projected to increase by 4.8 per cent this year, as against a 4.1 per cent pre-Budget projection (which did not include the impact of the new policy measures).[18]

Box A: Forecasts for VAT from *Budget 2012*

Introduction

The major discretionary tax change in Budget 2012 was the 2 percentage point increase in the standard VAT rate from 21 per cent to 23 per cent, with effect from 1 January 2012. VAT is the second largest of the major tax heads and this rate change attracted considerable attention.[19]

VAT Announcements in 2012

The standard VAT rate increase was projected in *Budget 2012* to yield €560 million in 2012, accounting for just over half of the €1.0 billion in announced new tax measures.[20] These numbers refer to the "static" impact of the tax measures – that is, the impact assuming no change in consumer or business behaviour.[21] The other major VAT change for 2012 arises out of the May 2011 Jobs Initiative (JI) and its introduction of a temporary second reduced rate of VAT of 9 per cent. This temporary measure was estimated to cost an additional €230 million in 2012, once again on a static basis.[22] These two VAT changes give a static €330 million increase in projected VAT revenue for this year, all other things being equal. The actual VAT increase projected in the Budget, however, was €265 million. The €65 million difference between this number and the static estimate captures, among other things, any impact of the higher tax rate on the tax base and other judgemental factors.

VAT Forecasting Approach

The Department of Finance forecasts VAT receipts using a standard tax forecasting equation which links VAT to the growth in nominal personal consumption expenditure:

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[18] On the broader General Government basis, taxes are projected to increase by 3.8 per cent in 2012.

[19] See Dáil Éireann Debate, Reference: 40236/11, 14 December 2011.

[20] The full year effect was estimated at €670 million, which reflects the fact that VAT receipts in the early part of 2012 relate to purchases made (at a lower rate of VAT) in late 2011.

[21] A separate figure of -€775 million in the Budget captures the buoyancy effect of all new budgetary measures, including the impact of the VAT rate increase on nominal personal consumption expenditure that constitutes the tax base for VAT.

[22] The full year effect of this measure in 2012 was estimated to be €350 million whereas the effect in 2011 was estimated to be €120 million. This gives an estimated marginal effect of €230 million in 2012.

$$VAT_t = (VAT_{t-1} - T_{t-1}) * ((1 + dPCN_t) * E) + M_t + J_t$$

where VAT_t is the VAT take in year *t*, T_{t-1} are one-off items affecting the VAT yield in year *t-1*, $dPCN_t$ is the projected growth rate in nominal personal consumption expenditure in year *t*, *E* is the elasticity between VAT revenue and the tax base, assumed to be 1, M_t is the estimated static yield from any changes in tax policy affecting receipts in year *t* and J_t can be viewed as a judgemental factor in year *t* and could reflect items not easily captured in a standard tax equation.

The key factors driving the VAT take are the outturn for the previous (or outgoing) year, which is adjusted for one-off factors, and the forecast for growth in the tax base (nominal personal consumption expenditure). Any impact of the change in the tax rate on the tax base would be reflected in the estimate for *dPCN*.

Linking projected VAT revenue to the evolution of a consumption-based macroeconomic aggregate is a standard approach to tax forecasting. Apart from some decoupling of the series between 2006 and 2008 due to property market developments, Figure A.1 shows a reasonably close correlation between the growth rates in nominal personal consumption expenditure and VAT receipts.

Figure A.1: Nominal Personal Consumption and VAT Receipts
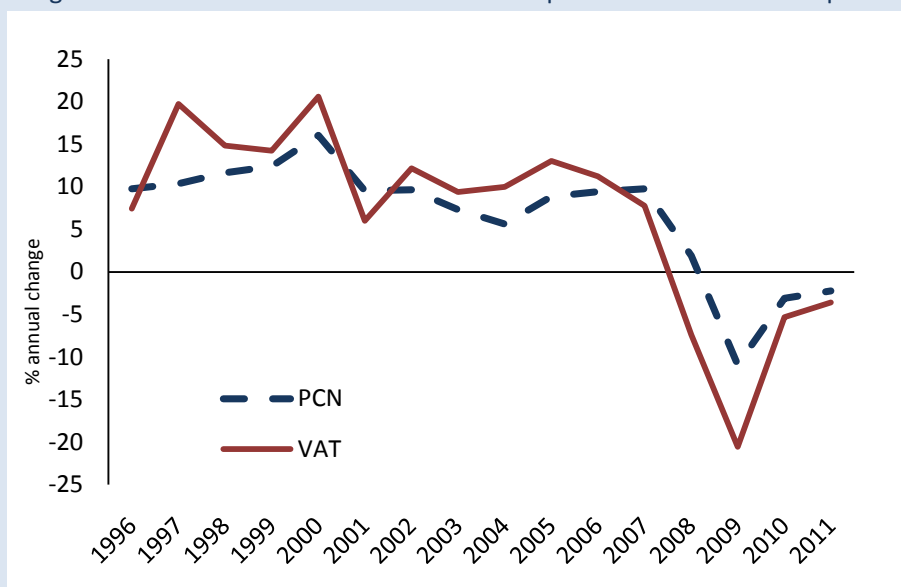
Source: CSO and Department of Finance Exchequer Statements.

Given that VAT applies only to some components of consumption and applies at different rates to those components, the relationship between VAT revenue and personal consumption may vary over time, especially in the face of budgetary changes to VAT rates. The question arises therefore as to whether an elasticity factor of 1 is an appropriate approximation of this relationship. One way to gauge this is to look at recent VAT revenue forecasting performance. Overall tax forecasting errors in Ireland have not been out of line with international experience and VAT projections produced by the Department of Finance had the lowest forecast error of all of the major taxes over the period 1999-2006.[23] This suggests that the current elasticity assumption is not unreasonable.

