Forecasts and facts – how reliable are GKI's macroeconomic forecasts?

This study compares GKI Economic Research Co.'s key annual macroeconomic forecasts published between 1995 and 2011 with actual data. Differences between the predictions and the actual data are not only the results of forecast errors. The quality of the forecasts and their reliability may be affected by several other factors as well. They include, for example, external economic effects, government intervention in the economy and the continuous adjustment of statistical data. The accuracy of GKI's forecasts is improving over time as more and more data are available.GKI provided the most accurate forecasts for the consumer price index. The mean absolute difference between GKI forecasts and actual inflation figures in the given period was 0.7 percentage points, which is extremely low. The average absolute difference between the forecasts and actual data of the volume index of GDP, which is the most common economic indicator, was 1 percentage point in the period between 1995 and 2011 (taking into account all six forecasts for each year), which is also a favourable value. This figure is only slightly better than the 0.6 percentage points mean difference of preliminary statistical figures (usually published in March of the following year) and final official ones of GDP released by the Central Statistical Office in 2012.The reliability of GDP and CPI forecasts issued by GKI in the period between 2006 and 2011 was comparable with the average reliability of expectations of 25-30 professional institutions published by Reuters.

Since it is extremely important for business entities to reduce risks that can be avoided, several generations of economists have worked on developing reliable and efficient forecasting techniques. Forecasts published by various organizations can influence the behaviour of economic agents, thus it would be important to have a look at the reliability of these forecasts regularly. Although several Hungarian organizations publish forecasts regularly, subsequent verification of their accuracy is quite rare.[1] This report [2] compares GKI Economic Research Co.'s key annual macroeconomic forecasts published between 1995 and 2011 with the actual data.

1. Forecasts as cognitive frameworks

Forecasts are visions depicting the expected changes of measurable, well-known and regularly published economic data. They are usually based on available actual data, mathematical and logical models describing regularities observed in the past, significant information on the regulatory (statutory) and business environment as well as professional experience and concepts regarding the future. Predicting the future and the expected outcome of economic trends, however, is **burdened with uncertainty**, thus the authors often warn regarding the possible positive and negative risks. These are known risk factors whose real impacts cannot be measured reliably at the time of the preparation of the forecast. However, there might be other factors whose existence is not known when making the forecast, and their effects obviously cannot be quantified. As a consequence, in addition to "known unknown" factors, there are "unknown unknown" factors as well. Therefore, from this point of view, forecasting is difficult but not hopeless. "Because of the things we don't know we don't know, the future is largely unpredictable. But there are some things we can foresee because they are developments anticipated or at least imaginable from knowledge already in hand", says M. Singer in her much-quoted article (1997, p. 39).

Forecasts, as mentioned earlier, deal with regularly published economic data. In Hungary, mainly the Hungarian Central Statistical Office, the National Bank of Hungary and the Ministry for National Economy publish such information. However, these data are not exact figures from precise

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[1] GKI has already made such studies. Last time in its 2007/4 forecast GKI published an analysis of the accuracy of its annual forecasts between 1995 and 2006 by Gabor Papanek, Peter Biro and Raymund Petz.

[2] Prepared by Gabor Papanek and Raymund Petz.

measurements; they are estimates that may obviously contain estimation errors. Repositories of data publish statistics based on data available at a given time. Statistics are often corrected at a later date as more and more information becomes available. Although the "quality" of data published is generally improving during this process, there is a drawback to forecasters. The subsequent correction of statistics hinders the evaluation of the accuracy of forecasts, as this means that **forecasters are "shooting at a constantly moving target"**. A forecast issued at a given time may prove to be less accurate or more accurate later due to these corrections. There is another negative aspect of this phenomenon: forecasts are sometimes based on "actual data" that are subsequently corrected. This means that forecast errors are sometimes caused by the statistical reporting process itself.

The following table shows the **mean absolute difference** between the **preliminary** statistical figures (usually published in March of the following year) and the **"final"** official ones of GDP **released by the Hungarian Central Statistical Office** in 2012 for the period between 1995 and 2011.

Table 1

The mean absolute difference of preliminary and final figures released by the HCSO in 2012*, 1995-2011 (percentage points)

GDP**	0.6
Industrial GDP**	1.9
Construction GDP**	3.0
Agricultural GDP**	4.0
Transport, telecommunications GDP**	2.1
GDP domestic demand**	0.9
Private consumption**	0.6
Investments**	2.0
Exports**	1.4
Imports**	1.1
Consumer price index***	0.0

Source: own calculations
*/ Arithmetical mean of the absolute values of differences between preliminary and final data released in 2012.
**/ Volume of GDP, previous year=100
***/ Previous year=100

Data show that the rate of subsequent corrections is sometimes quite significant. The only exception in this respect is the consumer price index, which is always available within 2 weeks, thus it is never modified later.

Forecasters assume the possibility of making errors. To aim at making accurate forecasts is advisable; however, to achieve it routinely is obviously an illusion. Preparing periodic forecasts is a **learning process**. The evaluation of previous failures, the lessons learnt, and incorporating the experiences in the forecasting process may improve its effectiveness. Naturally, forecasters may commit new kinds of errors, in spite of using past experience.

Economists often **dispute the role of macroeconomic forecasts in shaping the future**. One extreme view is that the results of reports published by prestigious and generally recognized forecasting institutions will be incorporated into economic agents' expectations so that they can significantly shape the future. (In this respect, government projections are different, as economic policy-makers have effective means to exert influence on economic processes, whereas independent institutions are mere observers of events.) The other extreme view is that economic actors respond only to their own business environment, and they **ignore** macroeconomic forecasts. We are not going to take sides in this issue, and we assume that the "truth" is somewhere in between these two statements.

2. Forecasts of GKI

Publishing various forecasts is a common practice, as decision-making processes require information on certain future developments. Governments, central banks, analyst firms and major international institutions such as the OECD, the IMF and the World Bank issue macroeconomic forecasts regularly. Several Hungarian institutions publish economic forecasts as well. **GKI**, using simple[3] methods generally accepted in international practice, produces three kinds of forecasts.[4]

Monthly forecasts overview and revise changes in **GDP expected for the current year**, the overall performance of the main sectors, investments and certain income and financial indicators (for example, gross wages, inflation, fiscal deficit) month by month. On-going mid-year adjustments take into account the monthly and quarterly publications of HCSO, external factors shaping the business environment, as well as the results of **GKI**'s economic sentiment surveys[5]. They feature few analyses and a lot of numbers.

- **Quarterly** forecasts provide a detailed analysis of the **main components of annual GDP production and expenditure** and the key indicators of national economic equilibrium. Forecasters always take into account the extrapolation of the statistics of the previous period (yearly or mid-year data). However, they adjust these trends by the anticipated impacts of known government intentions and other externalities.They feature a detailed textual and numerical analysis of the current state and perspectives of the economy.
- Main topics and details on **medium-term** forecasts (for 2-3 years) are the same as those of quarterly ones; however, a greater emphasis is laid on underlying structural changes and longer-term trends.

