FISCAL POLICY IN SWEDEN – AN ANALYSIS OF THE BUDGET OVER THE BUSINESS CYCLE

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1. Problem description, analytical framework

The development of the consolidated general government financial balance, referred to in this essay as the budget balance[1], is of great importance to the economy for a number of reasons. General government revenue and expenditure affects the state of the economy. At the same time, public finances are in turn affected by the state of the economy through the so-called automatic stabilisers. Large deficits can also create uncertainty about public finances in the long-term and contribute to speculation about the financial strength of the general government sector. These various aspects will become increasingly important with the establishment of the EMU and the stability pact. A need has therefore arisen to study both short and long-term factors in the analysis of public finances, i.e. to divide the budget balance into a structural and a cyclical component. The method of analysis selected depends, however, on the aspects of fiscal policy that are of interest. The long-term development of central government debt is a different matter than the short-term effects of fiscal policy on demand and inflation.

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[1] The variable on which convergence criteria and the target variables for economic policy in Sweden are based is precisely the consolidated general government financial balance. This is usually called the budget balance. The consolidated general government financial balance consists, however, of local government, the social insurance sector, and the central government financial balance. The Government and Riksdag only exercise direct control over the latter.

The purpose of this essay is to answer the following three questions:

1) How sensitive is the budget to cyclical swings (how large are the automatic stabilisers)?

2) How has the cyclically adjusted budget balance (i.e. the so-called structural balance) developed over time and what is the forecast for it?

3) How can an assessment be made whether fiscal policy is contractive or expansive with respect to the effect on household disposable incomes?

With respect to the first question, sensitivity is measured by a marginal effect that determines how much the balance can be expected to be affected by the business cycle, which is important for internal and external (primarily those relating to the stability and growth pact) budget objectives. The cyclical part of the balance can also be important for the development of public finances in the long-term since there is a tendency to use the surplus to finance political initiatives[2].

We use two methods for analysing the budget's cyclical sensitivity. The first method estimates the correlation between the budget balance (disaggregated into different items) and the output gap, i.e. the difference between actual and potential GDP. The second method uses a relatively detailed macroeconometric model, where we identify various reasons underlying changes in the output gap and the budget balance.

The second question deals with the structural balance. We analyse how this part has been developed and forecast and thereby shed light on the long-term development of public finances. Two methods are also used here. The first method is used to estimate the correlation between the output gap and the budget balance, whereupon the cyclical part of the

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[2] This elasticity also has a practical significance for the standard method of calculating the structural balance, which is a calculation that answers question two. This standard method involves estimating a output gap and then removing a cyclical component from the actual balance by multiplying the elasticity with the output gap.

budget can be determined. The structural balance is then determined as the difference between the actual balance and the cyclical part. The second method we use is Blanchard's method[3] which is an analysis of the change in the structural balance, not of its level. In brief, this method entails removing the effects that are due to unemployment from the changes in the actual balance.

The third question deals with a further aspect of fiscal policy, how it affects aggregate demand. The development of the structural balance is often taken as point of departure for this. Here we analyse the effects of fiscal policy on aggregated demand, and thus its effect on inflation. In this context, it is less important to differentiate whether impulses from fiscal policy are cyclically or structurally conditioned. Instead, we calculate the difference between households' factor and disposable incomes, which may be regarded as a measure of the effect of fiscal policy on households' purchasing power.

The analysis shows a number of interesting new, empirical results. As in previous studies, we find a high correlation between the budget balance and the output gap. The marginal effect is 0.98, i.e. if the output gap increases by one per cent, the budget balance improves by 0.98 percentage points. The empirical analysis shows that this figure is uncertain and has changed over time, especially in conjunction with the economic crisis in the early 1990s.

We also show that it is very important to try to identify the reasons underlying changes in the output gap. Changes in the state of the economy that depend on supply shocks entail a weak link between the budget balance and the output gap, while demand shocks produce a much stronger covariation. Our estimates show that the marginal effect of a demand shock is 0.89 but very near zero for a supply shock.

To sum up, we believe that the marginal effect is lower than these figures. However, it is not possible to give an exact figure on the basis of our analysis.

Our analysis of the *structural balance* shows that it has varied greatly throughout the period from 1980 and onwards. This is probably

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[3] See Blanchard (1993).

explained by fiscal policy being carried out with significant inputs of discretionary stabilisation policy, often of a non-recurrent character, and successive expansions of the public sector that affects the level of the structural balance. In terms of the development of the structural balance, fiscal policy has been very contractive during the consolidation period from 1994 and onwards. Forecasts indicate that more expansive policies will be pursued in 1999 and 2000.

Finally, our analysis of the effects of fiscal policy on households' purchasing power shows that disposable income increased considerably more slowly than factor income after 1994. Fiscal policy has on the whole varied very greatly in this respect, much more than private consumption. Our conclusion is therefore that fiscal policy has had a limited importance for the development of private consumption and has therefore not affected inflation to a great extent.

2. The cyclical sensitivity of the budget balance

As mentioned in the introduction, the issue of the size of the automatic stabilisers is closely related to the issue of the development of the structural balance. The budget balance is affected by the business cycle through the automatic stabilisers. The larger the automatic stabilisers, the greater the cyclical component and the smaller the structural component in the budget balance.

Figure 1 shows the causes that lead to the balance changing over time.

The development of the cyclical and structural components develop *depends on* political decisions but also on more or less automatic effects that cannot be affected in the short-term.

The upper half of the diagram describes discretionary fiscal policy, i.e. the result of political decisions. These are assumed to primarily affect the structural balance, i.e. the upper square to the right. However, political decisions that affect the structural balance can also affect the state of the economy. Therefore, there is an additional effect via the cyclical balance (the automatic stabilisers) as a result of political decisions – which is illustrated by the box on the top left. In the lower part of the diagram, the effects are illustrated of the balance that arises

automatically, i.e. independently of political decisions. The output gap opens and closes in the course of the business cycle due to quite other economic factors than fiscal policy decisions. This affects the balance via the automatic stabilisers which explains the major part of the changes in the cyclical balance. This is shown in the box to the bottom left. Finally, the structural balance is affected by other factors than direct political decisions, for example, underlying structural changes that affect NAIRU. The lower right box illustrates this.

Figure 1

	Cyclical effects	**Structural effects**
Political factors	Cyclical effects of fiscal policy decisions	Discretionary fiscal policy that effects the structural balance
Automatic effects	GDP gap opens or closes "naturally"	NAIRU is changed Changes in peoples "cheating behavior"

The most common way to describe the balance is to divide it into two components[4]:

$$d = d^s + d^c \tag{1}$$

where d stands for the actual balance, d^S for the structural budget balance and d^C for the cyclical budget balance.

