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Estimation of the structural balance based on the OECD approach

Theoretical considerations and empirical experiences

Correlations between the performance of the real economy and the budget position of the general government have been a key area of methodological research for decades. The related concepts focus on the recognition that the same budget may equally result in a surplus or a deficit depending on what happens on the national income side (Mackenzie, 1983). "All" we need to do in order to identify the underlying processes behind the budgetary position is to "remove" the impact of cyclical changes in the real economy. An improvement of the fiscal position can be a reflection of improvement in the real economy while a turnaround in fiscal developments is to be counted on once macroeconomic conditions deteriorate. Under these circumstances, fiscal policy cannot be claimed to be on the right track even if the related indicators suggest an improvement. No wonder that in the context of Hungary's convergence program, both the Ministry of Finance and the European Commission focus on assessing Hungary's budget from this viewpoint. The Research and Development Institute of the State Audit Office of Hungary (SAO RDI, hereinafter RDI) issued an evaluating study both in 2007 and 2008, highlighting to the National Assembly of Hungary the risks associated with the macroeconomic viability of the budget bill. The 2008 macroeconomic study of the RDI already contained calculations on the trends of the structural balance (RDI 2008). Although the budgeting process for 2009 took place under extraordinary circumstances which forced both the Ministry of Finance and the State Audit Office to depart from their usual work procedure (for further details refer to Báger – Pulay, 2008b), this third macroeconomic study of the RDI made a cautious attempt to forecast the structural balance for 2009 based on the budget bill figures.

Here we review the arguments supporting the estimation of the cyclically adjusted budget balance first. Then we move on to discuss the method recommended by the OECD for the quantification of the structural deficit and the related results. We will not strive for either presenting the methodology in full or highlighting the potential errors therein. Both of these are discussed extensively in technical literature. What we go for is to apply the method as consistently and possible and to present the results generated this way.

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CYCLICAL ADJUSTMENT AND POTENTIAL GDP

It already became clear to economists from the mid 1940's that the traditional interpretation of deficit (i.e. the balance of general government revenues and expenditures or that of a subsection of these broad categories) is not suitable for describing the budget position adequately. A part of the criticisms related to the fact that the growth (change) of the deficit may stem from multiple sources; this way, the macroeconomic impact of a specific deficit figure can vary significantly depending on whether the source of the deficit growth is the drop of revenues or the rise of government expenditures. However, the attempts to define and calculate balance indicators which eliminate the effect of economic cycles were built on another experience. As several elements of government revenues (and some expenditure items) are sensitive to the performance of the real economy, the view that any budget deficit is actually identical to the required fiscal corrections may become overly simplifying (Tanzi, 1993). In other words: *the same budget act may lead to diverse balances depending on the actual trend of the real economy – deceleration or boom.* As someone put it quite descriptively, we cannot really set the level of tax revenues in the budgetary planning process. We can only specify the set of tax laws – revenues will depend somehow on national income (or e.g. consumption expenditures) (Solomon, 1964), thus tax policy is only partially decisive. Therefore, if we wish to judge the extent of the deficit, it is indispensable to ensure that the balance indicator we examine reflects solely the position of the budget and that the big picture is not distorted by factors which do impact the budget position but the changes of which the financial government cannot be held liable for. This way, the cyclical adjustment of the general government balance enables a clear view [even if the cyclically adjusted deficit only provides an adequate answer to a limited range of questions about the functioning of the general government (Blanchard, 1990). Probably the most suitable use of the cyclical balance is for finding an answer to the initial question which generated this approach in the first place: what would be the balance of the central budget like if the real economy were in equilibrium?], since prosperity may suggest that the improvement of the general government balance is a result of fiscal policy accomplishments albeit it stems purely from cyclical sources while these processes may turn into an opposite direction once the real economy slips onto a downward curve. As a result of this approach, in some cases the cyclically adjusted balance becomes the an indicator of the sustainability of the budget. *If we clean the budget balance from the cyclical effects, we reveal the fiscal rearrangements which can be considered the results of discretional political steps*[1] (P. Kiss – Vadas, 2005). While in the period after 1962, this recognition drew special attention to the concept of *full-employment budget surplus,* today we talk about a *structural deficit*[2] (cyclically adjusted general government deficit). The former concept refers to the budget balance that would take shape under the tax regime in effect if the economy were in the state of full employment – later we will see that the notion of structural deficit quantified in accordance with OECD recommendations is very close to this former term (in our opinion, this approximation of terms occurs in each case when the structural balance is defined on the basis of a production function that starts out from a labour market equilibrium).[3] Thus if we reject the simplifying view, a (partially theoretical, partially methodological) problem crops up immediately. It is about the development of the right balance category that excludes the effect of real economy fluctuations. It is sufficient to refer briefly to the fact that while focusing on the diverse effects of deficit-gener-

ating fiscal policy steps and the concept of a structural balance originate in different approaches regarding financial management by the general government, these issues are not independent of each other. In order to gain a comprehensive view, both (what is more, as many as possible) aggregate indicators must be examined. Regarding the impact on aggregate demand, even numerically equal structural balances reflect some differences, since changes of the traditional and thus structural deficit may be fuelled by different shifts in revenues and expenditures.

A diverse set of methodologies are applied to the quantification of the structural balance and there is no consensus regarding the most adequate approach. The task is always a twofold one: the first step is to assess the cyclical position of the national economy concerned and then the resulting data must be used as a basis for quantifying the deficit. The two phases are linked by information that describes the sensitivity of specific government revenues and expenditures to the performance of the real economy. The approaches differ in the method used for measuring the cycle (Donders – Kollau, 2002), but the measuring of the cyclical impact on general government revenues and expenditures (and the assumptions in this respect) are more significant. The most widely used indicator to describe the cyclical position is the output gap. Thus the description of the cyclical position is equal to the task of defining the potential GDP. For long, the potential GDP trend was identified with the trend described by GDP time series. Consequently, the use of the HP filter or other trend estimation methods proved to be sufficient for generating the necessary time series; accordingly, GDP-smoothing was the suggested method in EU and OECD recommendations over a long time (P. Kiss, 1998, page 51). However, it is an undeniable drawback of these methods that all of them are purely mechanical thus the underlying information specific to the national economy under review has no role in the analysis at all.[4] At the same time, it is also true that estimates which rely on the production function unavoidably approximate the concept of full-employment budget deficit.

