# Measurement of Fiscal Policy

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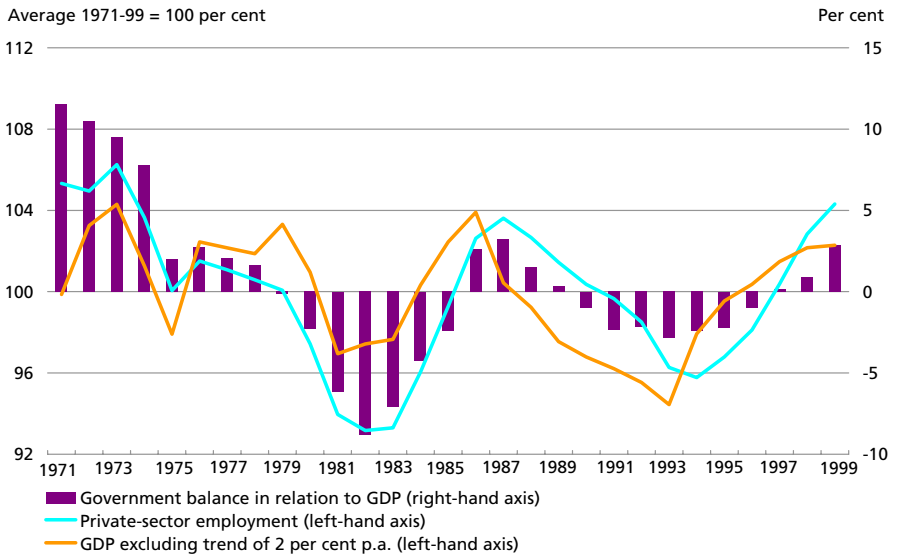
## GOVERNMENT FINANCES AND ECONOMIC ACTIVITY

The government budget balance has improved steadily since 1993. The favourable course is to a high degree attributable to the economic upswing in Denmark. Government finances also showed a clear improvement during the boom from 1982 to 1986, and deteriorated significantly during the ensuing recession. Chart 1 shows the covariation between the government balance and economic activity measured by private employment and by GDP adjusted for a trend of 2 per cent per annum. The statistics for 1999 are based on estimates by the Ministry of Economic Affairs.

During a boom, with growth in incomes, consumption, output and employment, government receipts will rise due to higher direct and indirect taxes and lower expenditure on e.g. unemployment benefits. During a recession the opposite applies.

The assessment and planning of fiscal policy must take these relations into account. During a boom it is appropriate to curb expenditure in

ACTIVITY LEVEL AND PUBLIC FINANCES — Chart 1



order to ensure scope for manoeuvre in less favourable times when the government balance is automatically pressed downwards. This line of thought is by no means new and is for example one of the elements behind the Stability and Growth Pact of the EU member states. The pact was adopted to ensure fiscal-policy scope in the EU member states and entails that a country's government finances must be close to balance or in surplus over one business cycle.[1]

Although the relationship between economic activity and government finances is both clear and important it is less obvious how measurement of and adjustment for the business cycle's impact on the government balance is to take place. It is necessary to estimate the extent to which the current cyclical position deviates from normal, as well as the implications of this deviation for the government budget.

This article discusses the structural balance that expresses the part of the government balance which is not attributable to the business cycle. At the core of the discussion we compile a structural balance based on the fixed-exchange-rate policy's requirements of wage development and the labour market. The level of the structural balance can be taken to indicate the appropriateness of the fiscal policy, and changes in the structural balance reflect changes in fiscal policy. These changes can also be measured by other methods. A principle frequently used in Denmark is the fiscal effect, which is calculated by the Ministry of Finance. The fiscal effect is a model-based indication of the impact on GDP of adjustments to the fiscal-policy instruments. The fiscal effect and the change in the structural balance are not the same thing, but do to a great extent express two aspects of the same issue. The two measures are compared in this article.

The following section presents a proposed structural balance. It is followed by a section on the impact of fiscal policy on activity and its budgetary effect, whereby the quarterly economic model, Mona, and its fiscal-policy variables are used to calculate the GDP effect and the budgetary impact of adjustments to the fiscal-policy instruments. A separate section illustrates the relationship between fiscal effect and the structural budget. This is followed by concluding remarks.

## THE STRUCTURAL BUDGET BALANCE

A number of international organisations, such as the OECD, EU and IMF, frequently compile and apply the concept of a structural budget bal-

[1] For an introduction to the Stability and Growth Pact, including a discussion of the underlying economic rationales, see Marco Buti, Daniele Franco and Hedvig Ongena, "Fiscal discipline and flexibility in EMU: The implementation of the Stability and Growth Pact", *Oxford Review of Economic Policy*, vol. 14, no. 3, 1998.

ance. In Denmark, this measure is published by e.g. the Ministry of Finance in various reports. Denmark's structural budget balances as compiled by different institutions are not identical, but are subject to different methods. The structural balance is not a concrete, measurable entity. It requires assumptions to be made to describe how far the actual economic situation is from equilibrium.

