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Structural Budget Deficits and Fiscal Stance

**Patrice Muller,
Robert Price**

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No. 15: STRUCTURAL BUDGET DEFICITS AND FISCAL STANCE

by

Patrice Muller and Robert W.R. Price

Monetary and Fiscal Policy Division

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ECONOMICS AND STATISTICS DEPARTMENT

WORKING PAPERS

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STRUCTURAL BUDGET DEFICITS AND FISCAL STANCE

by

Patrice Muller and Robert W.R. Price*

Monetary and Fiscal Policy Division

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I. INTRODUCTION

Conventionally, fiscal policy analysis makes a distinction between "discretionary" budget changes and "built-in stability". This distinction is the first step to defining a structural budget balance operationally. Budget deficits vary automatically with the business cycle. Revenues automatically rise as the economy expands; unemployment transfers are reduced, leaving a deficit or surplus at the cyclical peak which may be termed a "structural" budget balance. The "built-in stabilizer" component of the deficit should be self-cancelling as the cyclical output gap is closed so that it is temporary and non-structural. A structural budget deficit is then that excess of public spending over revenues which would persist if the economy were to grow steadily at its highest sustainable employment rate, i.e. at the same rate as potential output.

This paper is concerned with issues of definition and measurement. The origins of structural budget pressures and the significance of structural budget indicators for the interpretation of the demand and financial market impact of fiscal policy, in a period of variable inflation and rapid government debt accumulation, will be the subject-matter of a forthcoming Autumn edition of OECD Economic Studies. This working paper provides a methodological background. It first describes the purpose and method behind the cyclical adjustment process (Section II). It then assesses the need to construct a structural budget measure which is consistent with trend government debt accumulation (Section III). This necessitates "adjustments" for (i) the extent to which "built-in stabilizers" add to the long-run stock of outstanding debt; and (ii) the effects of inflation in reducing the real value of public debt (and hence private sector wealth) while raising government interest payments.

Structural budget trends are described for eighteen of the twenty-four OECD countries (representing 97 1/2 per cent of area GDP) in Annex 1. Estimates are given for the period 1970 to 1983. These are compatible with the structural budget estimates in OECD Economic Outlook No. 35, June 1984, which may be used to extend the series to 1985.

II. DEFINITION AND MEASUREMENT

A. Conceptual issues: interpretation and usage

The cyclically-adjusted indicator has advantages over the unadjusted budget balance in number of respects: (i) the analysis of short-term fiscal policy stance; (ii) medium-term budget planning and control; (iii) the pursuit of continuity and stability in budget-making and (iv) the monitoring of potential financial market pressures.

- (i) Measuring fiscal stance The cyclically-adjusted budget balance can be interpreted as an index of "discretionary" policy action in the sense of identifying budget deficit changes as a cause rather than effect of

variations in economic activity. Budget deficits tend automatically to rise as private sector demand falls, because tax yields decline and unemployment-related expenditures rise; such "automatic stabilizers" may however conceal deliberate policy interventions (changes in spending programmes or tax rate alterations) which may themselves be a source of demand disturbance in the economy.

- (ii) Medium-term budgetary planning Separating cyclically self-correcting changes in the budget from more permanent shifts may enable the longer-run course of public spending and taxation to be controlled more efficiently. Short-term tax and spending variations designed to balance the budget throughout the cycle would involve substantial disruption. This may be avoided if cyclical budget disturbances can be separated from underlying structural budget trends.
- (iii) Fiscal "neutrality" and economic stability Setting and pursuing budget balance targets independently of the state of the business cycle implies the need to offset "automatic stabilizers". This might be justified if credit market pressures fall as a result, or if economic incentives are thus enhanced: i.e. if such "stabilizers" have adverse marginal effects on financial and labour markets. But such offsetting action can be destabilizingly pro-cyclical if demand is cut and credit market pressures remain -- as may be the case where countries are deflating in concert. If allowing automatic stabilizers to operate does not entail interest rate or monetary control costs, following a structural budget rule may have stability advantages not just over traditional counter-cyclical "fine-tuning" but also over budget balance targets which entail pro-cyclical budget interventionism.
- (iv) Monitoring financial market pressures Private sector credit demands may be lower in periods of cyclical demand weakness, and financial markets may thus be unaffected by fluctuations in government debt which are perceived as temporary. In this case, interest rates may be influenced more by the trend accumulation of government debt in private portfolios over the cycle, including the expected competition for loanable funds as private investment recovers. The structural budget deficit may then be a better gauge of prospective government interest rate pressures than the actual budget deficit.

The cyclically-adjusted budget is not, however, without its drawbacks. As a method of describing fiscal policy stance it suffers from two (conceptual) deficiencies. First, it embraces rather a wide set of "discretionary" policy actions, including inflation-induced fiscal drag and variations in nominal debt interest payments. This defect, of course, does not make the budget deficit itself a more satisfactory indicator of fiscal stance; it argues for a degree of disaggregation and "inflation adjustment" when constructing a summary indicator of budgetary policy (1). Second, the indicator's relevance to economic policy analysis is, to some extent, model-dependent: its role would be limited if structural budget changes were "fiscally neutral" in the sense of being ineffective in explaining even short-term economic variations. Longer-run fiscal ineffectiveness would not, however, be an argument against the usefulness of the concept; indeed, it is perfectly compatible with conventional economic models incorporating short-term fiscal policy impacts on demand followed by (either partial or complete) "crowding-out" (2).

As used for medium-term public spending control the structural budget concept has tended to relate public sector expansion to the prospective longer-run trend growth of resources. But optimistic growth projections have tended to lead to over-expansion of the public sector, so that budget planning in the Netherlands, for instance, has retreated from reliance on the "structural deficit" concept as an aid to controlling medium-term budget growth. Emphasis is now on correcting the deficit per se. Nevertheless, in attempting to cut back budget deficits since the second oil shock, governments have not, in practice, been able to ignore the impact of the cycle on the budget when determining the rate of budget deficit reduction.

"High employment" budget targets have traditionally been used as a means of promoting economic expansion and achieving high employment, insofar as these objectives have been seen to depend on active policies of counter-cyclical deficit finance. This has been the case in the Netherlands. In Germany, also, the Council of Economic Experts initially used the concept of the "cyclically neutral" deficit -- the budget deficit net of cyclical revenue effects -- as a means of enhancing the counter-cyclical effectiveness of fiscal policy. Similarly, in the United States the Council of Economic Advisers has sometimes used the "high employment" deficit as a "self-fulfilling" means of stabilizing the economy and the budget at a high level of resource utilisation (3). The association of "high employment budgeting" with monetary accommodation, inflation, high interest rates and growing unemployment has tended to undermine the concept as a normative basis for budgetary activism, however. With the adoption of monetary targeting, budgetary stance has been subordinated to anti-inflation and monetary control objectives, as policies have reverted from a belief that there is a long-term positive trade-off between inflation and employment objectives. In this context, the United Kingdom treasury, for instance, has viewed the distinction between automatic stabilizers and structural budget deficits as inappropriate to a policy framework based on disinflationary monetary targets and interest rate reductions.

On the other hand, the usefulness of defining fiscal stance in cyclically-adjusted terms has often derived as much from its capacity to prevent unnecessary short-term budgetary interventionism as an ability to enhance the "fine tuning" potential of the budget. This is perhaps best demonstrated by reference to the 1982 American and Canadian budgets. The Canadian budget strategy explicitly acknowledged the need to avoid trying to achieve a particular level of actual deficit regardless of the economic conditions prevailing at the time (4). Such action may be destabilizing, amounting to pro-cyclical fiscal interventionism. An acknowledgement that "the business cycle does cause variations that are difficult to calculate and offset" also appeared in the 1982 United States Budget (5). Moreover during a recession the borrowing requirements of business and consumers tend to be small, so that a given budget deficit can be financed with less pressure on interest rates. Thus:

"it is not only the annual deficit that affects the economy but also the trend of deficits over the cycle and beyond. Because of the structure of certain spending and tax programs, deficits tend to vary conversely with the economy. To some extent, deficits that are generated when the economy is weak can be made up when the economy is strong. It is the trend of deficits which serves as an indicator of fiscal discipline" (6).

There has thus been a widespread recognition (sometimes less explicit than the above) that cyclical government borrowing may be more manageable than budget deficits which persist as recovery takes the economy to fuller levels of resource utilization. In this case, the cyclically-adjusted budget balance is a better indicator of "crowding out" pressures than the actual budget deficit.

But while a structural budget approach may have advantages from the point of view of monitoring competition for credit (i.e. loanable funds) between government and private sectors, it gives little information about the growth of government debt and resultant "portfolio" pressures. Rules aimed at balancing the budget at the cyclical peak would still, for instance, need to allow for the fact that the budget was not balanced throughout the cycle, so that government debt would be rising and portfolio pressures increasing. To construct a structural budget indicator consistent with the trend accumulation of government debt (interest rates being less influenced by contemporaneous debt changes than by secular debt accumulation), the cyclical adjustment should be estimated by reference to trend mid-cycle rather than peak-cycle) output. The structural budget balance would then show the rate of cyclically-adjusted debt accumulation (subject to provisos discussed below). The cyclical contributions of the economy to the budget balance would net out over the cycle, being positive at peak cycle, negative at the trough and summing to zero.

B. Potential output growth and the cyclical sensitivity of budget deficits

The estimation of structural balances set out in Table 1 and Annex 1 involves a process of measuring automatic short-term variations in the budget deficit, via a process of "cyclical adjustment". This process is described in detail in Annex 2. Among the most important questions of definition and measurement which immediately arise are, first, the specification of the long run growth path of the economy, which permits an identification of the gap between actual and potential output (the "GDP gap") and second, the sensitivity of the tax system, and unemployment benefits, to the gap (7).

a. Productive potential and the "GDP gap"

Perhaps most crucial to the structural budget calculation is the estimate of "cyclically-corrected GDP", or "potential output" (which are taken as synonymous). Put most simply this is trend output measured from peak-to-peak. It implies neither a fixed capacity utilization rate nor a constant employment rate (still less a "high employment" rate). Structural changes in the labour market have to be allowed for. Rather, it is meant to track the trend path of GDP if cyclical divergences between aggregate demand and supply were absent. It is difficult to measure operationally because the next peak is, of course, not precisely known; but the assumption is that "potential output" is the capacity utilization rate to which OECD economies naturally recover without fiscal and monetary stimulus. This implies a judgement (necessarily subjective) that such output is compatible with stable inflation and price expectations and sustainable external balance (8). The object of the measure is to estimate what deficit would remain when the economy recovers -- i.e. the tax receipts which governments can expect to

accrue automatically not those that would accrue if the economy were at some notional "high employment" output. If recovery leaves a higher unemployment level then the previous peak this extra unemployment is assumed to be structural at the new peak.

Productive potential has been estimated by extrapolating a long-run trend growth of output from a peak of high employment in the early 1970's to a peak in the late 1980's (a procedure described more fully in Annex 2). The base year is taken as that with the lowest unemployment level in the early 1970's -- generally 1970-71. The cyclical upturn of the 1972-73 period -- though resulting in substantial output growth -- was widely associated with "over-heating" in the form of inflation and balance of payments pressures. This means that for many economies negative output gaps emerged at the time of OPEC I (i.e. the level of capacity utilization was too high, and the rate of economic growth too fast to be sustained). However, as Annex 2 explains, the exact choice of base year differs with country circumstances and is taken, in a number of cases as 1973 or 1974.

Because of balance of payments constraints, potential growth rates depend to a large degree on potential growth elsewhere. This sets limits on any longer-run divergence in growth trends among countries. To ensure consistency between prospective growth rates, therefore, the potential growth rates of the European economies have been derived from equations linking this with the trend growth of output in North America, Japan and Germany, the rates for which have been taken from official sources (see Annex 2). As a check on the legitimacy of the productive potential and output gap estimates, the implied recovery rates needed to close the output gap during the upswing (taken as 1983-88) have been compared with past recovery rates in Table A2.4. The average rate of recovery for the major seven economies emerges as about 4 percent per annum; for the four major European economies it is about 3 1/4 per cent and for the smaller European economies -- where output gaps appear to be smaller -- it is nearer 2 3/4 per cent.

Uncertainty about potential growth must, however, be recognised as one of the most important drawbacks of structural budget balance estimation. Over-estimating the extent to which budget deficits are attributable to the cyclical gap might, by sustaining too high a structural deficit, add to interest rate pressures and hence to slower growth and further expanding structural deficits. Since productive potential must depend in part on the structural deficit, there may be a degree of circularity between overestimating growth and underestimating the structural deficit -- the one may lead to the other (9).

On the other hand, too small an attribution of the deficit to the cycle can lead to unnecessary deflationary action. Though the tendency in the past has been to overstate the true cyclical component of the deficit -- growth rates of productive potential have been revised down continuously in the last decade, so that "automatic stabilizers" have become part of the structural budget problem -- the danger of underestimating the effect of the cycle also exists. The current exercise attempts to chart a middle course between the dangers of underestimating and overestimating the degree of policy correction needed to overcome structural budget problems. Since, however, potential growth rates remain uncertain, Table A2.5 gives (for the major economies) alternative estimates for structural balances (from 1979-84) for growth rates one per cent above or below the "central" estimates presented here.

b. The cyclical sensitivity of the budget deficit

The sensitivity of the deficit to output depends both on the elasticity of the tax base (the various categories of income and expenditures) with respect to the cycle and on the tax rate structure (see Annex 2). It also depends on the extent to which unemployment benefits "replace" the wages of people becoming unemployed. Tax and transfer systems have seldom evolved with considerations of "built-in flexibility" in mind, so that large institutional variations exist between countries; these may cause significant cross-country differences in cyclical budget sensitivity and are described in detail in Annex 2.

Assessing the overall sensitivity of the budget to activity usually requires a structural model of the the fiscal sector -- where marginal tax and benefit rates are directly specified -- as well as a knowledge of the distribution of income and expenditures at high employment. In the accompanying calculations, the fiscal parameters used are those embedded in the Secretariat's Interlink system. Table A2.6 gives a set of "ready reckoners", relating the budget deficit to the GDP gap, based on this system. For the major seven taken as a group the sensitivity of public revenues and expenditures to the GDP gap is such that a one per cent shortfall in output results in an increase in the combined budget deficit of two-fifths of a percent of GDP. The estimated automatic increase in the United States general government deficit would, with this degree of sensitivity, amount to some \$12 billion at 1983 nominal income levels for a 1 per cent output gap. That of Japan is estimated at a slightly lower 0.3 per cent of GNP. Besides being related to differences in average and marginal tax rates, this budget deficit sensitivity depends on the relationship between unemployment (and hence unemployment benefits) and the cyclical output gap: the budgets of lower productivity economies would tend to display the greatest sensitivity to the cycle (10).

Prices are assumed invariant to the output gap, though in practice they may display a cyclical sensitivity. The difference made to the estimate of structural budget stance by adopting this assumption in preference to one where prices rise with recovery need not, in principle, be great. If both public and private sector prices are flexible, and fiscal indexation operates for revenues and expenditures, the share of the budget deficit in GDP would change only little where prices were assumed to rise with output. (11).

c. Structural budget estimates

The tables in Annex 1 give data on actual budget deficits (column 1), structural budget trends and government net debt accumulation. Structural (i.e. "cyclically-adjusted") budget trends are broken down into revenue and expenditures in columns 2 and 3, with social security transfers (on income maintenance) identified separately in column 4. Structural budget balances are given in column 5 and summarised in Table 1 of the text. (All the structural budget items are expressed relative to potential GDP or GNP.) "Built-in stabilizers" are quantified in column 6; adding these to the structural budget balances gives the actual budget balances in column 1.

