1. ASSESSING THE STANCE OF IRISH FISCAL POLICY

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1.1 Introduction Strong economic growth and buoyant public finances present the Government with both opportunities and dilemmas in formulating Budget 2001. In addition to targeting resources at specific areas and continuing the process of tax reform, the budget is an opportunity to set fiscal policy to steer the economy to a non-inflationary, sustainable growth path. Membership of Economic and Monetary Union (EMU) limits the range of macroeconomic tools available for economic demand management in Ireland to fiscal and incomes policies. As a small open economy, forming less than 1 per cent in output terms of a large monetary union, the macroeconomic context for Ireland will be predominantly driven by external factors but domestically determined fiscal policy still has a role to play. Monetary policy, as determined through interest rate decisions by the European Central Bank, will be set in response to the perceived needs of the euro area as a whole and are unlikely to reflect the contemporary needs of the Irish economy. Budgetary policy in Ireland, therefore, needs to be set in the context of either accommodative or restrictive monetary and exchange rate policies being pursued in the euro area.

Fiscal stance is a measure of the discretionary changes in budgetary policy, though there is no universal acceptance on its measurement. The fiscal stance can be used to assess the likely expansionary or contractionary impact of budgetary policy on economic activity. The appropriate stance of budgetary policy needs to take account of a number of factors such as the state of the public finances, the stage of the economic cycle and the growth prospects for the economy reflecting its stage of development. These three intertwined considerations are crucial in interpreting what fiscal stance should be. One dilemma for Budget 2001 is how large the fiscal surpluses should be, whether they should be increased further by contractionary policy or reduced by

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expansionary policy. The answer to this dilemma, if there is only one, depends on whether the economy is in a conventional economic cycle of a developed economy or is in a transition between stages of development. If the Irish economy is moving through a conventional economic cycle of expansion and contraction, then after seven consecutive years of rapid growth and now in the context of loose monetary and exchange rate policies, the recommended fiscal policy would be a contractionary stance. If, however, the Irish economy is considered to be in an exceptional phase moving between different growth paths, the appropriateness of the conventional fiscal stance measures for such a transition needs to be questioned.

The main focus of the paper is to examine alternative measures of fiscal stance in Ireland. We also give consideration to the appropriate stance for Budget 2001. Section 1.2 sets out the macroeconomic framework within which the budget must be constructed by outlining the short-to medium-term outlook for the Irish economy and the evolution of the public finances in recent years. Section 1.3 considers the way in which fiscal stance is typically assessed, presenting an overview of five alternative measures. In Section 1.4 these alternative measures are used to assess fiscal stance in Ireland over the last twenty-five years, highlighting the degree of uncertainty that permeates such assessments. A recommendation for the use of an indexed measure of fiscal stance is made to overcome some of the subjectivity involved with other measures. Section 1.5 considers the appropriate fiscal stance for Budget 2001 and Section 1.6 concludes.

1.2 Macroeconomic Context for Irish Budgetary Policy In setting the macroeconomic context any budget should be viewed in a longer time frame than a single year. Thus, budgetary policy should be conditioned not only by the immediate issues facing the economy but also by medium-term issues. In this section we start by considering the short-term economic outlook for setting budgetary policy before moving on to the medium-term context and concluding with a review of the evolution in Irish public finances over the past twenty-five years.

1.2.1 SHORT-TERM ECONOMIC OUTLOOK

The international outlook has become more positive during the first half of 2000. Economic indicators suggest the rate of growth in Europe is increasing and the US economy remains strong. Although remaining weak, the Japanese economy is expected to improve in 2000 and the other Asian economies will continue their recovery from the sharp downturn in 1997. Estimates for world trade suggest that growth could accelerate over the course of the next year. Monetary policy in the euro area, while tightening, still remains loose by historical standards and the euro exchange rate has depreciated significantly since its inception. The IMF (2000a) has calculated an index¹ for Ireland that indicates monetary conditions have been at their most expansionary in the past decade. This continues to be the case despite the rise in euro area interest rates during the first half of 2000 which has been offset by the depreciation in the currency and rising domestic inflation. In this context the monetary and exchange rate conditions for the Irish economy remain very loose and accommodative of strong economic growth.

The Irish economy continues its remarkably strong rate of output growth. Demand accelerated in the latter half of 1999 and this has carried over into the first half of 2000, underpinned by low interest rates and expectations of significant increases in disposable incomes. The projection is for growth in real GDP to slow somewhat, arising in the main from supply constraints rather than demand factors, as evidenced by a tight labour market. Growth in employment is also expected to slow as the pool of available labour diminishes. The unemployment rate has fallen dramatically in recent years and although some further decline is predicted it will not be as dramatic. The strong demand in the economy has led in part to a sharp rise in consumer prices, but is also putting severe pressures on the economy's infrastructure and the natural environment.

Analysis for the *Quarterly Economic Commentary* (McCoy *et al.*, 2000) indicates that over the next few years the government will continue to enjoy strong revenue growth as a result of the economy's exceptional performance. The public finances have continued to strengthen despite budgetary overruns in some areas through a combination of strong tax receipts and savings from lower debt servicing and lower unemployment. The trend and magnitude of the improvement in the position of the public finances can be observed in Table 1.1.

	1995	1996	1997	1998	1999	2000
Current Expenditure	12,029	12,662	14,015	14,412	15,553	16,285
Current Revenue	11,667	12,954	14,619	16,503	18,991	22,089
Current Balance	-362	292	604	2,090	3,438	5,804
General Balance	-1,064	-279	406	1,267	1,330	3,131
Primary Balance	9,94	1,828	2,469	3,002	2,591	4,140

Table 1.1: Public Finances 1995-2000 (£ millions)

Source: Department of Finance (2000), IMF (2000b), Own Estimates for 2000.

Even allowing for increased capital expenditure, the general government balance is likely to increase substantially as a percentage of GNP. The Exchequer Returns for the first half of 2000 indicate a budget surplus of $f_{2.9}$ billion driven by growth in tax receipts of

¹ The index is a weighted average of the percentage point changes in the real short-term interest rate and the real effective exchange rate, where the weights are 4 to 1 respectively. The more typical weighting used in the euro area is 7 to 1 but the higher weight given to the exchange rate reflects Ireland's large trade to GDP ratio.

14.5 per cent. While expenditure is expected to rise significantly as is the pattern in the latter half of each year, the Exchequer surplus for the year as a whole is likely to exceed $\pounds 2$ billion. This is higher than the revised Department of Finance forecast of $\pounds 1.8$ billion and is running at 3.1 per cent of GNP excluding privatisation and prefunding of pension payments. The general government balance, which is a broader measure than the Exchequer balance, was 3.7 per cent of GDP in 1999 or 1.9 per cent when adjusted for prefunding and privatisation payments. The general government debt to GDP ratio continues to fall as output grows rapidly, standing at 50.3 per cent in 1999.

The rise in inflation during 2000 has increased inflationary expectations resulting in real interest rates in the economy that are either extremely low or negative in some cases. Given the heightened risks of overheating in the economy a policy mix of tighter fiscal policy would seem to be required to offset the loose monetary conditions in order to moderate demand in the economy towards more sustainable levels and to ease inflationary pressures.

1.2.2 MEDIUM-TERM BUDGETARY POLICY

The determination of appropriate fiscal policy has increased in importance since the adoption of the euro. Participating member states are required to submit Stability Programmes to the European Commission setting out their medium-term budgetary objectives and projections to facilitate enhanced surveillance of budgetary positions and co-ordination of economic policies. The Stability and Growth Pact (SGP) incorporates fiscal rules to ensure the sustainability of national debt by requiring budgetary policy to aim for a medium-term objective of budget positions close to balance or in surplus in normal economic circumstances. To facilitate this objective, the budgetary process should adopt a multi-annual focus incorporating a medium-term outlook. In this context the recent decision by the government not to proceed with agreed financial departmental spending is an envelopes for unwelcome development.