3. The reliability of forecasts

It is common in international practice to compare forecasts and the actual figures, that is, to test the reliability of forecasts. Results of these comparisons are mixed. Predictions are often found to be correct, at least regarding the main trends. However, usually there are some estimation errors of various sizes[6]. A Forbes study drew attention to an interesting aspect. "It is surprising that some of the less known forecasters proved to be the best. The Northern Trust ... and the Wachovia / First Union Bank ... have surpassed some widely cited forecasters such as the Conference Board. The report observed the same in other parts of the world as well, and as a result referred to the IMF as one of the worst forecasters." (Simons, 2002) The failure of predicting crisis and positive or negative changes in trends causes problems worldwide. E. Solomon's ironic phrase has been often cited since 1985: "The only function of economic forecasting is to make astrology look respect."[7]

The present report gives an overview on the reliability of the key numerical predictions in the **quarterly forecasts of GKI** (see in the summary table as well) based on a comparison of forecasts with actual data in the **period between 1995 and 2011**. The 17-year time horizon of the analysis was made possible by the fact that the range of projected indicators used by **GKI** remained unchanged in this

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[3] Although complex models are also commonly used in international practice, experience shows that their reliability is similar to those compiled by simpler methods (Genre et al., 2013).

[4] The monthly forecasts of GKI are available to the public completely and the quarterly one in part (see: www.gki.hu). Since GKI relies on market revenues, the full versions of quarterly forecasts and long-term forecasts are available to subscribers.

[5] Monthly sentiment surveys are based on corporate questionnaires (see: http://www.gki.hu/elemzesek/konjunktura-kutatas). Sometimes their results are compared with statistics published later both by GKI and others throughout the world. These investigations suggest that the resultant corporate information reveals trends relatively well and one or two months earlier than statistics. See, for example, Tóth (2000). On GKI's surveys see more, for example, Némethné – Papanek – Petz (2001).

[6] Estimation errors are the differences between predictions and subsequent statistical data. As these differences may be caused by many reasons (including preventive measures taken as a result of projections warning of future dangers), the use of the term "errors" does **not** mean a criticism of the forecast.

[7] Source: http://www.barrypopik.com/index.php/new_york_city/entry/the_only_function_of_economic_ forecasting_is_to_make_astrology_look_respect/).

period. Analysing data of the pre-1995 period was impractical as in 1995 the Hungarian Central Statistical Office changed its method of preparing national accounts statistics in order to meet European standards. As a consequence, the composition of pre-1995 national accounts data is significantly different from that of the present one.

The analysis is based on relatively simple calculations, and the **results are easy to interpret**. The most important database contains the mean absolute values of differences of forecasts and statistics (in other terminology: actual data) showing our "errors"[8] in the 17-year period studied. Furthermore, we calculated the variance (standard deviation) between the forecasts and the actual data as well. We have assessed the differences for all indices.

This report considers statistics known at the time of its writing (November 2012) as actual data.

GKI forecasts regarding the **consumer price index** and **GDP** in the **2006-2011** period are compared with projections issued by **Reuters** reflecting the average expectations of 25-30 experts and institutions.

Figure 1.

Possible causes of deviations of forecasts from actual data
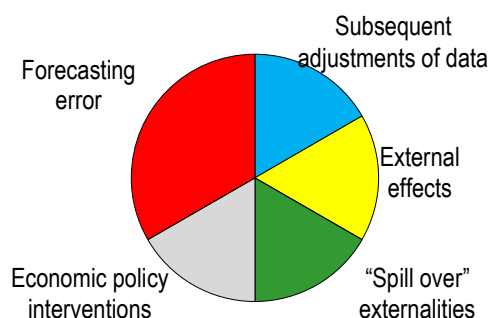
Before examining the accuracy of the forecasts of **GKI**, let's outline an **idea that may help in interpreting the results in a correct way**. The difference of a prediction for a given period and the actual data published later is **not equal to** the forecast (estimation) error. The **"gross" difference** may contain the effects of several factors, for example, virtually unpredictable external factors (such as bad weather, which may affect the performance of construction, not only agriculture), events occurring outside Hungary and having significant effects on Hungary's economy (for example, the Greek debt crisis), the government's surprising actions (such as the nationalization of private pension funds), or the reporting corrections mentioned earlier (forecasters presume a "reality" which becomes irrelevant at a later date). After cleaning the "gross" difference of forecasts and actual data of these effects, there remains the **"net" forecasting error**. Of course, **the exact quantification of these effects would be practically impossible, thus we are not attempting to do it**.

4. Evolution of forecasts for a given year

As mentioned above, **GKI**'s forecasts are based on monthly, quarterly and annual publications of the HCSO, an analyses of the external factors shaping the business environment, as well as the results of **GKI**'s economic sentiment surveys. In addition, we utilize our **relationship with economic actors** (company owners, managers, entrepreneurs, trade unions, government officials and analysts), **many**

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[8] From a professional viewpoint, it is very difficult to assess the differences. As mentioned above, most of the statistics also include estimates. Differences within their margins of error can certainly not be qualified as errors. It is also natural that forecasters should not take into account any methodological changes introduced in the international practice after the conclusion of their work.

years of experience, intuition and professional routine. As time progresses, more and more information is available.

GKI publishes six forecasts for a given year (in September and December preceding the year, then in March, June September and December). It would be interesting to examine whether the positive effects of broadening the information base can be detected in the forecasts, that is, whether the forecasts are becoming more accurate in time.

Table 2

The mean absolute differences of predicted indicators and actual data*, 1995-2011

(percentage point, or EUR billion for the current account balance)

	Previous year		Current year			
	3.	4.	1.	2.	3.	4.
	forecasts					
GDP**	**1.48**	**1.15**	**1.09**	**0.98**	**0.73**	**0.61**
Industrial GDP**	4.46	4.07	3.86	3.48	2.81	2.36
Construction GDP**	7.41	6.00	5.19	4.63	3.13	3.54
Agricultural GDP**	12.30	11.94	12.23	11.49	8.42	6.53
Transport, telecommunications GDP**	2.26	2.03	1.73	1.64	1.65	1.42
GDP domestic demand**	2.40	2.14	1.88	1.54	1.00	0.87
Private consumption**	1.71	1.50	1.31	1.25	0.93	0.79
Investments**	6.18	5.11	4.26	3.65	3.69	3.13
Exports**	6.74	5.77	3.94	3.59	2.86	2.19
Imports**	7.16	6.04	4.35	4.16	2.41	1.81
Consumer price index***	**1.26**	**1.29**	**0.68**	**0.58**	**0.16**	**0.05**
General government deficit /GDP****	1.91	1.87	1.46	1.34	1.31	1.10
Current account balance*****	1.56	1.55	1.45	1.41	1.09	1.06

Source: own calculations

*/ Arithmetical mean of the absolute values of differences between forecasts and actual data released in 2012.

/ Volume of GDP, previous year=100 */ Previous year=100 ****/ Per cent *****/ EUR billion

Table 2 suggests that the accuracy of the forecast significantly depends on the time it was made. **The accuracy of forecasts is improving as the end of the year is approaching**, and the mean absolute differences are decreasing. This holds true not only for the GDP reflecting the performance of the national economy but, with a few exceptions, for all indicators. The mean absolute differences of GDP forecasts published in June (when only a quarter of a year estimates are available) and the actual data was 65 per cent of the GDP forecasts published in September of the preceding in the period between 1995 and 2011. Forecasting errors between the first and last forecasts decreased by almost 60 per cent, that is, reliability increased significantly. In the period between 1995 and 2011 **the average "quality" of GKI forecasts published in December was not worse than that of the first HCSO statistics published one quarter later**. (According to Tables 1 and 2, both differences were 0.6.)