All methods calculate the structural balance as the actual balance after elimination of the effect of the economy's deviation from equilibrium. Like the OECD and the Ministry of Finance, among others, our focus is on whether output measured by GDP is in equilibrium. The calculation of the structural balance can be divided into three steps.

First an output gap is determined as the difference between actual GDP and estimated potential GDP. The second step is to evaluate the cyclical sensitivity or cyclical elasticity of the balance, i.e. the relation between the output gap and the cyclically-sensitive items of the government balance. In the third step the cyclical component of the budget balance is determined by multiplying the output gap by the cyclical elasticity. The structural balance is the actual budget balance less the cyclical component. If the output gap is zero in one year, the structural balance is equal to the actual balance.

Our calculation of potential GDP is based on the production function for the private non-agricultural sector in the Nationalbank's quarterly model, Mona, where output is a function of the input of labour and capital. Chart 2 shows the residual of the long-term production function, i.e. the difference between actual output and the output which would normally be the result of the actual input of labour and capital. The residual of the production function can be interpreted as total factor productivity after trend elimination. Positive residuals in individual years, i.e. high output in relation to factor input, express that production capacity is under pressure, as was the case in 1997 and 1998.

Potential output is determined by substituting potential employment for actual employment in the production function. By this is meant employment if there is equilibrium in the labour market.

Labour-market equilibrium can be interpreted in several ways. It is often stated that at a "natural" unemployment rate price and wage increases are stabilised. However, this is not our starting point. Instead, our calculation is based on the fixed-exchange-rate policy.

Under the fixed-exchange-rate policy the krone is pegged to the euro, and previously to the D-mark. To ensure the same degree of price stability as for the anchor currency, and to ensure competitiveness and long-term employment prospects, a natural element of Denmark's fixed-exchange-rate policy objective is to match the wage development

of the anchor-currency country. Up to and including 1998 this implied wage increases as in Germany, while today wage increases in the euro area are the determining factor.

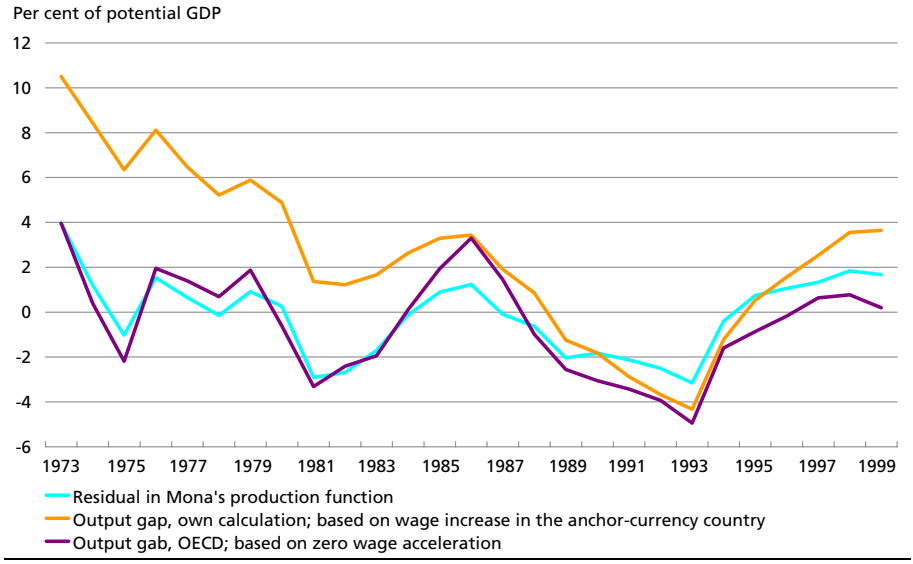
Denmark's overall competitiveness is naturally also affected by the labour costs in countries outside the euro area, but a central issue is to ensure wage competitiveness vis-à-vis the anchor currency. Excessive labour costs in both Denmark and the euro area in relation to the rest of the world will affect the rates for euro and krone vis-à-vis other currencies. If Denmark is alone in facing excessive labour costs this will not affect the euro and krone rates vis-à-vis other currencies.