Column 8 gives data on net government debt (financial liabilities less financial assets excluding equities). There is no link between structural budget deficit ratios and changes in outstanding government debt, and this

Table 1

GENERAL GOVERNMENT STRUCTURAL BUDGET BALANCES

	PERCENTAGE OF POTENTIAL GDP/GNP													
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
UNITED STATES	0	-0.5	0	-0.2	0.7	-0.9	0.4	0.6	0.9	1.2	0.7	1.6	0.3	-0.2
JAPAN	1.9	1.7	0.6	0.3	0.7	-1.9	-2.9	-3.1	-4.9	-4.3	-4.1	-3.5	-2.8	-2.2
GERMANY	-0.1	-0.2	0	1.3	-0.5	-3.4	-2.2	-1.3	-1.7	-2.3	-2.5	-2.4	-0.9	0.5
FRANCE	0.9	0.7	0.4	0.4	0.7	-0.4	0.2	-0.2	-1.7	-0.8	0.8	-0.2	-0.6	-0.7
UNITED KINGDOM	3.0	1.6	-0.8	-3.6	-3.7	-3.2	-3.4	-1.7	-3.8	-3.2	-1.1	1.8	3.3	1.6
ITALY	-5.2	-6.7	-8.4	-8.3	-8.1	-10.1	-8.4	-7.3	-9.1	-9.7	-8.6	-12.0	-12.0	-9.7
CANADA	1.4	0.1	-0.2	0.2	1.1	-2.4	-2.0	-2.2	-2.9	-1.6	-1.7	-0.5	-1.2	-1.9
SPAIN	0.7	-0.3	0.1	0.4	-0.6	0	-0.3	-0.8	-1.7	-1.1	-1.0	-1.3	-3.5	-3.7
AUSTRALIA	2.9	1.9	1.9	-1.1	2.0	-0.1	-2.7	1.0	-0.3	0.2	1.4	1.2	2.1	-1.6
NETHERLANDS	-0.8	-0.5	-0.4	-0.1	-1.1	-0.9	-1.9	-0.4	-0.8	-1.3	-1.5	-1.7	-1.9	-1.1
SWEDEN	4.4	5.9	5.2	4.0	0.8	1.6	3.9	3.7	2.2	-1.7	-2.6	-2.1	-2.6	-1.6
BELGIUM	-2.0	-2.3	-4.0	-4.8	-4.4	-3.9	-5.9	-4.1	-4.3	-5.1	-7.4	-9.1	-7.7	-7.0
AUSTRIA	2.1	2.4	2.3	1.3	1.2	-0.5	-2.7	-2.1	-1.5	-2.4	-1.6	-0.2	-1.3	-2.2
DENMARK	3.2	4.4	3.2	3.9	3.9	1.7	0.1	-0.1	0.7	-1.9	-1.6	-2.7	-6.6	-5.5
NORWAY	3.2	4.5	4.8	6.4	5.2	4.7	3.3	2.5	1.8	2.3	4.3	5.4	5.4	5.4
FINLAND	5.4	6.6	4.8	5.8	4.7	3.6	7.0	6.2	4.6	1.7	0.5	2.1	0.2	-0.9
GREECE	1.5	0.6	0.4	-1.4	0	-1.4	-0.8	0.1	0	-0.3	-3.0	-9.3	-5.7	-5.1
IRELAND	-2.5	-2.0	-2.7	-4.0	-6.8	-10.3	-5.7	-6.5	-9.2	-10.7	-11.7	-13.3	-14.3	-10.6
TOTAL MAJOR SEVEN	0.4	-0.2	-0.4	-0.6	-0.2	-2.0	-1.3	-1.0	-1.6	-1.3	-1.2	-0.6	-0.9	-1.0
TOTAL OF ABOVE COUNTRIES	0.5	0.1	-0.2	-0.4	-0.1	-1.7	-1.2	-0.9	-1.5	-1.3	-1.2	-0.7	-1.1	-1.2

complicates the interpretation of structural budget balances when the purpose is to monitor financial market pressures.

III. ADJUSTING STRUCTURAL BUDGET BALANCES FOR GOVERNMENT DEBT ACCUMULATION, INTEREST PAYMENTS AND INFLATION

A. Structural budget deficits and the growth of government debt

The estimation method described above defines the budget deficit/surplus as that which would remain at the cyclical peak. However, economies operate on average below full capacity. Debt issued to finance "automatic stabilizers" will add to outstanding government debt unless structural surpluses at times of peak employment are sufficient to offset budget deficits at times of less buoyant activity. A permanently balanced structural budget may still be adding to "structural" debt and portfolio problems because of the cumulation of "cyclical" budget deficits.

To make structural budget estimates consistent with longer-run (cyclically-adjusted) government debt accumulation, potential output needs to be defined not as peak output but as the mid-cycle average (see Annex 3). "Built-in stabilizers" are then measured by reference to the difference between actual output and mid-cycle output (not actual and peak output as is conventionally the case). At the trough of the cycle they would be negative; at the peak they would be positive, rather than zero, as in the conventional method. Over the whole cycle they would net out. Structural budget indicators estimated using this definition of "built-in stability" would seem a better gauge of potential "portfolio" pressures on financial markets, while yielding (in change form) a virtually identical description of "discretionary" fiscal policy stance as the usual structural budget indicator.

As would be expected, measuring cyclical effects by reference to the mid-cycle trend level of output lowers quite substantially the cyclical correction and raises structural deficit estimates for OECD economies (see Table A3.1 of annex 3).

B. Debt interest and inflation-adjusted structural budget balances

While actual deficit/GDP ratios (which incorporate built-in stabilizers) might, in principle, be expected to relate quite closely to changes in net debt/GDP ratios, inflation (and real GDP growth) tends to prevent any direct mathematical link between budget deficit ratios (actual or structural) and changes in the debt stock relative to GDP (Annex 3, Part B) (12).

Inflation reduces the value of outstanding government debt relative to GDP, while tending to increase budget deficit/GDP ratios. Interest rates on government stocks, and hence debt service payments, automatically rise to compensate for higher inflation (13). If all government debt was issued at a variable rate, higher interest payments would exactly offset the fall in the value of outstanding liabilities, leaving government debt/GDP ratios unchanged. There may thus be little or no connection between changes in general government net debt/GDP ratios and conventionally-measured budget deficits, either actual or structural. To create a budgetary flow measure consistent with debt stock changes, nominal interest payments resulting from inflation need to be excluded from the budget deficit (14).

Annex 3 gives structural budget balances net of (net) interest payments (Tables A3.2-A3.3). However, government debt is issued, for the most part, at a long-term fixed coupon, and that coupon often incorrectly anticipates inflation. Holders of government securities may thus incur a real capital loss, because the inflation-induced fall in the real value of debt (the "inflation adjustment" as defined in Annex 3) exceeds interest paid on public debt. Bond holders would then be subjected to an "inflation tax", equal to the difference between the "inflation adjustment" and net interest paid (Table A3.4). Governments make corresponding capital gains, reflected in declining debt/GDP ratios.

A budget deficit measure consistent with a declining real stock of debt would thus need to incorporate not debt service per se but the effect of inflation on the real value of household wealth -- i.e. the "inflation adjustment". Annex 3 gives a set of "inflation-adjusted" structural budget balances which allow for the inflationary erosion in the real value of government debt (Table A3.5). These are always in greater surplus or lower deficit than unadjusted structural budgets.

To the extent that "permanent income" is affected by this decline in real personal wealth, consumption will be lower and household savings higher. If the inflation-induced fall in the value of government debt (the "inflation adjustment") exceeds the interest component of the deficit bond-holders are subjected to an "inflation tax" (a negative real rate of return). When inflation rises unexpectedly the "inflation tax" rises, budget stance tightens and private spending declines. As inflation falls the inflation tax falls and so do private savings ratios. The "inflation-adjusted" structural budget indicator may thus give a more accurate assessment of the demand impact of a given budgetary stance than the (inflation-) unadjusted indicator. Year-to-year changes are especially relevant here -- see Tables A3.6-8 of Annex 3.

The appropriateness of inflation-adjusted structural budget indicators in fiscal policy analysis depends on private sector behaviour. If changes in real wealth affect household consumption then the inflation-adjusted indicator may be a more accurate gauge of fiscal impact than the unadjusted one. If, on the other hand, the "inflation premium" in interest receipts is treated as disposable income, the nominal component of interest rates would affect consumption and the "inflation tax" would not. The unadjusted structural budget indicator would then be the more relevant one. The choice of indicator is thus an empirical matter, with the evidence pointing to real household wealth as an important determinant of private spending.

Similarly, if financial markets treat the "inflation premium" as an accelerated repayment of capital (while discounting cyclical deficits as transitory), then the "inflation-adjusted" structural budget indicator would be a better gauge of financial market pressures than the unadjusted one. With "steady-state" inflation (the rate of price change both fixed and perfectly anticipated) the inflation-adjusted budget would be a measure of possible financial crowding-out stemming from government deficits. Investors in government stocks would not have to unbalance their portfolios in order to buy more government bonds if the nominal value of their financial assets was increasing with inflation -- as it would be if interest rates properly anticipated inflation. Indeed, they would need to buy more bonds with the interest payments received in order to keep their portfolios balanced. On the other hand, in circumstances of high, variable and uncertain inflation, the

real capital losses (past and expected) suffered by bond holders may lead to portfolio resistance on the part of financial investors. This would tend (and has tended) to prevent nominal interest payments from being "rolled over" without upward pressure on interest rates. Financial market perceptions may be such that concentrating on the inflation-adjusted deficit may lead to budget financing pressures being understated.

NOTES

1. The OECD Economic Outlook includes fiscal drag in the "discretionary" component, but this need not, in principle, be so: "high employment" deficit indicators available for the United States distinguish inflation-induced fiscal drag from direct policy shifts. See de Leeuw and Holloway, Survey of Current Business, April 1982.
2. The ex ante shift in the budget balance (the change in fiscal stance before allowing for tax feedbacks etc.) may be seen in terms of a lateral movement in the IS curve. This causes "high employment" demand to diverge from potential; the long-run movement in the curve is determined by ensuing domestic and foreign savings responses, while the eventual change in national income will depend on money market responses and interest rate effects. The structural budget approach is thus consistent with models showing long-run financial "crowding-out", complete or incomplete. However, rational expectations and/or "ultra-rationality" models may be based on an IS curve which does not shift in response to government deficit spending, either because the inflationary consequences of money-financed deficits are immediately discounted, or because bond-financed deficits lead to the anticipation of future debt interest payments and raise private savings. In such models, the structural budget indicator would have little or no relevance to demand variations except as "surprises".
3. See United States Budget for Fiscal Year 1972, p. 7 et seq.: "In this way, the budget is used as a tool to promote orderly economic expansion. The full employment budget idea is in the nature of a self-fulfilling prophecy. By operating as if we were at full employment we will help bring about that full employment."
4. See Canadian Budget Speech, June 28, 1982.
5. Economic Report of the President, February 1984, p. 102.
6. Ibid., pp.95-97.
7. For a discussion of the techniques involved see de Leeuw and Holloway, Survey of Current Business, October 1980 and April 1982.
8. The "high employment" level used by the United States administration is "not so high as to generate inflationary instability" (see Budget of the United States Government, Fiscal Year 1984, p. 2-18). Similarly, the Bundesbank estimates of productive potential relate to "normal" capacity utilization under which price stability is "approached as closely as possible" (see Monthly Report of the Deutsche Bundesbank, October 1981, pp. 30 et seq.)

9. See United States Budget for Fiscal Year 1984, op.cit. pp. 2-14 et seq.
10. Specifically, the sensitivity of the budget balance to the economy will be greater the larger is (i) the share of government revenues in GDP; (ii) the tax elasticity; and (iii) the "generosity" of unemployment benefits; also (iv) the lower the productivity per employee, the greater will be the cyclical expenditure on unemployment benefits for a given GDP gap. Paradoxically, all these factors would also tend to make for a larger structural component of the deficit in as much as they would cause greater structural rigidities in the labour market. High budget sensitivity need not, therefore, signify a relatively high cyclical component to the budget deficit.
11. On the other hand, if expenditures are assumed cash-limited then higher prices will lead to greater fiscal drag and a lower structural deficit because tax receipts will rise while expenditures will not.
12. Changes in net debt/GDP ratios (final column) are not directly derivable from the financial balance figures (first column) and the "inflation adjustment" col. 7). Valuation and timing adjustments related to stock issues (including discounts on new stocks, capital uplift due to index-linking and exchange rate effects) mean that there is no one-for-one link between borrowing requirements and changes in the nominal value of outstanding debt. See, for instance, Bank of England Quarterly Bulletin, December 1982, p.541.
13. If price rises were accurately anticipated, the interest rate would increase by the same amount as the rise in prices. Thus a 1 per cent increase in the rate of inflation would (for instance) cause a 10 per cent interest rate to rise to 11 per cent, giving a ten percent increase in interest payments (if all debt is variable rate) compared with a 1 per cent increase in nominal GDP.
14. See Jump, G.V. "Interest Rates, Inflation Expectations and Spurious Elements in Measured Real Income and Saving", American Economic Review, Vol. 70, No. 5, December 1980, pp. 990-1004. See OECD Economic Outlook 34 pp.40-41 for a discussion of this issue. See also Cukierman, A. and Mortensen, J., "Monetary Assets and Inflation Induced Distortions of the National Accounts", EEC Economic Papers, No.15, June 1983.

ANNEX 1. GENERAL GOVERNMENT STRUCTURAL BUDGET
TRENDS, BY COUNTRY AND AREA GROUP, 1970-83

The following Tables give a time series from 1970 to 1983 of general government budget balances, structural budgets, built-in stabilizers, the inflation-adjustment and net debt/GDP ratios by country and area:

Countries: (A1.1) United States; (A1.2) Japan; (A1.3) Germany;
(A1.4) France; (A1.5) U.K; (A1.6) Italy;
(A1.7) Canada; (A1.8) Australia; (A1.9) Austria;
(A1.10) Belgium; (A1.11) Denmark; (A1.12) Finland;
(A1.13) Greece; (A1.14) Ireland; (A1.15) Netherlands;
(A1.16) Norway; (A1.17) Spain; (A1.18) Sweden;

Area Groups:
(A1.19) Major Seven countries;
(A1.20) Major Seven ex. the United States;
(A1.21) Smaller OECD economies;
(A1.22) OECD Europe;
(A1.23) Major four European economies;
(A1.24) OECD excluding the United States;

(A1.25) OECD aggregate.

Structural budget estimates for 1984 and 1985 can be derived from the projected structural budget deficit changes given in OECD Economic Outlook no 35 (June 1984) with which the structural budget estimates given here are compatible.

Table A1.2

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

JAPAN

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

GERMANY

Table A1.4

FRANCE

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

- 19 -

IN PERCENT OF GDP/GNP

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.8

AUSTRALIA

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP

(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

BELGIUM

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP

(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.11

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

DENMARK

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP

(8) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.12

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

FINLAND

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
(8) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.14
GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

IRELAND

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.16
GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

NORWAY

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.17

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

SPAIN

IN PERCENT OF GDP/GNP									
I YEAR	I ACTUAL I BUDGET I BALANCE	I REVENUES	I EXPENDITURES	I STRUCTURAL BUDGET (A) I OF WHICH I SOCIAL SECURITY	I BALANCE	I STABILIZERS (B)	I BUILT-IN I STABILIZERS	I INFLATION I ADJUSTMENT	I GOVERNMENT I NET DEBT I GDP RATIO
I 1970	I 0.7	I 22.4	I 21.7	I 7.5	I 0.7	I 0	I 0	I 0.2	I 2.9
I 1971	I -0.6	I 22.5	I 22.8	I 8.3	I -0.3	I -0.3	I -0.3	I 0.2	I 2.9
I 1972	I 0.3	I 23.0	I 22.9	I 8.6	I 0.1	I 0.2	I 0.2	I 0.2	I 2.7
I 1973	I 1.1	I 23.8	I 23.4	I 9.0	I 0.4	I 0.7	I 0.7	I 0.2	I 2.2
I 1974	I 0.2	I 22.9	I 23.5	I 9.0	I -0.6	I 0.8	I 0.8	I 0.2	I 2.3
I 1975	I 0	I 24.3	I 24.3	I 9.3	I 0	I 0	I 0	I 0.3	I 2.5
I 1976	I -0.3	I 25.2	I 25.5	I 10.0	I -0.3	I 0	I 0	I 0.2	I 2.0
I 1977	I -0.6	I 26.5	I 27.3	I 10.5	I -0.8	I 0.2	I 0.2	I 0.2	I 3.0
I 1978	I -1.8	I 27.2	I 28.9	I 12.0	I -1.7	I -0.1	I -0.1	I 0.3	I 3.6
I 1979	I -1.7	I 28.4	I 29.4	I 12.7	I -1.1	I -0.6	I -0.6	I 0.5	I 5.2
I 1980	I -2.0	I 30.0	I 31.0	I 13.2	I -1.0	I -1.0	I -1.0	I 0.8	I 7.2
I 1981	I -3.0	I 30.8	I 32.1	I 13.9	I -1.3	I -1.7	I -1.7	I 1.1	I 10.5
I 1982	I -5.8	I 29.9	I 33.4	I 14.1	I -3.5	I -2.3	I -2.3	I 1.6	I 15.0
I 1983	I -6.0	I 30.6	I 34.3	I 13.6	I -3.7	I -2.3	I -2.3	I 1.8	I 19.4

