

## Cyclical adjustment of the public sector financial balance in Germany – a disaggregated approach

The overall public sector financial balance is an important fiscal policy indicator determined by manifold factors, including the government's fiscal policy stance, but also by cyclical influences. To evaluate a country's fiscal policy orientation, it is necessary to assess the effects of the business cycle on public sector budgets. This article presents a procedure for cyclically adjusting the government budget balance in Germany. It also seeks to highlight the trends that have been discernible in fiscal policy in the past several years by reference to the cyclically adjusted balance. The results suggest that the responsiveness of the public sector financial balance in Germany to cyclical trends is not very pronounced and that German fiscal policy has tended to be pro-cyclical since reunification. Although such calculations present an important tool for analysing fiscal policy, they cannot take the place of a comprehensive qualitative assessment which also takes due account of the overall financial balance as well as longer-term developments – in particular, signs of demographic strains.<sup>1</sup>

---

<sup>1</sup> This approach refines an article presented in an earlier Monthly Report. See Deutsche Bundesbank, Problems associated with calculating "structural" budget deficits, Monthly Report, April 1997, pages 31 ff.

## The need for cyclical adjustment

*Financial  
balance  
influenced by  
various factors*

The overall public sector deficit reflects the influence of various factors. It is determined by the results of fiscal policy debate and decision-making, but also by the macroeconomic environment, which is itself subject to fiscal policy stimuli.<sup>2</sup> These complex interrelations make it difficult to identify cyclical influences and, therefore, to interpret developments in the budget balance.

*Previous  
approaches*

For this reason, the calculation of “structural” budget deficits, which are virtually immune to short-term influences, has long been a focus of public finance research and fiscal policy. Numerous approaches have been elaborated, the most common being the methods of the OECD, the IMF and the European Commission.<sup>3</sup> However, the individual calculation methods yield quite different results, indicating a need for further debate on this topic. The analysis presented in this article, which takes special account of Germany’s institutional framework, is a step in that direction.

*Cyclically  
adjusted and  
structural  
balance*

The analysis is limited to the cyclically adjusted balance, which is defined as the financial balance of the public sector, as delineated in the national accounts, excluding the cyclically related components. This measure differs from the “structural” balance, which is intended to reflect the basic orientation of the public sector budget. The calculation of the structural balance requires additional steps that chiefly involve recording the “transitory” elements of the overall financial balance, for example irregular effects on tax revenue.

The government balance is usually adjusted for cyclical influences according to the “elasticity method” (for more details see page 33). The cyclically related revenue and expenditure components of the overall public sector budget are put in relation to macroeconomic aggregates – e.g. private consumption, compensation of employees, or unemployment – which are as similar as possible to the assessment bases for revenue and expenditure. The cyclical development of these macroeconomic variables, in turn, is calculated on the basis of deviations of real gross domestic product (GDP) from its longer-term potential or trend value. The analysis is based on the assumption of a stable relationship between the respective reference aggregate and GDP, i.e. that the cyclical deviations of the relevant macroeconomic variables from their trend development run parallel to those of GDP. The

*Elasticity  
method*

<sup>2</sup> While cyclical adjustment approaches are aimed at capturing the influence of cyclical factors on the budget, so-called fiscal impulse concepts measure the influence of budgetary developments on the business cycle. See the Report of the German Council of Economic Experts for 1998–99: *Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, Jahresgutachten 1998/99*, pages 299 ff.

<sup>3</sup> See Giorno, Claude, Pete Richardson, Deborah Roseveare, and Paul van den Noord (1995), Potential Output, Output Gaps, and Structural Budget Balances, OECD Economic Studies No. 24, 1995/II, pages 167–202; European Commission (1995), Technical Note, The Commission Services’ Method for the Cyclical Adjustment of Government Budget Balances, European Economy 60, pages 35–55; Ziebarth, Gerhard (1995), Methodology and technique for determining structural budget deficits, Discussion paper 2/95, Deutsche Bundesbank; Banca D’Italia (ed.) (1995), Indicators of structural budget balances. Essays presented at the Bank of Italy workshop held in Perugia, 26–28 November 1998, Banca D’Italia; Hagemann, Robert (1999), The Structural Budget Balance. The IMF’s Methodology, IMF Working Paper WP/99/95, IMF; Leibfritz, Willy (1999), *Finanzpolitik und Konjunktur: Die automatischen Stabilisatoren in Deutschland*, ifo Schnelldienst 29/99, pages 14–22; van den Noord, Paul (2000), The Size and Role of Automatic Fiscal Stabilisers in the 1990s and Beyond, Economics Department Working Papers No. 230, OECD.

relationships between the budgetary revenue and expenditure components, on the one hand, and the reference variables and GDP, on the other, are estimated by means of elasticities<sup>4</sup>. Thus, this concept ultimately traces all cyclically related revenue and expenditure back to the cyclical fluctuations of real GDP. From a long-term perspective, such an approach is justified because in the long run, there is a stable relationship between the development of overall GDP and that of its components.