The cyclical part of the balance is only affected by the business cycle through the automatic stabilisers and should *ex ante* be zero over the cycle. This part can be described by the following equation:

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[4] The absolute majority of the Working Papers presented at the Italian central bank's Workshop in Italy adopted this approach. An exception was the Netherlands, which applied an alternative approach with the balance divided into these two components plus a residual.

$$\Delta d^c = f(\Delta BNP - gap) \tag{2}$$

where Δ is the change operator and f is a general function. The appearance of this function is of great importance. It informs about the size of the fluctuations that may be expected in the total budget balance over a business cycle[5]. It is this function that is analysed here. Two alternative methods are presented below for calculating the correlation between changes in the output gap and the budget balance.

2.1 Estimates on Swedish data – traditional econometric approach

This method involves measuring the historical covariance between the budget balance and the state of the business cycle (measured as output gap) by regression analysis. A simple way of doing this is to estimate the equation:

$$\frac{R-E}{PY} = \alpha + \beta \frac{Y-Y^*}{Y^*} + \varepsilon \tag{3}$$

where *R-E* is the budget balance (revenue minus expenditure), *P* is the general price level, *Y* is the actual real GDP and *Y** is potential GDP (*Y-Y** is then the output gap), β is the marginal effect, which shows how much the balance is changed when the output gap changes (in this case measured in relation to GDP), which can be regarded as a measure of the automatic stabilisers[6].

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5 The rules for this are contained in the agreement concerning the Growth and Stability Pact. Besides the requirement of budget balance over a business cycle (the structural budget balance shall be zero), the total budget balance must not exceed – 3 per cent of GDP in a downturn. It is important to know how sensitive the public finances are to cyclical fluctuations for other reasons as well.

6 This marginal effect is not infrequently called elasticity, which is incorrect. Elasticity is by definition a *relative* change. In this context, it should be defined as $\beta^*(Y-Y^*)/(R-E)$. This is not of interest, however, as it will be infinite in the event of a budget balance.

There is a problem in interpreting the historic covariation between the output gap and the budget balance as a measure of the *actual* automatic stabilizers. The size of the automatic stabilizers is determined to a large extent by the rules of the taxation and social benefit systems. These are changed over time and an econometric approach that is based on historic conditions can easily make an incorrect assessment of the actual automatic stabilisers, especially if many tax and benefit rules have recently been changed[7]. An additional problem with the econometric method is that it weighs in all covariation between the output gap and the balance including covariation that does not take place automatically. The estimate of β will therefore include, for instance, countercyclical discretionary fiscal policy as well.

Usually, the budget balance is broken down into expenditure and revenue. Johan Fall (1996) estimated the total marginal effect in Sweden to be 0.9, of which 0.6 was on the revenue side and 0.3 on the expenditure side. In our estimate, the general government balance has been broken down into a somewhat larger number of revenue and expenditure headings and the cyclical effect has been estimated separately for each category.

The following general equation has been estimated on the basis of quarterly data during the period 1980, first quarter, to 1988, second quarter. The ratio between a particular kind of expenditure or revenue and nominal GDP, X_t^i, is a function of an intercept, *T* a linear time trend and the output gap, $\frac{Y}{Y^*}$, measured by the so-called UC method[8] and in logarithmic form.

$$\frac{X_t^i}{P_t Y_t} = \alpha^i + \gamma^i T + \beta^i \ln \frac{Y_t}{Y_t^*} + \varepsilon_t^i \qquad (4)$$

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7 Which was the case in Sweden during the consolidation period.

8 This method is used by the Riksbank for ongoing assessment of the output gap. UC means that a so-called unobserved components model is used where the cyclical component of GDP is assumed to be determined by other observable cyclical variables.

The superindex i denotes the respective revenue or expenditure category. The cyclical part of each revenue and expenditure component respectively, X_t^{ci}, is then given by

$$X_t^{ci} = \beta^i \ln \frac{Y}{Y^*}$$

Since the output gap by definition should be zero over a business cycle, these cyclical effects are also zero on average over a longer time horizon.

The total marginal effect of an increase in GDP on the general government balance is given by the sum of the effects on the different components:

$$\sum_i \frac{\partial(R^i - E^i)}{\partial(PY)} = \sum_i \beta^i$$

If all income and expenditure components were fixed proportions of GDP, this effect should be zero, i.e. the general government balance should be independent of the business cycle.

However, this is not to be expected since, for instance, general government revenue and expenditure is usually found to be pro or countercyclical respectively. If the sum of the β coefficients is greater than one, this means that the general government balance as a proportion of GDP will increase more than GDP in an upturn. This also means that the private sector's saving decreases more than GDP increases. The private sector's disposable income can be defined as GDP minus the budget balance. This assumes that general government investment and consumption are disregarded. which we can assume do not contain any automatic stabiliser effects. β greater than one then implies that the private sector's disposable income is countercyclical, which is hardly reasonable.

The cyclical balance is defined as the sum of the cyclical effects on the revenue items minus the sum of the effects on expenditure which should be zero over a longer time horizon. Finally, the structural balance is defined residually as the difference between the total general government balance and the structural balance. This means that the

structural balance will contain all temporary, as well as permanent, effects which cannot be directly related to variations in the output gap.

General government consumption and investment have been assumed to be independent of the business cycle. To the extent that they co-vary with the business cycle, this should rather be an expression of an active stabilization policy than the automatic stabilisers. The same also applies to general government interest payments. Even if the interest rate to a certain extent varies cyclically, interest payments are primarily a function of the accumulated central government debt. These items are included therefore as a whole in the structural balance. The net of other revenues and expenditure have been referred to as the structural balance. Social insurance contributions have been excluded on empirical grounds since the estimated coefficient was small and insignificant.

Table 1

Regression coefficients for the different components of the budget balance

OTN	Direct taxes (firms)	0.0544	(*)
OTN	Direct taxes (households)	0.2521	(**)
TINIT	Indirect taxes	0.2740	(**)
OSPIN	Social insurance contribs	0.0324	(-)
Total revenue			
TRN	Transfers to households	-0.3084	(**)
TINSUB	Subsidies	-0.0901	(**)
Total expenditure		-0.3985	
Budget balance		0.9791	

(*) and (**) indicates a significance level of five and one percent of the t distribution.

The cyclical sensitivity of transfers has been estimated as a function of the unemployment gap (the deviance of actual employment from NAIRU). The coefficient (-0.70) has then been multiplied by a so-called Okun coefficient (0.44) which can be derived from the UC model and relates the unemployment gap to the output gap.

A reduction of unemployment by one percentage point reduces transfers to the household sector by 0.70 per cent of GDP. This is a large effect, almost double as high as is assumed in section 3.2. However, it is not unreasonably high. The effect is estimated there as the actual unemployment benefit for an unemployed person. However, it is probable that other transfer payments in the form of housing allowances and social welfare payments also decrease when unemployment decline.

Taxes seem to be strongly procyclical. Taken as a whole, taxes in proportion to GDP increase by 0.58 percentage points when GDP increases by one percentage point. This seems to be unreasonably high. If all kinds of income were taxes with a common, constant marginal tax, the tax ratio would be constant over the business cycle.