In the period between 1995 and 2000 the mean forecasting errors of GDP did not decrease as time progressed. Between 2001 and 2006 the accuracy of forecasts for the current year improved only modestly: the forecasting errors between the first and last projections decreased only by about 10 per cent. **Between 2007 and 2011 the accuracy of forecasts for the current year improved significantly.**

The gradual improvement of the accuracy of forecasts could also be verified with data related to sectoral GDP, the use of GDP and other indicators. The **greatest improvement** could be seen in forecasting **exports and imports** as well as **domestic consumption** and **household consumption**. Forecasting the **consumer price index** improved significantly as well.

The average accuracy of GDP forecasts improved significantly for the first time in December of the preceding year compared with September, and for the second time in September of the current year compared with June. This is not surprising since the available information base in September of the preceding year is quite modest. Results of economic sentiment surveys provide some help only for the current year, not for the next one. At this time the budget for the next year is not adopted yet, and tax laws determining the near future exist only in draft versions. Major institutions (for example, the European Commission) publish their forecasts later. As a consequence, at this time of the year forecasters have few information, which is reflected in the quality of the forecasts. By December everything is much clearer: the legal and fiscal environments are generally more stable (sometimes only temporarily, of course), and the economic trends of the preceding year can also be seen more clearly and accurately. The reasons for the improvement from June to September of the current year are also obvious. By now data for the first half of the year are available (even more at the level of monthly data), which may reduce the uncertainties of forecasting significantly.

Although statistics published during the year (for example, monthly, quarterly) may influence forecasts, **their effects might be unfavourable** due to subsequent corrections of annual data. Adjustments of statistical data after their first publication are often quite significant.

5. Changes in the accuracy of forecasts over the years

In the previous section it was assessed how the accuracy of forecasts for a given year changed during the year. Now we are going to assess how we were able to make use of the **experience of previous years** in order to improve the accuracy of forecasts.

Table 3

The mean absolute differences of predicted indicators and actual data*, 1995-2011
(percentage point, or EUR billion for the current account balance)

	1995-2000	2001-2006	2007-2011
GDP **	**0.7**	**0.8**	**1.5**
Industrial GDP**	3.1	2.8	4.5
Construction GDP**	3.8	3.7	7.2
Agricultural GDP**	4.8	13.8	13.4
Transport, telecommunications GDP**	1.9	1.1	2.3
GDP domestic demand**	0.9	1.8	2.2
Private consumption**	1.4	1.0	1.4
Investments**	2.8	3.4	6.7
Exports**	0.9	0.4	0.7
Imports**	4.9	2.5	4.9
Consumer price index***	**4.7**	**3.6**	**4.5**
General government deficit /GDP****	1.1	2.3	1.3
Current account balance*****	1.0	1.2	1.8

Source: own calculations
*/ Arithmetical mean of the absolute values of differences between forecasts and actual data released in 2012.
/ Volume of GDP, previous year=100 */Previous year=100 ****/Per cent *****/EUR billion

To this end, the 1995 to 2011 period was divided into three sub-periods: from 1995 to 2000, from 2001 to 2006 and from 2007 to 2011. The absolute differences of forecasts and actual data were calculated for the three periods separately regarding the indicators examined.

The accuracy of GDP forecasts did not differ significantly from each other for the first two periods, whereas the difference increased significantly in the years between 2007 and 2011. According to our research and international experience, the reliability of forecasts depends mainly on the state of the economy. Data show that most of GKI's forecasts were more reliable during the boom period in the second half of the nineties than during the crisis between 2007 and 2011. It seems that **there are no effective techniques yet to predict forthcoming crises or changes in the trends of economic development**. It might be some sort of consolation that GKI is not alone in this regard, as the majority of international forecasters were unable to predict the global recession. (Some authors, however, for example, N. Roubini and R. Shiller repeatedly warned of the dangers of financial bubbles.)[9]

In 6 cases of the predicted 13 indicators the mean absolute differences between forecasts and facts were smaller in the 2001-2006 period than in the 1995-2000 one. In the 2007-2011 period the accuracy of forecasts declined at almost every indicator. It is interesting that the accuracy of forecasting consumption, inflation and exports did not deteriorate significantly, and the **accuracy of forecasting general government trends even improved**. Obviously, constraints played a role in this.

6. Forecasting accuracy of production and expenditure sides of GDP
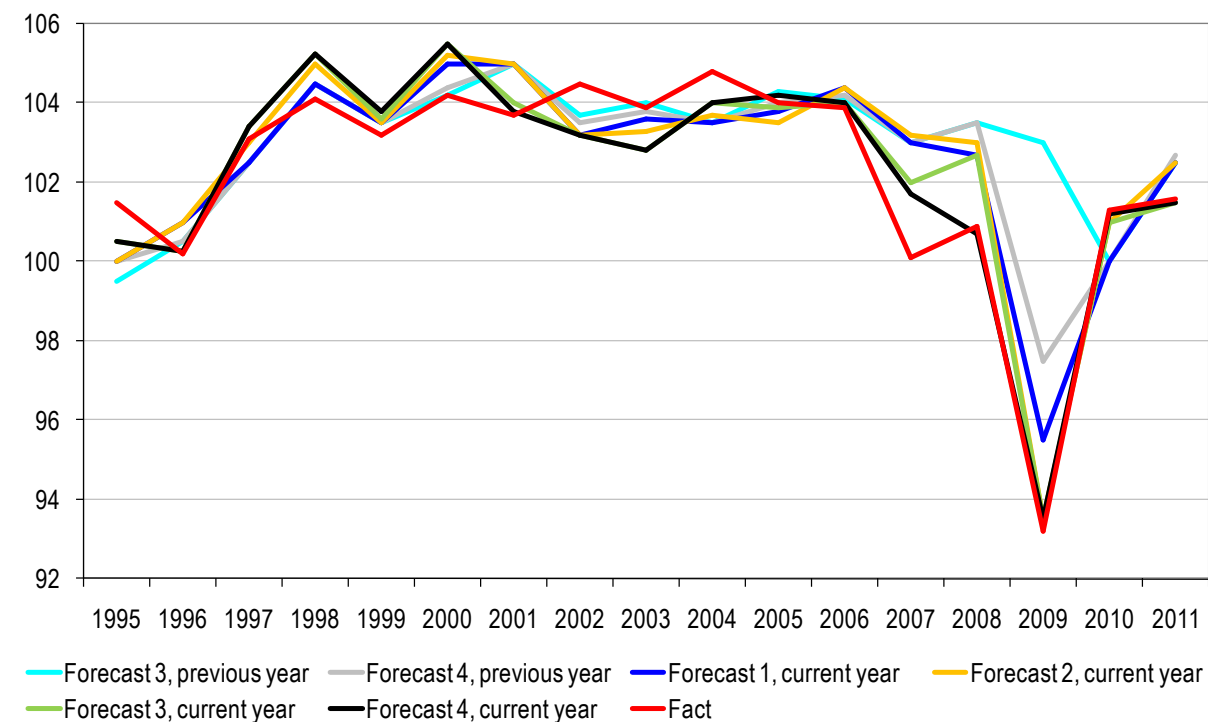
As it is known in economic theory, there are several information sources that can be used to estimate GDP, which measures economic performance. When GKI prepares forecasts, the first step is making an analysis of possible GDP growth trends. First the expected changes in demand (domestic consumption and exports) and supply (added value of the main sectors, as well as imports) are analysed iteratively, and, finally, the national accounts balance is examined by using previous results. At the end of this process we have a set of forecasts regarding the production and expenditure sides of GDP. In most cases this mutual control of estimates provides good results, that is, it can be considered an effective technique. **The average absolute difference between the forecasts and actual data of the volume index of GDP**, which is the most common economic indicator, **was 1 percentage point** in the period between 1995 and 2011 (taking into account all six forecasts for each year), which is also a favourable value. This figure is **only slightly better than the 0.6 percentage points mean difference of preliminary statistical figures** (usually published in March of the following year) **and final official ones of GDP released by the Hungarian Central Statistical Office in 2012**.