*Disaggregated  
approach*

In the short term, however, there can be considerable deviations which are of relevance for the evaluation of fiscal policy, particularly during the current period. An approach focused exclusively on the cyclical development of GDP can thus lead to inaccurate assessments in individual years. Therefore, this article presents a variant of the elasticity approach to estimating cyclical deficits in which the cyclical movements of the major macro-economic variables are analysed as their deviation from their own long-term trend development. Consequently, their short-term development may differ from that of GDP.<sup>5</sup> Unlike the conventional elasticity approach, in which deviations from the potential or trend value of real GDP characterise the course of business activity, the approach presented in this article is based on the trend deviation of the nominal reference variables instead of the real reference variables because

<sup>4</sup> The elasticity of a variable T with respect to a variable Y is generally defined as the ratio of the percentage change of T to the percentage change of Y ( $\Delta T/T$ )/( $\Delta Y/Y$ ).

<sup>5</sup> This approach is based on Momigliano, Sandro and Alessandra Staderini (1999), A New Method of Assessing the Structural Budget Balance: Results for the Years 1995–2000, in Banca d'Italia (1999), pages 119–157.

### Elasticity method for calculating cyclically adjusted balances

According to the elasticity method, the cyclically related components of the financial balance are calculated as follows:

$$T_c^i = T^i \eta_{T,V^i} \eta_{V^i,Y} y_c,$$

where  $\eta_{T,V^i}$  stands for the elasticity of revenue  $T^i$  with respect to reference variable  $V^i$ ,  $\eta_{V^i,Y}$  is the elasticity of  $V^i$  with respect to gross domestic product Y, and  $y_c$  is the percentage deviation of GDP from its trend or potential value. In the conventional approach, this implicitly defines a cyclical percentage deviation of reference variable  $V^i$  from its trend:

$$v_c^i = \eta_{V^i,Y} y_c,$$

where  $v_c^i$  stands for the trend percentage deviation of reference variable  $V^i$ . This calculation is based on the assumption that the relationship between the reference variable and GDP is likewise stable in the short term, and that this is reflected in its elasticity, causing the resulting cyclical pattern of variable  $V^i$  to be identical with that of GDP.

The disaggregated approach presented in this article is not based on the above assumption. Rather, the trend deviation  $v_c^i$  is calculated as the relative deviation from the variable's own trend, which means that the cyclical pattern of the reference variable may differ from that of GDP. The cyclical component of revenue category  $T^i$  is thus calculated as follows:

$$T_c^i = T^i \cdot \eta_{T,V^i} v_c^i.$$

If  $X^j$  denotes the expenditure component j, then the cyclically related financial balance can be calculated as the sum of cyclically related revenue less the sum of cyclically related expenditure:

$$B_c = \sum_i T_c^i - \sum_j X_c^j = \sum_i T^i \eta_{T,V^i} v_c^i - \sum_j X^j \eta_{X^j,V^j} v_c^j = \sum_i T_c^i - \sum_j X_c^j.$$

these are ultimately the relevant variables for the elasticities of the revenue and expenditure components.<sup>6</sup>

### Cyclically related revenue and expenditure

*Cyclically influenced revenue and expenditure*

To be able to identify the categories of revenue and expenditure influenced by cyclical factors, these must react automatically to cyclically induced changes in their respective assessment bases. In Germany, this is especially the case for tax revenue and social security contributions, on the revenue side, and the expenditure related to unemployment and the general Federal grant paid to the pension insurance funds, on the expenditure side. There are other categories of government revenue and expenditure which may also be cyclically related but do not, or only partly, react automatically to cyclical fluctuations. The largest of these categories, in quantitative terms, is expenditure on personnel, which has been included in the calculations presented here for the reasons cited later on in the text.<sup>7</sup> The revenue and expenditure categories that are taken into account in the cyclical adjustment must largely be corrected for payments within the public sector. Their assignment to the respective macroeconomic variables is shown in the table on page 35. The method of calculating the cyclical revenue and expenditure components is explained in the Annex.<sup>8</sup>

*Macroeconomic reference variables*

The first step is to estimate the macroeconomic reference variables' trend deviations, which are interpreted as cyclical fluctuations

in the economy, using the Hodrick-Prescott filter (HP filter, see page 36). With regard to the delineation of the reference variables, it is important that their cyclical pattern not be distorted too severely by discretionary government measures and that it principally reflect only developments in the private sector. Consequently, public sector transactions contained in these variables should be eliminated as much as possible. For example, public sector employees should be subtracted from the total number of wage and salary earners. In a second step, the elasticities with which the budget components react to the macroeconomic reference variables are estimated.