Wage increases in Denmark do not necessarily have to match those in the euro area for every single year. Should Danish exports face a decline in competitiveness, for a period there may be a need for wage increases below those in the euro area. On the other hand, particularly favourable competitiveness may allow for wage increases in Denmark to exceed wage increases abroad for a certain period. However, in the long term sustainable development requires an average rate of wage increases in the Danish economy equivalent to that in the anchor currency country. The issue here is hourly labour costs, not unit labour costs. This method thus disregards any variations in productivity increases according to the national accounts of the various countries. We assume that these variations to a greater degree reflect varying output compositions and measurement problems than they affect competitiveness. If a particular sector shows an especially steep increase in productivity the equivalent product price will also have to show particularly weak development due to competition. There is therefore not necessarily any basis for strong wage increases in those sectors. For a country which is generally characterised by old technology and poorly educated, low-paid labour catching up with other countries may entail a catch-up in wages, but this is not the case for Denmark vis-à-vis the euro area.

On the basis of the wage relation in the Nationalbank's Mona model[1] the unemployment rate since the beginning of the 1970s which would have been required for Danish wage development to be at the German level can be derived. This is achieved by "inverting the wage relation" so that it defines the unemployment rate for a given wage-increase rate – i.e. the German rate – rather than calculating the wage-increase rate for a given unemployment rate. According to the wage relationship the wage increase is determined by other factors besides the unemployment rate. For example, increasing the replacement rate of unemployment benefits will cause the wage-increase rate to accelerate. As a conse-

[1] See Niels Lynggård Hansen, "Wage Development in Denmark", Danmarks Nationalbank, *Monetary Review* – 2nd quarter 1998.

THE RESIDUAL OF THE PRODUCTION FUNCTION AND TWO MEASURES OF OUTPUT GAP Chart 2




quence, an increase in the replacement rate will also increase the calculated equilibrium unemployment rate, or the structural unemployment rate.

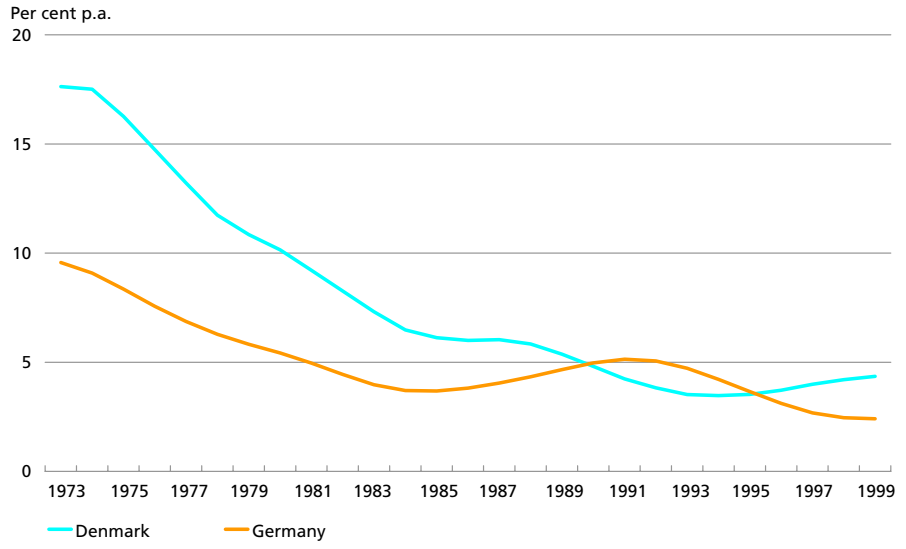
Once our version of structural unemployment has been derived, potential employment can be calculated as the labour force less structural unemployment, and potential GDP is calculated by inserting potential employment in the production function[1]. The difference between actual and potential GDP is the output gap, which is shown in Chart 2 together with the aforementioned residual in the production function.

In years where potential employment equals actual employment the output gap equals the residual in the output function, and the output gap solely reflects factor productivity, cf. above.

The calculated output gap has many characteristics in common with the residual in the production function, although there are also certain differences. It is particularly noteworthy that the output gap is considerably larger in the 1970s and somewhat larger in 1999. This variation expresses that actual employment considerably exceeded potential employment in the 1970s and the beginning of the 1980s, and was somewhat higher than potential employment in 1999. This can be related to the variation in wage rises in Denmark and Germany, cf. the method for

[1] The potential GDP for the overall economy is achieved by adding the potential GDP for the private non-agricultural sector and the actual GDP for sectors other than the private non-agricultural sector. In order to avoid random fluctuations in structural unemployment and potential GDP the calculations are to a great extent based on smoothed time series which focus on the trend – e.g. smoothed wage increases and smoothed employment. The smoothing is done by applying an HP filter.

WAGE-INCREASE TRENDS IN GERMANY AND DENMARK Chart 3




calculating potential employment. In the 1970s Danish wage increases were considerably higher than Germany's, cf. Chart 3.