In addition to commitments under the SGP, two significant domestic programmes set the parameters for medium-term fiscal policy. These include the expenditure plans made under the National Development Plan (NDP) and the budgetary commitments contained in the social partnership Programme for Prosperity and Fairness (PPF). The NDP involves expenditure of $\pounds 5.3$ billion per annum, or $\pounds 40.6$ billion in total, over the period 2000-2006 to address Ireland's development needs. The PPF outlines commitments on taxation and social inclusion expenditure over a thirty-three month period to 2002 though the precise magnitude of the impact for the public finances have not been specified. Both of these programmes will significantly constrain the broad parameters of Budget 2001.

Based on the analysis undertaken for the ESRI *Medium-Term Review* (Duffy, *et al.*, 1999), the most likely scenario is that the current rapid economic growth will gradually slow to an annual average for GNP growth of 5 per cent between 2000 and 2005. The public finances will remain healthy, with a strong surplus and a declining level of debt. Because of a dramatic fall in the dependency ratio the burden of providing necessary public services is likely to fall in the period to 2005. Even allowing for a major increase in public investment in infrastructure over the next planning period to 2006 under the NDP, the government will continue to enjoy a substantial surplus, averaging more than 2 per cent age points of GNP over the course of the next decade. The General Government Surplus is envisaged to average around 3.5 per cent of GNP per annum between 1999 and 2005, see Figure 1.1. These figures are based on budget balance inclusive of the one per cent of GNP pension pre-funding commitment but exclude privatisation receipts. This is the appropriate measure for assessing fiscal stance.





Source: Duffy, et al. (1999).

1.2.3 THE EVOLUTION OF THE BUDGET BALANCE 1974-2000

The evolution of Irish budgetary policy over the past twenty-five years is well known,² see Figures 1.2 to 1.4. An expansion in current expenditure in the 1977 budget set the share of government current spending in GNP on a steady upward trend, rising from 37 per cent in 1977 to 45 per cent by 1981. This in turn led to a succession of deficits on the exchequer accounts running well above 10 per cent of GNP per annum, see Figure 1.2. Between 1975 and 1981 the debt-to-GNP ratio climbed by almost 18 percentage points and the exchequer deficit averaged more than 13 per cent of GNP. In a European context, analysis by the EU Commission shows that total government expenditures in countries belonging to the euro area amounted to 35 per cent of GDP in 1970. This increased by over 17 percentage points to a peak of over 52 per cent of GDP in 1993,

 $^{^2}$ See Honohan (1999) for a discussion of the phases of Irish fiscal policy over the past twenty-five years.

largely the result of expanding social transfers and interest payments. In contrast, Irish government total expenditure peaked at 56 per cent of GDP in 1982 from 37.5 per cent in 1970.



Figure 1.2: Exchequer and Primary Balances 1974-2000 (as % of GNP)

The long-term non-sustainability of Irish fiscal policy received considerable attention following the second oil crisis, when rising real interest rates sent the public finances into a downward spiral, with an ever-increasing portion of exchequer funds being used to service the growing public debt. In addition, the prolonged recession of the early 1980s led to a cyclical increase in the deficit as rising unemployment increased expenditure on transfers and reduced tax revenues. In this period, the primary deficit fell sharply as a result of a rising burden of taxation, while the share of noninterest current expenditure stabilised at just over 40 per cent.

It was towards the end of the 1980s before the deficit and the debt finally came under control, with strongly deflationary budgets introduced in both 1987 and 1988. In contrast to the corrective budgets of the early 1980s, which were largely based on tax increases and cuts in public investment, these were based on sharp reductions in current expenditure. Furthermore, they coincided with an export-led growth recovery that facilitated the fiscal adjustment. Consequently, the debt-GNP ratio began to decline from a peak of 130 per cent in 1987 and the primary surplus became positive.





In the 1990s the public finances continued to improve, and the exchequer finances finally moved into surplus in 1998. The average tax burden, which is roughly equal to the share of government current revenues in GNP, stabilised at around 42 per cent. With strong growth in the economy in more recent years there has been the steady decline in the share of current expenditure in GNP, with the share of non-interest current expenditure in GNP forecast to fall to 30 per cent in 2000 from a peak of 41.5 per cent in 1986. Fiscal consolidation in the run up to EMU led to a fall in the expenditure ratio for euro countries to approximately 47 per cent of GDP in 1999. In Ireland this ratio fell to 34.5 per cent in 1999. Unlike expenditures, the revenue ratio for euro countries is only expected to start falling from its historically high level of 46 per cent of GDP in 1999. Irish government total revenue as a percentage of GDP peaked in 1988 at 43 per cent and has declined to just under 37 per cent in 1999.

The path of budgetary policy in Ireland over the last two decades has clearly been a turbulent one. To understand this path it is important to distinguish between induced and automatic changes in exchequer balances. To identify the impact of discretionary fiscal policy on the budgetary arithmetic, it is necessary to disentangle the changes due to the economic cycle from those changes that are attributable to deliberate policy choices by the authorities. We examine the most popular methods used to estimate these discretionary changes, broadly defined as measuring the fiscal stance of the government, in the next section.





1.3 Measuring Fiscal Stance Measuring fiscal stance is an attempt to capture in a single indicator the combined macroeconomic effects of all the various decisions taken in a budget in respect of public expenditure and taxation. The macroeconomic impact of a government's budget is typically judged on whether the fiscal stance is considered to be expansionary or contractionary in terms of either boosting or dampening aggregate demand in the domestic economy. There is, however, no universally accepted indicator or methodology for assessing fiscal stance.

One, albeit crude, way of producing an indicator of the fiscal stance is to sum revenue inflows and expenditure outflows and take the difference between them to produce a budget balance. Increasing deficits (diminishing surpluses) in the budget balance would be considered expansionary as the government is putting more resources into the economy than it is withdrawing. Increasing surpluses (decreasing deficits) would be considered contractionary. Variations in this unadjusted budget balance can give a misleading indication of fiscal stance since it fails to distinguish between the budget's influence on the economy from the economy's influence on the budget. Improvements in fiscal balances may mask deterioration in the underlying public finances, particularly during a strong economic growth phase. This can give rise to the phenomenon of "bad policies in good times".

Actual budget balances reflect both cyclical developments and discretionary budgetary decisions. Therefore adjusting budget balances to account for the economic cycle is an important task. Fluctuations in economic activity significantly affect budget receipts and expenditure. During expansions tax receipts increase while some expenditures, such as unemployment benefits, decline and the reverse movements occur in recessions. The movements in these budgetary categories are referred to as "automatic stabilisers" that operate to offset the effects of the economic cycle and lead to counter-cyclical movements in aggregate demand in the absence of any discretionary changes by the fiscal authorities (van den Noord, 2000). When adjusted for the cycle, a budget close to balance is consistent with counter-cyclical fiscal policy when these automatic stabilisers are factored in. In this context an expansionary (contractionary) policy would be a decrease (increase) in the cyclically adjusted balance.

The problem is that there is no generally accepted method of calculating what part of the budget balance is due to short-term transitory factors caused by cyclical events and what part is structural resulting from decisions made by the fiscal authorities. The standard approach is to estimate a cyclically adjusted or "structural" budget balance. This is referred to as the "gaps and elasticities" approach that involves estimating an output gap measure and then using this along with elasticity measures to adjust budgetary items. This measure is defined as what the budget balance would be, were the economy operating at capacity, typically defined as full employment output or trend output. Many international institutions, including the OECD (1999), the EU Commission (1999) and the IMF (2000b) produce estimates of cyclically adjusted budget balances based on this definition.

There are a number of difficulties in interpreting the structural budget balance as an indicator of fiscal stance. First, there are methodological difficulties surrounding the definition and measurement of capacity output to generate the gap measure and the underlying elasticities in the measures favoured by the international agencies. Blanchard (1990) argues that the choice of a benchmark for the economy is "needlessly controversial" in measuring fiscal stance. The definition of capacity output involves making implicit assumptions about the future course of the economy that are unnecessary if we are interested is assessing fiscal stance.

Second, the structural budget balance (SBB) measures the total effects of discretionary policy, that is a cumulative measure, and does not measure the impact of the current year's budget relative to the previous year's budget. This could lead to misleading conclusions on the direction of policy in the current year. For example, if discretionary fiscal policy has over a number of years led to a substantial widening in the structural deficit, then a tightening of policy which narrows but does not close the deficit will still indicate a loosening of fiscal policy relative to the base year.