In the case of turnover tax, the proportion of tax revenue attributable to government purchases must be deducted. This tax is based on a proportional tax scale with a lower tax rate on selected goods. Based on the assumption that the proportion of goods taxed at the lower rate and those not taxed at all remains broadly constant throughout the course of the business cycle, the elasticity of turnover tax revenue with respect to nominal private consumption can be expected to equal one.<sup>9</sup>

*Turnover tax*

<sup>6</sup> It should be pointed out that the macroeconomic reference variables for revenue and expenditure chosen here are only approximations of the true assessment bases.

<sup>7</sup> Naturally, the results with regard to the cyclical responsiveness of the government budget balance will vary depending on which items are included in the calculation. This should be kept in mind when evaluating the results presented in this article.

<sup>8</sup> The calculation method that is used here is presented in detail in the following working paper, which is scheduled to appear in the near future: Mohr, Matthias (2000), *Zur Konjunkturbereinigung des staatlichen Finanzierungssaldos in Deutschland – Methodik und Resultate eines disaggregierten Ansatzes*, Deutsche Bundesbank.

<sup>9</sup> This calculation does not take account of housing construction, which should generally be included in the reference variable.

## Classification of revenue and expenditure by macroeconomic reference variable

### Revenue

Turnover tax <sup>1</sup>  
Consumer taxes <sup>2</sup>  
Wage tax incl. solidarity surcharge  
  
Social security contributions <sup>3</sup>  
Taxes on entrepreneurial and investment income <sup>4</sup>

### Macroeconomic reference variable

Nominal private consumption  
Real private consumption  
Average nominal wages and salaries, private sector employees  
Nominal private sector wages and salaries  
  
Nominal entrepreneurial and investment income according to the internal market concept (operating surplus and mixed income pursuant to the ESA 95)

### Expenditure

Expenditure on unemployment benefits <sup>5</sup>  
Short-time working benefits  
General Federal grant paid to wage and salary earners' pension insurance funds  
Government expenditure on personnel

### Macroeconomic reference variable

Number of unemployed  
Short-time workers  
Nominal private sector wages and salaries, average nominal private sector wages and salaries  
Negotiated private sector wages and salaries

<sup>1</sup> Adjusted for turnover tax on government purchases. — <sup>2</sup> Including motor vehicle and insurance taxes. From 1999 including electricity tax. — <sup>3</sup> Contributions to the Federal Labour Office and for statutory health and nursing insurance schemes only, adjusted for the contributions paid by the Federal Labour Office and the pension insurance

funds. — <sup>4</sup> Sum of assessed income tax, corporation tax, non-assessed taxes on investment income (all including solidarity surcharge) as well as trade tax. — <sup>5</sup> Adjusted for health and nursing insurance contributions paid by the Federal Labour Office.

Deutsche Bundesbank

#### Special consumer taxes

In a derogation from the usual procedure, special consumer taxes (their major components being mineral oil, tobacco and spirits taxes) are expressed in terms of real private consumption because they are predominantly quantity-based. The short-term elasticity of these special consumer taxes with respect to changes in real private consumption is econometrically estimated at 0.8.

changes in average wages affects the revenue by a considerably higher elasticity (an estimated average of just over 1.8) owing to the progressive wage tax scale.<sup>10</sup>

#### Wage tax

With regard to the inflow of revenue from progressive wage taxation, the following two cyclical factors must be analysed separately: on the one hand, wage tax revenue reacts to absolute increases in employment with an elasticity of one if the average wages and the distribution of employees' income are assumed to be constant. On the other hand, if employment is assumed to remain constant,

Such a subdivision of the assessment base is not necessary in the case of social security contributions because the relationship between the contributions and compensation of employees can be assumed to be broadly proportional, implying an elasticity of one.<sup>11</sup> By contrast to the previous cyclical adjust-

*Social security  
contributions*

<sup>10</sup> The elasticity of wage tax revenue is estimated on the basis of a wage tax model that takes into account the current tax rate and the most important tax allowances as well as the distribution of income and thus enables an estimation of both tax rate and tax base elasticity.

<sup>11</sup> The immediate regressive effect of the income thresholds for assessing contributions is broadly compensated by the annual adjustment of the thresholds, which means a proportional rate of taxation of social security contributions may serve as a good approximation.

## The Hodrick-Prescott filter

A time series  $Y$  can theoretically be decomposed into a trend component  $Y_{g,t}$  and a cyclical component  $Y_{c,t}$ :

$$Y_t = Y_{g,t} + Y_{c,t}.$$

The Hodrick-Prescott filter <sup>1</sup> is the result of the minimisation of a loss function which is made up of two terms: the square sum of the deviations of the actual values from the trend values and the variability of the trend, measured in terms of the square sum of the second differences of the trend values:

$$\sum_{t=2}^{T-1} ((Y_t - Y_{g,t})^2 + \lambda (\Delta Y_{g,t+1} - \Delta Y_{g,t})^2).$$

The series of the trend values  $Y_g$  is chosen in a way that minimises the target function. This is designed to create a trend which is flexible over time while at the same time being adjusted for short-term and medium-term cyclical movements in the original series. The weight attached to the trend variability relative to the deviations of the actual values from the trend in the minimisation approach depends on the parameter  $\lambda$ . The bigger  $\lambda$  is, the more severely trend variability is penalised in the optimisation procedure and the more rigid the resulting trend is. If  $\lambda = 0$ , the trend series is identical with the original series. If, however,  $\lambda$  approaches infinity, a rigid linear trend is created. The value of 20 for annualised data used in this exercise was chosen in a way which allows the resulting series of trend deviations to reproduce as plausibly as possible the cyclical patterns of the macroeconomic aggregates.