Thus the method preferred by the OECD (and the European Union) since the mid-1990's quantifies the potential output based on a Cobb-Douglas production function[5] which uses substantially more data. Consequently, expert estimates and judgements on specific national economies play an incomparably bigger role in this approach than before. The main advantage of the production function-based approach is not that it yields more reliable results than the trend filtering approach; the real step forward is the lavish amount of information used. In this approach, the potential output of the real economy will equal a GDP level where the utilisation of capacities and labour is in equilibrium. At that point, the relatedness to full-employment budget balance may become clear, since the equilibrium utilisation of labour can be approximated with operational terms like the natural or equilibrium rate of unemployment[6]. This way, the result will rely on a more solid foundation although it will be more disputable, too. The alternative estimates that are based on different assumptions must become part of discussions on economic policy and methodologies.

BRIEF DESCRIPTION OF METHODOLOGY AND SUPPLEMENTARY RESULTS

The methodology applied by the OECD is presented in *Giorno et al.* (1995), using the accomplishments of *Torres et al.* (1989) and Torres – *Martin* (1990). According to the recommendations, the coefficients (α and $1-\alpha$) of capital and labour inputs in the private sector must be estimated with the standard two-

factor Cobb–Douglas production function and the same applies to factor productivity which appears as a residual variable. Error member values generated in the first regression and smoothed with a HP filter produce factor productivity (e^*) which contribute to the generation of the potential GDP line of the non-governmental sector at the actual level of applied capital (k) and potential (equilibrium) labour (n^*)

$$y^* = \alpha + \alpha^* + (1 - \alpha)k + e^*, \qquad (1)$$

(trend smoothing remains an element of the toolset although its role is reduced to the subsequent correction of econometric estimates). The potential output of the entire national economy must be completed with the real income generated by the government sector. According to the recommended methodology, the labour input (n^*) of the private sector can be calculated as follows:

$$N^* = LFS(1 - NAWRU_{HPTREND}) - EG \qquad (2)$$

Where

LFS is the smoothed number of people who are active in economic terms (working age population multiplied by activity rate data smoothed by the HP filter),

NAWRU is the unemployment rate that does not inflate wages, and

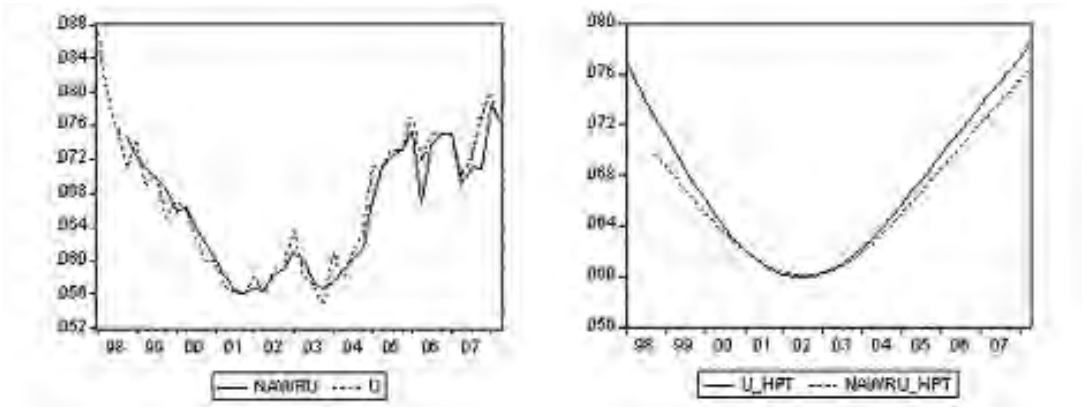
EG is the number of people employed in the government sector.

The estimation of *NAWRU*-based production functions can be considered general (see e.g. Slevin, 2001 with further examples), but the equilibrium unemployment is sometimes taken as identical to the HP trend of unemployment rate [the quarterly forecast model of the Magyar Nemzeti Bank belongs to this category of methodologies (Jakab et al., 2004, page 4). Without ranking the approaches,[7] we must point out that the two methodologies (naturally) do not lead to equivalent time series – at least the estimates generated upon the quantification of the structural balance suggest so. *(See Chart 1)*

The unemployment rate at equilibrium employment is apparently changing over time, although the very first explanations of the natural rate would predict differently. The first estimates of the natural rate of unemployment were prepared by *Samuelson* and *Solow* (1960). Subsequent estimates were showing the stability of equilibrium unemployment for a long time (see Gravelis, 2007).

Chart 1

NAWRU AND UNEMPLOYMENT AND THE HP TREND OF VARIABLES (λ=1600), HUNGARY, QUARTER 1, 1998 - QUARTER 2, 2008



Source: HCSO

Later a theoretical explanation was developed regarding the variability of the natural unemployment rate (e.g. Ball – Mankiw, 2002): It suggested that the changes of this rate were also impacted by the improving expiry structure of frictional unemployment, i.e. more efficient operation of the labour market, higher productivity and changes in the structure of labour. There are more obvious reasons of course: as the *NAWRU* follows closely the fluctuations in actual unemployment, its curve is affected by all the factors which are decisive for actual unemployment as well, e.g. demand and supply shocks.[8] *Camarero et al.* (2005) found that the unemployment curve in Hungary is not unique within the newest European Union member states. Unemployment in these countries decreased from the mid-1990's then began to increase again. In the unemployment trends of the EU10, several breaking points were identified which suggest that structural changes induced by transition and convergence (also) influence the functioning of the labour market, in particular its equilibrium [in the period after 2000, the unemployment trend was determined by intensifying international competition and the resulting second restructuring process (see more in Laky, 2005, page 90)]

The quantification of the *NAWRU* time series requires more information. The related methodologies (among others Elmeskov – MacFarlan, 1993; based on Elmeskov, 1993) rely on the assumption that wages inflation (and the changes thereof) are in linear correlation with the gap between actual unemployment and the *NAWRU* (due to the fact that the *NAWRU* represents a level of unemployment where wages inflation is constant). Accepting the fact that the *NAWRU* value changes only gradually over time, the observations on inflation and actual unemployment may be used for originating the *NAWRU* time series.