The total cyclical effect of the general government budget balance is 0.98, which must be regarded as very high. A one per cent decrease in GDP relatively to trend weakens the general government balance by the equivalent of almost one percentage point of GDP. This also means that the private sector's disposable income is practically independent of the business cycle. If GDP falls by one per cent, taxes fall by 0.58 percentage points of GDP while transfers and subsidies fall by 0.39 percentage points. These results are only marginally higher than the figures computed by Fall (1996).

There are a number of reasons to believe that these figures overestimate the cyclical sensitivity of public finances. These estimates can be regarded as an historic average over the period 1980-97 and there is a priori reason to assume that cyclical sensitivity was reduced during the 1990s due to the effects of the tax reform on marginal tax and the effect of the reduced compensation rules on the size of transfers. It also seems as if the strong cyclical downturn at the beginning of the 1990s weighs heavily. The building boom at the end of the 1980s generated considerable public expenditure in the 1990s in the form of bank support and housing subsidies, which cannot be directly related to the following downturn. The downturn in the tax ratio during the same period also

coincides with a number of other factors which only partly coincide with the downturn. The downturn in consumption's share of GDP relative to net exports and in the wage proportion relative to operating profit should for instance reduce the aggregate tax take-up.

Recursive estimates[9] also show a considerable instability in the estimates. As shown by Diagram 2, all coefficients for tax variables do not differ significantly from zero until around 1990. Thereafter, the coefficient increases and moves back towards zero for direct household taxes but not for corporate income taxes and indirect taxes. A reasonable assessment in the light of this is that the marginal effect is less than 0.98 that was estimated for the total budget balance.

Direct taxes (households), direct taxes (businesses), indirect taxes, transfers to the household sector, subsidies.

2.2 Demand and supply shocks – simulations with a macroeconometric model

In this section, a large macroeconometric model is used for the entire world economy. Unexpected changes (shocks) are introduced into the model, which lead to all variables being affected. Eventually, however, most variables return to their original equilibrium level, which generally is the case for real but not for nominal variables. During the period GDP deviates from its equilibrium level, a output gap arises in the model, which can be regarded as an alternative to the output gap derived in the UC model.

In the simple econometric estimates of how sensitive the budget balance are to cyclical changes in output, it is assumed explicitly or implicitly that the former are endogenous while the latter are exogenous. One problem with this type of estimates are that output cannot be regarded as an exogenous variable. Both the budget balance as well as output are endogenous variables which are affected, *inter alia*, by various

[9] By recursive estimation is meant a regression equation where the parameters are updated by successively adding a further observation until the data sample has been exhausted.

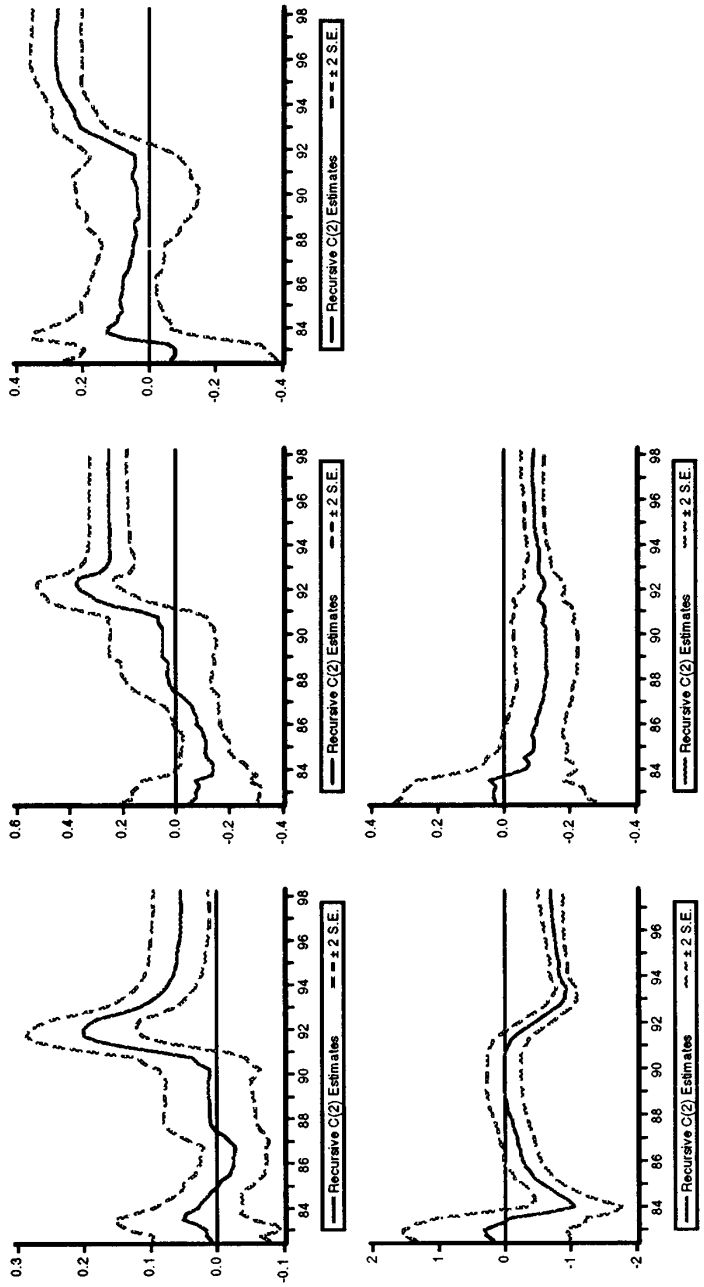

Diagram 1. Recursive estimates

disturbances that affect the economy. An output gap can arise for various reasons, for instance, due to a supply or demand shock and it is unlikely that output or general government finances will be affected in the same way in these different circumstances. In the case of a demand shock, that increases output and the output gap, there will also be upward pressure on prices and an incentive for the central bank to increase the interest rate. In the event of a supply shock, which also increases the output gap, prices will instead fall and there will thus arise an incentive for the central bank to reduce interest rates, which would delay the adjustment of real variables.

How sensitive the budget deficit is to changes in the cycle thus depends on the kind of shock that takes place. When estimating the cyclical effect on general government finances on historical data, a summary measure is obtained of

- the sensitivity of the budget deficit for supply shocks, γ_s
- the sensitivity of the budget deficit to demand shocks, γ_d
- the shocks that have taken place historically.

If, for instance, $\gamma_s = 0.5$ and $\gamma_d = 1$ and it has historically been as common with supply as with demand shocks, β will equal 0.75. However, β can also have a high value primarily because demand shocks have been more common historically. β cannot therefore without further consideration be interpreted as an expression for how sensitive the budget is to the business cycle, the so-called automatic stabilisers[10].

This section investigates:

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[10] It is quite common in the empirical literature that an attempt is made to identify and estimate aggregate demand and supply shocks. This is often done in simple time serie models where the economic structure is very simple. So-called vector autoregressions are specified and it is sometimes assumed that a supply shock is permanent and a demand shock temporary. Changes in the price level or wage changes are usually regarded as supply shocks while demand shocks may be, for instance, changes in private saving or public expenditure. Another way is to study the correlation between price level and output changes. During periods when the correlation is positive, it is then probable that demand shocks will dominate, while supply shocks make the correlation negative.