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.18

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

SWEDEN

IN PERCENT OF GDP/GNP										
I	I	I	I	I	I	I	I	I	I	I
I YEAR	I ACTUAL	I REVENUES	I EXPENDITURES	I STRUCTURAL BUDGET(A)	I OF WHICH	I BALANCE	I BUILT-IN	I INFLATION	I GOVERNMENT	I
I	I BALANCE	I	I	I SOCIAL SECURITY	I	I	I STABILIZERS(B)	I ADJUSTMENT	I NET DEBT	I
I	I	I	I	I	I	I	I	I	I GDP RATIO	I
I 1970	I 4.4	I 48.6	I 44.2	I 11.2	I 4.4	I 0	I	I -1.9	I -24.2	I
I 1971	I 5.2	I 51.3	I 45.4	I 12.1	I 5.9	I -0.7	I	I -1.7	I -27.6	I
I 1972	I 4.4	I 51.7	I 46.5	I 12.7	I 5.2	I -0.8	I	I -2.0	I -29.7	I
I 1973	I 4.1	I 49.7	I 45.6	I 12.6	I 4.0	I 0.1	I	I -3.0	I -31.2	I
I 1974	I 2.0	I 50.6	I 49.8	I 15.2	I 0.8	I 1.2	I	I -2.7	I -30.2	I
I 1975	I 2.8	I 52.2	I 50.7	I 15.1	I 1.6	I 1.2	I	I -2.9	I -28.9	I
I 1976	I 4.5	I 57.0	I 53.1	I 15.8	I 3.9	I 0.6	I	I -3.4	I -29.9	I
I 1977	I 1.7	I 60.1	I 56.4	I 16.7	I 3.7	I -2.0	I	I -2.9	I -29.1	I
I 1978	I -0.5	I 59.5	I 57.4	I 17.2	I 2.2	I -2.7	I	I -1.9	I -25.5	I
I 1979	I -3.0	I 58.4	I 60.1	I 17.8	I -1.7	I -1.3	I	I -3.0	I -20.0	I
I 1980	I -3.6	I 56.9	I 59.5	I 13.7	I -2.6	I -1.0	I	I -2.2	I -13.6	I
I 1981	I -4.7	I 58.6	I 60.6	I 14.1	I -2.1	I -2.6	I	I -1.0	I -5.3	I
I 1982	I -6.2	I 59.6	I 62.2	I 13.9	I -2.6	I -3.6	I	I -0.5	I 4.7	I
I 1983	I -5.0	I 60.0	I 61.6	I 14.2	I -1.6	I -3.4	I	I	I 11.0	I

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

WEIGHTED AVERAGE FOR THE MAJOR SEVEN OECD COUNTRIES

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP

WEIGHTED AVERAGE IS COMPUTED WITH 1982 GDP/GNP WEIGHTS AND EXCHANGE RATES

(8) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.20

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

WEIGHTED AVERAGE FOR THE MAJOR SEVEN OECD COUNTRIES
EXCLUDING THE UNITED STATES

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
WEIGHTED AVERAGE IS COMPUTED WITH 1982 GDP/GNP WEIGHTS AND EXCHANGE RATES

(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.21
GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

WEIGHTED AVERAGE FOR THE SMALLER OECD COUNTRIES(★)

[illegible]

(*) EXCLUDING ICELAND, LUXEMBOURG, PORTUGAL, SWITZERLAND AND TURKEY
(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
(B) WEIGHTED AVERAGE IS COMPUTED WITH 1982 GDP/GNP WEIGHTS AND EXCHANGE RATES
(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

WEIGHTED AVERAGE FOR THE MAJOR FOUR EUROPEAN COUNTRIES

[illegible]

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP
WEIGHTED AVERAGE IS COMPUTED WITH 1982 GDP/GNP WEIGHTS AND EXCHANGE RATES
(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

Table A1.24

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

WEIGHTED AVERAGE FOR OECD AREA(*)

EXCLUDING THE UNITED STATES

IN PERCENT OF GDP/GNP

[illegible]

(*) EXCLUDING ICELAND, LUXEMBOURG, NEW-ZEALAND, PORTUGAL, SWITZERLAND AND TURKEY

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP

(A) STRUCTURE BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF GDP/GNP WEIGHTS AND EXCHANGE RATES WEIGHTED AVERAGE IS COMPUTED WITH 1982 GDP/GNP WEIGHTS AND EXCHANGE RATES

(B) BUILT IN STABILIZERS = ACTUAL BUDGET BALANCE - STRUCTURAL BUDGET BALANCE

GENERAL GOVERNMENT STRUCTURAL BUDGET TRENDS

WEIGHTED AVERAGE FOR THE OECD AREA(*)

[illegible]

(*) EXCLUDING ICELAND, LUXEMBOURG, NEW-ZEALAND, PORTUGAL, SWITZERLAND AND TURKEY

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GNP

(A) STRUCTURAL BUDGET ITEMS ARE EXPRESSED AS A PERCENTAGE OF POTENTIAL GDP/GRAND WEIGHTED AVERAGE IS COMPUTED WITH 1982 GDP/GNP WEIGHTS AND EXCHANGE RATES

(8) $\text{BUILT IN STABILIZERS} = \text{ACTUAL BUDGET BALANCE} - \text{STRUCTURAL BUDGET BALANCE}$

(9) $\text{WEIGHTED AVERAGE IS COMPUTED WITH 1982 GDP/GNP WEIGHTS AND EXCHANGE RATES}$

ANNEX 2. STRUCTURAL BUDGET METHODOLOGY

This annex describes the process of cyclical adjustment. It discusses:

- A. the method behind the structural deficit concept;
 - B. estimation procedures, including the calculation of productive potential, the cyclical output gap and the cyclical sensitivity of the budget balance;
 - C. unemployment benefits and replacement rates.
- and D. the relationship between the German "cyclically-neutral budget" and the structural budget method.

A. Interpretation and method

Built-in and policy-induced budget changes

Fiscal policy stance may be thought of as varying both indirectly as a result of income-induced changes, or discretely as a result of direct policy intervention. Expressing the budget deficit (B) in terms of the difference between revenue and government spending ($R - G$), and assuming, for expositional purposes, a linear relationship between the deficit and GDP (Y), the budget balance may be specified as:

$$B = (\beta^r - \beta^g) + (m^r - m^g)Y; \quad (1a)$$

$$= \beta + mY; \quad (1b)$$

where the β s are constants which may be altered discretely by policy action and the m s are marginal rates of change in revenues and expenditures with respect to GDP [superscript r relates to revenues and g to expenditures, so that $\beta = \beta^r - \beta^g$]. More specifically, the marginal rate of change in the budget balance with respect to GDP is then:

$$dB/dY = dR/dY - dG/dY = m^r - m^g = m, \quad (1c)$$

which is assumed constant and invariant to any policy change.

The ratio of the budget deficit, b , to GDP is:

$$b = R/Y - G/Y = s^r - s^g \quad (2a)$$

$$= \beta Y^{-1} + m, \quad (2b)$$

while the automatic change in this ratio with respect to changes in income is given by:

$$db/dY = (m - b)/Y \quad (2c)$$

The budget balance/GDP ratio increases in proportion to the difference between the marginal deficit change and the existing deficit/GDP ratio, for a given level of Y.

Analysing year-to-year changes in budget deficits (where # signifies a first-difference operator) we have:

$$B_t = B_{t-1} + \#B + m\#Y, \quad (3a)$$

which may be expressed in terms of "elasticities" ($e = m/s_{t-1}$):

$$= B_{t-1} + \underbrace{(\#B^r - \#B^g)}_{\text{policy change}} + \underbrace{(e^r s_{t-1}^r - e^g s_{t-1}^g)}_{\text{built-in stability}} \#Y \quad (3b)$$

The middle term measures the effect of policy decisions on revenue and expenditures. The final term quantifies the effect of responses to income growth.

The budget balance/GDP ratio can be similarly translated into automatic and policy-induced components. Using 3(a), dividing by Y and rearranging:

$$b_t = b_{t-1} + \#B/Y_t + (m - b_{t-1})(\#Y/Y_t) \quad (4a)$$

$$= b_{t-1} + \underbrace{\#B/Y_t}_{\text{policy}} + \underbrace{[(e^r - 1)s_{t-1}^r - (e^g - 1)s_{t-1}^g]/}_{\text{fiscal drag}} (\#Y/Y_t) \quad (4b)$$

[-----"discretionary" change-----]

The change in the share of revenues and expenditures in GDP here depends on short-term policy interventions and on the built-in effect of existing policies ("current service" tax and spending plans(1)). Fiscal stance would tighten automatically if the revenue elasticity was greater than the expenditure elasticity: "fiscal drag" (defined as the automatic change in the budget/GDP ratio) would be positive because the average rate of tax would automatically increase faster than the public spending share, giving a tendency towards lower deficit (or higher surplus) as GDP grows.

Distinguishing cyclical from long-run income changes

Taking year t as a year of peak-cycle output, subsequent income changes ($\#Y$) can, in turn, be divided into long-run and cyclical components:

$$Y_t = Y_{t-1}(1+r) + (a-r)(Y_{t-1}) \quad (5a)$$

$$\#Y = \underbrace{rY_{t-1}}_{\text{long-run growth}} + \underbrace{(a-r)Y_{t-1}}_{\text{cyclical gap}} \quad (5b)$$

where r = the rate of growth of productive potential and
 a = the rate of growth of actual GDP.

The cyclical gap in output, as a proportion of potential GDP,
 is then given by :

$$\text{gap} = (a-r)/(1+r) \quad (5c)$$

Distinguishing between these two types of automatic change for $\#Y$ in
 equations (3) and (4), allows an identification of cyclical and other sources
 of variation in the budget deficit:

$$B_t = B_{t-1} + \#B_t + m(rY_{t-1}) + m(a-r)Y_{t-1} \quad (6a)$$

$$= B_{t-1} + \underbrace{\#B_t}_{\text{policy change}} + \underbrace{(e^r s_{t-1}^r - e^g s_{t-1}^g)rY_{t-1}}_{\text{fiscal drag}} + \underbrace{m(a-r)Y_{t-1}}_{\text{built-in stabilizers}} \quad (6b)$$

[----- "discretionary change" -----]
 [----- structural budget balance -----]

Similarly, so far as the budget balance/GDP ratio is concerned, changes
 can be expressed as follows:

$$b = b_{t-1} + \underbrace{\#B_t/(Y_{t-1}(1+r))}_{\text{policy change}} + \underbrace{[(e^r - 1)s_{t-1}^r - (e^g - 1)s_{t-1}^g][r/(1+r)]}_{\text{fiscal drag}} \quad (7)$$

[----- structural budget balance (b_t^x) -----]
 $+ (m - b_t)(a-r)/(1+r)$
 $\underbrace{\hspace{10em}}_{\text{built-in stabilizers } (b_t^s)}$

When $a-r = 0$ the economy is at its cyclical peak: the output gap is zero and
 so is the "built-in stabilizer" element. At this point the budget balance may
 be defined as "structural" in the sense that deliberate action would be
 necessary to alter it. Similarly, the notional structural budget balance for
 years where $(a-r)$ is negative can be estimated by netting out the built-in
 stabilizer component(2).

Example

Taking the budget function as

$$B = -5 + (.30 - .35)Y,$$

where $\beta = \beta^r = -5$ and $m^r = .30$ and $m^g = .35$. This implies a progressive
 tax structure, with an elasticity of 1.2 at an initial "high employment" level
 of 100 in year $t-1$, and a proportional expenditure schedule. With income
 growth at a potential rate of $(r) = .05$ (x 100) per cent p.a. and an actual
 growth rate of $(a) = .03$ (x 100) per cent p.a., Y grows to 103 in year t , with
 a potential GDP of 105. The budget deficit would increase from 10 to 10.15,

but a discretionary intervention of +2 decreases it to 8.75. The budget balance/GDP ratio will, incorporating a policy change (#B) of +2 in year t, then develop as follows:

	b_{t-1}	b_t % of GDP	Change
1. Actual budget balance	10.0	-7.913	+2.087
2. Structural	<u>10.0</u>	<u>-7.857</u>	<u>+2.143</u>
3 "Built-in stabilizers" (1-2)	-	-0.056	-0.056

The structural deficit decreases by 2.143 per cent as a result of policy action ($2/105 = 1.905\%$) and fiscal drag $[\cdot 2 \times \cdot 25] \times [\cdot 05 / 1.05] = 0.2381\%$, where $(e^r - 1) = \cdot 2$ and $s^r = \cdot 25$. Both the policy change and the built-in fiscal drag reduce the deficit/GDP ratio in this example, (though without the discretionary change the deficit would increase in absolute terms). The effect of built-in stabilizers is $[-.05 + \cdot 07913] \times [-.02/1.05] = -0.0555\%$.

Public expenditures are usually fixed in the short term, except for unemployment benefits (and debt interest). The budget deficit change with respect to a cyclical gap would thus be negative; transfers would rise as output fell, "discretionary" spending remaining unchanged. The marginal short-run response of public spending to output is thus negative. Taking a value of m^g equal to $-.10$ (while assuming that m^r is still $\cdot 30$), the total built-in response of the budget balance to the cycle, m , would be equal to $\cdot 3 - [-.1] = \cdot 4$. In this case cyclical adjustment would give:

	b_{t-1}	b_t % of GDP	Change
1. Actual balance	-10.0	-8.786	+1.214
2. Structural	<u>-10.0</u>	<u>-7.857</u>	<u>+2.143</u>
3. Built-in stabilizers	-	-0.929	-0.929

The treatment of inflation

Where the rate of inflation is cyclically sensitive, prices would tend to rise as the cyclical output gap was closed; the gap would, in nominal GDP terms, be larger than that shown in equation (5c), which is a gap measured at current prices, but on the assumption that prices assumed are unchanged as between actual and potential GDP.

If revenues are assumed to be sensitive to inflation while expenditures are not, adjusting prices for the state of the cycle would imply that inflation-induced revenue increases would add to the "built-in stabilizer" component (3). The cyclically corrected budget balance would then appear in

larger surplus (lower deficit) than if no price adjustment were made. If, on the other hand, prices in both public and private sectors are assumed equally affected, while tax indexation is in force, both the revenue and expenditure elasticities would approximate to unity and the sensitivity of the budget balance/GDP ratio to the inflationary gap ($p'-p$) would be zero. The assumption of unchanged prices, as incorporated in the structural budget estimates presented here, can thus be defended both on practical grounds that the variation of prices with the cycle is not sufficiently unambiguous to be included in a measure of the ex ante demand stance, and on the a priori basis that fiscal indexation would ensure inflation was fiscally neutral vis-a-vis the deficit/GDP ratio.

The treatment of interest payments

Interest rates are assumed constant (i.e. financial asset prices are assumed unchanged). Nor are interest payments cyclically adjusted to allow for the fact that if the economy were operating at potential output government borrowing -- and hence debt servicing -- would be lower. The interest payments on all outstanding debt, including that due to "built-in stabilizers" are incorporated in the structural budget balance.

B. Estimation procedures

"High-employment" budget simulations

The estimation procedure involves two steps. For the period since 1979 (including forecast years) the effects of the GDP gap on the budget are simulated through the OECD's Interlink model. This is a structural model with separately specified tax functions covering company and personal income taxes, indirect taxes and social security transfers, as well as unemployment benefits.

Beginning from a "baseline" of actual (and projected) GDP and its components, including government appropriation accounts, "constant unemployment" government accounts are generated directly by estimating what receipts and expenditures would be if the economy was growing at a rate consistent with stable cyclical unemployment. A "targeting" procedure is used (with stockbuilding as the "ex ante" instrument) in order to close the gap between actual and constant-employment aggregate demand.

The composition of aggregate demand thus produced is endogenous to the (Interlink) model, which, in turn, generates constant-unemployment tax receipts and social security transfers. (Since Interlink is a disaggregated model, income taxes, (personal and company), indirect taxes and social security contributions are separately generated) (4).

This allows the calculation of a set of "reduced form" estimates of the sensitivity of government revenues and social security outlays to output changes: i.e. it generates the cyclical estimates of m^r , m^g , e^r and e^g . Cyclically-adjusted budget changes are estimated and projected from 1979 directly from the Interlink model, as part of the biannual Economic Outlook forecasting round, up to two years ahead. (For this exercise the 1979 cyclical unemployment level is extrapolated.) To construct structural budget estimates for the period 1970-79 the "reduced form" coefficients are used directly in order to adjust the general government accounts.

Estimates of potential output and the GDP gap

The potential real output growth rates used in this study are listed in Table A2.1. For the three largest economies (and for Canada) these are official estimates (Table A2.2). To ensure international consistency, and allow for the fact that balance of payments constraints demand a degree of harmonisation between growth rates, for most of the other countries potential growth has been derived from regressions relating national output to a weighted average of output in the above four major economies.

In most countries the base year for the extrapolation of potential output is taken as that with the lowest sustainable level of unemployment in the early 1970s -- the cyclical peak preceding the rapid growth phase which coincided with the first oil crisis. The levels of activity reached during this period were widely associated with unsustainable rates of inflation, exchange rate pressure and balance of payments weakness. The output gaps, given in Table A2.3, are thus based principally on a zero gap in 1970, with over-capacity utilization emerging in many countries in the 1972-4 period. However, where the choice of 1970 resulted in negative output gaps in the 1980-3 period, the base was taken as 1973-4. As a check on the implications of the productive potential figures for future recovery paths, Table A2.4 shows the real growth rates needed to close the 1983 gap by 1988, assuming potential output continues to grow at its 1983 rate throughout the period.