Since the Hodrick-Prescott filter is a two-sided moving average, the trend values at the beginning and the end of the time series are distorted because of the lack of data for calculating a two-sided average near the starting or end points. For the assessment of fiscal policy, however, the end point is of particular importance. For this reason, the time series are extended beyond the end point on the basis of forecasts before the filter is applied. This enables the methodological distortions to be reduced. <sup>2</sup>

The series  $y_c$  which denotes the percentage trend deviation, is ultimately derived from the time series  $Y_g$ :

$$y_{c,t} = (Y_t - Y_{g,t})/Y_{g,t} \approx \log(Y_t) - \log(Y_{g,t}).$$

<sup>1</sup> See Hodrick, Robert J./Edward C. Prescott (1980): Post-war U.S. Business Cycles: An Empirical Investigation, Discussion Paper No. 451, Carnegie Mellon University. —

<sup>2</sup> Another imperfection of this filtering method is the inadequate coverage of jumps in time series, e.g. owing to German unification or the transition of national accounts to ESA 95, which caused the level of GDP to shift. This problem was solved by adjusting the time series for the leaps in levels resulting from these special effects before applying the filter.

ment methods, however, the approach presented in this article is limited to unemployment, health and nursing insurance contributions. Statutory pension insurance contributions, on the other hand, are not taken into account. Although pension insurance schemes' revenue and expenditure is subject to cyclical influences (on the revenue side, revenue from contributions is linked to compensation of employees, and since the pensions are adjusted according to the net wages of the previous year, the expenditure side is also subject to cyclical stimuli, albeit with a time lag), the pension reform of 1992 provides that the budget of the statutory pension insurance funds must be broadly balanced each year if the fluctuation reserves reach the level of one month's expenditure. The budget is balanced by automatically adjusting the contribution rate on the basis of the estimated wage developments in the current and the coming year in such a way that the pension insurance scheme's revenue exactly equals its expenditure including the funds necessary for maintaining the statutory reserve. In this way, cyclically induced changes in contribution-related revenue and pension expenditure are generally neutralised. The budget is balanced ex ante; regarded ex post, estimation errors can, of course, lead to deviations from the prescribed fluctuation reserves. Such estimation errors are not regarded as being cyclically related. If a structural deficit were being calculated, they would have to be taken into account as temporary special effects.

In principle, the necessity of a balanced budget also applies to the other sectors of so-

cial security, yet in those cases, in contrast to the pension insurance funds, this does not immediately lead to a cyclically neutral balance. Nursing insurance contributions, for example, are not adjusted automatically. Here, and also in the case of statutory health insurance schemes, reserves exceeding the required amount make it possible for the business cycle to occasionally impact on their budget. The Federal Labour Office balances its budget by means of a Federal grant, which means that, through this payment, cyclical effects in the development of contribution-related revenue (and unemployment-related expenditure) are ultimately reflected in the Federal budget.

*Taxation of  
entrepreneurial  
income and  
investment  
income*

The revenue components discussed so far may be assumed to be empirically closely correlated to their respective macroeconomic reference variables. In the case of the aggregated taxes on entrepreneurial and investment income,<sup>12</sup> the correlation is much less certain. There are two main reasons for this. Firstly, a part of assessed tax revenue reacts to developments in the assessment bases with sharply fluctuating time lags. Secondly, the macroeconomic reference variable for these taxes is a residual derived from the national accounts which is subject to substantial uncertainty. The calculation presented in this article is based on a revenue time lag of up to two years; the reference variable for the current year is given a 70% weighting, while the variables for the two preceding years are each assigned a weight of 15%. This extremely simplified subdivision of the tax aggregate on the basis of stable revenue time lags and stable elasticities may lead to in-

accurate assessments in individual years and must, where applicable, be modified by means of a qualitative evaluation.

On the expenditure side, unemployment benefits and short-time working benefits are clearly subject to cyclical influences. Short-time working benefits are treated entirely as cyclical expenditure. With regard to unemployment benefits, however, it must be borne in mind that a large proportion of unemployment is deemed to be structural. The cyclical component of expenditure on unemployment benefits is thus determined by means of the trend deviation of the relevant reference variable – the number of unemployed. This calculation is based on the assumption that all employees that became unemployed owing to cyclical factors receive unemployment benefits to the amount of the average expenditure per recipient less the health and nursing insurance contributions of the Federal Labour Office contained in that amount. The cyclical component of unemployment benefits is then determined as the product of those average net receipts and the number of cyclical unemployed.

