Fiscal Rules and Stabilisers in Europe

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Abstract

Fiscal and monetary policies in Europe have been designed to ensure that a stability oriented framework is in place, but they have not always been successful in this end. In this paper we assess the fiscal rules in Europe in this context using NiGEM and other tools. We first look at fiscal developments and their impacts since 1997 in the four largest European Union countries. We then look in particular at the timing and nature of fiscal changes, and at the multiplier impacts of changes in taxes and in spending in these countries. We discuss why these multipliers differ between countries, and look in particular at the role of consumption behaviour and differing liquidity constraints in determining their size. We also argue that spending increases have more impacts than tax cuts. Hence, we conclude that the evolution of demand and budget deficits has varied between these countries both because of the composition of budget changes and their impacts. This analysis allows us to evaluate the automatic stabilizers in Europe, and we argue that these are small. We also look at the cyclical adjustment of deficits using estimates of trend output. These results impact on the final discussion of alternative fiscal rules for Europe.

Introduction

Within a common currency area, such as EMU, monetary policy is administered by the central monetary authority and is directed to respond in a symmetric manner across all member states. This implies that monetary policy will not respond to *country specific* or *asymmetric* shocks unless, of course, there are area-wide ramifications.[1] Moreover, membership in a monetary union carries with it certain fiscal responsibilities, which can be enforced by mechanisms such as the Stability and Growth Pact (SGP) currently in place in EMU. Consequently, there is a greater role for the prudent administration of fiscal policy as a stabilizing mechanism whether it is directed through discretionary measures, automatic stabilisers, or a combination of these.

Fiscal and monetary policies in Europe have been designed to ensure that a stability oriented framework is in place, but they have not always been successful in this end. In this paper, we assess the fiscal rules in the four major economies of Europe – France, Germany, Italy and the United Kingdom – using NiGEM and other tools. In

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[1] This includes symmetric shocks with an asymmetric effect.

doing so, we examine the fiscal policy stance of these countries over recent years and isolate the transmission mechanism or *multiplier effect* for key instruments, including both direct and indirect taxation as well as public expenditure. We find that the composition and timing of discretionary actions help to explain differences in GDP growth between the UK and EMU countries in recent times.[2] This view is supported by estimates of discretionary changes in budget deficits as well as in the size of the fiscal multipliers themselves. Moreover, we find empirical evidence of liquidity constrained behaviour in domestic agents and this helps to explain differences in the size of multipliers between economies. For countries, such as Germany, with a high proportion of liquidity constrained agents the fiscal multipliers are larger than those found in economies with fewer such agents, like the United Kingdom. This proposition is similar in vein to the "output composition puzzle" put forth by Angeloni et al (2003), which attributes differences in the monetary transmission mechanism between the Euro area and the US to its effect on household consumption. Much of this difference is clearly located in Germany.

The size of the multipliers suggests that public spending yields a larger (stimulative) impact than tax cuts do on their own. This supports the view that a larger portion of budget deficits devoted to public spending would contribute more to aggregate demand. Moreover, given the composition and timing of recent discretionary measures in these economies, this could help to explain differences in real GDP growth between them. Analysis below, which isolates the impact of government spending and tax measures on growth, echoes this point further. In particular, it is clear that both Germany and France, and to a lesser extent Italy, were engaged in pro-cyclical fiscal policies at the beginning of this decade rendering this transmission mechanism impotent during the subsequent economic slowdown. Conversely, the UK, albeit operating under a different cycle, retained fiscal traction helping the economy to weather the global slowdown.

Building on these results, we are able to quantify the automatic stabilisers currently in place in these countries and to provide estimates of their impact over demand shocks in the 1990s. Overall, the size of automatic stabilisers in Europe are small, however, in line with our findings on liquidity constrained behaviour, Germany does support noticeably larger stabilisers.