It is easiest to accept the method applied to calculate the output gap with a clear fixed-exchange-rate regime as in the present situation where the central rate against the D-mark has been unchanged since 1987. On the other hand, the method appears to give a fair description of the Danish economy in the 1970s and the beginning of the 1980s by indicating that actual output was considerably higher than potential output at that time, and there was a need to raise the potential output. Despite unemployment there was a constant deficit on the balance of payments. At that time the fulfilment of a simple objective of low wage and price increases would easily have required a much higher unemployment rate than was the case. In other words, a low inflation rate would have required extensive measures in the labour market of that time, which was characterised by e.g. automatic price-indexation of wages. The overall evaluation is that the more or less pronounced adjustment policy prior to 1982 was not a sustainable strategy. This lacking sustainability is apparent from our calculation as a considerable output gap, reflecting the need to reduce the high wage increases in Denmark.

It is inherent in the applied method that the output gap calculated according to this method is not an absolute concept. High wage increases in Denmark's currency partner countries in the first instance increase the scope for higher employment. In other words, in the short term there is

a trade off between wage increases and unemployment, as a consequence of the estimated wage relation. In this respect the wage relation expresses the immediately apparent relationship in the Danish data. It is quite another matter to put this relationship to systematic use, not least because this will increase inflation expectations. Permanent high wage increases and high inflation among Denmark's currency partner countries would not entail sustainable employment gains. Moreover, reducing inflation expectations via tight economic policy can be costly. The inflation objective of the European Central Bank is maximum 2 per cent, which requires modest wage increases in the euro area, perhaps at around 3.5 per cent on average.

The calculated output gap measure can be compared to the OECD's output gap, which is also shown in Chart 2. The two output gaps share many characteristics, although the output gap calculated here is generally higher, particularly in the 1970s and less so in recent years. The OECD also applies a production function to the determination of potential GDP. The OECD naturally does not use the Mona production function, but probably a similar function since the OECD's output gap is relatively close to the residual in the Mona production function. This indicates that the OECD's potential employment value is closer to actual employment than our potential employment value.

The OECD calculates output gap and structural balance for many countries using the same basic method irrespective of the various countries' monetary- and foreign-exchange-policy regimes. The basis for the OECD's calculation of potential employment is not wage increases abroad, but that tenable development in wages is equal to an unchanged rate of wage increases irrespective of level. This method implies that in the long term the Danish economy is bound to an unemployment level which eliminates any wage acceleration trend (Non Accelerating Wage Rate of Unemployment). The implication of this approach to labour-market equilibrium is that any rise in the wage-increase rate reveals an unemployment rate below its equilibrium level, while a constant wage-increase rate indicates that the labour market is at equilibrium. In rough terms this method implies that for a given labour-market policy there is one structural unemployment rate, a natural unemployment rate, where the economy is at long-term equilibrium. There is nothing wrong with this line of reasoning in principle, although it is difficult to quantify a long-term equilibrium concept such as the natural unemployment rate.

In recent years wage increases have been stronger in Denmark than in Germany. At the same time Denmark's wage-increase rate has been very stable for a certain period, despite a decline in registered unemploy-

ment. Since our measure focuses on deviations from Denmark's currency partner countries this explains how for later years we state a stronger variation from actual down to potential output than in the OECD approach. Our positive output gap in 1999 includes a signal to design economic policy to reduce the present wage-increase rate of around 4.5 per cent down towards the current level of less than 3 per cent in the euro area. The OECD's output gap of around zero signals that it is possible in the long term to keep the wage-increase rate below 3 per cent and generally to keep it randomly low at the present rate of unemployment. The current unemployment rate thus appears to be equal to the structural unemployment rate, irrespective of the need to bring the wage-increase rate down to the euro-area level.

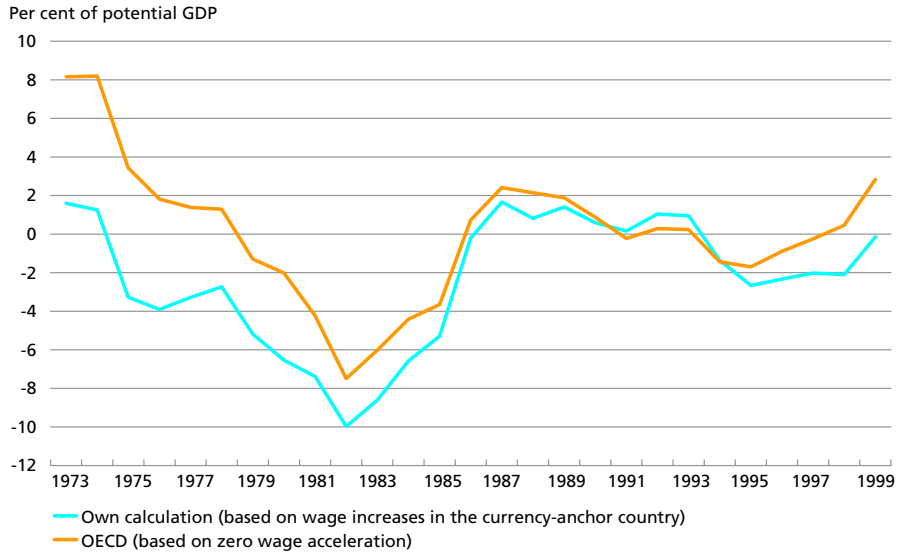
The measures of structural unemployment and output gap in the OECD's and our own calculations are not necessarily incompatible. The two methods can be combined and do supplement each other by considering respectively the long-term and the short-term. We have set a more short-term measure of the output gap since the natural rate of unemployment is hard to determine. Furthermore, special requirements arise from the difference between wage increases in Denmark and in the euro area since in Denmark the cyclical development is controlled solely by fiscal and labour-market policies. The role of monetary policy is to maintain a stable krone vis-à-vis the euro.