*Expenditure on  
unemployment*

Government expenditure on the wages and salaries of public sector employees may also be regarded as a cyclically related expenditure component. All other cyclical adjustment

*Expenditure on  
personnel*

---

12 This tax aggregate comprises assessed income tax, corporation tax, non-assessed taxes on investment income (all including solidarity surcharge) as well as trade earnings tax. Operating surplus and mixed income pursuant to the ESA 95 were chosen as the macroeconomic reference variable. This classification of the above mentioned taxes takes no account of the statistical overlapping of assessed income tax and income tax deducted at source with regard to wage and salary income.

methods treat this component as entirely discretionary and thus as irrelevant to cyclical adjustment. As a result, however, all changes in public sector wages and salaries fully impact on cyclically adjusted expenditure. In Germany, at least, the underlying assumption that public sector income developments are not influenced by overall wage and salary trends is not very plausible. In the usual German institutional pay negotiation process, private sector pay settlements generally set the pace for public sector negotiations.<sup>13</sup> Overall, it therefore seems justified to include a cyclical component of government expenditure on personnel. However, public sector personnel costs are only adjusted for the adaptation of negotiated public sector wages and salaries to corresponding cyclical developments in the private sector. In that sense, changes in public sector personnel costs are only considered discretionary if they result from changes in public sector employment or from wage and salary adjustments that differ from those in the private sector. Together with the trend change in negotiated private sector earnings, these discretionary changes determine cyclically adjusted expenditure.

*Federal grant to  
the pension  
insurance funds*

The general Federal grant paid to the pension insurance funds of salary and wage earners is adjusted every year according to the percentage change in average salaries and wages in the previous year and the percentage change in the pension insurance contribution rate in the current year. This rule can be used to derive the elasticities of the Federal grant with respect to the average wages and salaries in the previous year and the current year.<sup>14</sup>

Although the Federal grant to the pension insurance funds constitutes a payment within the government sector, this transaction cannot be excluded. Since the pension insurance funds always factor in the expected Federal grant when making plans for a balanced budget (and adjust the contribution rate accordingly), a change in the Federal grant does not manifest itself in the pension fund's balance sheet, but rather in a change in its contribution rate. Consequently, a higher Federal grant leads to a deterioration of not only the Federal Government's financial balance, but also the general government financial balance, part of which is attributable to cyclical factors. All in all, however, the impact of this effect is only minor.

### Fundamental differences compared with other calculation methods

The calculation methods used by other institutions (Board of Experts for the Assessment of Overall Economic Trends, OECD, IMF and European Commission) usually provide for the cyclical adjustment of all social security contributions – including those for public sector employees – and do not take into account cyclically related expenditure on pension insurance funds. In addition, they all regard ex-

*Different  
methods of  
recording  
revenue and  
expenditure ...*

<sup>13</sup> A close short-term correlation can also be proven between German public and private sector wages and salaries by means of regression analysis.

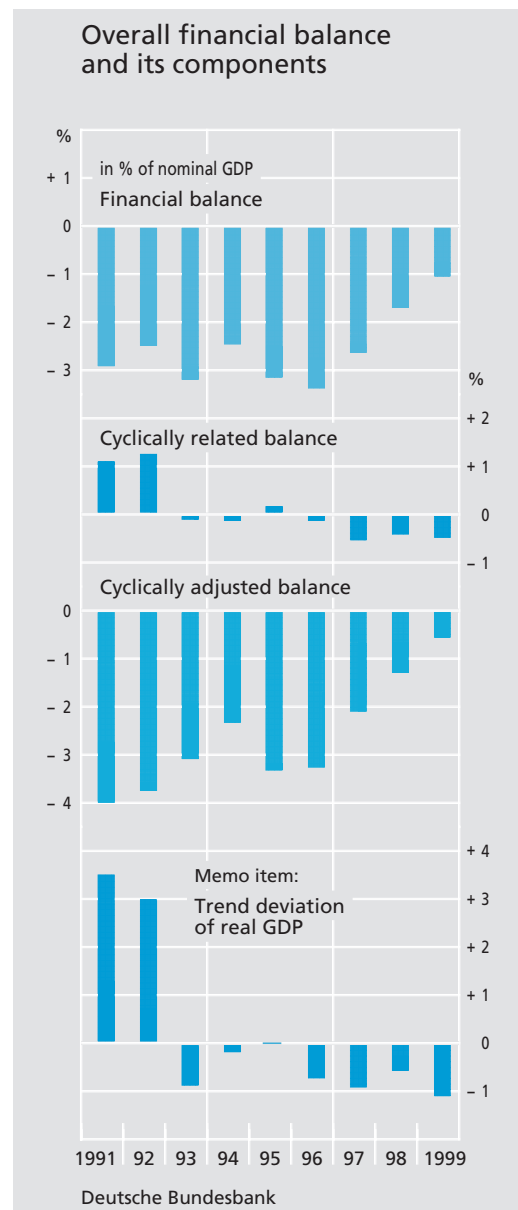
<sup>14</sup> Only the general Federal grant is taken into account. The Federal grants paid in connection with periods of child-rearing, which are being financed by means of the "ecological tax reform", were introduced in 1999, but will not be automatically adjusted until 2001. The additional Federal grant pegged to the development of turnover tax revenue and the "ecology tax" is also disregarded.