Because of these difficulties many institutions now use the *change* in the SBB as a measure of fiscal stance, which is an incremental measure. The rationale being that fiscal stance can only be interpreted meaningfully in comparison to policy decisions in a previous time period so it is the change, not the level, of the budget balance that is the relevant consideration. This assumes that the previous year's policy mix is permanent, and considers the current year's budget relative to this baseline. If the SBB increases (decreases) in a given year, then this would imply a tightening (loosening) of fiscal policy in that year's budget. To arrive at an estimate of the total stance of discretionary fiscal policy over a number of years, these changes can be aggregated over time.

Alternatively, an incremental measure of fiscal stance can be estimated directly. Blanchard (1990) suggests a methodology that avoids the difficulties associated with the calculation of capacity. His "indicator of discretionary changes in policy" is defined as the difference between the budget balance if unemployment had not changed from the previous year, thereby eliminating the cyclical component of the budget, and the previous year's budget balance. A zero difference would imply a fully indexed budget with no discretionary policy changes in the current year, while a positive (negative) difference indicates a tightening (loosening) of fiscal policy. To avoid difficulties associated with changes in inflation and interest payments, Blanchard suggests using the primary fiscal balance, which is the fiscal balance net of interest payments.

Another method of estimating fiscal stance is to use a macroeconomic model to simulate the effects of an indexed budget, where indexation is based on the previous year's budget. The difference between the indexed budget balance and the actual budget balance is a measure of fiscal stance. A positive (negative) difference indicates a loosening (tightening) of fiscal policy. This measure is based on the incremental approach and so can be cumulated over time. The advantage in using a macroeconomic model for estimation is that it allows for the implementation of detailed indexation rules for different items of revenue and expenditure.

An additional approach is to use Structural Vector Autoregression (SVAR) analysis, which is sometimes referred to as shock or disturbance analysis (McCoy, 1997). This method decomposes changes in the budget balance into those arising from output shocks and fiscal shocks. The traditional gaps and elasticity approach only consider the possibility for one-way causation from the output gap to the fiscal balance. The output gap, however, can be modified by fiscal policy. It is expected that through a smoothing effect the observed output gap will be reduced by fiscal policy. By failing to take account of this effect, the traditional procedure is likely to overestimate the deterioration of the structural part of the deficit (Bouthevilain and Quinet, 1999).

We identify five separate measures of fiscal stance that we outline below. These can be categorised into three broad approaches:

- 1. Gaps and Elasticities Approach
 - Production Function Measure
 - Trend Smoothing Measure (Hodrick Prescott Filter)
- 2. Incremental Approach
 - Indexed Budget Measure (HERMES Method)
 - Blanchard's Discretionary Changes Measure

3. Structural VAR Approach

In Section 1.4 we estimate these measures for Irish budgetary policy and discuss what they suggest about the direction of discretionary fiscal policy over the past twenty-five years. We now briefly outline the main features of the alternative measures. A more technical description of these measures is contained in the Appendix.

1.3.1 GAPS AND ELASTICITIES APPROACH

The gaps and elasticities approach is a two-stage procedure. The first stage is to estimate the output gap. This is computed using a benchmark "potential" output measure. There are a number of methods used to estimate potential output. Two of the most common methods are the production function approach and the trend smoothing approach. The production function approach estimates potential output based on calculations of full employment and trend productivity. The trend smoothing approach tries to filter an estimate of trend output from the data over time, the most common method is the Hodrick-Prescott (H-P) filter. The output gap, which is the difference between potential and actual output, is then a measure of the cycle.

The second stage is to use the output gap to estimate the cyclical component of the budget balance using a series of revenue and expenditure elasticities. These elasticities measure the sensitivity of specific budget items to changes in output. Revenues are typically much more sensitive to the cycle than expenditures, since all tax revenues vary with the cycle while transfers are the only item of expenditure treated as directly linked to the cycle. Multiplying these elasticities by the output gap gives an estimate of the cyclical component of the budget. The cyclically adjusted balance is then obtained by subtracting the cyclical component from the actual balance.

Applying the "gaps and elasticities" approach, structural revenue and expenditure items are derived by multiplying actual revenue by the output gap weighted by an elasticity, with the latter measuring the sensitivity of that particular revenue item to changes in GDP. If there is no output gap, then actual and structural revenues coincide and the cyclical component is zero. Summing over all revenue items then gives structurally adjusted government revenue. Similarly adding structural estimates of transfer payments to actual expenditure on other items gives an estimate of structural expenditures.

Production function methods are based on theoretical concepts of capacity, with the economy's potential output level defined as that consistent with a sustainable non-inflationary level of employment of all factor inputs. This is the method preferred by the OECD to estimate potential output as outlined in Giorno *et al.* (1995). The measure of potential employment is derived from estimates of the non-accelerating inflation rate of unemployment (NAIRU). This is the main difficulty with the approach as identifying full employment in any economy is difficult, however this is compounded in a highly open labour market such as Ireland's (Cronin and McCoy, 1999). Therefore this estimate of full employment is subject to much uncertainty.

Trend smoothing methods involve applying statistical techniques to "smooth" output and thereby decomposing it into its structural and cyclical components. One of the most common methods is based on the H-P filter. This approach is used by the IMF, the European Commission and the Department of Finance in the EU Stability Programmes.³ This method estimates trend output by applying a weighted moving average, or fitted trend, to the economy's actual output. One of the main advantages of this approach is that it is relatively straight forward, in the sense that all that is needed for estimation is an output time series for GDP. This, however, is also its main weakness, as no account is taken of resource constraints. For example, no account is taken of an economy's factors of production, and consequently whether or not estimated output is even capable of being produced. Because of this, trend-smoothing methods are often criticised as being overly mechanistic as they fail to incorporate basic economic fundamentals in estimation.

A further weakness with the H-P filter is that it cannot adequately account for sudden large upswings or downturns in economic activity, as it merely smoothes over their impact. It also suffers from what is known as the "end-point" problem. This arises from the assumption in estimation that the beginning and end of the economic cycle are similar points. If this is not the case, then the estimated trend can be biased upwards or downwards depending on the position of actual output at the end of the sample period. For example, if one were to apply the filter to Ireland, it is likely that trend output would be overestimated because of the fact that the economy has been booming in recent years. The most obvious way of tackling such a problem is to include forecasts for the years ahead so as to try and give the most recent years less weight in the estimation process. This use of forecasts introduces an element of subjectivity into the estimation of the output gap.

1.3.2 INCREMENTAL APPROACH

There are difficulties in interpreting estimated structural budget balances, particularly as indicators of fiscal stance, since they are based on a benchmark measure which implicitly defines the path to which the economy is expected to return. Such difficulties can be avoided by basing the measure of fiscal stance on the change in discretionary policy relative to the previous year's budget. Two such methods are an indexed budget measure using the ESRI HERMES macroeconomic model and Blanchard's indicator of discretionary change.

The HERMES indexed measure can be derived by comparing the actual budget balance in a given calendar year with that which

³ The Department of Finance (1999) have indicated their reservations about the appropriateness of this measure for a small open economy like Ireland.

would have pertained in the absence of any budgetary changes in that year, an indexed budget. The difference between the two is then an indicator of discretionary change in policy. The concept underlying the HERMES indexed budget measure is that in the absence of any policy changes, revenues and cyclical expenditure items will grow in line with actual output growth while non-cyclical expenditure items will grow in line with trend output growth.

The indexed budget is computed assuming no change in average tax and expenditure rates from the previous year, and applying the actual growth rate to the revenue and cyclical expenditure base. The use of average tax and expenditure rates ensures full indexation of the tax and welfare system. The non-cyclical expenditure base grows at trend growth rate.⁴ The indicator of discretionary change is defined as the difference between the indexed and actual budget. A positive indicator suggests a loosening of fiscal stance. It is relatively straightforward to estimate an indexed budget outcome in some detail using the HERMES macroeconomic model. This includes a detailed series of relations describing public sector activity and its interaction with the rest of the economy.