Without a fiscal and labour-market policy reaction excessive wage development in Denmark will be eliminated via the dampening which ultimately always results from declining competitiveness and loss of market shares. This negative adjustment of exports in particular is incompatible with consideration of the balance of payments and the intended aim of reducing Denmark's external debt. It is appropriate that there is a reaction in fiscal and labour-market policy to varying wage-increase rates in Denmark and the euro area. This is equivalent to a reaction to our simple output gap.

Apart from the output gap, the calculation of a structural balance requires a measure of the cyclical sensitivity of government finances. A Mona calculation shows an improvement in the government balance by around 0.85 per cent of GDP in the event of an increase in GDP by 1 per cent. This represents the balance effect after two years in the case of shocks to overall demand whereby employment has adjusted to the higher GDP. The estimate is roughly equivalent to the estimates of the Ministry of Finance, cf. various reports from the Ministry. The balance effect in the first year is less and rather at around 0.5 of GDP.

As will appear we simplify the cyclical sensitivity of the government budget to a single elasticity with respect to GDP and thus with respect to

STRUCTURAL BALANCE Chart 4




the output gap. GDP is a broad measure of economic activity. If it were to be taken into account, for example, that due to the element of indirect taxation private consumption is of more significance to net government receipts than exports and investments this would make the calculations more complicated. In that case it would be necessary to include the composition of demand.[1] Instead, like the OECD (and other institutions), we have simplified the assumptions and calculate the structural balance by subtracting the cyclical elasticity multiplied by the output gap from the actual balance as a percentage of GDP.

Compared to the OECD calculations ours predominantly shows a poorer structural balance throughout the period under review from 1973 until today. This primarily reflects the difference in the calculated output gaps. After being close to equilibrium since the mid-1980s, cf. Chart 4, the structural balance deteriorated in 1993 and 1994 – coinciding with the kick-start of the Danish economy and the beginning of the present boom. The improvement after 1994 in the actual balance, estimated to show a surplus of 3 per cent of GDP in 1999, did not have an equivalent impact on the structural budget balance, which appears to be close to equilibrium. This reflects that the improvement in government finances can be attributed first and foremost to the strong economic

[1] If the intention is to close a positive output gap in consideration of the balance of payments by means of a lower consumption ratio rather than lower exports and investments this would imply a relatively strong deterioration in the government balance. Indirect taxes are levied on consumption, in contrast to exports and investments, and a lower consumption ratio implies a lower indirect taxation burden.

development since 1993, which has also led to higher wage increases than in e.g. Germany.

## THE IMPACT OF FISCAL POLICY ON BUDGET AND ACTIVITY

According to the principles of this calculation method a structural balance is not affected by the cyclical position, but may be influenced via fiscal and labour-market policy. For example, a tightening of fiscal policy will improve the structural balance. The year-on-year change in the structural balance therefore describes the change in the stance of e.g. fiscal policy.

However, fiscal policy can also be measured differently. The evaluation of economic policy by the Ministry of Finance is not based primarily on the development in a structural balance. On the contrary, the evaluation of fiscal policy centres to a high degree on the fiscal effects calculated by the Ministry.