penditure on personnel as being entirely discretionary. These two factors largely explain the greater cyclical responsiveness of the budget, on a long-term average, according to these calculations.

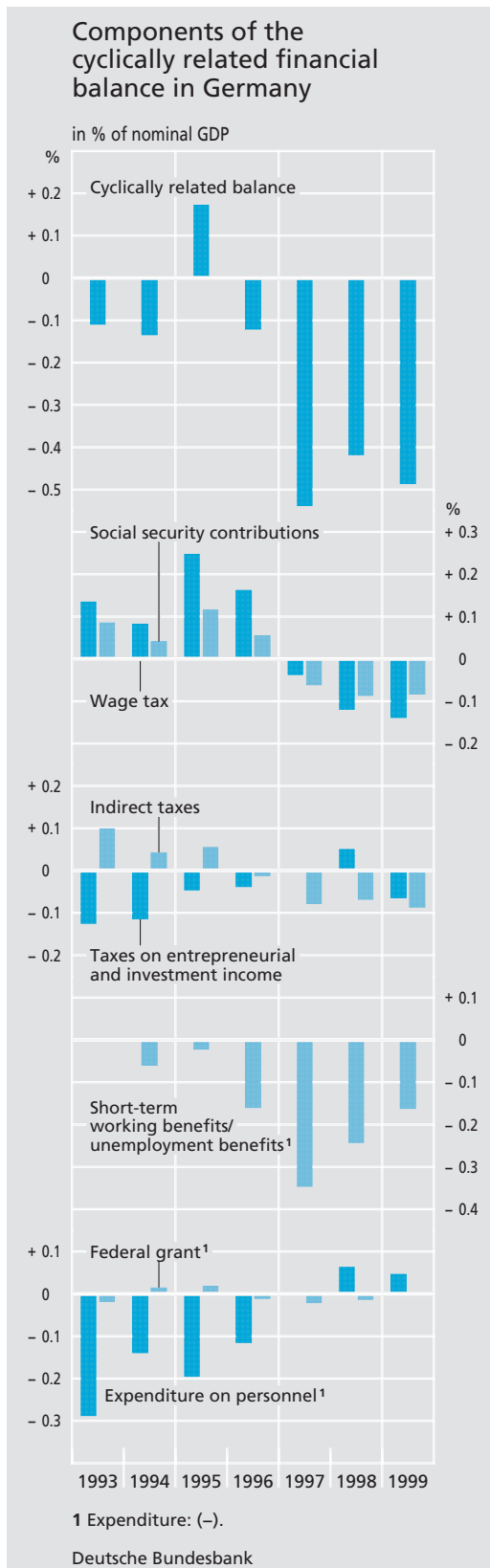
*... and of  
adjusting the  
macroeconomic  
variables*

In addition, the different methods for estimating cyclically related deviations of the underlying macroeconomic variables create differences in their measured cyclical responsiveness. The OECD, the IMF and the Board of Experts for the Assessment of Overall Economic Trends all base their assessments of the economic situation on an estimation of the overall output gap, calculating the cyclical component of GDP as the deviation from overall output given normal utilisation of factors of production.<sup>15</sup> These approaches generally lead to greater cyclical deviations than an HP filter. The advantage of such procedures based on production functions is that the course of business activity, from a theoretical point of view, is determined in a more satisfactory manner. The HP filter, by contrast, represents a purely statistical trend calculation procedure that provides almost no degree of freedom to take account of economic criteria when estimating the course of business activity. However, one may also regard the associated limited structuring possibilities as an improvement in transparency. Moreover, the methods based on output gaps hardly allow a differentiated approach to be followed that takes account of potential disparities in cyclical developments in the reference variables for revenue and expenditure, because the business cycle is determined exclusively by the real output gap. Finally, unlike the HP filter procedure, these methods do not guarantee



that cyclically induced surpluses and deficits nearly offset one another over a manageable time-horizon.

<sup>15</sup> The European Commission, by contrast, calculates the cyclical component of real GDP using an HP filter.