Therefore,

$$D^2 lnW = -\alpha(U - NAWRU) \qquad (3)$$

where D is the difference operator (i.e. $D^2 lnW_t = DlnW_t - DlnW_{t-1}$), which is the change of the wages growth rate,

W stands for wages, and

U represents unemployment.[9]

The equation for estimating the *NAWRU* is as follows:

$$NAWRU = U - \left(\frac{DU}{D^2 \log W} \right) D^2 \log W \qquad (4)$$

The resulting *NAWRU* line must be smoothed using the HP filter in order to eliminate erratic fluctuations. The n^* data derived from this smoothed time series will be used in the production function. After that we can get the total added value generated by the economy by summing up the added value actually created by the government sector with the estimate for the private sector (i.e. the private sector's potential added value) or we can calculate the potential output level for this sector, too (the third option is to quantify the production function for the entire national economy – this was our preferred approach during the calculations[10]).

Prior to presenting the calculation methodology of the structural balance and the resulting estimates, we must mention briefly the data sets of capital inputs (capital stock). Several time series are available on the capital stock used by the private sector. The Hungarian Central Statistical Office (HCSO) regularly carries out questionnaire-based surveys and in recent years they have been using estimates that rely on complex methodologies (which use the time series of investments); Similar initiatives were launched at the Magyar Nemzeti Bank, too. What is a major problem though is the considerable gap between the estimated net capital figures that result from the two methodologies. Net capital assets are affected by a number of

factors which corporations do not monitor and therefore the questionnaire-based survey is not reliable (Pula, 2003). Both the HCSO and the MNB applied the PIM (Perpetual Inventory Method) approach[11] when generating estimates. Yet the HCSO's algorithm was specified for annual figures only while the MNB also calculates quarterly (but not yet public) data [there is nothing in the way of generating quarterly figures at the HCSO either as model input data are available on a quarterly basis (Becskei, 2003]. The variable that describes the trend of capital inputs is expressed in the formula

$$C_t = C_{t-1} \times (1-D) + INV_t \qquad (5)$$

which calculates the total capital stock of the national economy where

C_t is quarterly real capital,

D is the average depreciation rate,

INV_t represents total investments in the national economy at a constant price.[12]

The quantification of the structural deficit (interpreted in some way) is based on the potential output calculated as described above. In the course of the calculation, we split actually realized government revenues and actual expenditures into cyclical and structural components. In other words, we attempt to quantify the would-be balance of revenues and expenditures upon the assumed equality of actual GDP and potential GDP. The structural balance must be determined based on actual revenues and expenditures. In this process, we adjust the components of the equation to potential and actual output ratios as follows:

$$\frac{T_i^*}{T_i} = \left[\frac{Y^*}{Y}\right]^{\alpha_i} \quad \text{és} \quad \frac{G^*}{G} = \left[\frac{Y^*}{Y}\right]^{\beta} \qquad 6)$$

where

T_i stands for (cycle sensitive) revenues actually realized from tax i,

T^*_i represents structural revenues realized from tax i (to be estimated),

G is actual government expenditures cleaned from capital expenditures,

Y is actual output,

Y^* is potential output,

α_t is tax category i,

β represents the output elasticity of government expenditures.

Some sources consider expenditures based on unemployment and thus talk about the elasticity of expenditures in comparison to unemployment (Girouard – André, 2005). This distinction, however, is insignificant concerning our calculations: the only expenditure regarded by the OECD methodology as elastic to real economic cycles is unemployment benefit (Girouard – André, 2005, page 4). These items are outside the budget balance as per our definition which means that expenditures can be shown with their actual values (actual expenditures and structural expenditures can be considered identical). Similarly, we can disregard social security contributions which constitute revenues for the respective funds and thus are outside the scope of this examination. Naturally, the central budget is related to both social security and separated state funds; this relationship is regulated by the individual acts on the budget but it also keeps the incomes of these funds separated from central budget revenues. Furthermore, when quantifying the structural balance, we took revenues from simplified entrepreneur tax as an external factor (i.e. independent of the effect of cycles). Revenues from this tax type have been collected since January 2003 and their amount reflects an upward trend. According to the tax subject statistics of the Hungarian Tax and Financial Control Administration (APEH), the number of subjects that chose to pay taxes in the simplified entrepreneur tax (Hungarian acronym: EVA) scheme has been growing constantly. As

a consequence, the examination of the related impacts would not yield comparable results due to the expanding group of taxpayers involved. Among expenditures, the unemployment contribution (job seeking allowance) examined by the OECD and other unemployment benefits are financed in part from the Labour Market Fund – thus supports to the unemployed do not show up directly on the expenditure side of the central budget. Using these congruencies, the structural balance can also be expressed as follows:

$$B^{*} = \sum_{i=1}^{4} T_i \left[\frac{Y^{*}}{Y}\right]^{\alpha_i} + T_{NS} - G\left[\frac{Y^{*}}{Y}\right]^{\beta} - G_{NS} \quad , (7)$$

where $\alpha_i > 0$ and $\beta < 0$. This equation also takes into consideration the fact that the methodology classifies cycle-sensitive taxes into four groups as follows: corporate tax, income tax, social security contribution and indirect taxes. We considered all taxes which do not fit into any of these four groups at their actual value (T_{NS}) as their course is independent from the cyclical fluctuations of the real economy. Based on the considerations outlined above, cycle-sensitive expenditures can be disregarded as we accepted to use total expenditures as structural expenditures in our estimations. We took the elasticity coefficients required for the definition of the structural balance (α_i) from the OECD's presentation (Girouard – André, 2005, page 19).[13] Accordingly, we used the following elasticity figures: $\alpha_{i=1,44}$ for corporate tax; $\alpha_2 = 1{,}70$ for personal income tax and $\alpha_3 = 1{,}0$ for consumption taxes.