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[9] This subject is discussed in more detail in Hungarian, for example, Magas (2009).

Figure 2.

Volume of GDP forecasts and actual data, 1995-2011
(previous year=100)

Legend			
Forecast 3, previous year	Forecast 4, previous year	Forecast 1, current year	Forecast 2, current year
Forecast 3, current year	Forecast 4, current year	Fact	

Source: HCSO, **GKI** forecasts

The accuracy of the forecasts of **GKI** can be compared with that of **international prognoses**. There is a simple method to check the reliability of projections. Compare the accuracy of the forecast with the accuracy of a very simple forecast that guesses that next year's GDP growth will be the same as this year's GDP growth. In developed countries, the errors of these simple projections total usually about 1 percentage point (source: http://www.angrybearblog.com/ 2006/01/forecast-accuracy_24.html), whereas in Hungary the average error of a GDP forecast for the period under review using a similar method was almost 2 percentage points. **This means that the accuracy of GKI's GDP forecasts is much better than that of the above simple forecast.**

In the period 2006-2011 the reliability of GKI's forecasts was essentially the same (or only slightly worse) than that of the average of the analysts polled by Reuters.

Table 4

The mean absolute differences of GDP forecasts and actual data*, 2006-2011

(percentage point)

	Reuters	GKI
Previous year 1	2.5	3.0
Previous year 2	1.9	2.1
Current year 1	1.5	1.6
Current year 2	1.3	1.2
Current year 3	0.7	0.7
Average	1.6	1.7

Source: own calculations

The fourth forecast was not published by Reuters for each year, thus it is not included here.

*/ Arithmetical mean of the absolute values of differences between forecasts and actual data released in 2012.

During the period under review **GKI proved to be optimistic on more occasions than pessimistic** (that is, it overestimated the growth rate of GDP). In the period between 1995 and 2011, 60 per cent of the forecasts can be considered optimistic, 38 per cent pessimistic (the remaining 2 per cent was the same as the actual data). **GKI** overestimated growth opportunities in 1998-2001 and in 2007-2008, whereas it underestimated them in the period 2002-2004.

In the 2006-2011 period **GKI** overestimated the rate of economic growth in 80 per cent of cases and underestimated it in 20 per cent of cases. The same two rates for forecasts published by Reuters are 77 per cent and 20 per cent, respectively. The remaining 3 per cent include the exact results. **This relative optimism (underestimating the impacts of fiscal adjustments and later the global financial crisis) in the period under review characterised not only GKI but all other forecasters in Hungary as well.**

Figure 3.

**Volume of industrial GDP forecasts and actual data, 1995-2011**

(previous year=100)
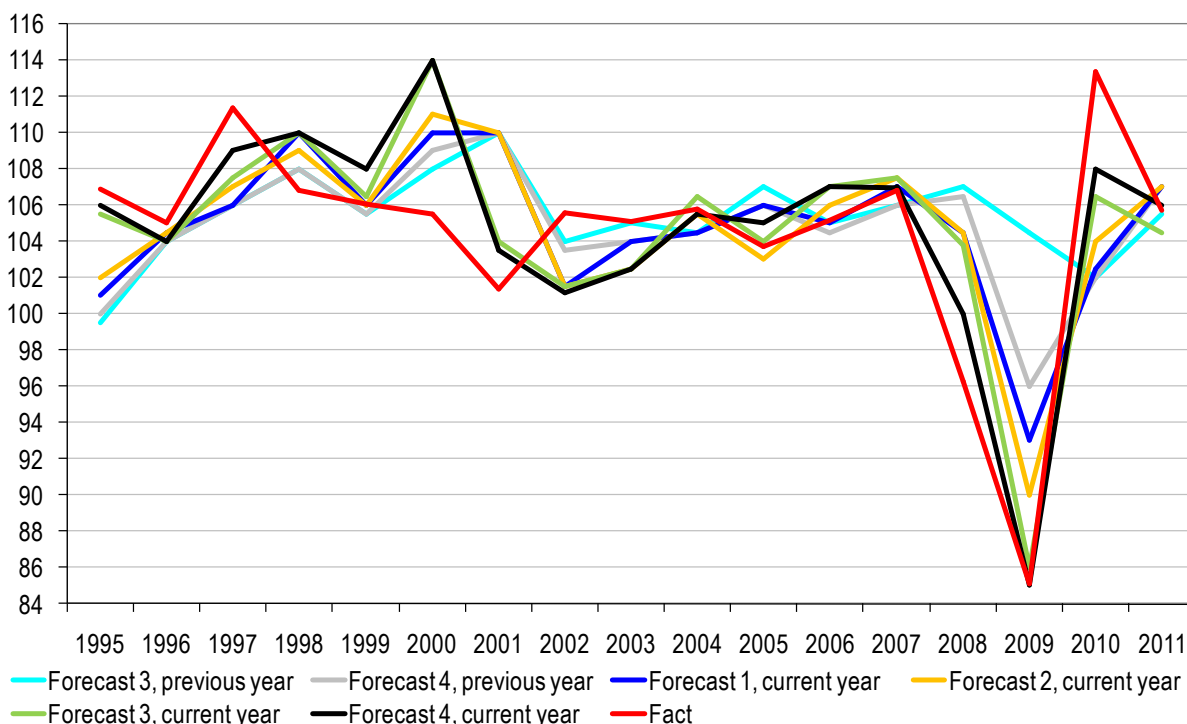
Source: HCSO, **GKI** forecasts

GKI's forecasts of total GDP were much more accurate than either its supply (production) or demand (expenditure) side items in the forecasts. Since in the system of national accounts GDP is the highest level of aggregation, this is not at all surprising. Sectoral performance indicators representing a lower level of aggregation and the expenditure side items showed much larger fluctuations in the 1995-2011 period than total GDP. The standard deviation of the volume index of GDP in the period was 2.8 per cent (transportation, storage: 5.3 per cent, industry: 6.2 per cent, construction: 7.3 per cent, and agriculture: 21.1 per cent). The same data on the expenditure side were the following. Consumption: 4.8 per cent, investments: 6.6 per cent, exports: 7.5 per cent, and imports: 8.8 per cent. Consequently, preparing forecasts for the individual items of the production and expenditure sides of GDP represents a much greater challenge to forecasters than doing it for the total GDP. It might be, in lucky cases, that the errors in sectoral forecasts can annul each other.