The rest of the paper proceeds as follows. Section I provides a brief overview and reasoning behind fiscal pacts. Section II highlights features of NiGEM. Section III discusses fiscal developments in Europe and examines the cyclically adjusted fiscal balances of the countries of interest. Section IV conducts fiscal policy simulations

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[2] Though, as noted in Barrell et al (2004), it is difficult to disentangle supply-side developments from movements in demand.

with NiGEM to assess the multiplier effect for key fiscal instruments. This section also discusses the role of consumption behaviour and factors which may contribute to discrepancies in fiscal policy performance across these economies. Section V investigates government contributions to real GDP growth by isolating discretionary tax and spending initiatives. Section VI calculates values for automatic stabilisers and, finally, Section VII concludes.

Fiscal policy

Fiscal policies involve the setting of taxes and expenditures and they are embedded in a political environment that makes decision making over the government deficit difficult. There is a clear connection between the economic cycle and the deficit, in part because taxes and expenditures respond automatically to the cycle, but also because politicians find it difficult not to respond to the state of the economic cycle. To the extent that taxes fall with incomes and spending, and expenditure rises with unemployment, the government budget can be seen as a shock absorber, using automatic stabilisers.

There are always pressures to increase borrowing over the cycle, but this inevitably puts pressure on real interest rates. The real rate of interest in the economy is a price that reflects the balance of saving and investment, and an increase in government borrowing might be expected to put upward pressure on the rate. This in turn might lead to the crowding out of private sector investment and hence the reduction, at least in the long run, of production potential. Higher levels of debt also raise pressure on governments to use inflation as a way of reducing the burden of debt, and this risk may also affect long term prospects for output.

The risks of higher inflation and higher real rates have been important when politicians have considered the design of the Stability Pact in Europe. A government acting alone might still decide to have a Pact with its own citizens, as in the UK. The long term real interest rate that affects private sector investment depends on expected short term real interest rates over the future and these in turn depend upon expectations of the fiscal stance and government borrowing. A credible pact between the government and its citizens assures them that the risks of it borrowing excessively in future are low and, hence, anticipated real interest rates will be lower than they otherwise would have been.

There is a great deal of uncertainty in the economy and it is very difficult to extract signals about changes in trend output and cyclically adjusted budget deficits from the barrage of data facing economists and politicians. In downturns, governments borrow and use fiscal policy to offset slow growth. In upturns, the strength of tax revenues is

taken to be a sign of a 'new economy' and tax rates may be cut rather than debt reduced.[3] As a result, government debt will be ratcheted-up and the real interest rate facing the private sector will rise. This was the case in Europe over the 1970s and 1980s and provoked a noticeable tightening of policy in the 1990s as fiscal pacts began to bite. One way around the problem of government optimism in the upturn is to have clear and independently produced indicators of the fiscal stance and the cyclical position that it does not produce.

Random fluctuations in the deficit are probably more common than is often recognised. Receipts or spending may not be 'on plan' and hence the deficit may be at undesired levels. Good housekeeping requires that at some point corrective action is taken if either receipts are too high (or too low) or spending too low (or high). If politicians set themselves targets for debts or deficits they should also be clear that they stand ready to adjust tax rates down (or up) if the deficit turns out better (or worse) than planned without a cyclical or discretionary policy explanation.

Cyclical, Discretionary and Random Components in the Budget

Seemingly random fluctuations in the government budgetary position are common. Tax revenues change for many reasons, and probably the least significant are those associated with the economic cycle. Tax revenues tend to fall with the cycle, whilst expenditure rises with it and, hence, when evaluating the budgetary stance it is important to understand the cyclical position. However, it is extremely difficult to assess what the cyclical position of the economy might be, and there are a large number of ways of extracting the information, as Massman, Mitchell and Weale (2003) discuss. Even if we can measure the cycle, it is important to know what has driven a particular cycle before one can asses its implications for the budget position.

There has been considerable debate about the scale of changes in revenues and spending in relation to the cycle and it is widely thought that a 1% deviation in GDP from its trend might cause a 0.5 percent of GDP change in the budget deficit. This figure is perhaps a little high and it should differ noticeably between countries and will also depend on the causes of the cyclical movement. A slowdown in activity driven by falling export demand is likely to have noticeably less impact on revenues than one driven by weak consumer spending, as the latter is more tax rich than the former. It is clear from this that producing a single gross measure of the sensitivity of the budget to the cycle is at best misleading. Although a single measure is simple and transparent, the trade off with information about the causes of the shift in the budget may be too great.