OUTPUT GAP AND STRUCTURAL BALANCE

When reviewing the methodology above, we could already get a brief insight into some important partial results, so now we can focus on the estimates of the output gap and the structural balance. We considered the structural balance a complete balance of the central budget; this was necessary to enable the comparison of the related figures as the convergence program only quantifies the structural balance for this balance category (Ministry of Finance, 2007). Naturally, we aggregated the monthly figures to (calendar) quarterly level.

Based on the estimation of the production function with limitations, we got to the following equation:

$$\hat{Y} = 0{,}287294 \times N^{0{,}36251} \times K^{0{,}63749}. \quad (8)$$

where the potential output of the real economy can be calculated using the methodology after factor productivity has been smoothed. The resulting output gap in percent of the GDP is showed in *Chart 2;* We compared the difference between the real GDP adjusted for seasonality and the potential GDP to the potential GDP in the quarter under review.

For control purposes, we also present the estimation prepared with the HP filter (as recommended in the methodology, $\gamma = 1600$). *(See Chart 3)*

It is apparent that the estimation generated with the production function shows more intense fluctuations, but the plus or minus sign of the output gap is sufficiently close in the case of both methods (which is quite important for the reliability of estimations). In order to adjust for the fluctuations, we may consider smoothing the output gap (or perhaps the potential GDP time series) with a sufficiently low λ. For the period in question, the Magyar Nemzeti Bank published the following estimates *(see Chart 4)*.

In the light of international experiences, it is no surprise that the output gaps generated with different methods are different. When the OECD began to prefer the production function-based approach over trend smoothing in