- how sensitive the general government deficit is to supply and demand shocks respectively
- how common supply and demand shocks respectively have been historically.

We use a structural so-called large econometric model for the entire world economy, the National Institute Global Econometric Model (Nigem) to simulate the effects of supply and demand shocks on the budget balance. Supply and demand shocks are not unambiguous concepts. In a large model, they can be represented by changes in many different variables. Here we shall make simulations where we expose the model to two *typical* disturbances. We assume that a change in compensation can be regarded as a typical supply shock and a change in private consumption can be regarded as a typical demand shock. These simulations are made so that

- the total compensation is assumed to increase by 2 per cent in the one case, and
- private consumption falls by 2 per cent in the other case.

The shocks are introduced in the model as so-called endogenous shocks that occur unexpectedly during the third quarter of 1998. Thereafter both compensation and private consumption are adjusted by the model, for instance, stimulating the economy by interest rate reductions that increase disposable income and wealth and thereby also stimulating consumption.

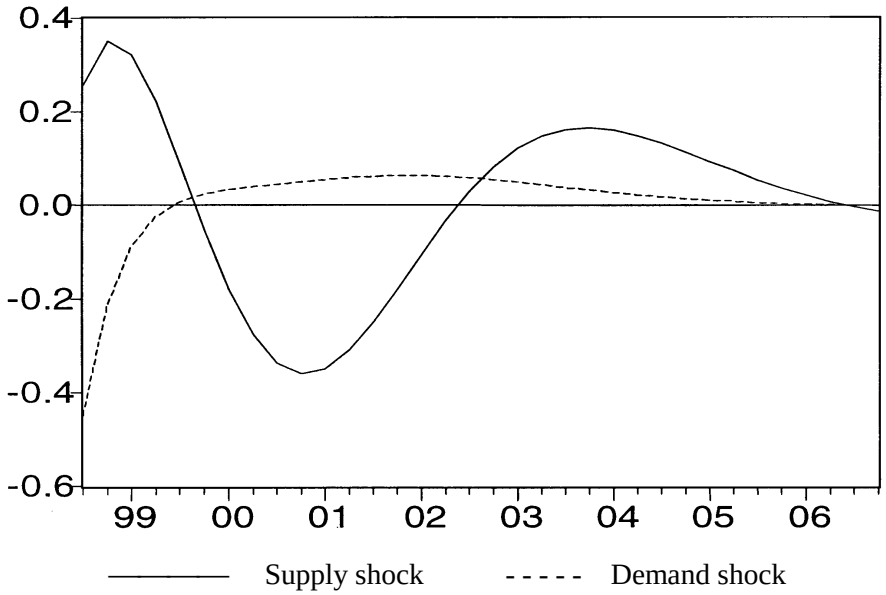
These changes are analysed for the following ten countries: Sweden, Denmark, Finland, Germany, France, United Kingdom, Italy, Spain, USA and Japan.

The diagrams below show how various variables in Sweden have developed and how the respective variable estimated in per cent (or percentage points for the budget balance) deviates from the base forecast that the model makes for the period 1998-2006.

Diagram 2 shows how the budget balance is affected by supply and demand shocks respectively. Here we see that the reduction in consumption initially increases the budget deficit which thereafter recovers. The reduction in consumption pulls down demand and increases unemployment which in turn leads to increased general government expenditure. When wages increase, this leads initially to an increased effective demand and thus to a fall in unemployment. This

Diagram 2

Budget balance and business cycle



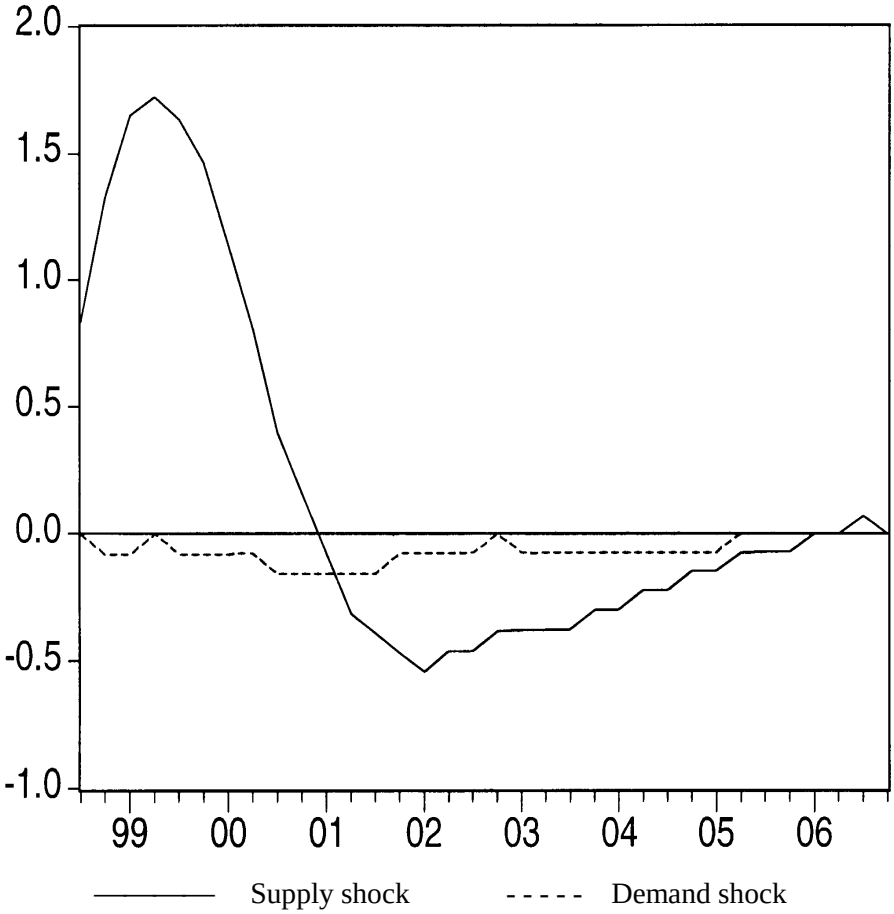
effect is temporary, however for about a quarter. Thereafter, unemployment and the budget deficit increases and the maximum negative effect of the wage shock occurs after just over two years.

Diagram 3 below describes the effects on inflation. As expected, the rate of inflation increases in conjunction with a supply shock but decreases in the case of a demand shock.

Since the rate of inflation increases in conjunction with supply shocks, an increase in interest rates can be expected from the central bank, which is also the case in the model. The short interest rate (in this case the three-month interest rate) rises by around 0.4 percentage points in the case of a wage shock, but falls by at most 0.15 percentage points in the case of a demand shock. The development of inflation will also reflect the development of the budget deficit in Diagram 3. When unemployment increases after the initial reduction, the rate of inflation also drops since demand and employment falls.