The 1983 output gap implies an average recovery rate up to 1988 of about 4 cent per annum among the major economies -- slightly lower than that obtaining during the recovery period which followed the first oil price shock (1976-79). A somewhat slower rate of recovery is assumed for Europe, with that for the smaller countries as a group being slightly below the recovery rate of the major four European economies, where the cyclical downturn (and associated budgetary restraint) appears to have been more marked.

Structural unemployment rates

The structural unemployment rate, i.e. the unemployment rate which would prevail when the economy is operating at "potential output" has increased over the last 15 years. Deriving precise estimates of this structural unemployment rate is complex; it involves the estimation and separation of cyclical effects from the impact of supply shocks, technological innovation and various demographic factors on employment and labour supply. However, approximate estimates of the structural unemployment rates underlying the productive potential assumptions on which the structural budget estimates are based are derived from a reduced form approach, which attempts to capture the major factors affecting labour demand and/or labour supply in a single equation. Regressions are run relating the actual unemployment rate to the contemporaneous and one period lagged values of the gap between potential and actual output, incorporating a trend variable and intercept shift dummies marking the two oil price shocks. For the United States the 1983 structural unemployment rate is estimated to be around 6 per cent, for Japan the underlying unemployment rate is estimated to be close to 2 1/4 per cent and for the four major European economies the structural unemployment rate is estimated to lie in the 7 to 7 1/2 per cent range. For the seven major countries taken as a group, approximately two-thirds of the unemployment in 1983 is estimated to have been structural.

Table A2.1
GROWTH RATE OF POTENTIAL GDP/GNP

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
UNITED STATES	3.6	3.9	3.7	3.8	3.7	3.6	3.6	3.6	3.9	3.1	2.9	2.7	2.7	2.7
JAPAN	9.0	9.0	7.0	5.5	4.9	4.9	4.9	4.9	4.5	4.5	4.0	4.0	4.0	4.0
GERMANY	5.3	4.9	6.4	3.1	3.1	2.5	2.7	2.7	2.6	2.6	2.8	2.3	1.9	1.9
FRANCE	5.6	5.6	5.5	5.3	5.2	4.2	3.1	3.1	3.1	3.1	2.6	2.0	2.0	2.0
UNITED KINGDOM	3.3	3.3	3.3	2.8	2.6	2.5	2.5	2.5	2.5	2.2	2.1	2.0	2.0	2.0
ITALY	5.3	5.2	5.2	4.8	3.7	2.6	2.6	2.6	2.6	2.4	2.3	2.2	2.2	2.2
CANADA	5.2	5.3	5.3	5.3	4.0	4.0	4.0	4.0	3.7	3.0	2.8	2.5	2.3	2.4
SPAIN	6.6	6.6	6.5	6.3	6.2	5.0	4.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5
AUSTRALIA	4.5	4.5	4.4	4.1	4.0	4.0	4.0	4.0	4.0	2.9	2.8	2.7	2.7	2.7
NETHERLANDS	4.5	4.5	4.4	4.2	4.0	3.9	3.9	3.9	3.9	2.6	1.2	1.0	1.0	1.0
SWEDEN	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.3	2.2	2.1	2.1	2.1
BELGIUM	4.1	4.1	4.0	4.0	4.0	4.0	4.0	3.6	3.6	2.7	1.8	1.8	1.7	1.7
AUSTRIA	4.7	5.0	5.1	4.7	4.1	3.7	2.9	3.0	2.5	2.5	2.7	2.1	1.8	1.5
DENMARK	3.6	3.6	3.6	3.2	2.8	2.7	2.7	2.7	2.7	2.3	2.0	2.0	2.0	2.0
NORWAY	5.5	5.5	5.5	5.5	5.5	5.4	5.4	5.4	5.4	4.0	2.5	2.4	2.3	2.3
FINLAND	4.7	4.7	4.7	4.7	4.0	2.9	2.9	2.9	2.8	2.8	2.8	3.0	3.2	2.7
GREECE	6.6	6.4	5.9	5.7	5.6	5.6	5.6	5.6	5.6	3.8	2.1	2.0	2.0	2.0
IRELAND	4.7	4.7	4.6	4.5	4.4	4.4	4.4	4.4	4.4	4.4	4.4	3.3	3.3	3.3
TOTAL MAJOR SEVEN	5.0	5.1	4.8	4.2	3.9	3.6	3.6	3.6	3.6	3.2	3.0	2.8	2.7	2.7
TOTAL OF ABOVE COUNTRIES	4.9	5.0	4.8	4.2	4.0	3.7	3.6	3.6	3.6	3.1	2.9	2.7	2.6	2.6

Table A2.2
POTENTIAL OUTPUT SOURCES

Country	Source of real potential output growth rate estimate	Base year
United States	Bureau of Economic Analysis	
Japan	EPA and OECD	1970
Germany	Bundesbank	1971
France	OECD	1970
United Kingdom	OECD	1970
Italy	OECD	1974
Canada	Department of Finance	1971
Australia	OECD	1970
Austria	WIFO	1973
Belgium	OECD	1970
Denmark	OECD	1970
Finland	Ministry of Finance	1974
Greece	OECD	1973
Ireland	OECD	1979
Netherlands	OECD	1970
Norway	OECD	1970
Spain	OECD	1970
Sweden	OECD	1970

Table A2.3

OUTPUT GAP (1)

	PERCENT OF GDP/GNP														
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	
UNITED STATES	2.2	2.5	0.5	-1.6	2.4	7.0	5.0	2.9	1.5	1.5	4.6	4.5	9.3	8.5	
JAPAN	0	3.7	1.6	-1.9	2.9	5.7	4.9	4.2	3.3	2.5	1.6	1.5	2.1	3.0	
GERMANY	-1.1	0	1.9	0.3	2.6	6.6	3.7	3.5	2.5	1.1	1.8	4.3	7.4	8.0	
FRANCE	0	-0.1	-0.8	-1.2	0.2	3.7	1.4	1.2	0.3	-0.1	1.1	2.6	2.4	3.5	
UNITED KINGDOM	0	0.4	1.2	-3.3	0.2	2.4	2.1	2.2	0.5	0	4.1	7.6	7.4	6.2	
ITALY	-1.2	2.0	3.6	1.0	0	6.1	2.4	2.7	2.3	-0.5	-2.3	-0.7	1.6	4.7	
CANADA	1.4	0	-0.8	-2.7	-2.3	0.1	-0.9	0.6	0.7	0.6	2.1	1.0	8.0	7.1	
SPAIN	0	1.1	-0.9	-3.0	-3.3	-0.3	0.1	-0.7	0.2	1.9	3.0	4.8	6.0	5.9	
AUSTRALIA	0	-1.4	-0.8	-2.4	-0.9	1.0	0.9	3.5	4.0	3.6	4.2	1.6	3.5	4.8	
NETHERLANDS	0	-0.1	0.5	-1.3	-1.2	3.4	1.7	3.0	3.9	4.4	4.3	6.2	8.9	8.9	
SWEDEN	0	1.4	1.5	-0.1	-2.0	-2.1	-1.0	3.3	4.2	1.9	1.6	4.2	5.6	5.2	
BELGIUM	0	1.5	0	-2.4	-3.3	1.3	-0.8	2.2	2.6	2.7	1.1	4.0	4.5	5.7	
AUSTRIA	2.3	1.9	0.5	0	-0.2	3.7	1.8	0.4	2.2	-0.1	-0.5	1.6	2.2	1.7	
DENMARK	0	0.9	-1.2	-2.1	1.1	4.5	0.6	0.7	1.4	-0.1	2.2	5.0	3.3	2.7	
NORWAY	0	0.6	0.6	1.5	1.3	2.0	0.3	1.7	2.2	0.9	-1.3	-0.1	1.0	0	
FINLAND	2.8	5.4	2.3	-0.1	0	2.0	4.4	6.6	7.1	2.7	-0.1	1.1	1.4	0.9	
GREECE	6.7	5.9	2.7	0	8.8	7.6	6.1	7.7	5.9	5.4	5.5	7.5	9.3	10.8	
IRELAND	2.7	3.5	1.3	0.4	0.3	1.9	3.4	0.7	-0.7	0	-0.3	0.9	2.5	4.5	
TOTAL MAJOR SEVEN	0.9	1.9	0.9	-1.4	1.8	5.8	3.9	2.9	1.7	1.2	3.0	3.6	6.7	6.7	
TOTAL OF ABOVE COUNTRIES	0.9	1.8	0.8	-1.4	1.5	5.2	3.5	2.8	1.9	1.4	2.9	3.6	6.5	6.5	

(1) OUTPUT GAP = (POTENTIAL GDP/GNP / ACTUAL GDP/GNP) - 1

Table A2.4

AVERAGE GROWTH RATES
REQUIRED TO CLOSE THE 1983 OUTPUT GAP BY 1988

	Average real GDP/GNP growth rate 1976-1979	Required average GNP/GDP growth rate (a) to close the real output gap by 1988
United States	4.7	4.4
Japan	5.2	4.6
Germany	4.0	3.5
France	3.9	2.8
United Kingdom	2.6	3.2
Italy	3.9	3.2
Canada	3.5	3.8
Australia	2.8	3.7
Austria	3.6	1.8
Belgium	3.0	2.8
Denmark	3.6	2.5
Finland	2.7	2.9
Greece	5.1	4.1
Ireland	4.3	3.2
Netherlands	3.1	2.7
Norway	5.0	2.3
Spain	2.1	3.7
Sweden	1.2	3.1

a. Average compounded annual rate of change from 1983 to 1988.

Table A2.5
STRUCTURAL BUDGET BALANCES UNDER
ALTERNATIVE REAL POTENTIAL GROWTH ASSUMPTIONS(a)

General government net lending at potential output as a percentage of potential GDP/GNP			1979	1980	1981	1982	1983
		Average potential growth rate 1979-83					
United States	A	3.8	1.6	1.4	3.1	1.9	1.7
	B	2.8	1.2	0.7	1.6	0.3	-0.2
	C	1.8	0.8	0	0.1	-1.3	-2.2
Japan	A	5.1	-4.1	-3.7	-2.6	-1.7	-0.7
	B	4.1	-4.3	-4.1	-3.5	-2.8	-2.2
	C	3.1	-4.5	-4.5	-4.5	-3.9	-3.7
Germany	A	3.3	-2.0	-1.9	-1.6	0.3	2.3
	B	2.3	-2.3	-2.5	-2.4	-0.9	0.5
	C	1.3	-2.7	-3.1	-3.4	-2.2	-1.4
France	A	3.3	-0.3	1.7	1.4	2.2	2.4
	B	2.3	-0.8	0.8	-0.2	-0.6	-0.7
	C	1.3	-1.2	-0.2	-1.9	-3.6	-4.0
United Kingdom	A	3.1	-2.6	-0.2	3.4	5.8	5.2
	B	2.1	-3.2	-1.1	1.8	3.3	1.6
	C	1.1	-3.8	-2.1	0.2	0.7	-2.3
Italy	A	3.3	-9.4	-8.2	-11.4	-10.4	-7.9
	B	2.3	-9.7	-8.6	-12.0	-12.0	-9.7
	C	1.3	-9.9	-9.0	-12.7	-13.6	-11.6
Canada	A	3.6	-1.2	-1.1	1.0	0.6	0.6
	B	2.6	-1.6	-1.7	-0.5	-1.2	-1.9
	C	1.6	-1.9	-2.4	-2.1	-3.1	-4.4
TOTAL	A	4.0	-0.8	-0.4	0.6	0.6	1.0
Major	B	3.0	-1.1	-1.0	-0.5	-0.8	-0.8
Seven	C	2.0	-1.4	-1.6	-1.7	-2.3	-2.7

a. Case B is the "central" estimate used to calculate the structural deficits in Table 1.

Table A2.6
THE SENSITIVITY OF GENERAL GOVERNMENT
BUDGET BALANCES TO THE "GDP GAP"

Cyclical adjustment to general government balance per 1 per cent output gap				
	Billions of local currency		Ratio of GDP (a)	
	1983	1981-1983	1983	1981-1983
United States	12.0	12.9	.4	.4
Japan	704	614	.3	.2
Germany	5.9	4.4	.4	.3
France	20.9	18.8	.5	.5
United Kingdom	1.7	1.4	.6	.5
Italy	1543	1222	.3	.3
Canada	2.1	2.3	.5	.6
Average (b)			.4	.4

- a. This measure of the cyclical adjustment corresponds to the difference between the marginal deficit change and the existing deficit/GDP ratio, $m-b_t$, of the built-in stabilizers component in equation (7) on page 40.
- b. 1982 GDP/GNP weights and exchange rates.

The sensitivity of budget deficits to changes in output

Since the estimates of general government structural balances are sensitive to the assumption of real potential output growth, Table A2.5 compares the effects of two additional growth rate hypotheses, besides the "central" estimates used to derive the structural deficit figures described in this study. The first case (A) assumes a real output growth higher by one per cent per annum from 1979; the other alternative (C) assumes real output growth one per cent lower from 1979 on. The central estimate is given as case (B).

To obtain a "rule-of-thumb" measure of the impact of the output gap on general government financial balances a set of sensitivity measures have been constructed in Table A2.6 showing: (i) the change in the general government financial balance in local currency for each 1 per cent output gap, and (ii) the change in the ratio of general government lending to GDP for each 1 per cent output gap (5). These measures have been derived from the simulations used to calculate the structural deficit. As the estimates of the change in the general government financial balance vary somewhat due to lags in the system, the average value for 1982-1984 is also shown in the table.

In the United States, a shortfall of 1 per cent in GNP growth increases the general government deficit on average by U.S.\$13 billion (or 0.4 per cent of potential GNP). This is comparable with the Department of Commerce and CBO sensitivity estimates. The German general government deficit is estimated to rise by approximately DM4 1/2 billion and the Japanese general government balance deteriorates by approximately 0.6 trillion yen for each 1 per cent reduction output. For France the results show that on average the general government financial deficit increases by FF18.8 billion and in the United Kingdom the general government deficit is estimated to rise on average by £1.4 billion. For Canada the general government budget deficit rises by Can.\$2.3 billion on average for each 1 per cent reduction in output.

C. Unemployment benefits and replacement rates

Tables A2.7 and A2.8 give cross-section information on unemployment insurance regimes in OECD countries. Table A2.7 indicates:

- i) the "generosity" of income replacement schemes in terms of "replacement ratios", which measure the amount of the post-tax wage which is made up in unemployment benefit(6) This is defined as the household's disposable income when the breadwinner is unemployed as a percentage of his post-tax income while employed. The figures assume maximum benefit for the individual who may, in fact, be ineligible for benefits for a period (for example, if he resigned), or may be eligible only for a lower level of benefit (for example, if he has not been employed long enough);
- ii) the costs of unemployment to the government, in terms of tax revenue foregone plus benefits paid (relative to the pre-tax wage);
- iii) the proportion of total social security payments (insurance and assistance) allocated to unemployment benefits; and

- iv) the ratio of total social security payments, and of total social security contributions, to earned income.

Table A2.8 gives institutional details on unemployment insurance and old age benefits. It indicates:

- i) whether old age benefits and unemployment insurance are indexed;
- ii) whether an unemployed person must pay income tax and social security contributions on the unemployment benefit he receives. (The trend over recent years has been to make the unemployment benefit liable for income tax); and
- iii) the maximum length of time for which an unemployed person is entitled to receive benefits.

Unemployment benefits vary among countries. While expenditure on unemployment benefits average only 8 per cent of total social security payments, they make up to 18 per cent in countries such as Denmark. Unemployment expenditure, like expenditure on social security benefits generally, has tended to rise since 1972 as a percentage of earned income. This increase appears largely to reflect increased unemployment rates -- including "structural unemployment" -- and changes in the composition of the unemployed more than changes in the real level of benefits. Replacement ratios show no clear trend across OECD countries; they have risen as a percentage of earned income in four of the seven major OECD countries.

The replacement ratio, the duration of benefits, and the degree of supplementary income support for the unemployed once eligibility for insurance benefits has been exhausted, may all affect labour supply. Recent work (see, e.g. Danziger, Haverman and Plotnick Journal of Economic Literature, September 1981) has concluded that unemployment insurance added significantly (but not substantially) to the measured unemployment rate, largely because there was more time spent in job search and because there was a greater incentive to join the registered labour force.

United States' studies on the effect of social welfare assistance, other than unemployment support, on work effort again find only small effects. If typical of other countries, this suggests that the major cause for concern with social security spending may be its effect on savings and (perhaps) on future government debt and taxation. In particular, there has been increasing pressure on social security budgets. In the seven largest OECD countries the ratio of social security payments to earned income averaged 19 per cent in 1980, and had grown an average of 34 per cent since 1972.