## Development of the cyclically adjusted financial balance since 1991

Following the unification-related boom, overall economic developments in Germany in the nineties were chiefly characterised by periods of weakness. The cyclically related financial balance developed broadly in line with the trend deviation of GDP, although divergences were quite discernible in individual years. In 1994, for example, the financial balance did not undergo the expected improvement despite a distinct economic upswing. In 1999, on the other hand, it hardly deteriorated despite the economic slowdown. The key factor in 1994 was the inverse development of the trend deviation of employee compensation and GDP, with wage and salary increases remaining moderate. Wages and salaries play a special role in this context because they are the factors determining wage taxes and social security contributions, both of which yield high revenue. In 1999, unemployment declined despite weaker economic growth.

*GDP and cyclically related balance*

In the other years, the change in the cyclically adjusted balance moved in the same "direction" as the trend deviation of GDP, but the type of invariable correlation such calculations are generally based on was not discernible. In the disaggregated cyclical adjustment approach, sensitivity with regard to the trend deviation of GDP can only be regarded as a meaningful indicator for the analysis of longer-term developments; for the short-term analysis, the indicator must be used with caution.

A further important result of the calculations discussed in this article is that the cyclically related fiscal balances are relatively small in

*Relatively small cyclically related balances*

Germany and thus indicate that the government budget balance is not very responsive to cyclical changes. After the exceptional years of 1991 to 1993 following German reunification, the cyclical balance remained within a margin of around plus/minus ½% of GDP. The most prominent change occurred in 1997, when a deterioration of almost one-half percentage point was recorded. All in all, the cyclically adjusted balance thus follows a pattern very similar to that of its unadjusted counterpart. This is chiefly attributable to the fact that cyclically related revenue goes hand in hand with considerable cyclically related expenditure in the form of staff costs, which tend to react in a pro-cyclical way and thus partially offset the effects of revenue developments on the financial balance. In the procedure presented in this article, revenue amounting to just over 29% of GDP and expenditure to the amount of around 11% of nominal GDP are adjusted for cyclical influences, with spending on personnel alone accounting for just over 8%.

*Development of the cyclically adjusted deficit*

The relative development of the cyclically adjusted balance and the trend deviation of real GDP indicates that despite mostly weak economic development, fiscal policy was on a path of consolidation in the past decade. Throughout the nineties, the cyclically adjusted deficit was reduced substantially, from 4% of GDP in 1991 to ½% in 1999. This development can be subdivided into three phases.

*Substantial decline until 1994*

In the years up to 1994, i.e. following the unification-related boom, the cyclically adjusted financial gap declined substantially to around 2 ½%. While the unexpectedly high

financial burden ensuing in the wake of unification was initially financed mainly through borrowing, consolidation efforts were stepped up later on. These were, however, focused on the revenue side; a temporary solidarity surcharge on income and corporation taxes was introduced, and mineral oil taxes were increased over the long term. Social security contributions rose even more sharply owing, above all, to the need to finance the deficits in social security funds in the new Länder. The expenditure side, by contrast, did nothing to reduce the deficit. The additional unification-related spending was not offset by corresponding expenditure cuts in other areas.

In the two following years, the cyclically adjusted deficit increased again, reaching a level of almost 3 ½% of GDP. Of course, this was not least due to the fact that in 1995, the budget of the Treuhand agency was integrated into the overall public sector budget, causing the interest burden of the Treuhand debt to have an effect on the deficit. On the revenue side, a new solidarity surcharge was introduced in 1995 within the framework of the "solidarity pact", yet at the same time an erosion of the tax base became apparent, caused above all by generous tax concessions for investment in the new Länder. Therefore, tax revenue growth remained muted at that time.

*Renewed increase in 1995–96*

This "interim period" was followed by a renewed reduction in the cyclically adjusted deficit – although economic growth tended to be weak – which lasted until 1999 and was primarily attributable to the efforts of the

*Renewed decline up to 1999*

regional and local authorities to cut spending. At the same time, tax revenue increased considerably, owing above all to the expiry of the special depreciation allowances for investment in the new Länder, a rise in the value-added tax and increased energy taxation. However, the tax hikes were mainly used to reduce the pension insurance contribution rate, thus causing the burden of social security contributions to decline. Finally, the deficit reduction also benefited in 1999 from the influence of temporary factors, especially a large surplus of the pension insurance funds for replenishing their fluctuation reserves.

*Deficit  
reduction  
absolutely  
imperative*

In view of the need for public sector consolidation, the reduction of the cyclically adjusted budget deficit observable in the past decade was absolutely imperative. Since the high unification-related financial burden was initially financed mainly through borrowing, public debt – and therefore also the government's interest burden – reached a scale that left little room for fiscal policy manoeuvre. Moreover, the need to fulfil the fiscal convergence criteria for participation in monetary union as laid down in the Maastricht Treaty posed additional requirements. This development makes it all too clear that if a government allows excessive fiscal deficits, it relinquishes all possibilities of responding to cyclical variations.