The average forecasting error of **GKI** for industrial production was around 3.5 percentage points, which is much higher than the error for total GDP of about 1 percentage point. The average forecasting error of the above-described simple technique was over 5 percentage points. In industry, the proportions of **GKI**'s over- and underestimations were roughly equal (47 and 53 per cent). Experience shows that errors in industrial forecasts tend to be caused by difficulties of assessing export demands. In addition, statistics regarding industrial production are less accurate than those concerning total GDP. The average difference between figures published by the HCSO for the first time and the "final" ones in 2012 was 2 percentage points.

Figure 4.

Volume of construction GDP forecasts and actual data, 1995-2011
(previous year=100)
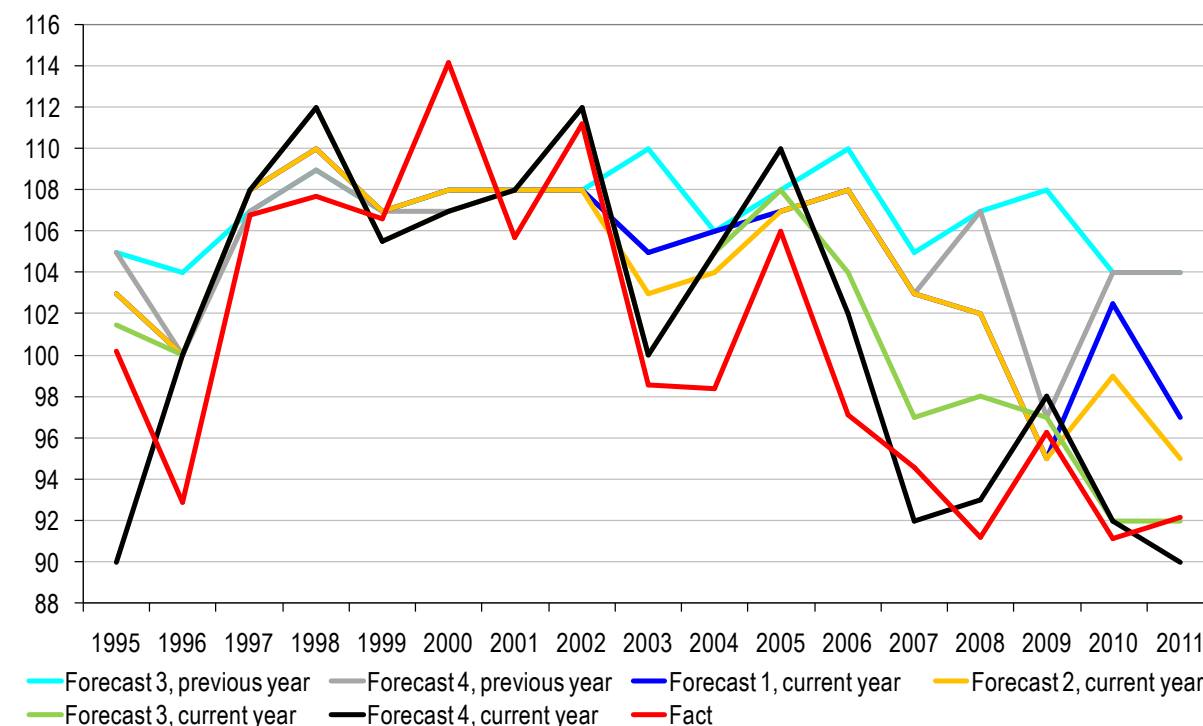
Source: HCSO, **GKI** forecasts

In **construction**, the average forecasting error was around 5 percentage points, which is significantly higher than that of industry. Construction forecasts, especially after 2004, usually **proved to be overly optimistic**. We overestimated the growth potential of the sector in 82 per cent of cases, and underestimated in 18 per cent of cases. Prediction problems in the construction industry stem

particularly from the extreme volatility of the demand for its products, and the tightening/loosening investment policy of the government. On the other hand, it is also true that after the accession to the European Union, not only the forecasters of **GKI** expected a surge of investments based on EU funds but other institutions and industrial organizations as well. However, the construction demand was much lower than expected after the bursting of the housing bubble and the constraints introduced in connection with the financial crisis. The evaluation of applications practically stopped in 2009, and the new government did not speed up the process either. **GKI**'s forecasters became much less optimistic after realising this.

In **agriculture**, the average forecasting error, partly for natural reasons, is much larger than either in industry or in construction. Forecasters in period under review overestimated and underestimated the performance of agriculture almost equally (47 and 53 per cent). Forecasting errors started to decline only from the fourth forecast substantially because weather conditions of the current year were largely unknown before that. The main problems of agricultural forecasts stem from the high uncertainty of weather in Hungary and the great exposure of domestic producers to it.

GKI was able to forecast the performance of the **transport and communications** sector with a forecasting error of around 2 percentage points in the 1995-2011 period. As a result, this is the industry whose performance could be predicted most effectively.

Figure 5.

