difference between potential and actual growth, was also biased. As fiscal policy would not have been able to counter the effects of a global downturn after 2001, a markedly negative output gap would have materialised in 2002 and 2003. In contrast, the business cycle in 2000 and 2001 would also have been perceived as a stronger upswing. Providing an estimate of the output gap on

Chart 3

Cyclical component of GDP

(Calculated by the Band-Pass filter; departure from trend in percentages)



⁴ Both the time series method and the one based on the estimate of the production function, especially in short-term samples, are rather sensitive at the end of the data series. Moreover, in our case, the GDP along a neutral fiscal path is an estimated data series itself, which is affected by other limitations of historical simulation, thus, mainly by the specification-related and parameter assessment errors of the QPM.

⁵ For details, see Analysis of the Convergence Process, Chapter 2, December 2006.

the assumption of a lower potential growth rate both for the past years and for the future, a box in the November 2007 issue of the Quarterly Report on Inflation was devoted to quantifying such a scenario.⁶

Overall, we may conclude that had the fiscal path been a neutral one, the fluctuations in simulated GDP would have been larger than what was actually measured; furthermore, they would have moved in closer conjunction with the business cycle in the euro area.

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⁶ See Box 3-1 on the output and consumption gap in the *Report on Inflation*, November 2007.