### Conclusions with regard to fiscal policy

*Stabilising  
function of  
fiscal policy*

Within the policy mix, fiscal policy – along with monetary policy – is often said to have a stabilising function because it can contain the

influence of cyclical fluctuations on overall economic developments. This is claimed to have become more important within the framework of monetary union because monetary policy now relates to the euro area as a whole and can thus no longer take account of national differences in business cycles. In view of the fact that, as described above, the German public sector financial balance is not very responsive to cyclical factors, this could make it appear advisable to pursue an increasingly discretionary national fiscal policy. However, experience of earlier decades calls for caution. It has shown that such policies have tended to have pro-cyclical effects owing, in particular, to the problem of time lags. Moreover, policies of this sort have chiefly been used to stimulate the economy, not to slow it down. These disadvantages can be avoided by using automatic stabilisers, but the possibilities of strengthening those stabilisers are likely to be limited in Germany.

Regardless of the exact cyclical influences on the public sector budget, the underlying orientation of fiscal policy is and will remain the key factor. To provide the government with a sound basis on which to conduct fiscal policy and strengthen the markets' confidence in the financeability of the public sector over the long term, it is imperative to achieve the medium-term objective of a budgetary position close to balance or in surplus as laid down in the Stability and Growth Pact as soon as possible. Although, in a reversal of the trend observable in the past several years, the general government deficit ratio is expected to increase to around 1½% next year because the planned corporate tax reform and the im-

*Underlying  
orientation of  
fiscal policy  
necessary*

plementation ahead of schedule of the 1999/2000/2002 Tax Relief Act will lead to considerable revenue shortfalls, a renewed reduction of the deficit ratio is planned from 2002. For the year 2003, the German Federal Government's stability programme envisages a deficit-to-GDP ratio of ½%.

*Limited  
informative  
value of the  
cyclically  
adjusted  
balance*

The cyclically adjusted financial balance clearly represents an important instrument for analysing fiscal policy. However, it must be kept in mind that this concept only sheds light on a very limited aspect of fiscal policy. For example, regardless of cyclical fluctuations, net borrowing is the relevant measure

for analysing current government recourse to the credit markets. Above all, however, the overall budget is subject not only to short-term cyclical risks, but also to long-term pressures – especially demographic strains – which must be quantified using other methods (such as generational accounting). Therefore, a budget that is at least structurally balanced not only makes it possible to cope with cyclical influences on fiscal developments, but is also the prerequisite for a fiscal policy geared towards long-term stability which avoids the overburdening of future generations by the government.

## Annex

### Calculation of the cyclical components of revenue and expenditure

Turnover tax:

$$T_{c,t}^U = T_t^U \cdot k_{c,t}$$

Special consumer taxes:

$$T_{c,t}^V = T_t^V \cdot 0,8 \cdot k_{r,c,t}$$

Social security contributions:

$$T_{c,t}^S = T_t^S \cdot w_{q,c,t}$$

Wage tax:

$$T_{c,t}^W = T_t^W \cdot (1,8 \cdot (w_{q,c,t} - l_{q,c,t}) + l_{q,c,t})$$

Taxes on entrepreneurial income and investment income:

$$T_{c,t}^P = T_t^P (0,9 \cdot p_{c,t} + 0,2 \cdot p_{c,t-1} + 0,2 \cdot p_{c,t-2})$$

Short-time working benefits:

$$X_{c,t}^K = X_t^K$$

Public sector expenditure on personnel:

$$X_{c,t}^O = X_t^O \cdot f_{q,c,t}$$

General Federal grant paid to the pension insurance funds:

$$X_{c,t}^Z = X_t^Z \cdot ((2 - z_t) \cdot (w_{q,c,t-1} - l_{q,c,t-1}) - (1 - z_t) \cdot w_{q,c,t})$$

Expenditure on unemployment benefits:

$$X_{c,t}^L = h_t \cdot A_t \cdot a_{c,t}$$

### Symbols used

$Y_g, Y_c$  trend component, cyclical component of variable Y

$y_{c,t} = \log(Y_t) - \log(Y_{g,t})$  trend deviation of variable Y in year t, in %

$\Delta Y_t = Y_t - Y_{t-1}$  absolute change in variable Y in year t

$\eta_{XY} = (\Delta X/X) / (\Delta Y/Y)$	elasticity of variable X with respect to variable Y	$T^W, T^P, T^V, T^U, T^S$	wage tax, taxes on entrepreneurial income and investment income, special consumer taxes, turnover tax, social security contributions
$W, W_q$	wages and salaries (total/private sector)		
$L, L_q$	wage and salary earners (total/private sector)	$X^O, X^L, X^K, X^Z$	expenditure on personnel, unemployment benefits, short-term working benefits, general Federal grant paid to the pension insurance funds
$F_q$	index of negotiated private sector wage levels		
$P$	entrepreneurial income and investment income (internal market concept)	$z$	share of the general Federal grant in the pension insurance funds' expenditure on pensions
$K, K_r$	nominal and real private consumption	$A, h$	number of unemployed, average (net) unemployment benefits per recipient