Forecasts and actual data of the volume of
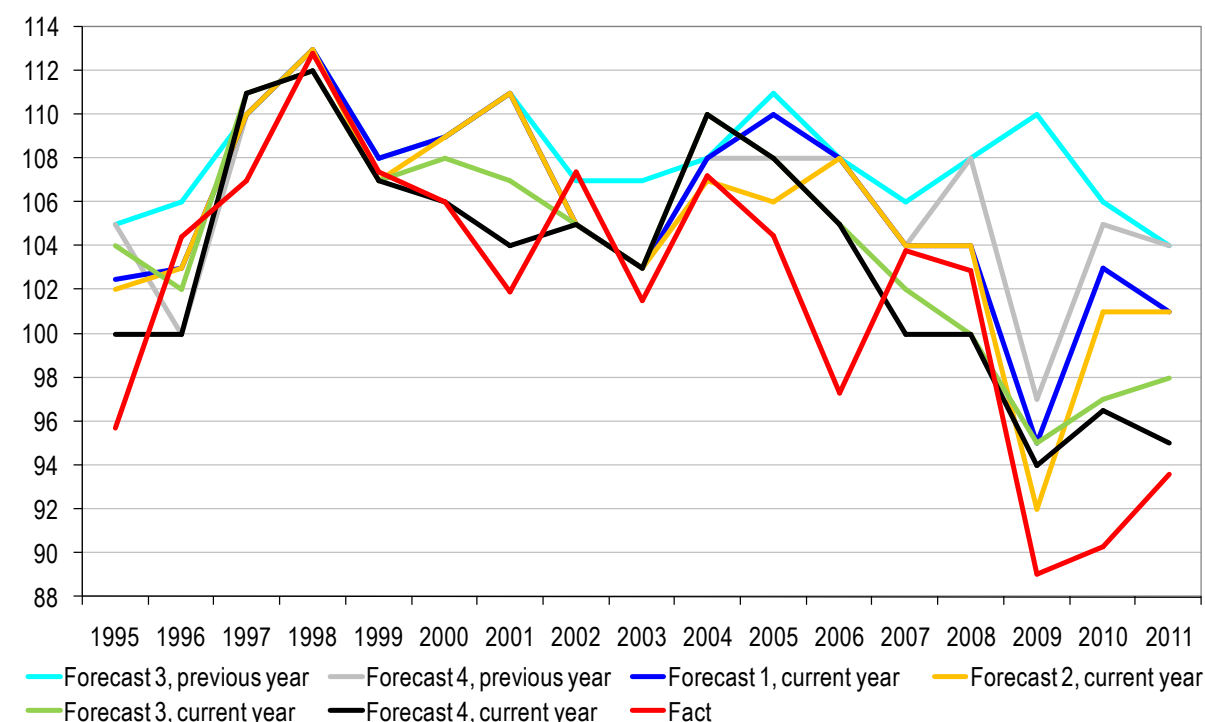**final consumption of households, 1995-2011** (previous year=100)
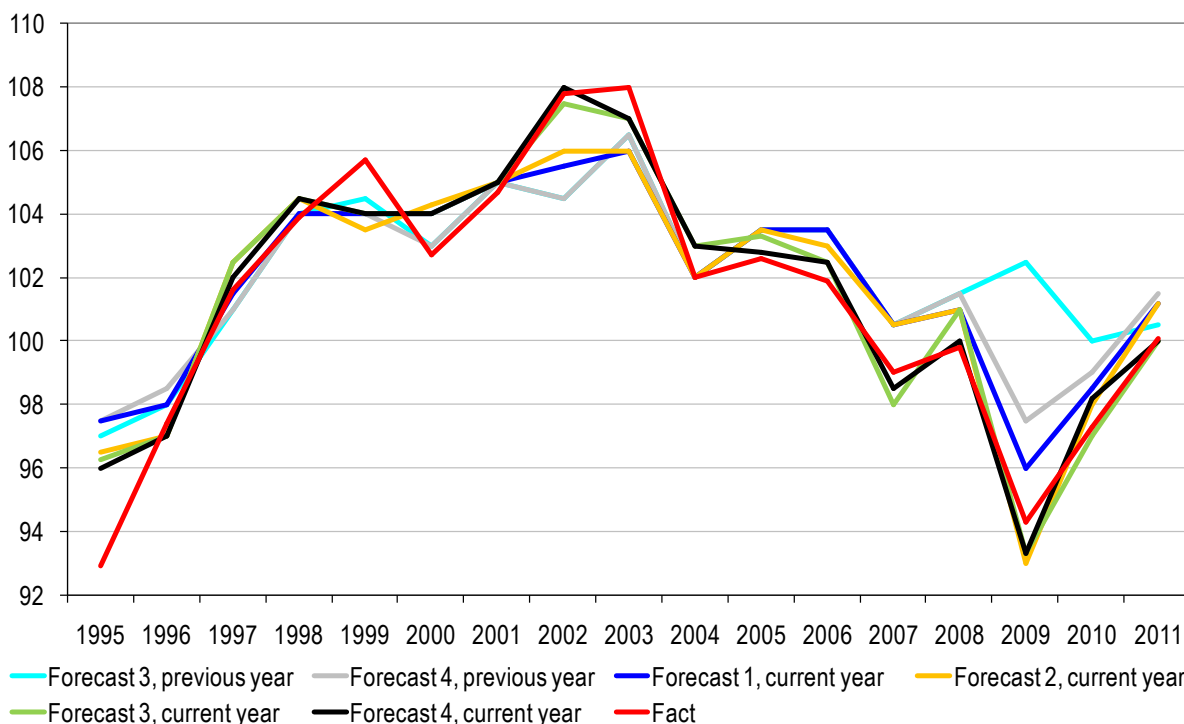
Source: HCSO, **GKI** forecasts

The largest component of GDP's expenditure side is household consumption. **GKI's forecasts of consumption are relatively reliable**: the average error in the period under review was hardly over 1 percentage point. The reliability of the forecast of consumption is only slightly weaker than that of GDP. However, possibilities were overestimated in 66 per cent of cases, underestimated in 30 per cent of cases, and the remaining 4 per cent included the exact results.

Figure 6.

Volume of investments forecasts and actual data, 1995-2011
(previous year=100)

Forecast 3, previous year — Forecast 4, previous year — Forecast 1, current year — Forecast 2, current year — Forecast 3, current year — Forecast 4, current year — Fact

Source: HCSO, **GKI** forecasts

The average error of investments forecasts exceeds 4 percentage points, that is, their reliability is significantly weaker than that of consumption. When evaluating this fact, it has to be taken into account that consumption reacts relatively slowly to changes in or to externalities affecting the economy. This means that consumption reacts to changes of incomes (even if they are rapid and significant) with a delay. In contrast, **investments are strongly exposed to changes in profit expectations and the wider business environment**. Investment decisions of the government are often based on pure political, not economic, considerations. Predicting the operation of political decision-making processes lies outside the scope of economic forecasters. Exaggerating the stimulating role of EU funds caused that in 78 per cent of cases **GKI** overestimated the investment performance in Hungary.

Average forecasting errors of the volume indices of **exports and imports** were similar to those of investments. Forecasting exports and imports is even more difficult as in addition to knowing the conditions and possibilities of the Hungarian economy, forecasters should have a realistic vision regarding the future trends of demand in the major partner countries.

As a consequence of these difficulties of forecasting the structure of supply and demand, **forecasting the individual components of GDP is much more uncertain than forecasting total GDP**. Perhaps it is not surprising that publishing forecasts of these factors is much less common in the international practice than in the case of GDP.

7. Forecasting accuracy of economic equilibrium indices

Forecasting the expected inflation rate has considerable emphasis in renowned international forecasts[10]. It is widely acknowledged that inflation forecasts have a self-fulfilling effect, because companies rely heavily on price projections when determining the prices of their products. Authors of this study believe that the inflation rate of the previous year published by HCSO exerts the greatest influence on the expectations of companies and their contracts (compare to the "simple" forecasting logic mentioned earlier).

Figure 7.

Consumer price index forecasts and actual data, 1995-2011
(previous year=100)