Table A2.7

SOCIAL SECURITY BENEFITS

	"Replacement ratios" (a)		Total cost of unemployment to government of an unemployed worker entitled to benefits(b)(c)	Gross unemployment benefits as proportion of soc. sec. payments (d)(e)	Soc. sec. payments as proportion of earned income (d)(e)	Total soc. sec. contributions as proportion of earned income (d)(e)
	Value in 1980(c)	Growth rate 1972	1980	1980	1980	1980
	£	£ p.a.	£	£	£	£
CANADA	67.3 (f)	..	..	23.1	16.7	5.5
UNITED STATES	61.4	0.5	71.2	5.5	17.1	11.8
JAPAN				3.9	15.5	11.2
AUSTRALIA	60.0 (f)	..	..	9.1(g,j)	13.2(g,h)	0.0
AUSTRIA	49.7(i)	..	93.7	4.6(h)	17.4(h,j)	22.9(j)
BELGIUM	66.4	0.5	126.0	12.2	29.9	17.7
DENMARK	95.0	1.8	79.0	18.3(h)	28.4(g,h,j)	1.3(g,j)
FINLAND	45.4	-3.1	73.1	5.8	10.1(j)	6.8(j)
FRANCE	93.8(k)	1.3(k)	141.8(k)	6.9	30.5(j)	26.6(j)
GERMANY	69.0	-0.2	97.8	7.7	19.0(g,j)	19.3(g,j)
IRELAND	81.7	-0.4(m)	97.2	13.9(g,j)	21.2(g)	10.5(g)
ITALY	46.7(k)	0.9(k)	106.4(k)	3.0	19.6	15.7
NETHERLANDS	88.5(g)	0.6(n)	119.1	2.0(g)	39.3(g)	29.2(g)
NORWAY	64.2(i)	0.2	94.6	1.6(h)	28.6(h,j)	23.6(j)
SWEDEN	80.3	1.9	90.2	2.3	25.0	20.7
UNITED KINGDOM	48.2	-4.2	81.5	8.8	15.2	8.8

- a. Replacement ratio = unemployment benefits after tax (including all benefits and allowances for the unemployed) as a percentage of former disposable income, for an average production worker). The fully insured worker is assumed to be unemployed for 1 year.
- b. As a percentage of the unemployed worker's former gross earnings in 1980. Cost includes foregone tax revenues (direct and indirect), foregone social security receipts and unemployment benefits paid.
- c. Source: United Nations "Economic Survey of Europe in 1981", 1982.
- d. Source: Country Sources and OECD National Accounts.
- e. Earned income is wages and salaries including social security contributions, plus income from self-employment (including imputed rental income). Social security payments is social security benefits plus social assistance grants.
- f. Source: Kamerman and Kahn, "Income Transfers, Work and the Economic Wellbeing of Families with children", International Social Security Review 3/82. Data relates to 1979.
- g. Value in 1979.
- h. Excludes social assistance grants.
- i. Approximate value, 1976.
- j. Excludes income from self employment.
- k. For unemployment due to economic reasons; i.e. cessation of business or reduction in staff.
- l. Growth for 1976-1980.
- m. Growth 1972-1979.
- n. An "average production worker" (APW) is defined to be a married man with a non-working wife and two children earning the average production wage.

Table A2.8

SOCIAL INSURANCE

Old Age Allowances			Unemployment Insurance		
	Indexation Provisions(a,b)	Indexation Provisions(b)	Taxation Treatment(c)		Maximum Length(d)
			Income Tax	Social Security Contrib.	
CANADA	Indexed to CPI	Linked to previous gross insured earnings. Nominal ceiling indexed to industrial wage index(e)	Paid	Not paid	50 weeks
UNITED STATES	Indexed to price movements	Varies by state. Generally linked to previous wages. Nominal ceiling on benefits, adjusted by average wage trend	In practice no(f)	Not paid	26-39 weeks
JAPAN	Indexed to price movements	Linked to previous gross earnings. Nominal ceiling and floor, not formally indexed.	Not paid	Not paid	90-300 days (for seasonal workers, 50 days)
AUSTRALIA	Indexed to CPI	Married workers' personal benefits only are indexed to prices.	Paid	N/A(g)	No limit
AUSTRIA	Indexed to national average covered earnings	Linked to previous gross earnings. Ceiling not indexed	Not paid	Not paid	30 weeks
BELGIUM	Partly indexed to prices	Formally indexed to prices above a threshold. Additional discretionary adjustment in line with wages trends(h).	In practice no(f)	Not paid	No limit, but reduced over time for non family head.
DENMARK	Indexed to prices	Linked to previous gross earnings. Ceiling not indexed.	Paid	Not paid	130 weeks.
FINLAND	Universal pension indexed to prices; earnings related pension indexed to average of price and wage changes	Linked to previous gross earnings, but with a nominal ceiling on benefits and supplements. Ceiling not indexed.	Not paid	Not paid	200 days continuously 450 days in 3 years
FRANCE	Indexed to national average wages	Partly linked to previous earnings. Remainder altered 1/2 yearly in line with average pay increases.	Paid	1½ lev only	365 days
GERMANY	Indexed to national wage	Linked to previous net earnings. Ceiling altered yearly in line with national average earnings.	Not paid	Not paid	52 weeks
ITALY	Indexed to wages and cost of living	Unemployment benefit not formally indexed. More important C.I.G. scheme linked to lost earnings.	In practice no(f) CIG:Paid	Paid	Benefit 180 days CIG: In practice, indefinite.
NETHERLANDS	Indexed to net average wage, with minimum level linked to net minimum wage	Linked to previous gross earnings, with nominal ceiling. Altered 1/2 yearly in line with national wage index.	Paid	Paid	2 1/2 years (two consecutive schemes)

SOCIAL INSURANCE (continued)

Old Age Allowances		Unemployment Insurance			
	Indexation Provisions(a,b)	Indexation Provisions(b)	Taxation Treatment(c)		Maximum Length(d)
			Income Tax	Social Security Contrib.	
NORWAY	Indexed to prices and incomes	Linked to previous gross earnings, with nominal ceiling and dependent supplement. Usually altered 6 monthly in line with national pay rates	Paid	Not paid	40 weeks
SWEDEN	Indexed to prices	Linked to previous gross earnings, but with a nominal ceiling on benefits and supplements. Ceiling not indexed.	Paid	N/A(g)	300 days
UNITED KINGDOM	Indexed to prices	Altered yearly in line with projected price changes.	Paid	Not paid	52 weeks

Sources: Country Sources: U.S. Department of Health and Social Sciences, "Social Security Programmes throughout the World"; European Industrial Relations Review, October 1982; OECD "Unemployment Compensation and Related Employment Policy Measures"; European Community, "Comparative Tables of the Social Security Systems in the Member States of the European Communities", 11th edition.

- Unless otherwise stated, the starting base of all indexed pensions is indexed, either by being equated to the universal pension, or on the basis of the recipient's previous earnings.
- In practice, non indexed benefits tend to follow the trend in prices and wages, while indexed benefits are subject to occasional discretionary adjustment.
- These two columns indicate whether the recipient of unemployment insurance must pay income tax and/or social security contributions on the unemployment benefit he receives (indicated by "paid") or not (indicated by "not paid").
- This maximum length refers to the formal unemployment insurance scheme only. In general, people ineligible for or no longer eligible for these benefits can receive less generous means tested public benefits. Length given is for a fully qualified worker not close to retirement.
- Indexation currently capped as part of the 6/5 stabilisation programme.
- Benefits are in principle subject to tax, but the maximum benefit generally paid is below the threshold of taxation.
- "N/A" means there is no system of employee social security contributions in this country.
- Shortly to be fully indexed to wages.

D. Comparison with the German "cyclically-neutral" budget methodology

There are close links between the "structural budget" methodology outlined above and the German "cyclically neutral" budget indicator; but there are also differences. The principle of using potential growth to derive the GDP gap is the same in both cases. The "built-in" component of the deficit however, comprises two elements: built-in stabilizers (which as in the structural deficit are zero at the cyclical peak) and a "normal" element of deficit (b^*_0) which would (and should) remain at peak-cycle output. (The notion of "built-in stability" is not used as such, but is implicit to the calculation.) "Built-in stability" here contains an implicit notion of secular stabilizing potential, which with built-in cyclical stability add up to a "cyclically neutral" budget. Thus (remaining as closely as possible to the terminology in equation 1):

$$b_t = b_{t-1} + \#B_t / (Y_{t-1}(1+r)) + [(e^r-1)s_{t-1}^r - (e^g-1)s_{t-1}^g][r/(1+r)] - b^*_0 \quad (8)$$

$$\begin{array}{l} \text{[-----structural budget balance-----][normal]} \\ \text{[-----Cyclical Budget Impulse-----][balance]} \\ \qquad \qquad \qquad + (m-b_t)(a-r)/(1+r) + b^*_0 \\ \qquad \qquad \qquad \underbrace{\hspace{10em}} \\ \qquad \qquad \qquad \text{cyclically-neutral budget} \end{array}$$

Changes in the "cyclically neutral" indicator, it can be seen, correspond to the "automatic stabilizer" element in equation 7, with the normal borrowing element added. (This is taken as roughly 1 per cent.) If year-to-year differences in the "cyclically-neutral" budget are analysed the two methods might, in principle, yield identical results. (In this case the "normal" element, which is constant as a proportion of potential GDP approximately nets out).

However, the assumed values of m^r and m^g differ from those implied in equation 7. The marginal revenue rate (m^r) is taken as unity and is not estimated structurally (7), while the cyclical expenditure response is zero, rather than negative as would be implied by the inclusion of unemployment transfers; although cyclical transfers to unemployment funds may be incorporated in the cyclically neutral estimate, this is not an essential part of the cyclical adjustment process.

The difference between the "cyclically-neutral" deficit and the actual budget balance is the "cyclically-adjusted fiscal impact". This, though corresponding quite closely to the "discretionary" indicator in equation 7 will include unemployment transfers; it will also include, in practice, a cyclical effect on receipts where the actual structural value of m^r in the built-in stabilizer element differs from the assumed value of unity.

NOTES TO ANNEX 2

1. The public expenditure reaction to income growth is taken as predetermined: the growth rate of such spending being deliberately linked, ex ante, with GDP growth. The tax sensitivity, on the other hand, is linked statutorily with income through the various tax bases.
2. The automatic change in b as a result of the shortfall of GDP from potential is $(m-b^*_t)(a-r)/(1+a)$, where b^* is the structural budget balance in year t . This can also be written, as in equation (7) as $(m-b_t)(a-r)/(1+r)$, where b_t is the actual deficit in year t (B_t/Y_t) and $(a-r)/(1+r) = \text{gap}$; i.e. $(m-b_t)\text{gap}$ measures the effect of built-in stabilizers on the deficit/GDP ratio.

3. In this case, assuming an actual inflation rate of p' ($= dp/p_{t-1}$) and a cyclically-adjusted inflation rate of p'' ,

$$\begin{aligned} Y &= Y_{t-1}(1+r)(1+p'') + Y_{t-1}[(1+a)(1+p') - (1+r)(1+p'')] \\ &= Y_{t-1}(1+r)(1+p'') + [(1-r)(1+p') - /p(1+r)] \end{aligned}$$

long-run growth
cyclical gap

The cyclical gap is larger the larger the cyclical change in prices $dp = (p''-p')$.

4. Royalties on energy and other property income, though responsive to the cycle in the same way as energy taxes, are not adjusted.
5. The budget sensitivity is defined as $(m-b_t)$ as in the built-in stabilizer component of equation 7.
6. Data on replacement ratios are subject to criticism both because they do not incorporate benefits in kind or expenses associated with being unemployed and because the "average production worker" may not be typical of the average unemployed worker. These difficulties are discussed in "Income in Work and When Unemployed: Some Problems in Calculating Replacement Ratios", National Institute Economic Review, February 1983.
7. The automatic increase in revenues is proportional to the gap, being a function of the ratio of taxes to GDP in the base year.

ANNEX 3. ADJUSTING FOR GOVERNMENT DEBT ACCUMULATION, INTEREST
PAYMENTS AND INFLATION

A. Budget deficits, debt accumulation and the measurement of structural
budget balances at trend output

Structural budget balances calculated on the basis of mid-cycle output are presented in Table A3.1. These are more consistent with underlying government debt accumulation than the peak-cycle structural budget estimates.

Expressing government debt (D) as a proportion of GDP at market prices, year-to-year changes are defined as:

$$D_t/GDP_t - D_{t-1}/GDP_{t-1} = s_t^d - s_{t-1}^d \quad (9)$$

These changes can be decomposed into debt-change and GDP-change components:

$$s_t^d - s_{t-1}^d = s_{t-1}^d \frac{-g}{(1+g)} + s_{t-1}^d \frac{(D_t - D_{t-1})}{D_{t-1}(1+g)} \quad (10a)$$

Equating $(D_t - D_{t-1})/GDP_t$ with b_t (as defined in equation 2), this gives:

$$s_t^d - s_{t-1}^d = s_{t-1}^d \frac{-g}{(1+g)} + b_t \quad (10b)$$

This divides changes in the debt/GDP ratio into those arising from the budget deficit as a ratio of GDP (b) and the growth of GDP (g).

The debt/GDP ratio is constant when the budget deficit ratio (b) equals the fall in the debt/GDP ratio brought about by the growth of GDP in the denominator, i.e. $\#s^d = 0$ where

$$-b_t = s_{t-1}^d \frac{-g}{(1+g)} \quad (10c)$$

It follows that neither cumulating b_t (actual budget balance ratios) nor cumulating b_t^s (structural budget balance ratios as defined in equation 7) would give an accurate description of what is happening to the debt stock/GDP ratio, which also depends on the growth rate of GDP.

As may be seen from equation 6, however, the cumulation of structural budget deficits would not even be consistent with absolute (nominal) debt accumulation, since built-in stabilizers also add to outstanding debt. For structural budget indicators to be consistent with debt accumulation they need to be measured not at the cyclical peak, but at the cyclical average: i.e. inclusive of the average value of the "built-in stabilizer" component of the deficit. Referring to equation 7, "built-in stabilizers" would then be measured by reference to the difference between actual output and average output:

$$b_t^{s'} = b_t^s - \sum_{t=1}^{n'} b_t^s / n' \quad (11)$$

where the built-in stabilizer component of the deficit ($b^{s'}$) is now defined as the difference between the built-in stabilizers in year t (b_t^s) as

Table A3.1

STRUCTURAL BUDGET BALANCES MEASURED AT TREND (MID-CYCLE) OUTPUT

	CENTAGE OF POTENTIAL GDP/GNP													
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
UNITED STATES	-1.8	-2.3	-1.8	-2.0	-1.1	-2.6	-1.4	-1.2	-0.9	-0.6	-1.1	-0.2	-1.4	-2.0
JAPAN	1.3	4.2	0	-0.3	0.2	-2.4	-3.4	-3.7	-5.5	-4.8	-4.7	-4.1	-3.4	-2.8
GERMANY	-1.5	-1.6	-1.4	-0.1	-1.9	-4.8	-3.6	-2.7	-3.1	-3.7	-3.9	-3.8	-2.3	-0.9
FRANCE	-0.4	-0.6	-0.9	-0.9	-0.6	-1.7	-1.1	-1.5	-3.1	-2.1	-0.5	-1.5	-1.9	-2.0
UNITED KINGDOM	0.7	-0.7	-3.1	-5.9	-6.0	-5.5	-5.7	-4.0	-6.1	-5.5	-3.5	-0.5	1.0	-0.7
ITALY	-6.0	-7.5	-9.2	-9.1	-8.9	-10.9	-9.2	-8.1	-9.9	-10.5	-9.4	-12.9	-12.8	-10.5
CANADA	0.3	-1.0	-1.3	-0.9	0	-3.5	-3.1	-3.3	-4.0	-2.7	-2.8	-1.6	-2.3	-3.0
SPAIN	-0.3	-1.3	-0.9	-0.5	-1.6	-1.0	-1.3	-1.8	-2.7	-2.1	-2.0	-2.3	-4.5	-4.7
AUSTRALIA	2.2	1.2	1.2	-1.8	1.3	-0.8	-3.3	0.3	-1.0	-0.5	0.7	0.6	1.4	-2.3
NETHERLANDS	-3.5	-3.2	-3.1	-2.8	-3.8	-3.6	-4.6	-3.1	-3.5	-4.0	-4.2	-4.4	-4.6	-3.8
SWEDEN	3.3	4.7	4.0	2.9	-0.4	0.4	2.8	2.5	1.0	-2.9	-3.7	-3.2	-3.8	-2.8
BELGIUM	-3.6	-3.9	-5.7	-6.4	-6.0	-5.5	-7.5	-5.8	-5.9	-6.8	-9.1	-10.7	-9.3	-8.6
AUSTRIA	1.6	1.9	1.8	0.8	0.7	-1.0	-3.2	-2.7	-2.0	-2.9	-2.1	-0.7	-1.8	-2.7
DENMARK	2.4	3.6	2.3	3.1	3.1	0.8	-0.7	-0.9	-0.2	-2.7	-2.4	-3.5	-7.5	-6.4
NORWAY	3.0	4.2	4.5	6.1	5.0	4.5	3.0	2.2	1.5	2.0	4.0	5.1	5.2	5.1
FINLAND	4.8	6.0	4.2	5.2	4.0	2.9	6.3	5.6	4.0	1.1	-0.2	1.4	-0.4	-1.5
GREECE	-0.9	-1.9	-2.1	-3.8	-2.4	-3.8	-3.3	-2.4	-2.4	-2.7	-5.4	-11.7	-8.2	-7.5
IRELAND	-4.0	-3.5	-4.2	-5.5	-8.3	-11.8	-7.1	-8.0	-10.7	-12.2	-13.2	-14.8	-15.8	-12.0
TOTAL MAJOR SEVEN	-1.1	-1.6	-1.9	-2.0	-1.7	-3.5	-2.8	-2.5	-3.0	-2.7	-2.6	-2.1	-2.4	-2.4
TOTAL OF ABOVE COUNTRIES	-0.9	-1.4	-1.6	-1.9	-1.5	-3.2	-2.6	-2.3	-2.9	-2.7	-2.6	-2.2	-2.5	-2.6

defined in equation 7) and the average value of built-in stabilizers over the cycle (or cycles) lasting from year 1 to year n' .