Blanchard (1990) defines an indicator of discretionary change as "the value of the primary surplus which would have prevailed, were unemployment at the same value as in the previous year, minus the value of the primary surplus in the previous year, both in ratio to GNP in each year" (p.12). By using the previous year as the benchmark, Blanchard's indicator of discretionary change captures policy-induced differences attributable to the current year's budget, in other words it is an incremental measure of fiscal stance.

The cyclical element of the current year's budget balance is removed by assuming the unemployment rate, or employment gap, is unchanged from the previous year, and inferring the output growth rate that would have then prevailed. This can be inferred from the Okun coefficient, which estimates the long-run relationship between unemployment and output. Using this benchmark, and a set of elasticities, a cyclically adjusted budget balance is calculated. Comparing this with the previous year's actual balance gives an indicator of policy changes in the current year. To adjust for inflation and interest rates, the indicator is based on the primary budget balance.

Blanchard's indicator is designed to be simple and easy to implement so it ignores more slowly changing factors such as demographic variables. More generally, Blanchard argues that cyclically adjusting budget balances is an inappropriate methodology for assessing the sustainability of fiscal policy or the relationship between fiscal policy and aggregate demand.

1.3.3 STRUCTURAL VAR APPROACH

⁴ In previous estimates (Duffy, *et al.*, 1999), there was no volume growth in non-cyclical expenditure which built in a deflationary bias to the indexed budget measure. This has now been corrected by using trend volume growth.

The problem with most measures of fiscal stance is their inability to distinguish between the budget's influence on the economy from the economy's influence on the budget. One attempt to take account of this is to use a structural vector autoregression (SVAR) model to decompose the fluctuations in deficit-to-GDP ratio into fluctuations arising from shocks to output and those arising from shocks to the deficit itself.

Once the SVAR has been estimated, the structural component of the deficit can be calculated as the accumulation of the fiscal shocks over the review period. That is, the part of the deficit resulting from the policy actions of the government and not as a result of deviations from "normal" or potential economic growth. Likewise, the cyclical component is derived from shocks to GDP over the period. The main disadvantage of this approach is the fact that the identifying procedure used in the SVAR is, inevitably, to a certain degree subjective. Therefore, the estimates are sensitive to small changes in the restrictions. SVARs are also poor at capturing structural breaks that may have occurred in an economy.

1.4 Estimates of Fiscal Stance for Ireland

 \mathbf{D} oubts on the suitability of the traditional stance measures for a small open economy like Ireland motivated us to estimate a range of measures to see if they provide a coherent assessment of fiscal policy. In this section we use the five measures outlined above to estimate the stance of fiscal policy in Ireland over the last twentyfive years. A fairly consistent assessment on budgetary policy from these measures over the period up until the latter half of the 1990s is evident. It is in the latter period that a significant divergence occurs between the standard gaps and elasticities approach, adopted by the international agencies, and the incremental approach. The main source of the divergence lies in the difficulty in using the gaps and elasticities approach in a fast growing, open economy like Ireland. Potential output estimation in an economy experiencing rapid growth and structural transition is fraught with uncertainty and calls into question the suitability of using such measures to assess fiscal policy in Ireland. The incremental approach, in avoiding this problem of deciding on a potential output estimate, we believe offers a more reliable assessment of discretionary fiscal actions.

The time period under review, 1977-2000, can be split into five sub-periods. The periods chosen were based on four phases of distinct shifts in Irish fiscal policy identified by Honohan (1999) as

1977-1981	Unsustainable Expansion
1982-1986	Good Intentions
1987-1989	Decisive Action
1990- present	A New Equilibrium

We further split the post 1989 period into two sub-periods, 1989-1993 "New Equilibrium" 1994-2000 "Celtic Tiger".

There is a high degree of consensus among the five measures on the direction of fiscal policy over most of this period, the main exception being during the "Celtic Tiger" period, though there is some ambiguity on the magnitude of the stance throughout. Estimation of all the various measures, which is described in more detail in the Appendix, is dependent upon a range of parameters. Differences in the choice of values for these parameters can introduce considerable variation in the alternative measures adding significant subjectivity to the assessment of fiscal stance.

The gaps and elasticities measures are particularly dependent on the choice of potential output values that can alter the size of the output gap significantly. The gap measures produced on what we consider plausible values for the production function method indicate that the Irish economy is operating significantly above its sustainable potential output, particularly since 1997. While the trend smoothing measures indicate a similar pattern, the magnitude of the difference between actual and potential output is typically smaller for a range of smoothing parameters, see Appendix.

Figure 1.5 shows the change in the structural budget balance for the production function method and the Hodrick-Prescott filter, positive values indicate expansionary where (negative) (contractionary) phases. While there are differences in individual years, these measures broadly follow a similar pattern. Fiscal policy was expansionary in the late 1970s, while during the 1980s it moved into a contractionary phase. The production function method suggests that this contractionary phase ended in 1990 while the H-P filter suggests a year earlier. Both methods seem to concur during the assessment of more recent budgets suggesting that these have been mildly contractionary or neutral.

assessment of recent budgets being neutral The or contractionary concurs with the assessment of the IMF (2000a) in their recent report on Ireland and with the Department of Finance (1999) in its Stability Programmes, both of which use the trend smoothing method. As the IMF (2000a, p. 21) concede their trend smoothing approach "relies on estimates of potential growth, which normally would be stable but is more uncertain in Ireland. If recent potential growth were lower than staff estimates suggest (7.5 per cent in 1997-99), for example, the SBB measures would show a looser fiscal stance than indicated". The Department of Finance (1999, p.27), using 7.7 per cent trend growth rate in 1997-1999, likewise caution on the appropriateness of the trend smoothing method for Ireland "the relevance of the trend output for a small open economy has not been established".

In contrast a potential output growth of 5 per cent, a rate close to that considered sustainable over the medium term by many domestic agencies such as the Central Bank and the ESRI, would have shown the fiscal stance over 1997-1999 to be expansionary. This difference in potential output growth is a significant factor in explaining the variation in fiscal stance assessment by the alternative gaps and elasticities measures. It is this sensitivity to the uncertainties surrounding potential output growth that encourages the use of methods that do not depend on trend growth determination.





The incremental approach methods, for the most part, yield fiscal stance measures that are similar in terms of direction and timing, though the magnitude differ somewhat. Figure 6 shows the estimated results over the period 1975-2000 using the HERMES indexed measure and Blanchard's indicator of discretionary change. Again positive (negative) values indicate expansionary (contractionary) phases. These measures both suggest that Budget 2000 was expansionary but differ on the stance in 1999, with the HERMES viewing it as expansionary and Blanchard measures assessing it as broadly neutral.

Figure 1.6: Incremental Measures of Fiscal Stance (as % of GDP where +ve is expansionary and –ve is contractionary)



We also used a SVAR approach in the Irish context. This method, however, proved to be the least reliable indicator of stance compared to the consensus among the other measures. The SVAR method concurs with the other methods that policy was expansionary in the late 1970s and contractionary in the early 1980s, but it deviates considerably from 1987 onwards. This method suggests that the budgets between 1997-1999 were expansionary, see Figure 1.7 where positive (negative) values indicate expansionary (contractionary) phases.

Table 1.2 shows the direction of policy change suggested by all five indicators, together with the most recent IMF, OECD and European Commission estimates. Clearly there is a high degree of consensus about the direction of policy in individual year budgets across all these measures. In the most recent period, all eight indicators agree that the 1995 and 1997 budgets were expansionary, while five out of eight agree that the 2000 budget was expansionary.

Figure 1.7: The SVAR Measure of Fiscal Stance (as % of GDP where +ve is expansionary and –ve is contractionary)



Table 1.2: Direction of Discretionary Change in Irish Fiscal Policy (+ Loosening, - Tightening)

	Production Function	Hodrick Prescott	HERMES	Blanchard	SVAR	IMF	EU	OECD
1977	+	+	-	+	+		+	
1978	+	+	+	+	-		+	
1979	+	+	+	+	-		+	
1980	+	+	+	+	+		+	
1981	-	+	-	+	-		+	
1982	-	-	-	-	-		-	
1983	-	-	-	-	-		-	-
1984	-	-	-	-	-		-	-
1985	+	+	+	+	-		+	+
1986	-	-	+	-	-		-	-
1987	-	-	-	-	-		-	-
1988	-	-	-	-	+		-	-
1989	-	-	-	-	+		-	-
1990	+	+	+	+	+		+	+
1991	-	-	-	-	-		-	-
1992	-	+	+	+	-	-	+	-
1993	-	-	-	-	-	-	-	-
1994	-	-	+	+	-	-	+	-
1995	+	+	+	+	+	+	+	+
1996	-	-	-	+	-	-	-	-
1997	+	+	+	+	+	-	+	+
1998	-	-	-	-	+	-	-	-
1999	-	-	+	-	+	-	+	-
2000	+	-	+	+		-	+	-

Sources: EU Commission (2000), IMF (2000b), OECD (1999).