Diagram 3

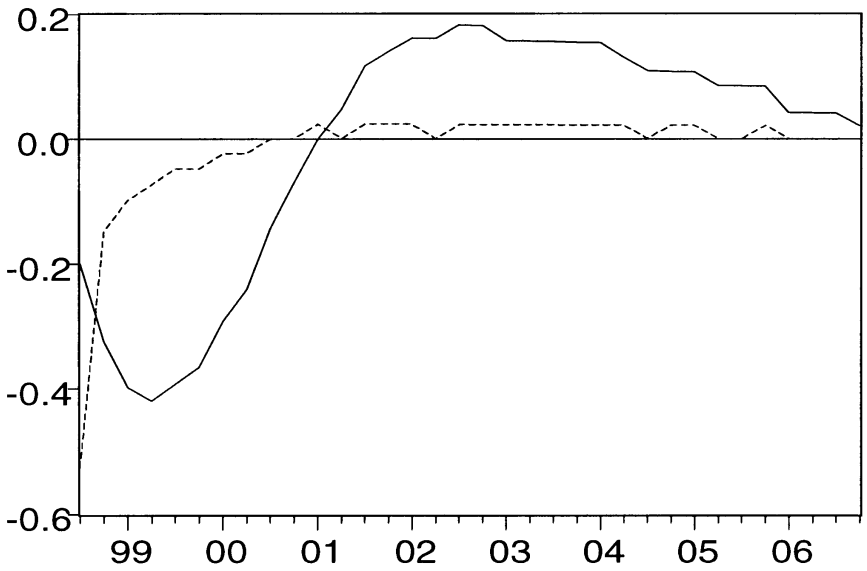
Effects on inflation



Finally, we see in Diagram 4 the effect on GDP. As intended, the shock entails a downturn and GDP falls in both cases by at most 0.4 per cent. Thereafter, a recovery takes place which approximately three years after the shock has taken place leads to renewed growth and an upturn This is the typical pattern a shock should give rise to where the combination of different forms of rigidities and expectations leads to a successive adjustment towards equilibrium.

Diagram 4

Effects on GDP



Simulations show that the demand shock initially gives large real effects and small effects on inflation. The supply shock gives greater effects on inflation but eventually also gives large real effects. This depends on inflation being sensitive to wage changes and is cyclically most affected by unemployment. When private consumption falls, GDP is affected directly but inflation mostly by delay. In the model, inflation is affected mainly as demand for labour declines, whereupon wages fall and unemployment increases.

A conclusion we can finally draw of these simulations is that the correlation between the business cycle and the budget deficit is not stable but depends on the underlying cause of the cyclical change. A typical supply shock, such as a rise in wages, produces another pattern in the development of the budget deficit than a typical demand shock.

2.3 Empirical results

This section contains an investigation of the state budget's cyclical sensitivity with respect to supply and demand shocks and we measure the sensitivity in the manner usually done in other empirical investigations. We then apply formula (3) defined above to measure cyclical sensitivity and use our simulated data to measure parameters β in (3). The results for all countries are shown in Table 2 below.

Table 2

The effect of the business cycle on the general government deficit from demand shocks, elasticities

Country	Supply shock	Demand Shock
Sweden	***-0,08***	***0,89***
Denmark	-0,18	0,56
Finland	0,46	0,53
Germany	0,45	0,41
France	0,21	0,32
United Kingdom	0,27	0,49
Italy	0,34	0,54
Spain	0,16	0,29
USA	0,18	0,49
Japan	0,89	0,51

Table 2 shows how the elasticities will be for supply and demand shocks for the ten countries. A ranking of countries according to the size of the elasticity is made in Table 3. Sweden is the country in which the budget is most sensitive to demand shocks. Here, the elasticity is 0.89 which means that if the output gap is reduced by one per cent, the deficit will fall by 0.89 percentage points. In Spain, the elasticity is lowest, there the deficit would only fall by 0.29 percentage points.

Table 3
Ranking of countries according to the automatic stabilisers in the case of supply and demand shocks respectively

Supply shock	Demand shock
Japan	**Sweden**
Finland	Denmark
Germany	Italy
United Kingdom	Japan
France	United Kingdom
USA	USA
Spain	Germany
Sweden	France
Denmark	Spain

If we instead examine the effects of supply shocks, we can note that the Swedish sensitivity is very little and it cannot be statistically rejected that it is zero in Sweden and Denmark, respectively. One explanation of this can be that there are (or have been) stronger tendencies to accommodation in these countries. Accommodation means that the unemployment-increasing effect of wage increases is counteracted and that the effect on unemployment, and thus the budget deficit, will be small.

Finally, we can also assess the sensitivity of the deficit taking into consideration the shocks that have taken place historically. For example, assume that the wage equation is described by

$$w_t = f(x^w) + \varepsilon_t^w$$

where f (x^W) shows the part of the equation that explains the development of wages and x^W is comprised of variables such as productivity, expected inflation, and wage demands in earlier pay negotiations. ε^W_t is the wage shock, i.e. the part of change in wages that is unexpected. We can then calculate the variance (or standard deviation) in the wage shock as a percentage of the size of the wage (on average) and obtain a measure for how large wage shocks have been historically.

We proceed in the same way with the equation for private consumption (which is explained by private disposable income and financial wealth). In this way, we can weigh the elasticities in Table 2, taking into consideration how common supply and demand shocks respectively have been. Should the historically observable shocks be as common in future, we can expect the elasticities presented in Table 4 below.

There it is evident that the Japanese deficit is the most cyclically sensitive. With the shocks that can be expected in Japan, a typical downturn by one per cent will lead to an increase in the deficit of 0.7 percentage points. The equivalent figure for Sweden is then 0.46 which is in an intermediate position between the countries investigated. Denmark would seem to have the least cyclically sensitive deficit, which largely depends on supply shocks there being most common and the deficit being very insensitive for such shocks.

Table 4

The total effects of the business cycle on the *general government* deficit, historical average from supply- and demand shocks

Country	Effect of shock
Japan	0,70
Finland	0,48
Italy	0,46
Sweden	***0,46***
Germany	0,42
USA	0,37
UK	0,35
Spain	0,26
France	0,25
Denmark	0,03

A conclusion we can draw from this reasoning and calculations is that the cyclical sensitivity of the budget balance is strongly dependent on the underlying shocks that cause cyclical changes. Simple calculations of the correlation between the budget balance and the business cycle on historical data thereby risk being misleading. Sweden and other countries have during recent years also carried out changes both with respect to the budget process and wage formation and not least in the direction of monetary policy with an inflation target. It is then probable that the nature of the shocks will be changed and thereby the cyclical sensitivity of the deficit. The transition from accommodation policy to a (credible) inflation target should, for instance, reduce wages shocks. It is, however, difficult to predict which shocks can be expected to increase and which decrease in future.

3. The development of the structural balance

If the structural balance is determined residually, (1) can be written as

$$d^s = d - d^c \tag{5}$$

When the cyclical component is zero, the actual and the structural budget balance will coincide. The cyclical component is by definition zero in the case of a closed output gap. Therefore the structural budget deficit is defined as the budget balance in the event of a closed output gap. This contains information about the sustainability of fiscal policy.