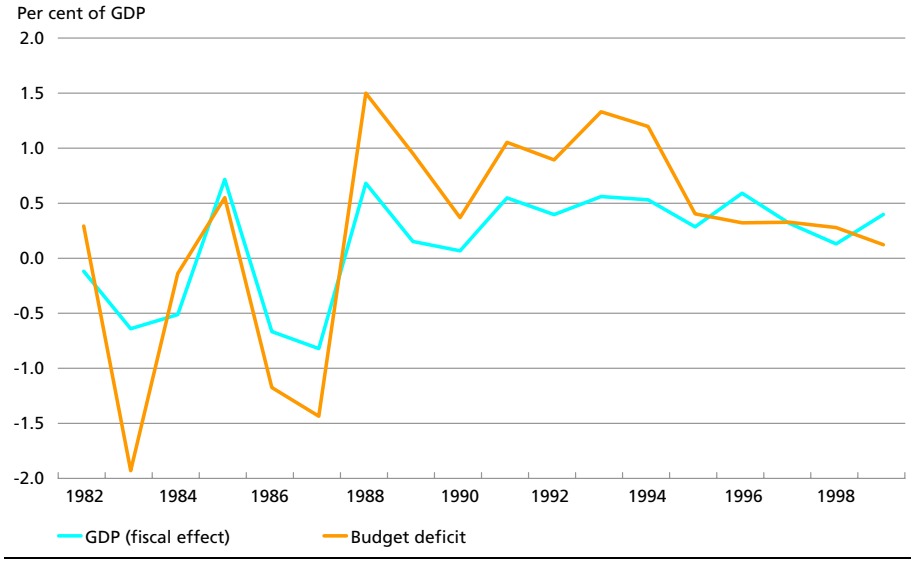
This calculation consists of identifying the effect on activity of the discretionary elements of fiscal policy, i.e. the elements which entail active political decisions. In principle, the fiscal-policy instruments are reviewed individually. In the event of changes in these the activity effect is found by applying first-year GDP multipliers from the ADAM macroeconomic model. It must be added that in practice the delineation of the discretionary or active element of fiscal policy involves many arbitrary elements.

The calculations for this article apply the principles of the Ministry of Finance to Mona's fiscal-policy variables. For example, all changes in direct and indirect tax rates are regarded as active fiscal-policy measures. All changes in government employment or purchases of goods at constant prices are active policy measures, as is any deviation between the increase in government wages and transfer-income rates, and wage increases in the private sector.

The fiscal effect is the first-year effect on GDP of the active adjustments to the instruments. These can also be evaluated in terms of their immediate impact on the government balance. The GDP effect requires a calculation using Mona in its entirety and depends on the behavioural relationships in the model such as consumption and investment relations, while the immediate budgetary effect requires only the application of Mona's equations for government receipts and expenditure. In Chart 5 the fiscal effect on GDP is compared with the immediate effect on the government budget deficit of the instrument adjustments.

The covariation between the two measures indicates that an expansionary fiscal policy tends to increase GDP and cause the budget to deteriorate. The correlation is less than perfect because a given increase in

FISCAL-POLICY EFFECT ON GDP AND BUDGET DEFICIT (DERIVED FROM MONA) Chart 5




receipts can have a varying impact on GDP in the first year, depending on the instruments used. For example, an increase in government employment and thereby public-sector output has a direct effect on GDP. On the other hand, the effect of a tax reduction is not apparent until households begin to respond to the increase in their disposable income by increasing consumption, causing business enterprises to increase output. Almost by definition job creation in the government sector for a value of kr. 1 billion will have a greater impact on GDP in the first year than tax receipts of kr. 1 billion. Another example is that indirect taxes affect consumption and GDP more swiftly than direct taxes due to a faster consumption response in the Mona model. If the price level is increased by 1 per cent due to higher indirect taxes consumption responds faster than would have been the case if nominal income is reduced by 1 per cent as a result of higher income taxes.[1]

## STRUCTURAL BALANCE AND FISCAL EFFECT

This section compares the various measures of the budgetary impact of fiscal policy. In general, fiscal effects are compiled at a detailed level with focus on the individual elements of fiscal policy, cf. above. On the other hand, the structural balance is compiled at an aggregated level

[1] Cf. Morten Malle Høyer, "The Income and Price Sensitivity of Private Consumption", Danmarks Nationalbank, *Monetary Review*, 4th quarter 1998.

based on the total balance and a measure of the output gap. Another noteworthy feature is that fiscal effects can be stated as the GDP effect and the budgetary effect. The Ministry of Finance normally focuses on the GDP effect which describes the effect of fiscal policy on the cyclical course and the output gap. Our compilation focuses on the fiscal effect calculated as the budgetary effect since this measure of the immediate budgetary effect of fiscal policy is easiest to compare with the change in the structural budget.