The implied fiscal stance cumulated over the successive periods is shown in Figure 1.8. The period 1977-1981 shows a cumulative expansionary effect, reflecting the strong expansion in current expenditure, while the budgets of the 1980s show up as contractionary, particularly in the 1987-1989 period of sharp fiscal adjustment. The exception is the SVAR measure, which perversely interprets the latter part of the 1980s as an expansionary phase contrary to most interpretations of this era.

We consider the HERMES model estimates to be the most reliable for Ireland, given the detailed indexation rules upon which they are based. The other measures rely on broad budget balance aggregates that do not capture the underlying structure of the budget. The gaps and elasticities measures rely on average elasticity relationships applied to aggregate data and approximate calculations of trend or potential output are used. The rapid growth in economic activity and the high mobility of the factors of production means that there is considerable uncertainty on what is the sustainable, potential growth rate in Ireland. This makes the gaps and elasticities measures less reliable for assessing fiscal stance in a period of considerable changes as during the "Celtic Tiger" phase. The SVAR measure uses an arbitrary classification of fiscal and output shocks into temporary and permanent effects that may not capture effectively the real dynamics in the economy. The Blanchard indicator depends upon an assumed stable relationship between changes in unemployment and economic activity, which is not appropriate for Ireland.

Figure 1.8: Cumulative Estimates of Budget Impulse (as % of GDP⁵ where +ve is expansionary and –ve is contractionary)



On the basis of our preferred measure, the cumulative effects estimated by the HERMES indexed measure are in general more modest than under the other methods. The exception to this is in the "Celtic Tiger" period, 1994-2000, when the HERMES estimates

⁵ Except the HERMES measure which is expressed as a % of GNP.

suggest that the recent expansion in fiscal policy is marginally bigger than the corresponding expansion in the 1977-1981 period. The predominantly expansionary budgets since 1994 have taken place against a backdrop of exceptionally high economic growth. Similarly, the contractionary fiscal policies of the 1980s coincided with a period of slow economic growth, well below the economy's potential growth rates.

Table 1.3 shows the annual average GNP growth rate and changes in unemployment along with cumulative fiscal stance under each of the measures. This indicates a mostly pro-cyclical trend in discretionary fiscal policy over the last two decades, the exception being the 1987-1993 period of counter-cyclical fiscal policy. All measures suggest that the 1977-1986 sub-periods were pro-cyclical, expansionary in the first part and contractionary from 1982 onwards. All measures suggest that 1987-1993 was a counter-cyclical period of contractionary fiscal policy, with the exception of the SVAR in the 1987-1989 sub-period and the Blanchard indicator between 1990-1993. The production function and trend smoothing methods suggest that the 1994-2000 period has been neutral to counter-cyclical while the HERMES method suggest pro-cyclicality in this time frame.

	GNP Growth	Unemploy -ment Rate	HERMES	Hodrick Prescott	Production Function	Blanchard	SVAR
	Percentage Change			Cumulated as Percentage of GDI			
1977-1981	3.56	0.18	0.71	2.04	1.30	2.03	6.34
1982-1986	-0.10	1.50	-0.40	-1.47	-1.21	-1.33	-3.48
1987-1989	3.95	-0.60	-1.44	-3.22	-2.46	-2.48	1.95
1990-1993	3.07	0.26	-0.32	-0.25	-0.39	1.12	-2.35
1994-2000	7.21	-1.75	1.91	-0.45	-0.33	0.94	1.23

Pro-cyclical fiscal policy in general has also been found by other researchers, such as Lane (1998, 2000) and Bradley *et al.* (1997). This pro-cyclicality in discretionary fiscal policy contrasts with the orthodox view. This would call for a neutral position for the structural budget balance over the cycle. Together with the automatic stabilisers this would result in counter-cyclical fiscal policy which would act as a stabilising force on the economy, being expansionary in downturns and contractionary in upswings. In the next section we examine whether pro-cyclical fiscal policy is a cause for concern and what does it imply for the appropriate fiscal stance in Budget 2001.

1.5 Appropriate Stance for Budget 2001 As previous sections have demonstrated, it is nearly as difficult *ex* post to determine what fiscal stance has been as it is *ex ante* to determine what it should be. The measures of fiscal stance estimated in Section 1.4 indicate pro-cyclicality in recent Irish budgetary policy. This may seem in hindsight to have been the

appropriate stance for fiscal policy particularly in the 1990s given the success of the economy over the last seven years. It runs contrary, however, to conventional economic advice that governments should set fiscal policy to "lean against the wind" of above trend economic growth. The danger is that with strong growth, what turns out in retrospect to be bad policies pursued in good times can leave a legacy that hampers future economic policy options. The lesson from Irish fiscal policy from the late 1970s is a cautionary reminder, when the extent of current expenditure gave rise to sustainability concerns for the national debt during the 1980s.

In framing Budget 2001, the government undoubtedly will have a set of microeconomic reforms and initiatives to pursue on topics such as childcare provision, educational and labour market interventions and so on. While these detailed changes within a budget are crucial in determining its overall impact, fiscal stance as conventionally measured focuses on a broad aggregate such as the general government balance. Factors that determine the appropriateness of fiscal stance include the state of the public finances, the position within the economic cycle and the economy's stage of development. Unlike the 1980s the state of the public finances are no longer the sole determinant of budgetary stance. The public finances have never been in a better position with the general government budget surplus expected to be in excess of 3 per cent of GDP in 2000. The primary macroeconomic consideration within the forthcoming Budget is how large should the surpluses be given the strength of the economy. The procyclicality in recent budgets, as indicated by the incremental fiscal stance measures, suggest that surpluses would even be higher than currently observed if neutral structural budgets were pursued.

The appropriate size of a country's fiscal surplus is attracting considerable attention internationally. The United States is likely to run substantial surpluses for some time while European countries like Britain and Germany are likely to run temporary surpluses as a result of windfall gains from auctions of third generation mobile phone licences. Debates on whether to use the proceeds to payoff national debt or to use the surplus to fund tax reductions abound. Lane (1999) considers what to do with the surpluses in the Irish context. The appropriate decision depends on the circumstances of the economy. A range of arguments can be used to justify fiscal surpluses (Hemmings and Daniel, 1995). The rationale for surpluses may result from the government pursuing a stabilisation role in the economy to meet inflation objectives or to slow the growth in demand in the economy.6 One allocative role for government encouraging the need for fiscal surpluses involves inter-generational transfers in pension payments. The decision to use the receipts from recent privatisations and to allocate one per cent of GNP to the

⁶ Other factors justifying running budget surpluses, which would seem to have little resonance for the current position of the Irish economy, include balance of payments objectives; unsustainable debt levels and/or heavy dependence on foreign grants, natural resources and privatisation receipts.

pre-funding of future pension liabilities is predicated on general government surpluses being run for another thirty years on the back of favourable demographic projections for Ireland over that time period.

In the shorter term, the focus of Budget 2001 is likely to be on the stabilisation role of fiscal policy to meet inflation objectives, particularly those underpinning the PPF agreement, but it should also be directed at steering growth rates in the economy towards more sustainable rates. These need not be mutually exclusive objectives since inflation results from excess demand, or "too much money chasing too few goods", so the textbook response is for the budget to reduce aggregate demand in the economy by contractionary policies.7 Contractionary fiscal policies would involve a combination of expenditure cuts and/or taxation increases. Both of these options are limited considerably by expenditure commitments under the NDP and personal tax reductions promised both within the PPF and the government's election manifestos and by the gradual scaling back of corporation taxes. These commitments will impart an expansionary tilt to budgetary policy but contractionary policy actions may neither be effective nor desirable, leaving aside their political feasibility.