By definition, the structural balance is affected by everything that affects the total balance except changes in the state of the economy. The following general function can be considered as describing the development of the structural balance

$$\Delta d^s = f(\Delta G, \Delta D, \Delta S) \tag{6}$$

where G stands for fiscal policy measures that lead to changes of the structural deficit, D stands for demographic factors, S stands for other structural changes in the economy that affect general government finances and f is a general function.

Fiscal policy measures can be of a temporary or permanent nature. An example of a temporary measure is the "book" non-recurring improvement that incorporation of the National Supplementary Fund's properties made in the 1998 calendar year. An example of a permanent improvement is the change in rules in the transfer systems. Therefore, a further division of the structural budget balance can be of interest, both before and after non-recurring measures. The budget balance should then be divided up into three components but it would seem to fall outside our purpose to carry out such an operation here.

Two alternative methods are presented below for analysing the development of the structural balance. In the first the econometrically estimated elasticity is used in section 2.1 for calculating the level and development of the cyclical balance. The other method presents an alternative approach – Blanchard's method.

3.1 Structural balance via budget sensitivity estimated on the basis of Swedish data

In this section, the elasticity is used that has been estimated on Swedish data which was presented in section 2.1 to construct a time series of the level and development of the structural balance.

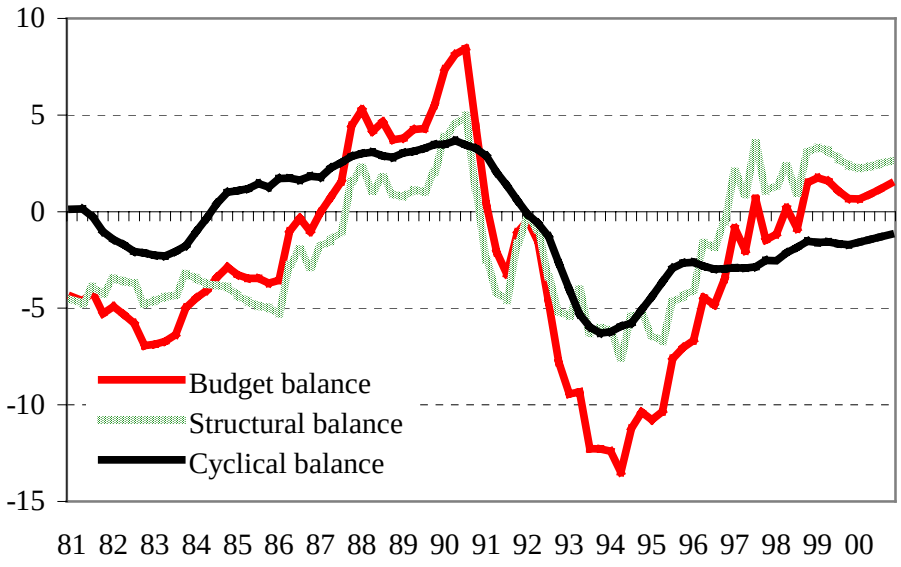
Diagram 5 shows the total budget balance divided into a structural and cyclical component. The estimate is based on the estimated elasticity of 0.98[11]. The balance for the years 1998-2000 is Riksbank's forecast while that for the years 2001-2004 is based on the National Institute of Economic Research's (KI) medium-term scenario from November 1998. The cyclical balance is calculated on an extrapolation of the output gap (calculated by the UC method) based on Riksbank's and KI's forecast of GDP development and an assumption of a rate of growth of potential

[11] As pointed out before, this figure is probably an overestimate of elasticity, but the figure that has been computed on the basis of historic data.

GDP of two per cent per year[12]. According to this calculation, the gap will be closed during 2003.

Diagram 5

Structural and cyclical component of budget balance



The structural balance will historically show a considerable volatility, which will probably include many temporary effects (such as bank support particularly in 1993). since the cyclical balance is determined only on the basis of the output gap. During the period 1995-98, the structural balance improved by eight percentage points, which is slightly lower than the estimate made by the Ministry of Finance for the effects of the convergence programme of just under 10 percentage points (including savings in the municipalities during this period).

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[12] KI's medium-term scenario assumes an average budget surplus of 2 per cent and an average rate of growth of 2.7 per cent during the years 2001-2004.

The cyclical deficit amounted to 6 per cent in 1993 and has since then been improved as the output gap has closed. At the end of 1998, it amounted to just under 2 per cent. It is expected to increase slightly during the next few years to close again during 2003.

3.2 Blanchard's method, measurement of the change in the budget balance

Blanchard's method entails removing the cyclical effects from the development of the budget via unemployment. The method can be viewed as an alternative to using the UC method. The question of principle that Blanchard's method responds to is: how much would the balance have changed between period t-1 and t given that unemployment is the same as in period t-1. The answer to this question is given in Blanchard's index.

$$BFI = \left(\frac{R_t}{P_t Y_t}(U_{t-1}) - \frac{E_t}{P_t Y_t}(U_{t-1})\right) - \left(\frac{R_{t-1}}{P_{t-1} Y_{t-1}} - \frac{E_{t-1}}{P_{t-1} Y_{t-1}}\right) \qquad (7)$$

where *BFI* is Blanchard's index and *U* is unemployment rate[13]. When *BFI* is greater than zero, the balance, adjusted for the development of unemployment, improves – i.e. a contractive fiscal policy.

Furthermore, Blanchard classifies fiscal policy according to the following scale for BFI:

	Fiscal policy is
BFI>1.5	very contractive
1.5>BFI>0.5	contractive
0.5>BFI>-0.5	neutral
-0.5>BFI>-1.5	expansive
BFI>-1.5	very expansive

[13] In similar calculations by Alesina and Perotti (1995), the budget deficit is used instead of the budget balance. It can therefore be noted that the signs on BFI in comparison with their calculations are reversed here.

As regards interpretation of this measure, two things can be noted. In the first place, BFI is a measure of the *change* of fiscal policy and does not say anything about the level of the structural balance. The index measures how fiscal policy changes from the immediately preceding year. This means, for instance, that if the balance between two years changes from –6 to –3 per cent of GDP (we assume for the sake of simplicity that unemployment is unchanged), BFI will indicate a contractive fiscal policy, despite the balance after a tightening of policy in this example amounting to –3 per cent of GDP.

In the second place, BFI can be regarded as a measure of the intended direction of policy, i.e. how the structural balance changes due to political measures (upper right field in Diagram 1) rather than the change of the total structural balance, since the measure by definition retains unemployment at a constant level. This means that if NAIRU increases, which affects the structural balance in a negative direction, BFI is not affected[14].

The table below shows the results for Sweden's fiscal policy during the 1980s and 1990s. The forecasts for GDP and the financial balance for 1998 and 1999 are the Riksbank's.

In order to adjust the actual balance for the development of unemployment, a standard assessment is required for how much each percentage point of unemployment costs per year. In this case, a standard assessment for each year (in current prices) has been calculated from National Accounts data. The cost per percentage unit's registered unemployment is multiplied by the respective year's total unemployment and the total unemployment has been adjusted by this amount[15]. The standard cost assessment for unemployment, measured as a cost in per cent of GDP per percentage unemployed, is reproduced in the table, as well as the total cost for unemployment measured in the same way. The

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[14] Other automatic factors that affect the structural balance will, however, have an effect on BFI.