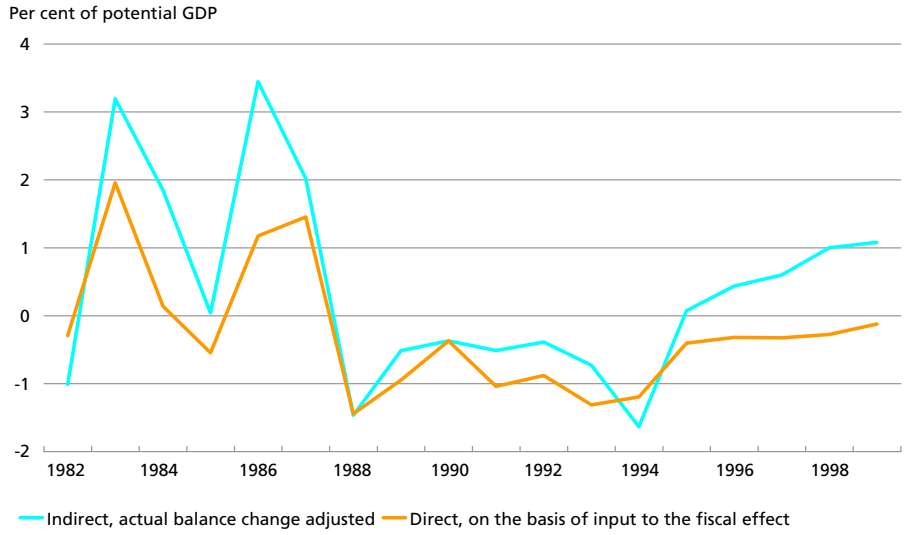
On measuring the fiscal effect as a budgetary effect there is a direct relation from calculation of the adjustments to the fiscal-policy instruments to the consequences for the government budget. On the other hand, the change in the structural balance is an indirect measure found by elimination of cyclical factors from the actual budgetary change. Irrespective of the differences both methods are based on the idea of a division of the government sector's balance into a cyclical element and a structural or discretionary element.

The two fiscal-policy measures are therefore in principle connected. Under very simple assumptions the change in the structural balance corresponds to the fiscal effect calculated as the budgetary effect. In more detail, achieving the simple accordance requires that the budgetary change only includes items with a discretionary fiscal effect, and that besides fiscal policy the budget is influenced only by the cyclical course. The latter's effect corresponds to the elements eliminated by applying the output gap. In practice, the relationship is less straightforward and the two fiscal-policy measures always differ. This can be attributed to several factors, of which the following three should be taken into consideration.

One problem is budget items with no discretionary fiscal effect, e.g. interest payments. These items affect the structural balance, but since the latter is not included in the calculation of the fiscal effect on GDP it is not included in the immediate budgetary effect calculated here either. Another problem is that the structural balance reflects several different factors and is influenced by e.g. labour-market policy. Labour-market policy influences potential GDP, and in general all uneven growth in potential GDP may affect the output gap and thus the change in the structural balance, without being related to fiscal policy. A third problem is the budget balance's cyclical elasticity of 0.85, which as stated is multiplied by the output gap to calculate the structural balance. 0.85 indicates a balance effect two years ahead, and thus probably entails excess adjustment for the effect of the year's increase in GDP on the budgetary change in that same year.

The three aforementioned problems can be circumvented by adjusting the change in the structural balance for budget items with no effect, for

THE BALANCE EFFECT OF FISCAL POLICY Chart 6




an uneven rate of increase in potential GDP, and by applying a coefficient of 0.5 to the output gap, instead of 0.85. These corrections are discussed in further detail in the Appendix.

After the correction the change in the structural balance is by and large equivalent to the direct measure of the budgetary effect of fiscal policy, cf. Chart 6. However, there are certain remaining differences between the two measures and these can be difficult to make adjustment for.

One difference of general interest is that on average the direct measure of budgetary effect is lowest. Applying the direct measure, fiscal policy in the various years appears more as relaxations with a negative budgetary effect. This is related to the fact that in the calculation of the fiscal effect the neutral course of the instruments, or their zero point, is set as a relatively low value. For example, any increase in public consumption is included as a relaxation, irrespective of the development in the labour force and production capacity.

There is no easy solution. The trend of fiscal policy is probably more difficult to quantify than the movements in fiscal policy around the trend. This is related to the ambiguity of defining a neutral development which is to function as the zero point of fiscal policy. For example, in real terms the impact of unchanged specific taxes declines as the price level rises, while the relative significance of an unchanged VAT rate remains constant. In other words: the implications of maintaining indirect taxes at a certain level are by no means clear. There are several similar examples where the final outcome is not given. Finally, it can be stated

that a neutral fiscal policy is a technical zero since maintaining a neutral fiscal-policy stance in the face of the upward drift in public consumption and public services requires a major political effort .

A certain zero point cannot be defined for the indirect measure, i.e. the adjusted balance change, either. This is e.g. related to the fact that it is difficult to specify the GDP trend and the effect of GDP over the years on government finances.

The problem of defining the zero by no means rules out the application of measures of the effect of fiscal policy. Irrespective of which neutral course is selected, the outcome is generally the same impression of the movements in fiscal policy towards a tightening or relaxation, and if a certain method is applied, it is also possible to compare fiscal policy in different years.