The desirability of using fiscal policies to tackle inflation pressures and to slow economic growth in the economy needs to be considered. As a small open economy, within a large monetary union the inflationary process in Ireland is largely, though not exclusively, determined by external factors. Budgetary changes in administered prices, such as the rise in tobacco duties last year, can impact on measured inflation but by their nature have temporary impacts. The widespread attention given to the role of the tobacco duty increase in the rise of the consumer price index (CPI) this year, it is predictable that Budget 2001 will be framed with a view to ensuring a downward move in the CPI inflation measure. This manipulation of the CPI is expected to occur through a range of indirect tax adjustments. Manipulating the measure of inflation is no substitute for tackling the underlying cause of inflation that results from a mismatch between aggregate demand and supply. The conventional advice within an economic cycle is to dampen demand but where an economy is moving between stages of development, increasing aggregate supply significantly might be the more appropriate response to tackling inflation pressures in the medium term.

Whatever about the desirability of fiscal stance, a crucial consideration is how effective can fiscal policy be in influencing aggregate demand in a small, open economy. The IMF (2000) estimates that the fiscal multiplier for Ireland is within the range 0.6 to 1.0. This implies that in order to reduce aggregate demand significantly, substantial expenditure cuts and/or increased levels of taxation would be required. In the context of EMU, the absence of independent monetary policy places a greater burden on fiscal

⁷ In a recent paper by Ljungqvist and Uhlig (2000) it is shown that the optimal tax policy in a productivity-shock driven economy where consumers have "catching-up with the Joneses" utility functions is to use pro-cyclical movements in taxes to offset the cycle.

policy. The appropriate fiscal stance hinges on the dilemma of deciding whether the Irish economy is in a conventional economic cycle of a developed economy or is it in a transition between stages of development.

If the economy is considered to be moving through a conventional economic cycle, then in the context of loose monetary and exchange rate policies and close to full employment, the recommended fiscal policy response in tackling inflationary pressures and slowing the economy would be contractionary. In contrast, where the economy is considered to be in an exceptional phase moving between different growth paths, increasing the productive capacity calls for supply side fiscal responses that are expansionary in nature. These measures include those proposed under the NDP to improve the economy's infrastructure and the personal taxation changes within the PPF to encourage greater labour market participation. Most foreign commentators seem to view the economy as overheating within a conventional economic cycle paradigm, whereas most domestic commentators seem to view the economy as being in transition to a higher growth path brought about by structural change in the sectoral composition of the economy (Cronin and McCoy, 2000).

In the context of the tension between these views our recommended stance for Budget 2001 would take a middle ground in calling for a broadly neutral budgetary policy position. This consists of a moderately expansionary structural budget, reflecting the spending commitments on investment in the NDP, offset by the automatic stabilisers arising from the high growth forecast for 2001. The personal taxation commitments agreed under the PPF should be honoured within the lifetime of the thirty-three month agreement but should be postponed until the later stages so as not to fuel inflationary pressures through higher disposable incomes. Indirect tax and expenditure adjustments in an effort to manipulate the CPI should be offset by widening the tax base through greater application of user fees and charges on publicly provided goods and services.

1.6 Conclusions I his paper analysed the stance of Irish fiscal policy over the last twenty-five years using a number of alternative measures and found it in general to be pro-cyclical over the period. This indicates that fiscal policy is expansionary in economic upswings though some differences exist between the measures as to the magnitude of the fiscal stance. The main divergence between the measures occurs during the last seven years in the "Celtic Tiger" phase. The traditional gaps and elasticities approach, favoured by international organisations in assessing fiscal stance, find that budgetary policy in Ireland has been slightly contractionary or broadly neutral during this period. In contrast the method favoured in this paper is an indexed measure of discretionary budget changes which suggest that the most recent period has been one of expansionary fiscal policy. The divergence seems to result in the main from estimates of high potential growth for the Irish economy used by the international organisations such as the EU Commission, the IMF and the OECD. Using more moderate potential growth rates, which we would consider sustainable, would lead to a concurrence between the approaches on the expansionary nature of recent budgets.

Formulation of budgetary policy is never an easy task. As the economy continues in its exceptional growth phase and the public finances seem to improve unremittingly, the task of allocating budgetary resources becomes even more difficult. The plethora of measures available on fiscal stance have not been consistent in determining the impact of budgetary policy in the past nor do they provide a clear view for the future. Within this context the correct fiscal policy is far from clear-cut for a small, open economy within a large monetary union, experiencing close to full employment conditions.

The stabilisation role of fiscal policy in achieving inflation and sustainable growth objectives is difficult to achieve. The stance depends on whether the economy is considered to be operating with an economic cycle or in a period of transition. Within a cycle the stance would be contractionary to counter the impact of rising inflation and in an effort to diminish rapid economic growth. In a transition the appropriate stance is probably expansionary, directed at increasing the economy's productive capacity through supply side measures. The recommended stance for Budget 2001 in this paper leans more to the economy in transition view encouraging the adherence to the expenditure outlined in the National Development Plan. In keeping with our analysis in successive Quarterly Economic Commentaries, budgetary policy on the taxation front should be tighter this year and next than it has been for much of the latter half of the 1990s. We are not calling for an indefinite deferment of taxation commitments under the Programme for Prosperity and Fairness but rather a postponement until the economy begins to slow towards more sustainable rates.

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APPENDIX: ESTIMATION OF FISCAL STANCE MEASURES

A1.1 Gaps and Elasticities Approach

Production Function Measure

This is based on the methodology adopted by the OECD (see Giorno *et al.* (1995)). The first stage involves estimation of a simple two-factor Cobb-Douglas production function using sample average labour shares. The residuals from this give estimates of total factor productivity. Estimates of potential output can then be retrieved from this production function, by combining trend measures of total factor productivity with the actual capital stock and an estimate of potential or full employment. Trend total factor productivity is estimated using a nine-period moving average of actual productivity.

The main difficulty with this approach lies in estimating the NAIRU. Identifying full employment in any economy is difficult, however this difficulty is compounded in a highly open labour market such as Ireland's (Kenny, 1996). Therefore this estimate is subject to much uncertainty. Consequently, a range of possible full employment estimates are used in order to test the sensitivity of potential output to changes in this crucial variable.

The production function is estimated as follows. Define output (Y) as GDP at factor cost in the industrial and marketed services sectors. The number of persons employed (L), and capital stock levels (K), in market services and industry, are weighted according to their sample shares in output (α , and (1- α)). The difference between actual output (Y) and these weighted factor inputs gives an estimate of total factor productivity (E).

<i>y</i> =	αl +	· (1 ·	- α) k	$^+$	е
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where		
Y	=	business sector value added in real terms
L	=	business sector labour input
Κ	=	business sector capital input
Е	=	total factor productivity
α	=	sample average labour share

Lower case letters denote logarithms. The next step is to estimate the level of full employment or potential employment in the business sector (L*). In order to do this an estimate of the non-accelerating inflation rate of unemployment (NAIRU) was derived, using a formula applied by the OECD.^{8.}

$$L^{*} = LFS^{*} (1 - NAIRU) - LG - LAG$$

⁸ The OECD derive estimates of the non-accelerating inflation rate of unemployment (NAIRU) by assuming that changes in wage inflation are proportional to the difference between actual unemployment and the NAIRU.

where			
LFS*	=	smoothed labour force ⁹	
NAIRU	=	non-accelerating inflation rate of unemployment	of
LG	=	employment in government sector	
LAG	=	employment in agriculture	

The estimated total factor productivity was smoothed using a nine period moving average to derive an estimate of trend productivity (e*). Then by substituting in the actual capital stock (k), the calculated full employment level of labour (l^*) and estimated trend productivity (e*) into the production function, an estimate of potential output in the business sector (v^*) can be derived:

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

where

L*	=	potential level of employment in the business
	=	sector
\mathbf{Y}^*	=	potential level of output in the business sector
Κ	=	capital stock in the business sector, assumed equal
		to its potential level
E^*	=	trend total factor productivity

The economy's overall potential level of output is computed by adding the actual level of value added in the public sector and agriculture to Y*, to get potential output in the economy, GDP*. The ratio of GDP* to actual GDP is the estimated output gap with the economy deemed to be growing at trend when the ratio is equal to one.