[15] According to the Ministry of Finance, the cost per percentage unit of registered unemployment, is a good standard assessment for the cost of total unemployment per percentage point. The Ministry of Finance uses the standard assessment of SEK 5 billion each year.

figures in bold style are BFI, i.e. the rate of change of the balance adjusted for the preceding year's unemployment. Finally, the actual change of the balance is reported.

Note that BFI is thus not a measure of the level of the structural balance, but of its change from the previous year[16].

Table 5

BFI's development

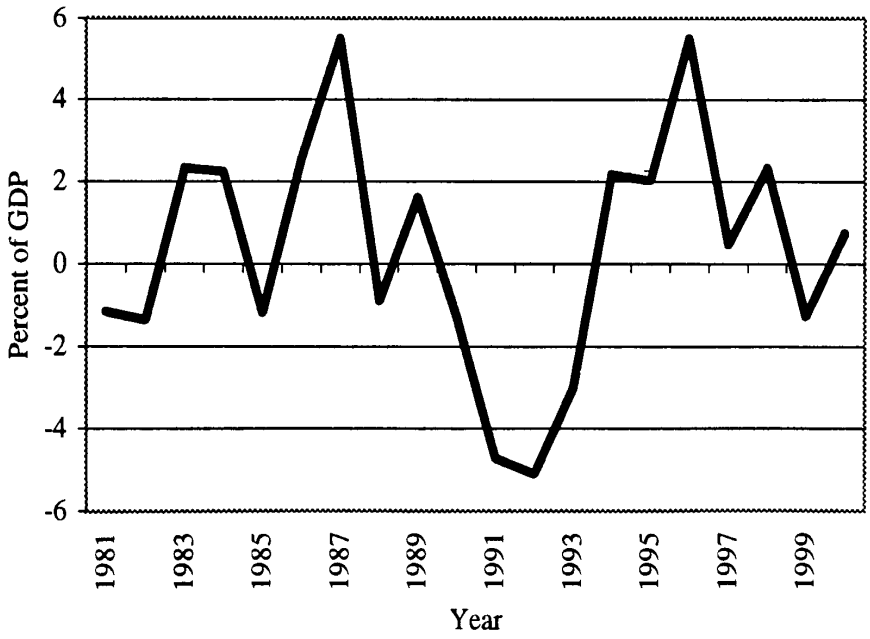
	Cost as percent of GDP per % Unit unemployment	Cost as percent of GDP for total unemployment	BFI	Change in actual balance
1981	0,22	0,73	-1,16	-1,24
1982	0,24	0,81	-1,37	-1,71
1983	0,28	1,14	2,32	1,94
1984	0,29	1,52	2,25	2,08
1985	0,29	1,69	-1,19	-0,9
1986	0,31	1,4	2,55	2,59
1987	0,36	1,37	5,5	5,49
1988	0,35	1,38	-0,9	-0,74
1989	0,34	1,22	1,6	1,88
1990	0,29	0,94	-1,28	-1,19
1991	0,29	0,85	-4,72	-5,3
1992	0,33	1,43	-5,12	-6,66
1993	0,36	2,97	-3,02	-4,51
1994	0,36	4,46	2,17	1,94
1995	0,34	4,69	2,01	2,57
1996	0,31	4,12	5,5	5,69
1997	0,28	3,94	0,46	0,97
1998	0,3	3,43	2,33	2,69
1999	0,29	3,07	-1,28	-0,95
2000	0,28	2,74	0,74	0,89

[16] This method implies that the marginal effect that was previously estimated at 0.98 is instead in the order of 0.1. This is because one per cent's unemployment according to the calculation costs approximately 0.3 per cent of GDP and each percentage point's change of the output gap according to the previously mentioned Okun correlation changes unemployment by 0.44 percentage points (0.44*0.3=0.132)

This analysis of fiscal policy indicates that the underlying cyclically adjusted component has developed erratically. During the beginning of the 1980s, periods of expansive fiscal policy were followed by periods of contractive fiscal policy. During 1987 a very strong restraints were introduced, the balance adjusted for unemployment improved by as much as 5.5 percentage points as a proportion of GDP. Directly afterwards a crisis took place and the balance deteriorated by a total of 14.1 percentage points of GDP when the changes due to unemployment were removed. During the consolidation period, 1994-98, the structural balance was improved by 12.5 per cent of GDP. The development is shown below in diagrammatic form:

Diagram 6

BFI

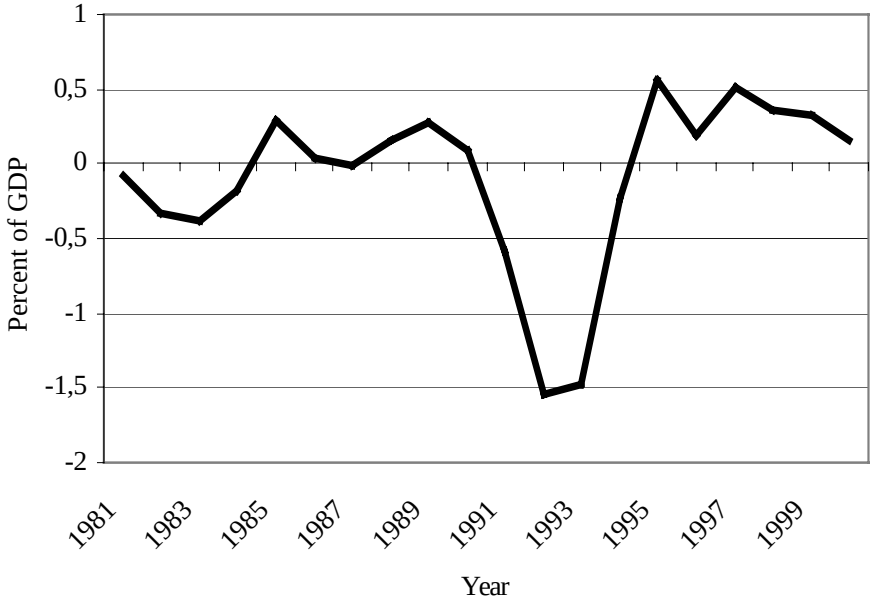


A question that arises is why the rate of change in the structural balance fluctuates so strongly. Part of the explanation can be that a method that only adjusts for costs for unemployment underestimates the

size of the cyclical component's size. There are, (perhaps especially in Sweden), other cyclically dependant parts of the balance. The estimates on Swedish data indicate this. However, there are a lot of calculations that indicate a strongly fluctuating structural balance in Sweden[17]. Another part of the explanation can be that the structural part contains components that are not normally associated with the structural part of the balance and that entail that development varies over the cycle. Accordingly, it need not be a problem that the structural balance fluctuates in a cyclical way. The cyclical balance, calculated here as the actual change minus the structural change above, displays a reasonable pattern, as shown in the following diagram.