Built-in stabilizers are temporary in both stock and flow terms under this definition, since the sum of b_t^S is equal to zero over the cycle; if they do not sum to zero over the cycle they are structural, in the sense that they add permanently to government debt and to the debt interest burden. To arrive at a structural budget indicator consistent with trend debt accumulation, therefore, the average value of b^S needs to be added to the conventional structural deficit. This gives a measure of structural budget balance at trend, or mid-cycle, output:

$$s_t^d - s_{t-1}^d = s_{t-1}^d \frac{-g}{(1+g)} + [b_t^x + \sum_{t=1}^{n'} b_t^S/n'] \quad (11)$$

The trend value of built-in stabilizers is here added to the peak-cycle structural balance, b^x , to give a structural budget balance measured at mid-cycle ($b^{x'}$). The change in debt/GDP ratio (Δs_t^d) thus defined is then a measure of cyclically-adjusted debt accumulation.

B. Interest payments and the inflation adjustment

Distinguishing between real and nominal increases in GDP, changes in government debt/GDP ratios (equation 10a) can be decomposed as follows:

$$s_t^d - s_{t-1}^d = s_{t-1}^d \underbrace{\frac{-p'}{(1+p')}}_{\text{Inflation Adjustment}} + b_t \underbrace{\frac{(1+g)}{(1+p')}}_{\text{Budget deficit}} - s_t^d \underbrace{\frac{(g-p')}{(1+p')}}_{\text{GDP growth effect}} \quad (13)$$

where p' = the rate of inflation (defined as the year-on-year rate of change in the consumer price index);

$g-p'$ = the real growth rate of GDP.

Since anticipated inflation is accounted for in the interest rate, the inflation-adjustment and net interest payments need to be analysed together:

$$s_t^d - s_{t-1}^d = s_{t-1}^d \underbrace{\frac{-p'}{(1+p')}}_{\text{Inflation Adjustment}} + i_t \underbrace{\frac{(1+g)}{(1+p')}}_{\text{Net Debt Interest}} + b_t' \underbrace{\frac{(1+g)}{(1+p')}}_{\text{Budget deficit net of interest}} + s_t^d \underbrace{\frac{(g-p')}{(1+p')}}_{\text{GDP growth effect}} \quad (14)$$

"Inflation Tax"

where $b = i + b'$; $i = I/\text{GDP}$; I is net debt interest paid, and b' is the net-of-interest budget balance ratio ($b - i$).

Table A3.2

	RATIO OF NET INTEREST PAYMENTS TO POTENTIAL GDP											PERCENTAGE OF POTENTIAL GDP/GNP				
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983		
UNITED STATES	1.2	1.1	1.0	1.1	1.1	1.1	1.2	1.2	1.1	1.2	1.3	1.7	1.9	2.0		
JAPAN	-0.3	-0.3	-0.3	-0.3	-0.3	-0.1	0.1	0.3	0.6	0.8	1.0	1.3	1.5	1.6		
GERMANY	-0.4	-0.4	-0.3	-0.4	-0.3	0	0.3	0.4	0.5	0.6	0.8	1.1	1.3	1.5		
FRANCE	0.4	0.4	0.3	0.3	0.3	0.5	0.5	0.5	0.6	0.6	0.6	0.8	0.9	1.2		
UNITED KINGDOM	3.5	3.2	3.1	3.2	3.4	3.5	3.8	3.9	3.9	4.0	4.8	4.3	4.3	4.2		
ITALY	1.5	1.6	1.8	2.0	2.4	3.5	4.3	4.7	5.4	5.6	5.9	7.0	8.1	8.6		
CANADA	0.9	0.8	0.7	0.6	0.4	0.7	0.8	1.0	1.3	1.5	1.6	1.8	2.5	2.9		
SPAIN	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.9		
AUSTRALIA	2.5	2.5	2.4	2.3	2.2	2.1	2.3	2.6	2.8	3.0	3.1	3.2	3.4	3.8		
NETHERLANDS	2.9	2.8	3.3	3.3	3.5	3.4	3.4	3.3	3.6	3.8	4.2	4.9	5.6	6.5		
SWEDEN	-1.5	-1.8	-1.8	-2.0	-2.1	-2.2	-2.3	-2.4	-1.9	-1.5	-1.2	-0.5	0.5	1.1		
BELGIUM	2.8	2.8	2.8	2.8	3.0	2.9	3.1	3.4	3.7	4.2	5.1	6.4	7.4	7.3		
AUSTRIA	1.1	1.0	1.0	1.0	1.0	1.3	1.6	1.9	2.2	2.3	2.5	2.7	3.1	3.2		
DENMARK	-0.3	-0.7	-1.2	-2.0	-2.2	-1.0	-0.7	-0.5	-0.2	0.2	0.8	1.9	2.8	4.3		
NORWAY	0.1	0.1	0	-0.1	-0.1	0	0.2	0.5	0.7	0.9	1.0	0.8	0.8	0.7		
FINLAND	-0.3	-0.5	-0.6	-0.8	-0.9	-0.7	-0.7	-0.7	-0.5	-0.5	-0.5	-0.4	-0.1	0		
GREECE	0.9	0.9	0.9	1.0	1.2	1.3	1.5	0.3	0.3	0.4	2.3	3.0	2.4	2.6		
IRELAND	1.9	1.9	1.8	1.9	2.1	2.6	3.1	3.4	3.9	4.5	5.2	6.1	7.5	7.7		
TOTAL MAJOR SEVEN	0.9	0.8	0.8	0.8	0.9	1.0	1.2	1.3	1.4	1.5	1.7	2.0	2.2	2.4		
TOTAL OF ABOVE COUNTRIES	0.9	0.8	0.8	0.8	0.9	1.0	1.2	1.3	1.4	1.5	1.7	2.0	2.3	2.5		

Table A3.3

STRUCTURAL BUDGET BALANCES NET OF NET INTEREST PAYMENTS

	PERCENT OF POTENTIAL GDP/GNP														
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	
UNITED STATES	1.2	0.5	1.0	0.9	1.8	0.2	1.6	1.8	2.0	2.4	2.0	3.3	2.2	1.8	
JAPAN	1.5	1.4	0.3	-0.1	0.4	-2.0	-2.8	-2.8	-4.3	-3.5	-3.1	-2.2	-1.3	-0.5	
GERMANY	-0.5	-0.5	-0.3	0.9	-0.8	-3.4	-1.9	-0.9	-1.2	-1.7	-1.7	-1.4	0.3	1.9	
FRANCE	1.4	1.1	0.7	0.7	1.1	0.1	0.8	0.3	-1.2	-0.2	1.4	0.6	0.3	0.4	
UNITED KINGDOM	6.5	4.8	2.3	-0.4	-0.3	0.3	0.4	2.2	0.1	0.9	3.7	6.1	7.6	5.8	
ITALY	-3.6	-5.0	-6.6	-6.2	-5.7	-6.6	-4.1	-2.6	-3.7	-4.0	-2.7	-5.0	-3.8	-1.2	
CANADA	2.2	0.9	0.6	0.8	1.6	-1.7	-1.2	-1.2	-1.6	0	-0.2	1.3	1.3	1.1	
SPAIN	0.8	-0.2	0.2	0.6	-0.5	0.1	-0.2	-0.7	-1.5	-0.9	-0.7	-1.0	-3.0	-2.8	
AUSTRALIA	5.4	4.4	4.3	1.2	4.2	2.0	-0.4	3.5	2.5	3.2	4.4	4.4	5.5	2.2	
NETHERLANDS	2.2	2.3	2.9	3.1	2.4	2.5	1.6	2.9	2.8	2.5	2.8	3.2	3.7	5.3	
SWEDEN	3.0	4.2	3.3	2.1	-1.3	-0.6	1.6	1.3	0.3	-3.2	-3.8	-2.6	-2.1	-0.5	
BELGIUM	0.8	0.5	-1.3	-2.0	-1.4	-1.0	-2.8	-0.7	-0.6	-0.9	-2.4	-2.7	-0.3	0.3	
AUSTRIA	3.2	3.4	3.3	2.3	2.2	0.7	-1.1	-0.3	0.7	-0.1	0.9	2.5	1.8	1.0	
DENMARK	2.9	3.8	1.9	1.9	1.6	0.7	-0.6	-0.6	0.5	-1.7	-0.8	-0.8	-3.8	-1.2	
NORWAY	3.3	4.6	4.8	6.3	5.2	4.8	3.5	3.0	2.5	3.2	5.2	6.2	6.2	6.1	
FINLAND	5.1	6.1	4.3	5.0	3.8	2.8	6.2	5.5	4.2	1.3	0	1.7	0.1	-0.9	
GREECE	2.4	1.5	1.3	-0.4	1.2	-0.1	0.7	0.4	0.3	0.1	-0.7	-6.3	-3.3	-2.4	
IRELAND	-0.5	-0.1	-0.9	-2.1	-4.8	-7.7	-2.5	-3.1	-5.3	-6.2	-6.5	-7.3	-6.8	-2.8	
TOTAL MAJOR SEVEN	1.3	0.6	0.4	0.3	0.7	-1.0	-0.1	0.3	-0.2	0.2	0.5	1.4	1.3	1.4	
TOTAL OF ABOVE COUNTRIES	1.5	0.9	0.6	0.4	0.8	-0.7	0	0.4	-0.1	0.2	0.5	1.3	1.2	1.3	

Table A3.2 and A3.3 give data on net debt interest and structural budget balances adjusted for this. However, because debt is issued, for the most part, at a fixed coupon and that coupon may incorrectly anticipate inflation, holders of government securities may incur a real capital loss. In this case the structural deficit does not increase as fast as the inflation adjustment -- at least in the short-run -- but only as fast as debt matures and needs to be refinanced at the new higher interest rate. Table A3.4 gives estimates of the resultant "inflation tax", as defined in equation 14. Table A3.5 gives structural budget balances (Table 1 of the text) net of the inflation adjustment, which -- from equation 14 -- can be seen to equal the net-of-interest structural budget balance (Table A3.3) plus the "inflation tax" (Table A3.4). The inflation adjustment is applied to debt nominally valued at par, whereas the value of financial assets (though not the discounted present value to maturity) is also reduced by the rise in the nominal interest rate. This "liquidity" effect may also affect spending.

The inflation-adjusted indicator may -- depending on the conditions discussed on page 9 above -- be a better indicator of the demand impact of the budget deficit than the unadjusted budget indicator. However, in measuring portfolio pressures resulting from continuous structural claims on savings (rather than those resulting from peak-cycle credit clashes) the inflation-adjusted structural budget balance measured at mid cycle may be the more relevant indicator (Table A3.6).

In year-to-year change form Tables A3.5 and A3.6 are virtually identical. In interpreting demand movements it is changes in structural budget deficits which are most relevant and these (derived directly from Table 1) are set out in Table A3.7. A given rate of inflation (above the nominal yield on financial assets) leads to an (approximately) steady rate of erosion in the purchasing power of debt and hence to an unchanged rate of "inflation tax". When inflation rises private spending slows as the inflation tax rises and the real budget stance tightens. As inflation falls the inflation tax falls. Changes in the "inflation tax" are given in Table A3.8, while the corresponding changes in inflation-adjusted structural balances are set out in Tables A3.9.

Definitions of public debt

Government net debt is defined as the net financial liabilities of the general government sector (central government, local authorities and social security) net of intra-sectoral claims. Net financial liabilities are defined as gross financial liabilities (at par value) minus financial assets (at par value), net of equity holdings because the effect of inflation on the purchasing power of such assets is ambiguous. In Ireland only central government net financial liabilities are shown. Austrian and Australian debt is equal to central and local authorities gross debt while Greek debt is equal to central government gross debt.

The inflation adjustment is calculated with respect to net government liabilities. As the aim of the "inflation adjustment" is to correct the impulse exerted by fiscal policy on the domestic economy for the additional contractionary/expansionary effect of inflation losses/gains on public debt holdings, foreign holdings of general government debt have been excluded from the governments' net financial liabilities for the purpose of the calculation. (In the case of the United States, Japan and France only central government foreign debt data are available.)

Table A3.4

THE "INFLATION TAX"(1)

THE "INFLATION TAX"(1)														
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
PERCENTAGE OF POTENTIAL GDP/GNP														
UNITED STATES	0	-0.3	0.1	0.9	0.6	-0.1	0	0.2	0.6	0.8	-0.2	-0.9	-1.3	
JAPAN	-0.1	0	-0.4	-1.0	-0.3	-0.1	0	-0.3	-0.4	0.3	-0.3	-0.9	-1.3	
GERMANY	0	-0.1	0	-0.1	-0.2	-0.1	-0.2	-0.3	-0.2	-0.2	-0.3	-0.5	-1.0	
FRANCE	0.1	0.2	0.3	0.7	0.5	0.4	0.4	0.4	0.3	0.4	0.6	0.3	0.3	0
UNITED KINGDOM	2.3	0.8	1.5	3.8	6.9	3.8	3.8	3.4	-0.1	1.7	2.3	0.4	-1.0	-2.0
ITALY	0.4	0.8	2.9	6.7	5.0	4.8	5.4	5.4	1.6	3.3	6.4	4.0	2.2	1.5
CANADA	-0.7	-0.7	-0.6	-0.6	-0.9	-1.0	-1.0	-1.2	-1.3	-1.4	-1.3	-1.5	-2.0	-2.4
SPAIN	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.7	1.0	0.8
AUSTRALIA	-0.4	-0.5	0.6	1.9	1.7	1.1	1.1	0.5	-0.8	-0.8	-0.9	-1.2	-1.4	-2.0
NETHERLANDS	0.8	0.2	0	0.1	0.2	-0.3	-0.3	-1.0	-2.1	-2.2	-1.6	-2.0	-2.8	-5.1
SWEDEN	-0.1	0.2	0	-0.9	-0.6	-0.7	-0.7	-1.0	-0.9	-0.3	-1.7	-1.6	-1.5	-1.7
BELGIUM	-0.3	0.4	1.2	3.7	3.6	1.6	1.6	0.4	-1.2	-1.6	-1.0	-1.4	-1.3	-1.5
AUSTRIA	-0.3	0	0.2	0.4	0.2	-0.2	-0.2	-0.6	-1.3	-1.3	-0.6	-0.7	-1.5	-2.1
DENMARK	0.2	0.4	0.6	-0.4	-0.5	-0.6	-0.6	-1.1	-1.1	-1.3	-1.7	-2.1	-2.4	-3.6
NORWAY	-0.3	-0.3	-0.3	-0.4	-0.7	-0.6	-0.6	-0.8	-0.9	-1.0	-0.8	-0.6	-0.6	-0.6
FINLAND	-0.1	-0.1	-0.4	-1.0	-1.2	-0.8	-0.8	-0.7	-0.5	-0.4	-0.9	-0.9	-0.8	-0.8
GREECE	-0.5	-0.2	1.3	2.3	0.5	0.4	0.4	1.5	2.1	3.5	2.5	1.9	2.2	2.2
IRELAND	0.6	0.5	1.0	2.4	3.2	1.9	1.9	0.5	-1.3	0.9	2.7	2.1	-0.4	-2.8