## CONCLUDING REMARKS

The year-on-year development in fiscal policy can be measured by the development in the government balance after elimination of cyclical fluctuations, or by compiling the change in the fiscal-policy instruments and calculating the effect on GDP or the government balance. The difference between the results of the two methods illustrates the problems in measuring fiscal policy. These problems are large enough to be taken seriously, but in general the different methods produce similar results. There is no reason to abandon the usual fiscal effects describing the GDP effect of fiscal policy. The effect on activity is a natural basis for evaluating the cyclical adjustment role of fiscal policy. This is a particularly important role in countries such as Denmark where monetary policy is dedicated to maintaining a stable exchange rate vis-à-vis the euro.

At the close of the 1990s government finances show a surplus, as was the case in the early 1970s and the mid-1980s. These surpluses were related to a high level of activity and unfortunately also relatively strong wage development in Denmark. In the slightly longer term wage increases which exceed the development in the euro area (previously Germany) are neither possible nor tenable. The large deviation from the wage-increase rate in Germany in the 1970s was neither tenable nor desirable in real terms either. All in all, for long periods the actual balance has overestimated the strength of government finances. The underlying or structural balance has generally been lower than the actual balance. For example, according to the aforementioned calculations the government surplus for 1999 of 3 per cent of GDP corresponds to a structural balance close to equilibrium.

## APPENDIX

### Adjustment of the structural balance change

The year-on-year change in the actual government budget balance obviously cannot be used to describe fiscal policy. In order to obtain a measure of the development in fiscal policy, adjustment should be made for the budgetary effect of variation in GDP growth and for changes in budget items which have no fiscal-policy significance.

Changes in the structural balance are a more appropriate tool to describe fiscal policy than the actual budgetary changes, but it is not the ideal solution to use the structural balance changes outright. In line with the necessary correction of the actual balance change the changes in the structural balance should be adjusted for variation in potential GDP growth and for changes in the aforementioned budget items with no fiscal policy significance.

The government budget balance, B, can be simplified as the sum of three independent elements: the fiscal-policy effect, F, the effect of the business cycle, K, and other elements, A.

The business cycle is here interpreted broadly as all fluctuations in GDP growth from average GDP growth. In other words: K not only signifies the fluctuations of GDP around potential GDP, but also the full fluctuation in GDP growth in relation to average growth in the period under review. These total fluctuations may be viewed as the sum of the fluctuations in GDP growth around growth in potential GDP, and the fluctuations in potential GDP growth around average growth. In this context the "other" item, A, can be defined as the sum of budget items for which the appurtenant instrument is not included in the calculation of the fiscal effect using the Ministry of Finance's method, for example interest payments. We now have $\Delta B = \Delta F + \Delta K + \Delta A$.

According to the main article and Chart 6 it is possible to measure the budgetary effect of an adjusted fiscal policy by applying an estimate directly to $\Delta F$ as for the calculation of the fiscal effect, or indirectly by deriving $\Delta F$ from estimates of $\Delta B - \Delta K - \Delta A$. The last-mentioned indirect measure is considered.

For the indirect measure we immediately have the actual change in balance and the change in budget variables with no fiscal effect – i.e. $\Delta B$ and $\Delta A$. The elements used to estimate the business cycle, $\Delta K$, are the deviation of GDP growth from average growth with a coefficient of 0.5 which reflects the same year's effect on the balance as a percentage of GDP: $\Delta K=0.5*(\Delta bnp-\underline{\Delta bnp})$ where letters in upper case are percentages of GDP and in lower case are logarithms. Underscored letters are aver-

ages for the period under review, so that an underscored variable is constant. The estimate for ΔF is: ΔB - 0.5*(Δbnp-$\underline{\Delta bnp}$) - ΔA.

The structural balance, BS, is described in the main article as the actual balance less the budgetary effect which can be related to the output gap. Applying the gap as the logarithmic difference between the actual and potential GDP gives the following: ΔBS = ΔB - 0.5*(Δbnp-Δbnppot). On substitution of ΔBS with ΔB it appears that the budgetary effect of fiscal policy, ΔF, can be calculated in two ways: by applying the actual change in balance adjusted for fluctuations in actual GDP growth, or by means of a change in the structural balance adjusted for fluctuations in potential GDP growth.

$$\Delta F = \Delta B - 0.5*(\Delta bnp-\underline{\Delta bnp}) - \Delta A = \Delta BS - 0.5*(\Delta bnpot-\underline{\Delta bnp}) - \Delta A$$

The first part of the equation is never exact in practice. It assumes a sustainable division of the budget change into additive components and a cyclical component of exactly 0.5 times GDP growth. The second part of the equation is exact, insofar as the structural balance is calculated as 0.5 times the output gap. The coefficient of 0.5 is a correction of the long-term coefficient of 0.85 applied in the section of the article on the structural balance. In principle, the correction could also be made by including a cyclical effect estimated as 0.35 times lagged GDP growth. This would complicate the picture, however.