Diagram 7

Cyclical change



[17] See, for instance, OECD's calculations in *OECD Economic Outlook*.

The cyclical balance varies with the business cycle, which is shown here particularly during the crisis of the 1990s. Note that this statistic also indicates the rate of change.

Most approaches used to divide up the budget balance into a cyclical and a structural component follow the pattern of calculating the cyclical pattern and letting the structural part form the residual. If the cyclical balance is calculated with a good method, so that only so-called automatic stabilisers are included, this entails that the structural component will include parts that are not normally associated with the concept of structural balance itself - which is more expected to say something about a long-term trend in public finances. This primarily concerns a discretionary fiscal policy of a non-recurring character. The strong negative change of the structural balance at the beginning of the 1990s is partly explained by the bank support, which was a non-recurring measure. The relatively strongly fluctuating series of change statistics during the period can accordingly be an indication of the erratic fiscal policy with many politically decided non-recurring measures. If the historical development of the balance can be explained by the non-recurring measures of fiscal policy, the earlier econometric calculations of aggregated marginal effects will overstate the automatic stabilisers[18]. This is due to the fact that simple econometric calculations do not succeed in differentiating political decisions from automatic effects but only show the historic covariation between the budget balance and the output gap. This is also indicated by the previously reported results in section 3.1. This shows, as section 2.2 and 2.3, the importance of supplementing the simple econometric calculations. To sum up, Blanchard's method probably has a tendency to underestimate the automatic stabilisers, while the previous simple econometric calculations probably have a tendency to overestimate them.

Another question concerns the forecast for the fiscal policy approach during the next few years.

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[18] This picture accords well with the assessment made by the Ministry of Finance in the Convergence Programme. There the picture is given of a fiscal policy that has been marked by discretionary countercyclical policies of a non-recurrent character. The Blanchard measure shows a picture that is compatible with this.

According to this assessment, fiscal policy is moving from having been very contractive during the period of consolidation to being expansive in 1999 and neutral in 2000. This is a consequence of the measures to ease fiscal policy that were introduced in 1999, primarily the temporary income tax relief.

The Blanchard index has some advantages. Among other things, it is easy to calculate. Furthermore, the index probably succeeds relatively well in adjusting the development of the balance for automatic stabilisers, since unemployment is the most important variable for these[19]. The simple econometric calculations tend, as mentioned above, to remove more than the automatic stabilisers from the balance.

The disadvantage with this method is that in certain cases, it can give a misleading picture of fiscal policy due to only measuring changes. In a case where a very large deficit occurs in a phase of consolidation, the measure will give a stringent picture of fiscal policy even if the deficit is very large. Neither can the method say very much about fiscal policy sustainability since it does not manage to distinguish temporary non-recurring measures from the long-term development of the cyclical balance.

The structural balance calculated with Blanchard's method varies over time. During the 1980s, improvements and replacements took place in turns. The crisis years in the early 1990s entailed an unexpectedly large fall of the structural balance and the consolidation period thereafter corresponding unexpected improvements. We make the assessment that the explanation for this is that fiscal policy has been carried out by turns in a contractive/expansive direction with various forms of discretionary decisions, but also that Blanchard's method understates the cyclical component. For the forecast period, it is the case that fiscal policy according to this method is relative expansive in 1999. The underlying balance deteriorates by around 1.3 percentage points, as a proportion of GDP. This is one result of the fiscal policy easements that have been decided this year (these have been calculated by the Ministry of Finance to total SEK 26 billion). For the year 2000, Blanchard's method gives,

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[19] Even if the method probably, as previously mentioned, underestimates the cyclical component slightly.

however, a more contractive picture of fiscal policy. The structural balance is improved by around 0.7 per cent of GDP. The picture of the forecast period seems reasonable.

4. Fiscal policy in terms of households' disposable income

In the Riksbank's inflation forecast, which has a horizon of two years, it is interesting to study the inflationary effects from fiscal policy. The effect of fiscal policy on households' demand will then be of interest. The extent to which this effect comes from cyclically or structurally conditioned factors is of less interest in this context.

The factor incomes in households consist in the national accounts of business incomes, wages, net of interest and dividends, and "other" factor incomes. They become (simplified) a measure of what households earn before tax. The difference between households factor incomes and their disposable income consists of transfers from the public sector (transfers), household tax payments and a very small item "transfers from the private sector" constitutes a measure of the net of taxes to and transfers from the general government sector. The difference is in other words a measure of the effect of fiscal policy on the change of households' purchasing power.

If disposable income grows more slowly than factor incomes, this means that tax revenues have grown more quickly than transfers, i.e. a contractive fiscal policy.

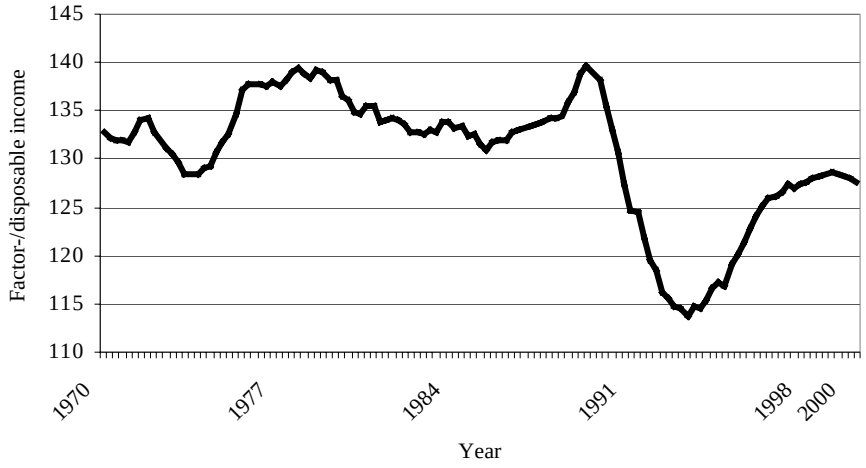
This measure does not distinguish between automatic stabilisers and discretionary decisions. In a downturn, there arises due to the automatic stabilisers having an automatic effect which entails that disposable income varies more rapidly than factor incomes. The difference between factor and disposable incomes development measures only fiscal policy's total effect on households' income.

In Figure 8, the ratio is shown between factor and disposable incomes for the period 1970-2000. Looking at the level of this index, we had a relatively contractive policy from the mid-1970s and up to 1990 and a relatively expansive policy up to the end of the 1990s. If we look instead at the changes in the ratio, a restrictive policy was carried out

during the years 1974-78, 1985-90, and 1994-99, and an expansive policy during 1970-74, 1978-85 and 1990-94.

Diagram 8

Factor income / disposable income



According to the life cycle hypothesis and theories of Ricardian equivalence, short-term changes do not need to affect households' consumption in the short term. All households can, however, not be rational in the meaning of these theories but are limited by restrictions *inter alia* on the credit market. It is therefore probable that the above measure of fiscal policy has affected households' consumption demand and thereby also has effects on inflation.

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