TOTAL MAJOR SEVEN	0.1	-0.1	0.2	0.9	0.9	0.4	0.4	0.5	0	0.4	0.8	0	-0.7	-1.1

TOTAL OF ABOVE COUNTRIES	0.1	0	0.3	0.9	0.9	0.4	0.4	0.4	0	0.3	0.7	-0.1	-0.7	-1.1

(1) INFLATION TAX=INFLATION ADJUSTMENT-NET INTEREST PAID

Table A3.5

INFLATION-ADJUSTED STRUCTURAL BUDGET BALANCES

	PERCENT OF POTENTIAL GDP/GNP												
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
UNITED STATES	0.5	0.7	1.1	2.7	0.8	1.5	1.8	2.2	3.0	2.7	3.1	1.3	0.5
JAPAN	1.3	0.2	-0.5	-0.6	-2.3	-2.9	-2.8	-4.6	-3.8	-2.8	-2.6	-2.2	-1.8
GERMANY	-0.6	-0.4	0.9	-0.9	-3.5	-2.1	-1.1	-1.5	-1.9	-1.8	-1.7	-0.2	1.0
FRANCE	1.2	1.0	1.0	1.8	0.6	1.2	0.7	-0.9	0.2	2.0	1.0	0.6	0.5
UNITED KINGDOM	7.1	3.1	1.1	3.5	7.1	4.2	5.6	0	2.6	6.0	6.5	6.6	3.8
ITALY	-4.6	-5.8	-3.3	1.0	-1.6	0.7	2.8	-2.1	-0.7	3.7	-1.0	-1.6	0.3
CANADA	0.2	-0.1	0.2	1.0	-2.6	-2.2	-2.4	-2.9	-1.4	-1.5	-0.2	-0.7	-1.4
SPAIN	-0.1	0.2	0.6	-0.3	0.3	0	-0.6	-1.4	-0.6	-0.2	-0.3	-2.0	-2.0
AUSTRALIA	4.0	3.9	1.8	6.1	3.7	0.7	4.0	1.7	2.3	3.6	3.2	4.1	0.1
NETHERLANDS	3.1	3.1	3.2	2.5	2.8	1.3	1.9	0.7	0.3	1.1	1.2	0.9	0.2
SWEDEN	4.1	3.5	2.1	-2.2	-1.2	1.0	0.3	-0.6	-3.5	-5.6	-4.2	-3.6	-2.1
BELGIUM	0.2	-0.9	-0.9	2.3	2.6	-1.2	-0.3	-1.8	-2.5	-3.4	-4.2	-1.5	-1.1
AUSTRIA	3.1	3.2	2.4	2.6	0.9	-1.3	-0.9	-0.6	-1.4	0.3	1.8	0.3	-1.1
DENMARK	3.9	2.4	2.5	1.3	0.2	-1.2	-1.7	-0.6	-2.9	-2.5	-3.0	-6.2	-4.8
NORWAY	4.3	4.5	6.0	4.7	4.1	2.8	2.2	1.6	2.2	4.4	5.6	5.6	5.5
FINLAND	6.0	4.2	4.6	2.8	1.7	5.4	4.8	3.7	0.8	-0.9	0.8	-0.7	-1.6
GREECE	1.0	1.1	0.9	3.5	0.4	1.0	1.9	2.4	3.6	1.8	-4.4	-1.2	-0.2
IRELAND	0.5	-0.4	-1.2	-2.4	-4.5	-0.7	-2.6	-6.5	-5.3	-3.8	-5.2	-7.2	-5.6
TOTAL MAJOR SEVEN	0.8	0.3	0.5	1.6	0	0.4	0.8	-0.2	0.7	1.4	1.4	0.7	0.3
TOTAL OF ABOVE COUNTRIES	1.0	0.6	0.7	1.7	0.2	0.4	0.8	-0.1	0.6	1.2	1.2	0.5	0.2

Table A3.6

INFLATION-ADJUSTED TREND (MID-CYCLE) STRUCTURAL BUDGET BALANCES

	PERCENTAGE OF POTENTIAL GDP/GNP												
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
UNITED STATES	-1.2	-1.0	-0.6	1.1	-0.8	-0.2	0.1	0.5	1.3	1.1	1.4	-0.4	-1.2
JAPAN	0.7	-0.3	-1.1	-1.2	-2.9	-3.4	-3.4	-5.1	-4.4	-3.3	-3.1	-2.7	-2.3
GERMANY	-2.0	-1.8	-0.6	-2.3	-5.0	-3.5	-2.5	-2.9	-3.3	-3.2	-3.0	-1.6	-0.4
FRANCE	0	-0.3	-0.3	0.5	-0.6	-0.1	-0.6	-2.1	-1.0	0.7	-0.3	-0.7	-0.8
UNITED KINGDOM	5.1	1.0	-0.9	1.6	5.3	2.3	3.6	-2.1	0.6	4.0	4.4	4.5	1.5
ITALY	-5.3	-6.5	-3.8	0.7	-2.0	0.3	2.4	-2.6	-1.2	3.4	-1.4	-2.0	0
CANADA	-0.9	-1.2	-0.9	-0.1	-3.7	-3.3	-3.5	-4.0	-2.5	-2.6	-1.3	-1.8	-2.4
SPAIN	-1.1	-0.8	-0.3	-1.3	-0.7	-1.0	-1.6	-2.3	-1.5	-1.2	-1.2	-2.9	-2.9
AUSTRALIA	3.4	3.3	1.2	5.6	3.2	0.2	3.4	1.1	1.7	3.0	2.6	3.5	-0.5
NETHERLANDS	0.7	0.7	0.7	0.1	0.4	-1.2	-0.6	-1.9	-2.3	-1.4	-1.3	-1.7	-2.4
SWEDEN	2.8	2.3	0.8	-3.5	-2.5	-0.3	-1.0	-1.9	-4.8	-6.9	-5.4	-4.8	-3.3
BELGIUM	-1.3	-2.3	-2.2	1.1	1.4	-2.5	-1.7	-3.3	-4.0	-4.8	-5.6	-2.9	-2.5
AUSTRIA	2.7	2.8	2.0	2.2	0.5	-1.7	-1.3	-1.0	-1.9	-0.2	1.3	-0.1	-1.6
DENMARK	3.1	1.5	1.6	0.4	-0.7	-2.0	-2.6	-1.5	-3.8	-3.4	-3.8	-7.0	-5.7
NORWAY	4.0	4.3	5.7	4.4	3.8	2.5	1.9	1.3	2.0	4.1	5.3	5.4	5.3
FINLAND	5.4	3.5	3.9	2.1	1.0	4.7	4.1	3.0	0.2	-1.6	0.1	-1.4	-2.3
GREECE	-1.4	-1.3	-1.3	1.5	-1.9	-1.2	-0.3	0.3	1.6	-0.2	-6.4	-3.2	-2.2
IRELAND	-0.8	-1.7	-2.4	-3.6	-5.6	-1.8	-3.8	-7.8	-6.4	-4.8	-6.2	-8.3	-6.8
TOTAL MAJOR SEVEN	-0.6	-1.1	-0.9	0.3	-1.3	-1.0	-0.5	-1.5	-0.7	0.1	0	-0.7	-1.1
TOTAL OF ABOVE COUNTRIES	-0.4	-0.8	-0.7	0.4	-1.1	-0.9	-0.5	-1.5	-0.8	-0.1	-0.1	-0.8	-1.2

Table A3.7

STRUCTURAL BUDGET BALANCE CHANGES														PERCENT OF POTENTIAL GDP/GNP				
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983					
UNITED STATES	-0.6	0.5	-0.2	0.9	-1.6	1.2	0.2	0.3	0.3	-0.5	0.9	-1.3	-0.5					
JAPAN	-0.1	-1.2	-0.3	0.5	-2.6	-1.0	-0.2	-1.8	0.6	0.2	0.6	0.7	0.6					
GERMANY	-0.1	0.2	1.3	-1.8	-2.9	1.2	0.9	-0.4	-0.6	-0.2	0.1	1.5	1.4					
FRANCE	-0.2	-0.3	0	0.3	-1.1	0.6	-0.5	-1.5	1.0	1.6	-1.0	-0.4	-0.1					
UNITED KINGDOM	-1.4	-2.4	-2.8	-0.1	0.5	-0.2	1.7	-2.1	0.6	2.0	3.0	1.5	-1.7					
ITALY	-1.5	-1.7	0.1	0.2	-2.0	1.7	1.1	-1.8	-0.6	1.1	-3.4	0.1	2.2					
CANADA	-1.2	-0.3	0.3	1.0	-3.5	0.4	-0.2	-0.7	1.3	-0.2	1.2	-0.7	-0.6					
SPAIN	-1.0	0.4	0.4	-1.0	0.6	-0.2	-0.5	-0.9	0.6	0.1	-0.3	-2.2	-0.2					
AUSTRALIA	-1.0	0	-3.0	3.1	-2.1	-2.5	3.6	-1.3	0.5	1.2	-0.1	0.8	-3.7					
NETHERLANDS	0.2	0.2	0.2	-1.0	0.2	-1.0	1.5	-0.3	-0.6	-0.1	-0.2	-0.2	0.8					
SWEDEN	1.5	-0.7	-1.1	-3.2	0.8	2.4	-0.3	-1.5	-3.9	-0.9	0.5	-0.6	1.0					
BELGIUM	-0.3	-1.7	-0.7	0.4	0.5	-2.0	1.8	-0.2	-0.8	-2.3	-1.7	1.5	0.7					
AUSTRIA	0.3	-0.1	-1.0	-0.1	-1.7	-2.2	0.6	0.7	-1.0	0.9	1.3	-1.0	-1.0					
DENMARK	1.2	-1.3	0.8	-0.1	-2.2	-1.6	-0.2	0.8	-2.6	0.3	-1.1	-3.9	1.1					
NORWAY	1.3	0.3	1.6	-1.2	-0.5	-1.4	-0.8	-0.7	0.5	2.0	1.1	0	0					
FINLAND	1.2	-1.8	1.0	-1.1	-1.1	3.4	-0.8	-1.6	-2.9	-1.3	1.6	-1.9	-1.1					
GREECE	-1.0	-0.2	-1.7	1.4	-1.4	0.6	0.9	0	-0.3	-2.7	-6.3	3.5	0.7					
IRELAND	0.5	-0.7	-1.3	-2.8	-3.5	4.6	-0.8	-2.7	-1.6	-1.0	-1.6	-1.0	3.8					

TOTAL MAJOR SEVEN	-0.6	-0.2	-0.2	0.4	-1.8	0.7	0.3	-0.6	0.3	0.1	0.6	-0.3	0					

TOTAL OF ABOVE COUNTRIES	-0.5	-0.2	-0.2	0.3	-1.6	0.5	0.4	-0.6	0.2	0.1	0.4	-0.3	-0.1					

Table A3.8

CHANGE IN THE INFLATION TAX(1)

	PERCENTAGE OF POTENTIAL GDP/GNP												
	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	
UNITED STATES	-0.2	0.4	0.8	-0.3	-0.7	0.1	0.2	0.4	0.2	-1.0	-0.8	-0.4	
JAPAN	0.1	-0.4	-0.7	0.7	0.2	0.1	-0.3	-0.1	0.6	-0.6	-0.5	-0.4	
GERMANY	0	0	-0.1	-0.1	0	-0.1	-0.1	0.1	0	-0.1	-0.3	-0.5	
FRANCE	0.1	0.1	0.4	-0.2	-0.1	0	-0.1	0.1	0.2	-0.3	0	-0.3	
UNITED KINGDOM	-1.5	0.6	2.4	3.2	-3.2	-0.4	-3.5	1.8	0.6	-2.0	-1.5	-1.1	
ITALY	0.4	2.1	3.7	-1.3	-0.4	0.7	-3.9	1.7	3.0	-2.3	-1.7	-0.7	
CANADA	0.1	0	0	-0.3	-0.1	-0.2	-0.2	-0.1	0	-0.2	-0.6	-0.4	
SPAIN	0	0	0.1	0.1	0	-0.1	0.1	0.1	0.2	0.3	0.3	-0.2	
AUSTRALIA	-0.1	1.0	1.3	-0.1	-0.7	-0.6	-1.3	0	0	-0.4	-0.2	-0.7	
NETHERLANDS	-0.6	-0.2	0.1	0.1	-0.5	-0.8	-1.1	-0.2	0.6	-0.4	-0.9	-2.5	
SWEDEN	0.3	-0.2	-0.8	0.3	0	-0.4	0.1	0.6	-1.5	0.1	0.1	-0.2	
BELGIUM	0.7	0.7	2.5	0.1	-2.1	-1.2	-1.7	-0.4	0.6	-0.5	0.2	-0.2	
AUSTRIA	0.3	3.2	0.2	-0.2	-0.3	-0.4	-0.7	0	0.7	-0.1	-0.8	-0.6	
DENMARK	0.3	0.1	-0.9	-0.1	-0.1	-0.5	0	-0.2	-0.5	-0.5	-0.2	-1.2	
NORWAY	0	0	-0.1	-0.2	0	-0.1	-0.1	-0.1	0.2	0.2	0	0	
FINLAND	-0.1	-0.2	-0.7	-0.2	0.3	0.1	0.3	0	-0.4	-0.1	0.1	0	
GREECE	0.3	1.5	1.3	-2.0	-0.1	1.2	0.6	1.5	-1.1	-0.6	0.3	0.1	
IRELAND	-0.1	0.4	1.4	0.9	-1.3	-1.5	-1.8	2.1	1.8	-0.6	-2.5	-2.5	
TOTAL MAJOR SEVEN	-0.2	0.3	0.7	0.1	-0.6	0.1	-0.4	0.4	0.4	-0.9	-0.7	-0.4	
TOTAL OF ABOVE COUNTRIES	-0.2	0.3	0.7	0	-0.6	0	-0.5	0.3	0.4	-0.8	-0.7	-0.5	

(1) INFLATION TAX=INFLATION ADJUSTMENT-NET INTEREST PAID

Table A3.9

INFLATION-ADJUSTED STRUCTURAL BUDGET BALANCE CHANGES													PERCENTAGE OF POTENTIAL GDP/GNP			
	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983				
UNITED STATES	0.2	0.3	1.7	-1.9	0.7	0.3	0.4	0.7	-0.3	0.4	-1.8	-0.8				
JAPAN	-1.1	-0.7	-0.1	-1.7	-0.6	0.1	-1.8	0.8	1.0	0.3	0.4	0.4				
GERMANY	0.2	1.2	-1.7	-2.7	1.5	1.0	-0.4	-0.4	0.1	0.2	1.5	1.2				
FRANCE	-0.3	0	0.8	-1.1	0.6	-0.5	-1.6	1.1	1.7	-1.0	-0.3	-0.1				
UNITED KINGDOM	-4.0	-1.9	2.4	3.6	-2.9	1.4	-5.5	2.6	3.4	0.5	0.2	-2.9				
ITALY	-1.2	2.5	4.3	-2.6	2.3	2.1	-4.9	1.4	4.4	-4.7	-0.6	2.0				
CANADA	-0.3	0.3	0.8	-3.6	0.4	-0.2	-0.6	1.5	-0.1	1.3	-0.5	-0.6				
SPAIN	0.4	0.4	-1.0	0.6	-0.3	-0.6	-0.8	0.8	0.3	-0.1	-1.7	0				
AUSTRALIA	-0.1	-2.1	4.3	-2.4	-3.0	3.3	-2.3	0.7	1.3	-0.4	1.0	-4.0				
NETHERLANDS	0.1	0	-0.6	0.2	-1.5	0.6	-1.2	-0.4	0.9	0.1	-0.3	-0.7				
SWEDEN	-0.5	-1.5	-4.2	1.0	2.2	-0.7	-0.9	-2.9	-2.0	1.4	0.6	1.4				
BELGIUM	-1.1	0	3.2	0.3	-3.8	0.8	-1.5	-0.7	-0.9	-0.8	2.6	0.4				
AUSTRIA	0.1	-0.8	0.2	-1.7	-2.1	0.4	0.3	-0.9	1.7	1.5	-1.4	-1.5				
DENMARK	-1.5	0.2	-1.3	-1.1	-1.4	-0.5	1.1	-2.3	0.4	-0.5	-3.2	1.4				
NORWAY	0.2	1.5	-1.3	-0.6	-1.3	-0.6	-0.6	0.6	2.2	1.2	0.1	-0.1				
FINLAND	-1.9	0.5	-1.9	-1.1	3.7	-0.6	-1.1	-2.8	-1.7	1.7	-1.5	-0.9				
GREECE	0	-0.2	2.6	-3.2	0.6	0.9	0.5	1.2	-1.8	-6.2	3.2	1.0				
IRELAND	-0.9	-0.8	-1.2	-2.1	3.8	-1.9	-3.9	1.2	1.5	-1.3	-2.0	1.6				
TOTAL MAJOR SEVEN	-0.4	0.2	1.1	-1.6	0.4	0.4	-1.0	0.8	0.7	0	-0.7	-0.3				
TOTAL OF ABOVE COUNTRIES	-0.4	0.1	1.0	-1.5	0.2	0.4	-1.0	0.7	0.6	0	-0.7	-0.4				

Since the analysis in this paper is based on annual (i.e. average year-to-year) changes in economic variables, the inflation adjustment has also been converted to this basis by using the annual average change in the consumer price index and defining net public debt in year t (ND_t) as:

$$ND_t = ND_{t-1} + 1/2 (ND_t - ND_{t-1}) \quad (15)$$

Tables A3.10 and A3.11 give data on net and gross government liabilities, while Tables A3.12 to A3.13 show the corresponding gross and net interest payments (relative to actual GDP). Data sources are defined on pages 74-75 below.