Chart 2

OUTPUT GAP IN PERCENT OF POTENTIAL GDP BASED ON THE COBB-DOUGLAS PRODUCTION FUNCTION, Q1 2000 – Q4 2007

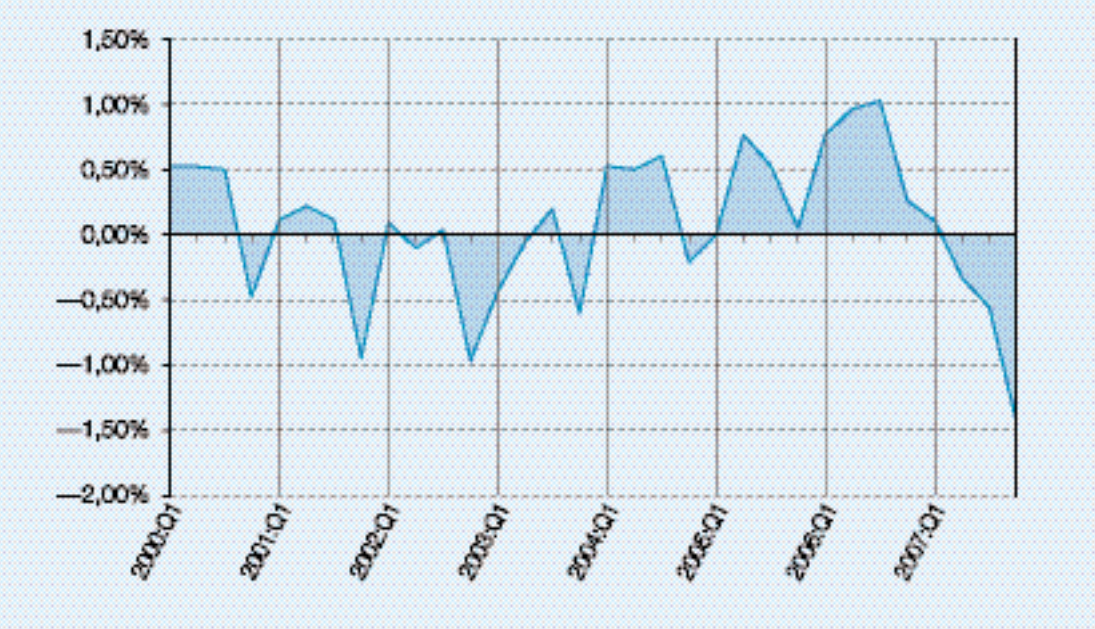


Chart 3

OUTPUT GAP IN PERCENT OF POTENTIAL GDP BASED ON THE HP FILTER, Q1 2000 – Q4 2007

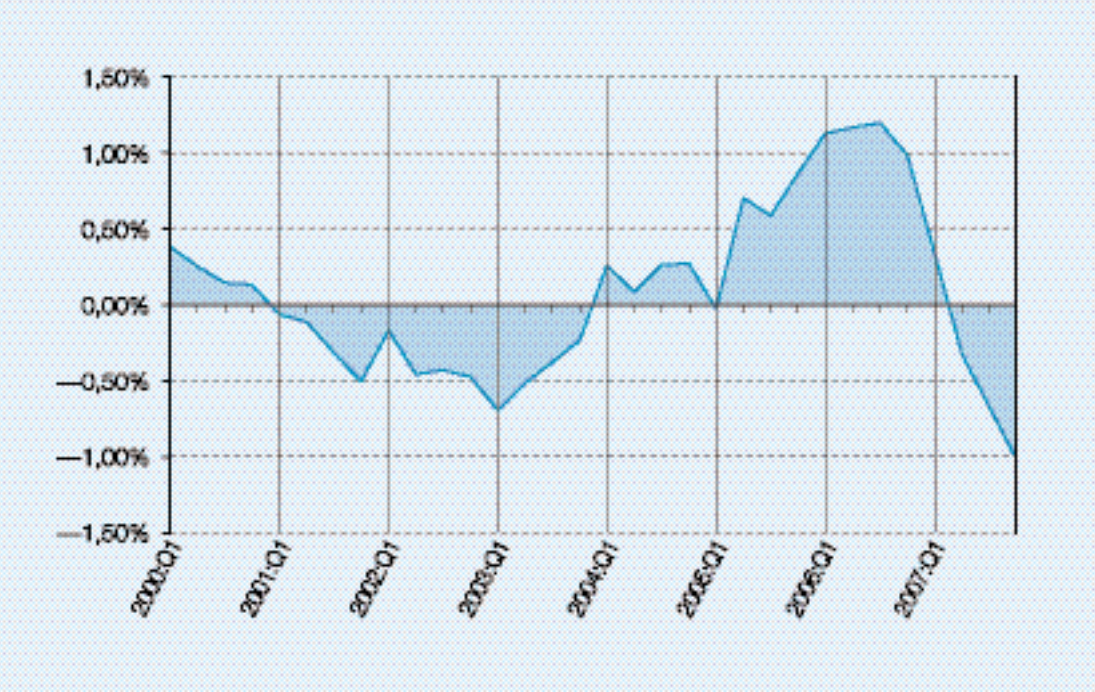
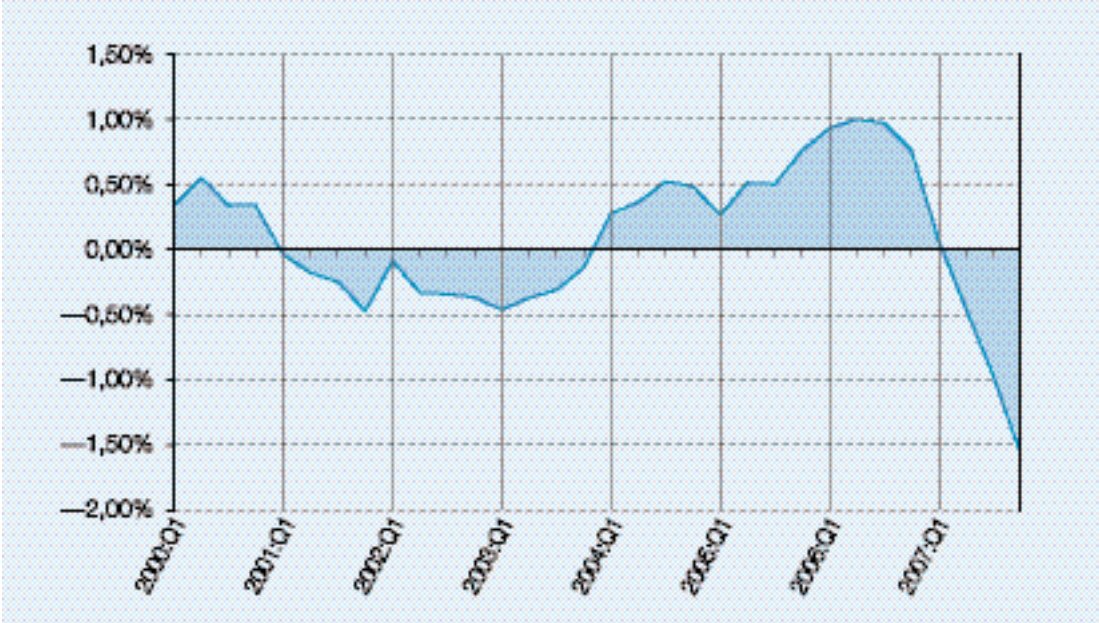


Chart 4

OUTPUT GAP IN PERCENT OF POTENTIAL GDP, Q1 2000 – Q4 2007



Source: MNB (2008)

the mid 1990's, Giorno et al. (1995) carried out a thorough comparison of the various approaches. An analysis of data from between 1971 and 1995 revealed several national economies where the estimates prepared with different approaches did not only differ in terms of the output gap but sometimes in respect of its prefix, too (the examples included Spain, Sweden, Greece and Australia). Another remarkable finding was that the growth rate of the potential output showed bigger year-on-year fluctuations in the case of production function-based estimates than with the smoothing methods. According to an analysis of 1996–2005 data, e.g. the Central Bank of Brazil (they also use inflation targeting) came to similar results when comparing the HP filter and the Cobb–Douglas production function (BCdB, 2005, page 94). It has to be noted though that there is still no consensus about which of these methods is more reliable. Naturally we cannot strive for deciding this matter or taking a clear stand. Although the production function-based approach undoubtedly uses information of a higher order, its application may be objectionable in some cases. There is extensive reasoning in technical literature about why the standard Cobb–Douglas production functions must be estimated with special care in the case of Hungary (e.g. Benk et al., 2005, pp. 10–13; P. Kiss – Vadas, 2004, page 6; 2005, pp. 111–112). Therefore, some specialists recommend complex methods that eliminate these difficulties; These methods partly break away from the approach of production functions and use the toolset of time series modelling instead (e.g. Darvas – Vadas, 2003), while some of them strive for eliminating certain deficiencies while retaining the production function (P. Kiss – Vadas, 2004).

Now it is time to turn our attention to the structural balances derived from the three different types of output gaps. The significance of difficulties with the various methodologies described above is mostly eliminated because

the balance estimates show very little difference *(see charts 5, 6 and 7)*.

The estimates of the structural balance seem to be stable and show no sensitivity to the specific method applied for determining the output gap. Table 1 provides a review of annual balances generated from estimates developed along different methods (the annual balances were prepared by adding up the quarterly balances of the respective years).

As expected, the annual structural balances calculated with the three output gaps show very little difference. What is remarkable however is that the structural balance calculated in accordance with OECD recommendations differ from the values published by the Ministry of Finance for both 2006 and 2007 (although the deviations point to different directions) and both figures suggest favourable fiscal developments (we do not investigate the obvious methodology-related reasons of the difference here).