$GDP^* = Y^* + YGO$	VT + YAGRIC				
Where					
GDP* =	estimated trend GDP				
Y* =	estimated trend output in the business				
	sector				
YGOVT =	output in the government sector				
YAGRIC =	output in the agricultural sector				

This production function equation was estimated for the period 1975-2000.¹⁰ A number of variants of Y^{*} were estimated, by first allowing the respective labour and capital shares to vary over time; second, by assuming a constant NAIRU of 3.5 per cent; and finally by using annual hours worked rather than numbers employed for L. These different approaches yielded similar results.¹¹ We proceeded

 $^{^9}$ Calculated as the product of the working age population and a nine-period moving average of the participation rate.

¹⁰ Data for 1999-2000 are based on the June 2000 Quarterly Economic Commentary forecasts.

¹¹ All methods indicated that growth has been above trend since 1997, with the ratio of potential to actual output ranging from 0.86 in the case of a constant NAIRU to 0.83 in the case of a varying NAIRU. The constant NAIRU method was the least satisfactory, suggesting

using numbers employed, a varying NAIRU and a constant labour share, an identical formulation to the OECD method.



Figure A1.1: Output Gap Estimated Using Production Function Ratio of Actual to Potential Output

The estimated output gap as shown in Figure A1.1 is greater than one in the 1977-1980 period, indicating that the economy was growing above trend. The gap was less than one throughout much of the 1980s, troughing in 1986, reflecting the very depressed economic environment at the time. In the 1990s, this pattern was reversed with the ratio of actual to potential output rising above one in 1997, indicating that the economy was once again growing above trend. This increase has continued in recent years suggesting that current levels of growth are well above potential or trend growth.

This estimated output gap is used to compute the cyclically adjusted budget balance. Using disaggregated data on revenue and expenditure, the cyclical component of revenue and expenditure is calculated as follows:

$$\mathbf{R}_{i}^{*} = \mathbf{R}_{i} \left(\frac{\mathbf{GDP}^{*}}{\mathbf{GDP}} \right)^{\mathbf{ZR}_{i}} ; \quad \mathbf{GTR}^{*} = \mathbf{GTR} \left(\frac{\mathbf{GDP}^{*}}{\mathbf{GDP}} \right)^{\mathbf{ZG}_{T}}$$

where

R;*

=

=

structural government revenue for item i. actual government revenue for item i.

GTR^{*} = structural government expenditure on transfers.

GTR *= actual government expenditure on transfers.

that growth was below potential in the late 1970s, while the other methods all showed an economy growing above trend in that period. Using hours worked rather than numbers employed produced very similar results except in the late 1990s when they differed slightly, with the ratio of potential to actual output averaging 0.92 for the latter as compared with 0.94 for the former for the period 1995-2000. This is partly due to the data problems to do with average hours worked in recent years.

$ZR_{I} =$	elasticity of revenue item i with respect t				
	changes in GDP.				
$ZG_{TR} =$	elasticity of transfers with respect to				
	changes in GDP.				

The elasticities of the various expenditure and revenue items with respect to GDP¹² were taken from published OECD (Giorno *et al.*,1995) and Department of Finance (1998) calculations and are shown below. The most notable difference between the two estimates is the corporate tax elasticity which is much higher in the OECD calculations, although this has been revised downwards in more recent work.¹³ For non-tax revenues we assume full indexation and apply an elasticity of 1. We apply the OECD elasticity for personal transfers in both cases.

	OECD	Department of Finance
Indirect Taxes	1.0	1.3
Corporate Taxes	2.5	1.5
Personal Income Taxes	1.3	1.3
Social Security Contributions	0.5	0.6
Personal Transfers	-0.5	

A tax elasticity greater than one indicates the presence of fiscal drag in the taxation system. The progressivity of personal income tax is reflected in the elasticity of 1.3, while the social security elasticity is less than one because of the income ceiling on contributions. The Department of Finance and the European Commission estimate an average tax revenue elasticity of 1.1, indicating that there is an overall element of fiscal drag in the taxation system, so that in the absence of discrete fiscal policy changes, revenues as a share of GDP will rise over time. This means that the tax system is less than fully indexed.

Figure A1.2: Production Function Estimates of SBB (% of GDP)

¹² In all cases elasticities are computed with respect to GDP. Therefore, we compute all estimates of the output gap in GDP terms.

¹³ Using the more recent elasticity estimates (OECD, 2000) significantly altered the *level* of the estimated structural budget balances in recent years, however the implied *direction* of fiscal policy, as measured by the change in the CABB, was unchanged using these estimates.



The difference between structurally adjusted revenues and expenditure is the structurally adjusted budget balance. Figure A1.2 shows actual and estimated structural budget balances as a percentage of GDP¹⁴ over the last twenty-five years, using both Department of Finance (1998) and OECD (1995) reported elasticity estimates. The structural balance has tended to fluctuate about the actual balance up until quite recently. Since 1997, however, a gap has opened up between the two measures, with the government continuing to run a small structural deficit despite the substantial actual surplus recorded.

Trend Smoothing Measure

Essentially the Hodrick-Prescott filter involves solving a constrained optimisation problem, of the form:

$$\sum_{t=1}^{T} (\ln Y_t - \ln Y_t^*)^2 + \lambda \sum_{t=2}^{T-1} [(\ln Y_{t+1}^* - \ln Y_t^*) - (\ln Y_t^* - \ln Y_{t-1}^*)]^2$$

where

A weakness of this measure concerns the choice of the Lagrange multiplier λ in the constrained optimisation procedure. The lower λ is, the closer estimated trend output is to actual output. In effect λ determines how trend output behaves, with higher values of λ resulting in smoother series of trend GDP.

¹⁴ Structural budget balances are expressed as a percentage of potential GDP.

A Hodrick-Prescott (HP) filter was estimated for real GDP for the period 1975 out to 2006, using forecasts from the ESRI's *Medium-Term Review* to overcome the end-point problem. Three different values of the smoothing parameter λ were used: 25, the value used by the OECD in their application of the HP filter to Ireland, 100, the value used by the European Commission, and 500. The estimated output gaps showed a similar pattern to the production function estimates. The results showed that the economy operated above trend in the late 1970s up until about 1981, and again in recent years as can be seen from Figure A1.3. However the size of the estimated output gap is much smaller using the H-P filter, especially for the late 1990s.



Figure A1.3: Output Gap Estimated Using H-P Filter Ratio of Actual to Potential Output

The estimated structurally adjusted budget balance, based on the H-P filter with λ set equal to 100 is shown in Figure A1.4 using exactly the same method as described above and using the OECD tax and expenditure elasticity estimates. Under this measure the structural deficit, which matched the actual deficit closely in the early period of the sample, disappeared in the late 1990s.



The difference with the production function estimate of a large structural deficit in this period is due to the much smaller estimated output gap under the HP methodology. The production function measure, which is based on estimates of available labour and capital resources, suggests that in the last three years the output gap has widened to an unprecedented level. Such a divergence between actual and potential output would not be possible under the H-P filtering process since trend output is determined by actual output.