IBDIE A2.1U

GENERAL GOVERNMENT GROSS FINANCIAL LIABILITIES
IN PERCENT OF GDP/GNP

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
UNITED STATES	66.2	47.1	45.1	41.9	41.3	44.9	45.2	43.8	42.0	39.8	40.1	39.0	43.2	45.7
JAPAN	12.1	13.5	17.5	17.1	17.9	22.5	28.2	33.6	42.2	47.6	52.9	58.1	62.3	66.5
GERMANY	18.4	18.4	18.7	18.6	19.7	24.9	27.0	28.4	29.8	30.6	32.5	36.3	39.4	41.1
FRANCE	29.4	28.4	26.4	25.1	24.7	25.8	24.7	25.2	26.3	26.3	25.1	25.9	28.7	32.5
UNITED KINGDOM	86.2	81.4	76.4	70.9	70.3	65.6	64.7	63.2	60.3	56.0	55.5	55.5	54.1	55.0
ITALY	44.4	52.3	60.1	60.6	57.7	65.0	63.1	62.3	68.4	68.1	65.3	68.4	74.3	79.7
CANADA	53.7	54.2	52.7	46.8	44.4	44.7	42.5	44.4	48.5	46.7	45.9	45.5	50.6	54.9
SPAIN(4)	14.4	15.0	13.9	12.5	12.0	12.5	12.5	13.6	13.7	15.5	17.7	21.4	26.7	32.1
AUSTRALIA(1)	41.7	38.3	35.9	31.8	29.2	28.5	27.8	29.1	30.3	29.5	26.6	23.5	23.0	24.8
NETHERLANDS(2)(4)	51.4	49.3	46.6	43.2	41.3	41.3	40.1	39.7	40.9	42.7	45.9	50.3	56.3	62.4
SWEDEN	30.7	31.0	30.8	30.1	30.5	29.6	27.7	30.1	34.8	39.9	44.8	52.8	62.7	67.0
BELGIUM	73.3	72.3	71.4	69.5	64.8	65.8	64.8	68.5	71.9	77.0	82.9	96.9	104.0	113.1
AUSTRIA(2)	19.4	18.2	17.5	17.5	17.6	23.9	27.4	30.1	33.9	36.0	37.0	39.2	41.2	44.5
DENMARK(4)	11.3	11.5	10.0	7.9	7.4	11.9	14.6	18.1	21.9	27.0	33.3	43.3	52.6	62.1
NORWAY	48.4	49.1	50.3	48.8	45.9	48.2	50.3	57.0	64.0	66.9	59.9	54.6	48.5	43.5
FINLAND	15.5	14.0	12.7	10.4	8.2	8.8	9.3	10.6	13.9	14.4	14.3	15.1	17.7	19.5
GREECE(3)	21.3	21.9	23.2	19.4	20.3	22.4	22.1	22.4	29.4	27.6	27.7	32.5	35.9	41.9
IRELAND(3)	66.8	65.6	61.6	58.2	65.5	73.5	78.8	76.9	80.5	87.4	89.0	96.3	106.4	115.0
TOTAL MAJOR SEVEN	39.5	40.1	39.7	37.4	37.0	40.1	41.1	41.4	42.5	42.0	42.9	43.9	47.5	50.5
TOTAL OF ABOVE COUNTRIES	38.9	39.4	38.8	36.5	36.0	38.9	39.7	40.2	41.5	41.4	42.3	43.6	47.4	50.5

(1) COMMONWEALTH AND STATES SECURITIES ON ISSUE

(2) CENTRAL AND LOCAL GOVERNMENT GROSS LIABILITIES, EXCLUDING

SOCIAL SECURITY LIABILITIES

(3) CENTRAL GOVERNMENT LIABILITIES

(4) OECD ESTIMATES FOR SPAIN(1970), NETHERLANDS(1970-71),
DENMARK(1970-74)

Table A3.11

GENERAL GOVERNMENT NET FINANCIAL LIABILITIES

IN PERCENT OF GDP/GNP

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
UNITED STATES	28.4	28.4	26.3	23.5	22.9	25.7	25.9	25.1	23.0	21.1	21.0	20.3	23.6	26.3
JAPAN	-6.6	-7.3	-6.5	-6.1	-5.4	-2.1	1.9	5.4	11.3	15.0	17.5	21.0	23.4	25.8
GERMANY	-8.2	-7.1	-5.8	-6.7	-4.7	1.0	4.6	7.0	9.4	11.5	14.3	17.5	19.8	21.5
FRANCE	11.5	11.0	9.1	8.3	8.8	11.1	10.9	10.2	10.2	9.8	9.1	10.6	12.5	15.0
UNITED KINGDOM	75.3	70.6	65.8	58.5	55.5	57.9	57.5	56.5	54.1	49.1	48.9	48.2	47.2	49.0
ITALY	39.2	44.1	50.0	52.1	49.2	59.9	60.9	60.7	64.5	65.5	60.0	66.2	72.4	78.5
CANADA	12.2	11.0	9.6	7.6	5.3	7.5	8.3	10.1	12.8	13.9	13.5	13.4	19.1	24.0
SPAIN(3)	2.9	2.9	2.7	2.2	2.3	2.5	2.0	3.0	3.6	5.2	7.2	10.5	15.0	19.4
NETHERLANDS(1)(3)	50.7	47.8	44.4	39.4	37.2	38.0	37.2	36.9	38.1	40.8	43.8	48.1	54.7	61.2
SWEDEN	-24.2	-27.6	-29.7	-31.2	-30.2	-28.9	-29.9	-29.1	-25.5	-20.0	-13.6	-5.3	4.7	11.0
BELGIUM	61.4	61.2	59.8	56.7	53.7	54.1	54.2	58.0	60.9	65.4	69.8	82.4	88.8	96.8
DENMARK(3)	-2.9	-5.5	-9.1	-12.3	-13.6	-10.1	-7.7	-5.0	-2.2	1.8	7.1	16.3	26.0	34.4
NORWAY	2.6	2.6	0.6	-1.4	-1.8	0.7	3.5	9.5	14.0	17.0	14.5	11.7	10.6	8.4
FINLAND	-5.1	-7.5	-8.2	-10.9	-10.8	-9.8	-10.8	-10.2	-8.5	-7.0	-6.3	-4.8	-2.0	0.4
IRELAND(2)	35.7	35.1	33.2	32.0	37.1	45.9	51.6	50.6	56.3	64.9	69.4	75.1	84.7	92.8
TOTAL MAJOR SEVEN	20.7	20.6	19.6	17.6	17.2	20.8	21.9	22.3	22.7	22.3	22.5	23.5	26.4	29.1
TOTAL OF ABOVE COUNTRIES	20.3	20.0	19.9	16.9	16.5	19.8	20.9	21.4	21.9	21.8	22.4	23.8	26.9	29.9

(1) CENTRAL AND LOCAL GOVERNMENT NET LIABILITIES, EXCLUDING

SOCIAL SECURITY LIABILITIES

(2) CENTRAL GOVERNMENT LIABILITIES

(3) OECD ESTIMATES FOR SPAIN(1970), NETHERLANDS(1970-71)

DENMARK(1970-74)

Table A3.12

RATIO OF NET INTEREST PAYMENTS TO GDP/GNP

	X OF GDP/GNP													
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
UNITED STATES	1.2	1.1	1.0	1.1	1.1	1.2	1.3	1.3	1.1	1.2	1.3	1.8	2.1	2.1
JAPAN	-0.3	-0.4	-0.3	-0.3	-0.3	-0.1	0.1	0.3	0.6	0.8	1.1	1.3	1.5	1.7
GERMANY	-0.4	-0.4	-0.3	-0.4	-0.3	0.1	0.3	0.4	0.5	0.6	0.9	1.1	1.4	1.6
FRANCE	0.4	0.4	0.3	0.3	0.3	0.5	0.6	0.5	0.6	0.6	0.6	0.9	1.0	1.2
UNITED KINGDOM	3.5	3.2	3.1	3.1	3.4	3.5	3.9	4.0	3.9	4.0	5.0	4.6	4.6	4.4
ITALY	1.5	1.7	1.8	2.1	2.4	3.7	4.4	4.8	5.5	5.6	5.7	7.0	8.3	9.0
CANADA	0.9	0.8	0.7	0.6	0.4	0.7	0.8	1.0	1.3	1.6	1.6	1.9	2.7	3.1
SPAIN	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.9
AUSTRALIA	2.5	2.5	2.4	2.2	2.2	2.1	2.3	2.7	2.9	3.1	3.2	3.2	3.5	4.0
NETHERLANDS	2.9	2.8	3.3	3.2	3.5	3.5	3.5	3.4	3.7	4.0	4.4	5.2	6.1	7.0
SWEDEN	-1.5	-1.8	-1.9	-2.0	-2.1	-2.1	-2.3	-2.4	-2.0	-1.5	-1.3	-0.6	0.6	1.2
BELGIUM	2.8	2.8	2.8	2.7	2.9	2.9	3.1	3.5	3.8	4.3	5.1	6.7	7.7	7.8
AUSTRIA	1.1	1.0	1.0	1.0	1.0	1.3	1.7	1.9	2.2	2.3	2.5	2.8	3.2	3.3
DENMARK	-0.3	-0.7	-1.2	-2.0	-2.3	-1.0	-0.7	-0.5	-0.2	0.2	0.8	2.0	2.9	4.4
NORWAY	0.1	0.1	0	-0.1	-0.1	0	0.2	0.5	0.7	1.0	0.9	0.8	0.8	0.7
FINLAND	-0.3	-0.5	-0.6	-0.8	-0.9	-0.7	-0.8	-0.8	-0.5	-0.5	-0.5	-0.4	-0.1	0
GREECE	0.9	1.0	0.9	1.0	1.3	1.4	1.6	0.3	0.3	0.4	2.4	3.2	2.6	2.9
IRELAND	2.0	1.9	1.8	1.9	2.1	2.6	3.2	3.4	3.9	4.5	5.2	6.1	7.7	8.1
TOTAL MAJOR SEVEN	0.9	0.8	0.8	0.8	0.9	1.1	1.3	1.3	1.4	1.5	1.7	2.0	2.4	2.5
TOTAL OF ABOVE COUNTRIES	0.9	0.8	0.8	0.8	0.9	1.1	1.2	1.3	1.4	1.5	1.7	2.1	2.4	2.6

Table A3.13

RATIO OF GROSS INTEREST PAYMENTS TO GDP/GNP

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
UNITED STATES	1.2	1.1	1.0	1.1	1.1	1.2	1.3	1.3	1.1	1.2	1.3	1.8	2.1	2.1
JAPAN	0.6	0.7	0.8	0.9	1.0	1.2	1.6	1.9	2.3	2.7	3.2	3.6	4.0	4.4
GERMANY	1.0	1.0	1.0	1.1	1.2	1.4	1.6	1.7	1.7	1.7	1.9	2.3	2.7	3.0
FRANCE	1.1	1.0	0.9	0.8	0.9	1.3	1.2	1.4	1.4	1.5	1.6	2.1	2.2	2.6
UNITED KINGDOM	4.0	3.6	3.6	3.8	4.4	4.0	4.4	4.4	4.4	4.6	5.7	5.3	5.3	5.0
ITALY	1.7	2.0	2.2	2.4	2.8	4.0	4.5	4.9	5.9	5.8	6.3	7.2	8.5	9.1
CANADA	3.8	3.8	3.9	3.9	3.7	4.0	4.2	4.4	4.9	5.2	5.5	6.3	7.2	7.1
SPAIN	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.5	0.6	0.6	0.8	0.7	0.9	1.5
AUSTRALIA	2.5	2.5	2.4	2.2	2.2	2.1	2.3	2.7	2.9	3.1	3.2	3.2	3.5	4.0
NETHERLANDS	3.0	2.9	3.5	3.6	3.8	3.9	3.8	3.7	4.0	4.2	4.6	5.4	6.3	7.2
SWEDEN	1.9	2.0	1.9	1.9	2.1	2.2	2.1	2.5	2.7	3.1	4.2	5.7	7.5	7.3
BELGIUM	3.4	3.3	3.3	3.3	3.5	3.5	3.7	4.1	4.5	5.1	6.1	7.9	9.1	9.1
AUSTRIA	1.1	1.0	1.0	1.0	1.0	1.3	1.7	1.9	2.2	2.3	2.5	2.8	3.2	3.3
DENMARK	1.4	1.4	1.3	1.3	1.2	1.2	1.4	1.9	2.2	3.5	3.9	5.3	5.9	7.9
NORWAY	1.8	1.8	2.0	2.0	2.1	2.1	2.5	2.9	3.3	3.7	3.9	3.9	3.8	3.7
FINLAND	1.0	1.0	0.9	0.8	0.7	0.7	0.7	0.8	0.9	1.0	1.1	1.1	1.3	1.6
GREECE	0.9	1.0	0.9	1.0	1.3	1.4	1.6	0.3	0.3	0.4	2.4	3.2	2.6	2.9
IRELAND	3.7	3.6	3.4	3.5	3.7	4.2	4.9	5.2	5.6	6.1	6.7	7.8	9.3	10.0
TOTAL MAJOR SEVEN	1.4	1.4	1.4	1.4	1.5	1.7	1.9	2.0	2.1	2.2	2.5	2.9	3.3	3.4
TOTAL OF ABOVE COUNTRIES	1.5	1.4	1.4	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.6	3.0	3.4	3.6

TABLE A3.14 DEBT DATA DEFINITIONS

<u>United States</u>	General government debt = gross financial liabilities of federal government and state and local authorities, net of intra-sectoral claims, including government liabilities held by the state and local authorities pension funds General government net debt = financial liabilities <u>less</u> financial assets, including government securities held by state and local government employee retirement funds.
<u>Japan</u>	General government debt = total financial liabilities General government net debt = financial liabilities <u>less</u> financial assets net of equity holdings.
<u>Germany</u>	General government debt = total government gross financial liabilities General government net debt = total financial liabilities <u>less</u> total financial assets and securities holdings of territorial entities and social security
<u>France</u>	General government debt = total gross financial liabilities of public administrations. General government net debt = total financial liabilities <u>less</u> financial assets of public administrations, excluding equity holdings.
<u>United Kingdom</u>	General government debt = central government and local authorities debt held by public corporations, domestic private sector and overseas. General government net debt = gross financial liabilities <u>less</u> public sector loans for home purchase, other public sector loans, accruals of taxes, rates and interest, central government and local authorities deposits with the domestic banking sector.
<u>Italy</u>	General government debt = total "public sector debt" (excluding ENEL). General government net debt = financial liabilities <u>less</u> financial assets (net of equity holdings) of central government, local authorities, social security and autonomous agencies.
<u>Canada</u>	General government debt = gross financial liabilities of federal government, provincial and local governments, Canada and Quebec pension plans net of intra-sectoral claims. General government net debt = federal government net financial liabilities <u>less</u> provincial and local governments and hospitals net financial assets and social security funds net assets.
<u>Australia</u>	General government debt = Commonwealth government and States securities.
<u>Austria</u>	General government debt = sum of federal, states and municipalities debt

<u>Belgium</u>	General government debt = total liabilities of State, social security and public sector not elsewhere mentioned (mostly local authorities), net of intra-sectoral claims. General government net debt = net financial liabilities of the state, social security and the public sector not elsewhere included.
<u>Denmark</u>	General government debt = general government financial liabilities. General government net debt = gross financial liabilities <u>less</u> financial assets.
<u>Finland</u>	General government debt = State, local authorities and social security gross debt net of intra-sectoral claims. General government net debt = general government financial liabilities <u>less</u> financial assets.
<u>Greece</u>	General government debt = public sector (general government plus public corporations) debt.
<u>Ireland</u>	General government debt = gross liabilities of the State. General government net debt = net liabilities of the State.
<u>Nether- lands</u>	General government debt = aggregate long-term and floating public debt. General government net debt = gross financial liabilities <u>less</u> floating assets held by the public sector.
<u>Norway</u>	General government debt = total financial liabilities of central government, National insurance funds and local authorities, net of intra-sectoral claims. General government net debt = gross financial liabilities less central government assets (net of capital in state banks, public independent enterprises, the Norwegian State Oil Company A/S, other independent enterprises and fixed capital in public enterprises) and local government assets (net of fixed assets).
<u>Spain</u>	General government debt = total financial liabilities of public administrations, net of Social Security holdings of fixed income assets. General government net debt = gross financial liabilities <u>less</u> public administration financial assets.
<u>Sweden</u>	General government debt = total gross financial liabilities of general government. General government net debt = general government net financial wealth.