Assessing the *Budget 2012* VAT Projection

The Budget forecast a 2.7 per cent increase (€265 million) in VAT receipts in 2012 to €9,995 million (Table A.1). To assess this forecast, the Council first calculated a VAT revenue projection for 2012 based on the forecasting equation presented above, the available estimate at the time of the Budget for the end-year 2011 VAT outturn, the projected growth in the tax base (using data underlying *Budget 2012*) and the effects of the static budgetary measures. The judgemental factor, J_t, was set to zero.

At the time of the Budget, the VAT outturn for 2011 was not known and so the estimate of €9,730 million available at the time (compared with an outturn of €9,741) was used as an input into the Council's calculation. To calculate the nominal growth in personal consumption expenditure for 2012, the data underlying *Budget 2012* giving a volume decline in personal consumption expenditure of 1.3 per cent and a deflator of 1.7 per cent were taken.[24] Finally, approximately €330 million was included to account for the static impact of

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[23] A recent paper by Buettner and Kauder (2010) compares tax forecast errors across a group of 12 OECD countries and shows that Ireland's relative performance was reasonable over the 10 years to 2009. A paper prepared by the Tax Forecasting Methodology Review Group (2008) finds that over the period 1999-2006, the average Root Mean Square Error (RMSE) for overall adjusted tax projections was 5.9 per cent, whereas the VAT error was 4.6 per cent. The report attributed a significant portion of the overall tax error to large errors in capital taxes relating to property market developments. An earlier IMF study found that the overshooting of tax revenue compared to forecasts in Ireland largely arose due to stronger than expected economic growth and that the Department of Finance growth forecasts were similar to those of other institutions at the time (IMF, 2005). Overall, the evidence indicates that the Department of Finance's VAT forecasting performance has been reasonable.

[24] These forecasts compared with the *MTFS* estimates of a volume decline of 1.0 per cent in personal consumption, with a deflator of 1.1 per cent.

the new VAT measures announced in the JI and *Budget 2012* discussed above. No other temporary factors were included.[25]

Table A.1 contains the outcome of the Council's exercise and includes the Budget estimate for comparison. Using the approach described above gives a projected VAT yield of €10,096 million, a number that is approximately €100 million or 1 per cent higher than the Budget estimate. The difference in the projected revenue increase may reflect a number of factors: possible differences in the tax base growth figure used by the Council versus that used in the official forecast, which may include some adjustments; any judgemental factors included in the Budget forecast; or any unpublished information on expected VAT yields and factors not captured by a relatively simple equation. This exercise confirms that the VAT revenue increase of €265 million forecast in the Budget is consistent with this standard approach to forecasting.

A key element of the forecast is whether the estimated impact of the VAT rate change on nominal personal consumption expenditure growth is reasonable. Ideally, a measure of the elasticity of the tax base to the tax rate could be calculated by looking at the change in the projected growth in nominal personal consumption expenditure after the announced change in the VAT rate. This exercise is complicated, however, by the fact that the change in the available *dPCN* number reflects more than just the VAT change. For example, the change in the projected growth in both nominal and real personal consumption expenditure between the *MTFS* and the Budget incorporates changes in general macroeconomic conditions and possible balance sheet repair activities of households.

Since *Budget 2012*, the CBI published a forecast for nominal personal consumption growth of 0.1 per cent in 2012 (CBI, 2012). Table A.1 shows that using this forecast instead for *dPCN* but maintaining all other *Budget 2012* assumptions gives a projected VAT take of €10,066 million in 2012, a figure that is closer to, although still higher than, the *Budget 2012* projection. As an alternative cross-check, it is useful to look at the *dPCN* rate implied by the Budget VAT projection for 2012 using the forecasting equation and keeping all other elements the same. The resulting growth rate of 0 per cent compares to a 0.4 per cent projected increase in the Budget. This suggests that the Budget number includes some

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[25]Although the JI measure is temporary, its marginal impact for 2012 was included in *M* for simplicity.

modest adjustments for judgemental factors and other information not captured by the standard equation above.

Table A.1: VAT Forecast for 2012

€ millions	2011	2012	Change
Budget 2012 **Estimate**	9,730	9,995	265
IFAC Estimate using Budget dPCN	9,730	10,096	366
IFAC Estimate using CBI dPCN	9,730	10,066	336

Source: *Budget 2012* and Council calculations.
Note: Rounding may affect totals.

Conclusions

The Budget day forecast for VAT based on the information available at that time appears to have been constructed in a reasonable manner. The forecasting equation used is standard, VAT forecast errors have not been unusually large by international standards and estimating the VAT take using an alternative estimate for nominal personal consumption growth from the CBI gives rise to a projected VAT yield for 2012 that is quite close to the *Budget 2012* forecast.

There are a number of issues that arise, however, in particular surrounding the need for improved transparency. For example, the extent to which the increase in VAT (or other budgetary measures) affects the forecast for nominal personal consumption expenditure and other macroeconomic aggregates is not clear. Ideally, a pre- and post-Budget forecast should be published for key macroeconomic aggregates and information should be provided on the extent to which these changes are driven by specific factors. The Department of Finance does publish a figure for the aggregate buoyancy effect of the total new Budget measures on the tax take (see footnote 21) but it would be useful if more information were available about the construction of this aggregate.

3.3.2 Possible Outturn for 2012

In Chapter 2 it was noted that the macroeconomic outlook for 2012 has deteriorated over the past few months with significant uncertainty surrounding medium-term economic prospects. It is useful to consider what the budgetary outturn for 2012 might be given lower GDP growth forecasts. This is done using a fiscal feedback model which was developed by the Council in order to replicate the