What should be pointed out regarding the analysis of data instead is that the structural balance followed closely the actual deficit in the years that had an unfavourable annual balance (2002 and 2006 but also 2004 and 2007). What it suggests is that unfavourable fiscal processes can hardly be blamed on actual prosperity or downturn trends. Furthermore, we must conclude that the growth performance of the Hungarian economy did not help the formation of a budget balance (Báger – Pulay, 2008a). In its audit report on the implementation of the act on the budget, the State Audit Office already highlighted the trends indicated by the extraordinary deficit in 2002 (SAO 2003; Kovács 2003). Items which are often qualified as unforeseeable in the final accounts obviously played a role in the sudden growth of the deficit. Most of these items were *budgeting errors* (SAO, 2003, page 18). These budgeting errors are not simply *mistakes:* the fulfilment of budget objec-

Chart 5

STRUCTURAL BALANCE (THE COMPLETE STRUCTURAL BALANCE OF THE CENTRAL BUDGET) IN PERCENT OF CURRENT-PRICE GDP BASED ON THE PRODUCTION FUNCTION, Q1 2000–Q4 2007

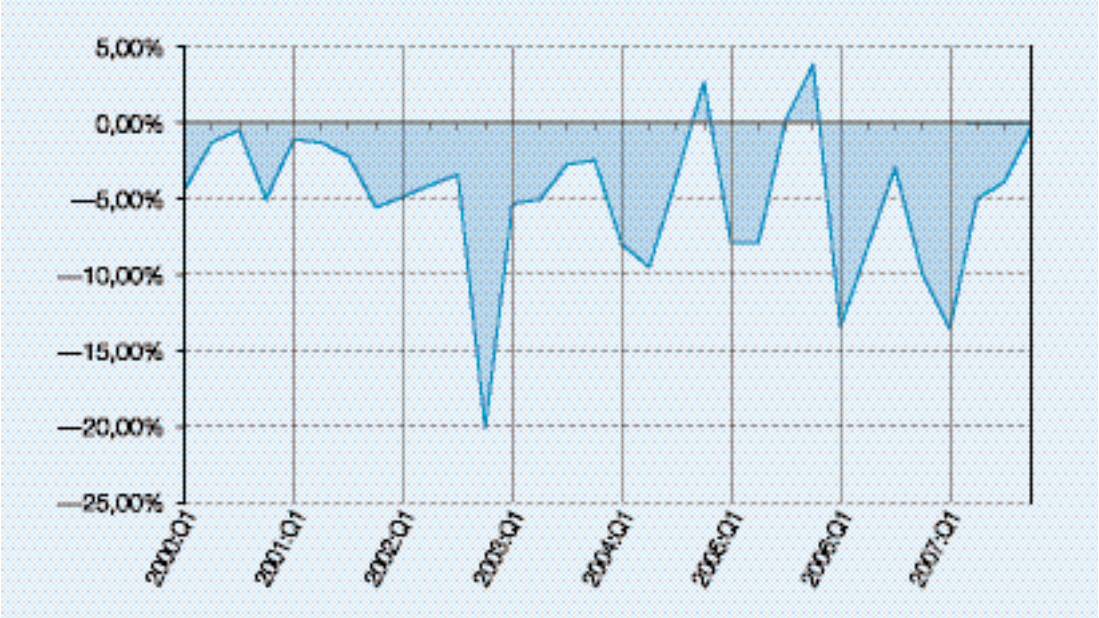


Chart 6

STRUCTURAL BALANCE (THE COMPLETE STRUCTURAL BALANCE OF THE CENTRAL BUDGET) IN PERCENT OF CURRENT-PRICE GDP BASED ON THE HP FILTER, Q1 2000–Q4 2007

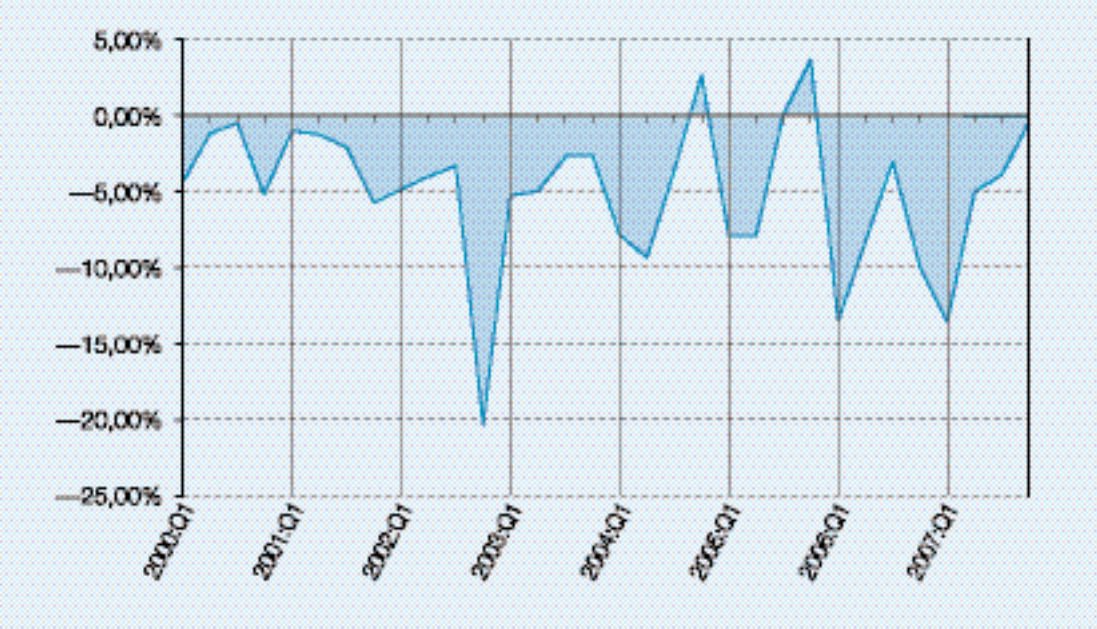


Chart 7

STRUCTURAL BALANCE (THE COMPLETE STRUCTURAL BALANCE OF THE CENTRAL BUDGET) IN PERCENT OF CURRENT-PRICE GDP BASED ON THE OUTPUT GAP ESTIMATED BY THE MAGYAR NEMZETI BANK, Q1 2000–Q4 2007