Source: HCSO, **GKI** forecasts
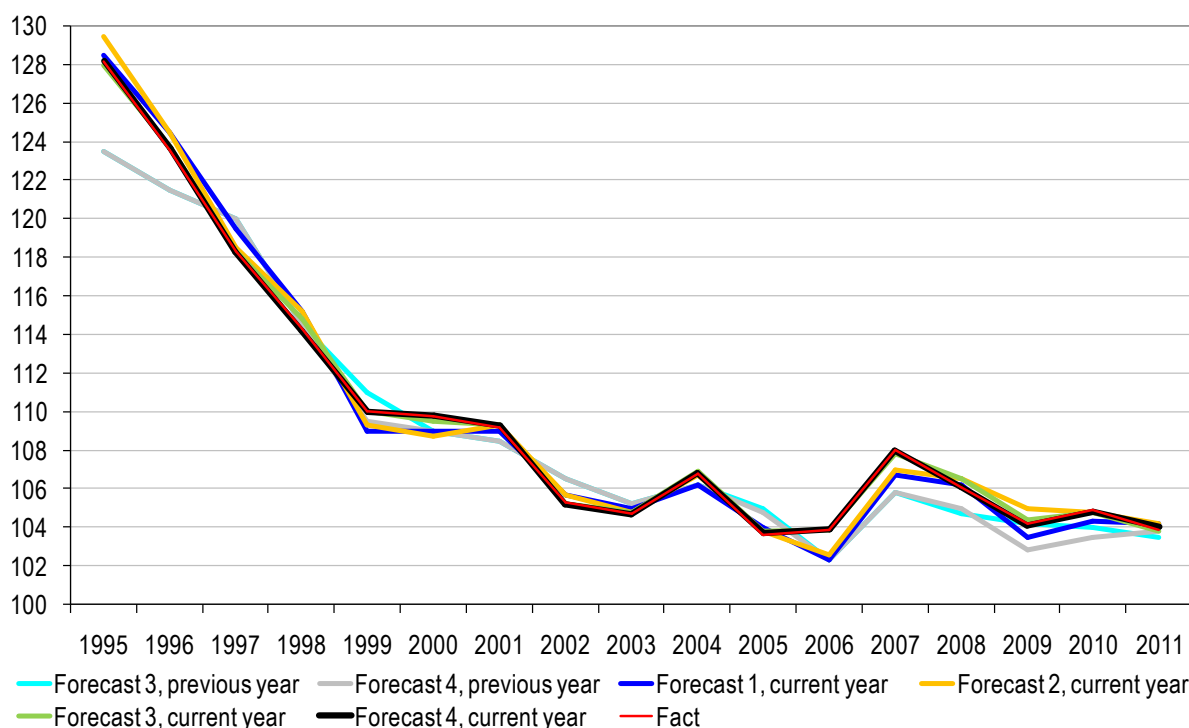
Consumer price index forecasts are one of **GKI**'s "success stories" because experience inflation forecasts proved to be the most accurate of all. The mean absolute difference between **GKI** forecasts and actual inflation figures in the given period was 0.7 percentage points, which is extremely low compared with the above figures. In 42 per cent of cases we underestimated the expected inflation rate; in 45 per cent of cases we overestimated it, whereas the remaining 13 per cent represents the exact results. This accurate prediction can be explained by several underlying factors. On the one hand, inflation is partly determined by factors already known from an earlier period. On the other hand, it is known that the inflation index is an annual average, that is, an average of the price trends of 12 months of the given year. This means that published statistical data offer a reliable basis for forecasters (as these data can be used well in the predictive model). Another major advantage is that the HCSO do not

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[10] According to M. Weale, a member of the Monetary Council of the Bank of England, the Bank was probably the first, at least in England, that published estimates about possible forecasting errors in 1979, and since 1993 they have published funnel diagrams showing the probability of their inflation rate forecasts (http://www.thefiscaltimes.com/Articles/2011/12/27/8-Outrageously-Flawed-Economic-Predictions.aspx#page1).

modify inflation data subsequently, so that this adjustment problem described earlier does not apply here.

Table 5

The mean absolute differences of consumer price index
forecasts and actual data*, 2006-2011 (percentage point)

	Reuters	GKI
Previous year 1	1.3	1.1
Previous year 2	1.2	1.2
Current year 1	0.7	0.8
Current year 2	0.6	0.7
Current year 3	0.2	0.2
Current year 4	0.1	0.1
Average	0.8	0.8

Source: own calculations
*/ Arithmetical mean of the absolute values of differences between forecasts and actual data released in 2012.

In the period 2006-2011 the reliability of **GKI**'s inflation forecasts was essentially the same as that of the average of the analysts polled by Reuters.

In recent years forecasting the general government balance has become at least as important as forecasting GDP and inflation. Forecasting errors committed in this field entailed serious economic consequences throughout the world.

Figure 8.

General government deficit to GDP ratio forecasts and actual data, 1995-2011
(per cent)
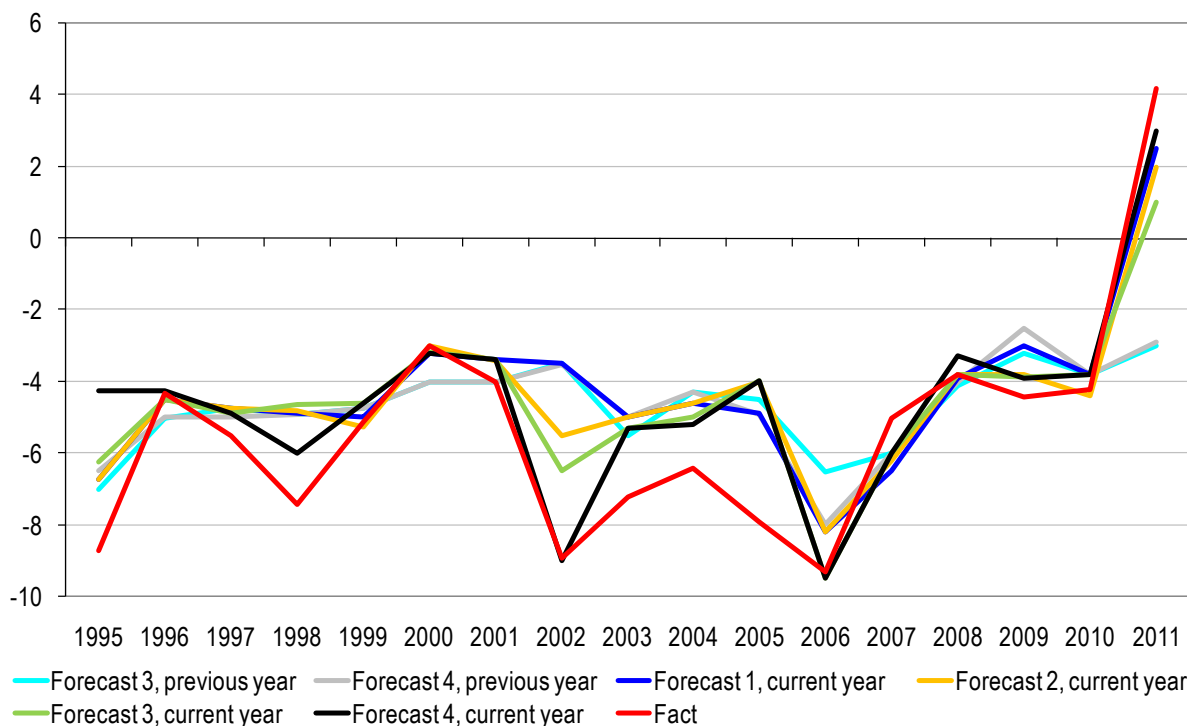
Source: HCSO, **GKI** forecasts

Hungarian forecasters, including **GKI**, usually **based their forecasts on a very detailed analysis of budgets**. The unpredictable policies of the government, however, in many cases upset these calculations. The government has repeatedly tried to exclude expenditure items (such as highway construction) from the budget, which later proved to be unacceptable by the EU. Sometimes consolidation expenditures were taken in account unexpectedly at the end of the year, significantly increasing the deficit. **GKI often handled these complicated situations by publishing forecasts that contained several scenarios.** Of course, **these scenarios cannot be taken into account when reviewing the accuracy of forecasts**.

The **average forecasting error** of the general government deficit to GDP ratio represented **around 1.5 percentage points**. Considering the above, this is an **acceptable** result. These predictions, especially in the period between 2001 and 2006, proved to be overly optimistic. In 66 per cent of cases we underestimated the deficit, in 29 per cent of cases we overestimated it, whereas the remaining 5 per cent was the exact hit ratio.[11]

Figure 9.