A1.2 Incremental Approach

HERMES Indexed Budget Measure

The derivation of an indexed budget using the HERMES macroeconomic model can be illustrated in a simplified example as follows. Define T as total revenue, GTR as cyclical expenditure and GO as non-cyclical expenditure, then the actual budget balance B in year t is:

$$\mathbf{B}_{t} = \mathbf{T}_{t} - GTR_{t} - GO_{t}$$

Define t as the average tax rate (T/Y), rtr as the average rate of cyclical expenditure (GTR/Y), rgo as the average rate of noncyclical expenditure (GO/Y). Then the budget balance can be expressed as a function of average tax and expenditure rates, which are discretionary policy instruments, times the base Y, which is determined by the rate of economic growth:

$$\mathbf{B}_{t} = \mathbf{t}_{t} Y_{t} - rtr_{t} Y_{t} - rgo_{t} Y_{t}$$

Now define z_t as the actual growth rate in year t, Y_t / Y_{t-1} , and z^* as the trend growth rate. The budget balance indexed on the previous year's budget is then:

$$\hat{\mathbf{B}}_{t} = \mathbf{t}_{t-1} Y_{t-1} \cdot z_{t} - rtr_{t-1} Y_{t-1} \cdot z_{t} - rgo_{t-1} Y_{t-1} \cdot z^{*}_{t}$$

where $z_t \cdot Y_{t-1} = Y_t$. With some manipulation this can be derived as:

$$\widetilde{\mathbf{B}}_{t} - \mathbf{B}_{t} = -\left(\Delta t_{t} - \Delta r t r_{t} - (rgo_{t} - rgo_{t-1} \cdot \frac{z^{*}}{z})\right) Y_{t}$$

From the formula we can see that increases in average tax rates will tighten fiscal stance while increases in average transfer rates will loosen fiscal stance. The last term implies that if non-cyclical expenditure grows faster than trend, this will loosen fiscal stance.¹⁵ Clearly offsetting policy changes on the expenditure and revenue sides will cancel out in this measure so that it cannot be used as an indicator of sustainability.

The main tax revenues are determined as the product of a tax "rate" by a "tax base":

$$T_{it} = t_{it} . BASE_{it}$$

For the purposes of indexation, there are nineteen separate revenue categories identified.¹⁶ Indexation to the previous year's budget is then relatively straightforward to implement, by setting the tax rate equal to that of the previous year, as follows:

$$\widetilde{T}_{it} = t_{it-1} . BASE_{it}$$

There are some exceptions to this rule built in to the model to ensure accurate indexation. For example, the *rate* of excise duty is indexed to the deflator of private consumption because excise duties are levied on volumes.

The Irish tax system is not fully indexed, the Department of Finance (1998) estimates that the aggregate tax elasticity in the economy is 1.1. This element of fiscal drag is eliminated by the use of average tax and expenditure rates which imply full indexation. This is an important point since the IMF (2000a) recently argued that the HERMES indexation rules do not allow for tax cuts designed to offset the effects of fiscal drag. This is not correct,

¹⁵ This can be seen by rewriting this third term as follows:

$$rgo_{t} - rgo_{t-1} \cdot \frac{z'}{z} = \frac{G_{t} - G_{t-1} \cdot z'}{Y_{t}}$$

¹⁶ These include expenditure taxes (VAT receipts, customs taxes, excise taxes, agricultural levies, motor vehicle duties, etc.) and income taxes (personal income taxes, social security contributions, corporate income taxes, DIRT taxes, agricultural income taxes, etc.).

indexation to average tax and expenditure rates has an in-built assumption that those tax cuts necessary to keep the average tax take constant are implemented in full.

The indexation of expenditure items is more complicated because not all items of expenditure are cyclical. For cyclical items the indexation rules used can be summarised as follows:

• Unemployment transfers, GTRU, are modelled as the product of an unemployment transfer "rate" ru, applied to the "base" of total numbers unemployed, U:

$$GTRU_{t} = ru_{t} \cdot U_{t}$$

Because numbers employed is a volume base, the rate must be indexed to the appropriate price. In the HERMES model indexation of the rate of transfer payments uses a weighted average of the private consumption deflator and the average wage rate as the price term:

$$\widetilde{G}\widetilde{T}\widetilde{R}\widetilde{U}_{t} = \mathrm{ru}_{t-1}.(\alpha\dot{P}_{t} + (1 - \alpha)\dot{W}_{t}).U_{it}$$

- Indexation of other personal transfers applies a similar price adjustment. In addition, because these transfers are mainly to the elderly (pensions) and the young (children's allowance) there is a volume adjustment based on the growth in the dependency rate (the proportion of the population over 65 and under 14 years of age).
- Transfers abroad, a separate item, are indexed to nominal GNP growth.
- Indexation of subsidy payments imposes a growth rate equal to the growth in the relevant subsidy base. For example, agricultural subsidies are assumed to grow at the same rate as agricultural output.

For non-cyclical expenditure items, volume indexation was applied using a trend volume growth rate, estimated using a nineperiod centred moving average, multiplied by the actual price or wage change in that year. Indexed values of four categories of public investment, two categories of employment and public consumption were all computed on this basis.¹⁷ This is an improvement on earlier estimates of the indexed budget (Duffy *et al.*, 1999) where non-cyclical expenditure was assumed to have no volume growth. Debt interest payments are not indexed. This is an oversimplification since the level of debt is a cumulation of past policy choices, however on a year-on-year basis it is a reasonable proxy.

Figure A1.5: HERMES Indexed Measure of Fiscal Stance (% of GDP)

¹⁷ These are investment in public administration, health and education, local authority housing and roads, water supply and sewerage; employment in public administration, and health and education; and government's purchases of goods and services.



Figure A1.5 shows the estimated results over the period 1976-2000. These suggest that the 1978 and 1997 budgets were the most expansionary of the entire period. Based on this measure the current year (2000) budget was the fifth most expansionary. The 1976 budget was the most contractionary closely followed by the 1983 budget.

Blanchard's Indicator of Discretionary Change

The most problematic conceptual issue in implementing this method for Ireland is the use of the Okun coefficient. The relationship between unemployment and output in Ireland is unstable, because of high migration flows (Honohan, 1999). To deal with this we used recently published estimates of the Okun coefficient from Walsh (1999) where he makes explicit adjustments for migration by including the UK unemployment rate in the basic Okun relationship. Walsh's estimate of the long-run Okun coefficient for GDP¹⁸ is 4.4.

Figure A1.6 shows the estimated indicator of discretionary change¹⁹ using the Blanchard method and the OECD and Department of Finance elasticities. The pattern is very similar to that estimated using the HERMES model, although the range of variation is wider. Once again the 2000 budget shows up as expansionary under this measure.

 $^{^{18}}$ Walsh publishes estimates on GNP and GDP basis. We use his GDP estimates because all the published elasticities are on a GDP basis.

¹⁹ For consistency with the HERMES indexed budget measure we have changed the sign of the indicator. Therefore a positive value indicates a loosening of fiscal policy and a negative value indicates a tightening of fiscal policy.



Figure A1.6: Blanchard Measure of Fiscal Stance (% of GDP)

A1.3 SVAR Approach Traditional VAR analysis is an attempt to *let the data speak for itself* by imposing a minimum amount of restrictions using multiple time series analysis. The VAR is set up so that all variables are estimated symmetrically with each equation containing the same number of regressors. Apart from using economic theory to decide on what variables to include the technique is considered atheoretic. The estimation is done in reduced form that requires a set of restrictions to allow for the underlying structural parameters to be identified. It is in the identification stage that structural VARs differ from reduced form VARs. SVAR impose identification restrictions based on economic theory rather than the atheoretic recursive restrictions imposed with reduced form VARs.

In order to examine fiscal stance, a two variable SVAR model can be formulated that decomposes fluctuations in the deficit to GDP ratio into those arising from output shocks and those arising from changes in the deficit itself. The output shocks are assumed to have permanent or long-term effects, while shocks to the deficit have transitory or short-term effects. An approach pioneered by Blanchard and Quah (1989) imposes a restriction on the long-term effect in order to achieve identification. In a two variable SVAR this provides the necessary one restriction.

The SVAR procedure, for the most part, tends to present a lower estimate (either expansionary or contractionary) of the SBB. This was the *a priori* expectation and part of the motivation for using the model. The exceptions to this are 1976, 1986 and, of especial interest, 1999. The expansionary nature of the 1999 budget is much lower than that predicted by the HERMES model. By contrast, the expansionary effects of the 1998 budget are much greater.

The cumulative effect over the period 1987-1989 gives an estimated expansion of the order of 2 per cent of GDP – thus not

capturing the fiscal consolidation in that period. This highlights the black-box nature of the SVAR, its over-sensitivity to small specification issues, and its inability to precisely estimate the relationships between the variables under consideration. This would explain the generally weak econometric estimates that the model gets. It may be the case that the model has not captured the major shift that took place in that period and so is applying a common estimate of the whole period when ideally, although data limitations do not allow it, the two periods should be estimated separately.