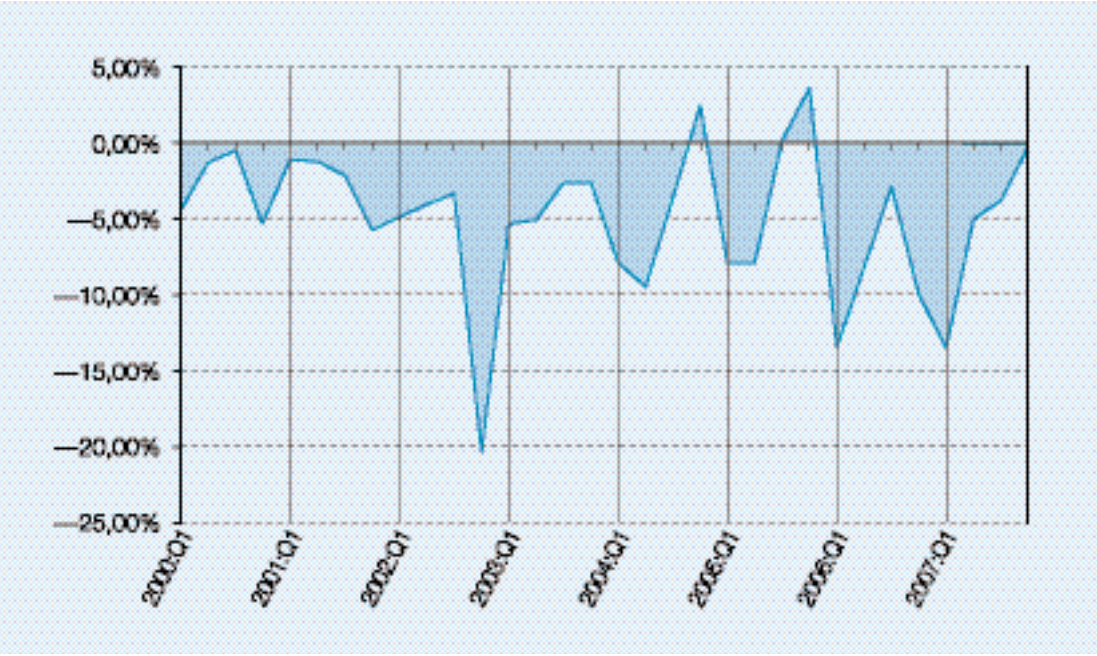


Table 1

ANNUAL BALANCE AND ANNUAL STRUCTURAL BALANCE IN PERCENT OF CURRENT-PRICE GDP, 2000–2007

Year	Structural balance for the year based on production function	Structural balace for the year based on the HP filter	Structural balance for the year based on MNB's output gap	Annual balance	Structural balance as per the convergence program (Ministry of Finance, 2007)
2000	–2.78	–2.78	–2.82	–2.73	
2001	–2.66	–2.64	–2.65	–2.71	
2002	–8.51	–8.49	–8.51	–8.58	
2003	–3.78	–3.74	–3.77	–3.84	
2004	–4.35	–4.34	–4.38	–4.29	
2005	–2.54	–2.59	–2.59	–2.47	
2006	–8.39	–8.48	–8.43	–8.23	–8.8
2007	–5.32	–5.36	–5.28	–5.47	–4.9

tives is burdened by a number of risks and uncertainties, including the incalculability of the macroeconomic environment and he resulting risk. The risk deriving from the functioning of the economic-social environment is inherently present: the improvement of forecasting methods would not provide a solution to the matter, since due to the stochastic nature of reality the future cannot be predicted with full certainty. Thus mistakes that occur during budgeting (provided budgeting is based on careful forecasts) are not necessarily budgeting errors. The latter would include intentional underbudgeting or overbudgeting (and potential technical mistakes) (Báger – Pulay, 2008a, pp. 387–388). Naturally, one-off items do disturb a clear view (P. Kiss, 1998, page 45). Although we more or less disregarded the impact of cycles, the balance still includes items that cannot be considered structural although they are not caused (or eliminated) by cyclical fluctuations. An in-depth analysis identified several one-off items for the period before 2007: e.g. the way motorway construction was accounted for which increased the budget deficit with HUF 250 billion in 2002 and 2006 respectively (amounts charged to this titled were around 200 billion in 2004 and 2005 as well). The budget balance for 2006 was further deteriorated by outstanding items related to the purchase of Gripen jet fighters. All that has been topped by the "additionality" requirement in relation to EU accession since 2004. Without attempting to analyse item by item the budget of each year mentioned here, we must emphasize that although one-off items and those deriving from EU accession had a negative impact on the budget, the deterioration of the budget position were mainly of structural origin and the unfavourable effects did not centre around any specific subset of budget revenues or expenditures (Ohnsorge-Szabó – Romhányi, 2007). As a result of these unfavourable processes, both sovereign debt and the budget deficit reached extraordinary levels by 2006 and unplanned items (or inappropriately budgeted items – meaning purposefully underbudgeted or overbudgeted ones) did play a role in that (Kovács, 2007). We are obviously more or less correct if we identify the *deficit inclination* of the budget with the structural nature of the deficit (applying the terminology used so far). Hungary's engagement in a definitely unhealthy competition with other new EU-10

countries obviously did not help these trends – what is more, they had an explicitly negative effect. In this rivalry, the lack of sustainability and a short-term approach may become economic policy "values" (Csaba, 2008). Talking about the new type of populism that is based on textbook examples, perhaps the way out could be the consideration of high theorems. For the related authors warned decades ago that the axiom of utility maximization is not a postulate without a time dimension. This economic theory and economic policy school (which also originated from the theorems of *Edmund S. Phelps*) firmly argued that attempts to exploit short term benefits clearly deteriorate the future opportunities of any economic policy as amidst unleashed expectations it takes bigger sacrifices in the real economy to redirect any macroeconomic system to the balanced (sustainable) track. Thus the costs of the short-term loosening of fiscal and monetary policy only appear on the medium and long run which may be enticing for the motivations and actions of fiscal government that is (also) driven by political considerations and, at the same time, has a destructive impact on annual planning and implementation of the budget.