Current account balance forecasts and actual data, 1995-2011
(EUR billion)
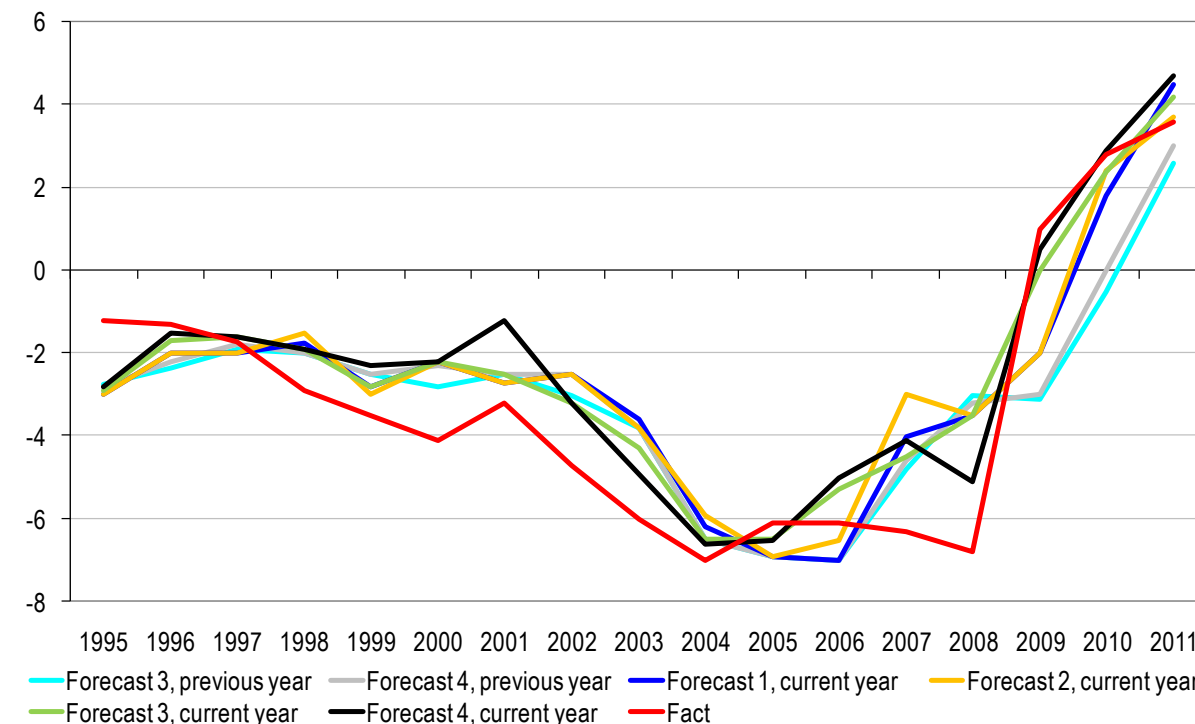
Source: HCSO, **GKI** forecasts

External balance estimates are very uncertain. The average underestimation of the current account balance by EUR1.4bn is not good. However, it is acceptable considering its very volatile and unpredictable income flow components. (The actual figures are only available later than usual and they are always estimates.)

8. Conclusions

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[11] It is hardly arguable that GKI's "optimism" did not cause as much damage as the recent incorrect EU forecasts regarding the Greek GDP (see Frederic, 2012).

If someone gives accurate predictions of the future, it is usually a mere coincidence. There is no difference in the cases of economic forecasts either. Analysts and forecasters collect all kinds of information regarding the past as well as testing tools (statistics, and logical, mathematical, statistical and econometric models) in order to make their forecasts as well-founded as possible. The revolution in information technology has expanded the possibilities (in both data access and processing), which is obviously helpful to forecasters. Publications on the accuracy of forecasts are issued more or less regularly. The basic lesson is that **in "quiet" times when development trends are determined basically by the internal movements of the economy, forecasts are in most cases reliable**. However, **in more hectic times**, when external influences are becoming stronger, markets and governments are showing signs of anxiousness, **the reliability of forecasts deteriorates dramatically**. It is not different in Hungary and in the case of **GKI** either. The most important lesson of this report is that we have to accept that **there are no effective techniques yet to predict forthcoming crises or changes in the trends of economic development**.

The authors of forecasts always assume the possibility of erring. It is no coincidence that the introductions of economic analyses and forecasts often contain a disclaimer. Here the authors declare that they cannot be held responsible for the consequences of business decisions taken on the basis of their forecasts. **Of course, GKI assumes no responsibility for business decisions based on its forecasts.** However, **GKI assumes responsibility for the forecasts themselves**; this is why it regularly publishes such comparisons. Although there are still many areas where we have plenty to improve on, we should not be ashamed of anything. The key indicators in GKI's forecasts are little or no worse than the actual data published by HCSO first time (and later amended several times) or the projections reflecting a consensus of experts published by Reuters, and they are acceptable in an international comparison as well.

9. Bibliography

Clements, M.P. - Hendry, D.F. (?): *An Overview of Economic Forecasting*
http://www.google.hu/#hl=hu&gs_nf=3&cp=19&gs_id=hl&xhr=t&q=economic+forecasting&pf=p&sclient=psy-ab&oq=economic+forecastin&gs_l=&pbx=1&bav=on.2,or.r_gc.r_pw.r_qf.&fp=14970a854c1b7bb3&bpcl=35466521&biw=1280&bih=633
DomokosLászló (2012): *Gondolatok a költségvetési terv makrogazdasági feltételrendszeréről*. Pénzügyi Szemle. Október. http://www.penzugyiszemle.hu/vitaforum/gondolatok-a-koltsegvetesi-terv-makrogazdasagi-feltetelrendszerol
Frederic, J. (2012): *Folly from Olly.The disastrous quality of the economic predictions of the EC*. JW productions. http://joweber.peopleunlikeus.com/2012/11/09/folly-from-olly-the-disasterous-quality-of-the-economic-predictions-of-the-european-commission/?goback=.gde_2830972_member_184105960
Genre, V. - Kenny, G. - Meyler, A. - Timmermann, A. (2013): *Combining expert forecasts:Can anything beat the* simple *average?*International Journal of Forecasting, Issue 1.
Granger, C. W. J. - Newbold, P. (1973): *Some Comments on the Evaluation of Economic Forecasts*, Applied Economics, 5, 35-47
Magas István:*Válságtanulságok, rendszerhibák*. Magyar Tudomány. 2009. 08.
Némethné Pál K.-Papanek G. – Petz R. (2001): *A vállalati várakozási felmérések megbízhatóságáról.* Statisztikai Szemle 9.sz.
Papanek G.–Sulok Z. (2003): *A GKI Rt. előrejelzéseinek megbízhatósága*. Gazdaság és Statisztika. 2.sz.
Papanek G. - **Bíró P. - Munkácsy A. - Némethné P.K. - Petz R.** (2008): *A gazdasági előrejelzések és a „tények"*. In: Bagó E. és mások (szerk.): A gazdasági környezet és a vállalati stratégiák. MTA IVB.
Papanek Gábor(2009): A *nemzetgazdasági előrejelzés lehetőségei és korlátjai.* Polgári Szemle. 1. sz.
Porter, M. (1990): *The Competitive Advantage of Nations*. Free Press. New York.
Samuelson, P. A. – Nordhaus, W.D.: *Közgazdaságtan*. KJK. 1993.

Singer, M. (1997): *Thoughts of a Nonmillenarian.* Bulletin of the American Academy of Arts and Sciences. No. 2.

Tóth István János (2000): *Vállalati és lakossági konjunktúra felmérések Magyarországon*. MTA Közgazdaságtudományi Intézet