SUMMARY

The structural balance indicator is not a miraculous, cure-all tool. It does not answer all the questions about the functioning of fiscal policy. Its application is only appropriate if we employ the widest possible range of tools for judging the position and direction of fiscal policy. It seems that the former debate on the proper interpretation of cyclically adjusted balance and its usefulness has settled by now and excess expectations concerning the indicator have become moderate.

We think that the selection of one item from the diverse set of approaches available for the quantification of the structural balance and the implementation of recommendations as consistently as possible may help clarify the questions about the usability of this methodology. Our study was intended to serve this very purpose. The results we got were consistent with the structural balances gained with alternative methods or based on output gaps, i.e. the method does not seem to be sensitive to the method selected for the determination of the output gap – assuming the methodology is correct and produces an output that is theoretically defendable.

NOTES

[1] Interestingly, technical literature was evidently too demanding in respect of the cyclically adjusted budget balance indicator. E.g. Muller and Price (1984) argued that the sustainability of the budget can be assessed correctly based on the structural balance indicator since cyclical correction separates the effects of booms/downturns and discretional fiscal policy measures; in their view, the structural balance is a good indicator of the aggregate demand-regulating activities of fiscal policy. Later the clarification of misunderstandings around the proper use of the structural balance and the right question became just as important an issue as establishing the right methodology (see more about this in Blanchard, 1990).

[2] Due to the conceptual relation to the core inflation indicator, the structural balance indicator is often referred to in technical literature as the core balance (see e.g. Ize, 1983).

[3] The accurate definition of the structural balance highlights the same feature, defining the balance as the difference between budget expenditures and revenues which we would have in case the real economy were steadily and lastingly growing at its full potential (Muller – Price, 1984).

[4] Naturally, the analyst must make decisions when applying this methodology, too. These decisions, however, are hardly related to the quality of data

used and the structural characteristics of the national economy concerned. E.g. when using the HP filter, one must arbitrarily select a parameter that defines the robustness of smoothing. Although the original methodology does provide recommendations on this (Hodrick – Prescott, 1997, page 4), technical literature mostly rejects this approach and researchers are divided over the principles to follow during the analysis. E.g. the parameter in question can be chosen in a way that the resulting smoothed time series produces cycles which are consistent with former expert opinions of the cycles of the national economy. The heart of the problem is that researchers must make an arbitrary judgement on the smoothness of potential GDP changes (see more in OECD, 2001, pp. 41–42). Another thing to pay attention to with the HP filter is to have the start date and end date of the analyzed period in the same section of the cycle or else the resulting trend will be distorted. One solution of this problem is to provide an expert estimate of future GDP, i.e. the extension of the sample period.

[5] This conceptual change is not independent of how we interpret potential output. If potential output is a trend around which actual output fluctuates and forms cycles, it can be described well with trend filtering approaches. If we definitely link potential output to the supply side, potential output will be equal to an output level that would emerge upon the optimal use of capacities (labour, capital assets, human capital). In these cases, quantification calls for a production function (see all this in more detail in Benk et al., 2005). The difference between these two approaches also highlights the key difference between the methodologies used for estimating the potential GDP.

[6] If we were to review the historic evolution of labour market equilibrium categories, we would run into an interesting theoretical problem. Without outlining this topic in any detail, we just refer briefly to the fact that the groundbreakers in this area were Milton Friedman and Edmund S. Phelps. Despite the similarities on the surface, they established fundamentally different concepts. For Friedman, the natural rate of unemployment was an unemployment level at which inflation could be increased in a sustainable manner and at which all people can be employed who are willing to seek a job (Friedman, 1986, pp. 228–229; Begg, 1982, pp. 132–133). Thus supply and demand on the labour market are equal here. In Phelps' interpretation, the equilibrium rate of unemployment refers to an unemployment level where ex-ante and ex-post inflation are identical – forced unemployment can be present though (Phelps, 2006), i.e. we cannot talk about the equilibrium of the labour market here. It seems highly obvious that estimates prepared with the production function will differ depending on the equilibrium concept selected for describing the position of the labour market.

[7] Another reason for not doing so is that with the N.E.M., the explanation of HP filtering is not savings but the fact that equilibrium unemployment is affected by a number of variables which are exogenous factors in the model and their relation to labour supply is difficult to clarify according to the supporters of these arguments (Benk et al., 2005, page 11).

[8] After more thorough consideration, we cannot think that the variability of NAWRU over time is proving the mainstream theory wrong. In this context, Ball and Mankiw (2002) argues that the fluctuations of the natural unemployment rate prove that monetary policy, at least on the short run, is able to affect the level of aggregate demand thus trigger changes in inflation and unemployment.

[9] In the analyses herein we took unemployment for the 15–74 age groups based on HCSO figures. W represents quarterly gross wages of full time employees.

[10] The application of this approach is not unprecedented in Hungary (see e.g. P. Kiss – Vadas, 2004; furthermore, this method is used in the MNB's quarterly forecast model; see Jakab et al., 2004). What is more, the OECD methodology leaves room for this simplification by allowing the estimation of the potential output of the government sector. Although the methodology recommends the splitting of the real output of the national economy by governmental and non-governmental sector (Torres – Jarrett – Suyker, 1989, page 5), it would only be feasible with the introduction of a number of assumptions which would erode the validity pf estimation results.

[11] The point of this concept is that the net capital stock of any t point of time can be determined using three figures (net capital stock in the t–1 period, gross investment in the t period and depreciation in the t period).

[12] Based on expert opinions, we assume a depreciation rate of rate of D=0,016 (i.e. 1.6 per cent) in the calculations. Relying on Pula (2003), we took the year-end capital stock of 1994 as the starting value; For Q1 1995, we already applied estimates as per (5), using figures published by the HCSO (we converted both the 1994 capital stock and investments to year 2000 prices).

[13] That study did not examine the elasticity of simplified entrepreneur tax which was another reason to take the related tax revenues as a given factor.

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