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[3] Melitz (2002) documents the potential asymmetry in government responses

Discerning discretionary fiscal policy moves is difficult since it involves the detailed analysis of budgets and their impacts. Changes in tax rates and the definition of tax bases must be seen as discretionary movements in the government position as must changes in expenditure on goods services and transfers. In general, an improvement in the budgetary position made by a conscious discretionary policy might be expected to have a contractionary impact on the economy in the short term, although it might lead to lower long term real interest rates, and these might offset the contractionary impact of the policy. However, it is important not to assume that any non-cyclical movement in the budget represents discretionary policy.

Random variations in tax receipts or in spending may push the budget outturn well away from its predicted level without a cyclical explanation or a discretionary policy driving the change. Economic models cannot encompass all of the factors driving the economy, and models explaining tax receipts are bound to be incomplete descriptions. Tax receipts may change even when both the tax base and the tax rate do not move. A change in tax paying behaviour after the introduction of self assessment in the UK in the 1990s could not have been picked up by any model. A shift in the pattern of consumption away from taxed to untaxed goods may not be picked up in our equations for indirect tax receipts unless we have very detailed models. Both of these events will look like random (but explicable) elements in our analysis of taxes. We know such things will happen in the future and we should set our budgetary rules to deal with them. If receipts change permanently in this way, tax rates somewhere have to change in response to keep the government on target.

Section II – The Model

The analysis in this paper uses the National Institute Global Model, NiGEM. It is an estimated world model, which uses a 'New-Keynesian' framework in that agents are presumed to be forward-looking but nominal rigidities slow the process of adjustment to external events.[4] Economies are linked through the effects of trade and competitiveness and are fully simultaneous. There are also links between countries in their financial markets as we model the structure and composition of wealth, emphasising the role and origin of foreign assets and liabilities. We have forward-looking wages, forward looking consumption, forward-looking exchange rates and long-term interest rates are the forward convolution of short-term interest rates.[5]

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[4] The theoretical structure and the relevant simulation properties of NiGEM are described in, NIESR (2002) and Barrell, Dury, Hurst and Pain (2001)

[5] We use the Extended Path Method to obtain model consistent expectations.

Each country has a description of its domestic economy that can be broken up into sectors: the government, the labour market, consumption behaviour, the supply side of the economy and financial markets. We need to ensure that interest rates are set to stabilise the economy. We use a policy of nominal aggregate targeting and inflation rate targeting, or two pillar strategy advocated by the European Central Bank

$$r_t = \gamma_1 (P_t Y_t - P^*_t Y_t^*) + \gamma_2 (\Delta P_t - \Delta P_t^*) . \tag{1}$$

All variables are in logs, PY is (the log of) nominal GDP, P is (the log of) the Consumer Price Index (CPI) inflation rate, and a * denotes a target.

We have models of direct and indirect taxes, and of government spending. We consider the financing of the government deficit (BUD), and we allow either money (M) or bond finance (DEBT).

$$BUD = \Delta M + \Delta DEBT. \tag{2}$$

Current fiscal revenues can be disaggregated. Personal taxes (TAX, which includes both personal income tax and social security contributions) depend on personal incomes. Corporate taxes (CTAX) depend on longer term profitability. Miscellaneous taxes (mainly indirect; MTAX) depend on consumer expenditure. Transfers to individuals (TRAN) depend upon prices and on unemployment, and hence these vary with the economic cycle. Government consumption and investment (GC and GI) which are assumed to be on plan except for random fluctuations, and they are not influenced by the cycle. As GC and GI are in constant prices, we convert them to nominal terms using the private consumption deflator CED and the GDP deflator P, respectively. Government interest payments (GIP) are modelled as the income on a perpetual inventory, the change in the debt stock each period paying the long interest rate in the issue period until it is replaced.[6] The budget balance thus reads

$$BUD = TAX + MTAX + CTAX - TRAN - GIP - GC*CED - GI*P. \tag{3}$$

We normally assume budget deficits are kept within bounds in the longer term, and taxes rise to do this. We can describe the simple fiscal rule as

$$Tax_t = Tax_{t-1} + \phi \, [GBRT - GBR], \tag{4}$$

where Tax is the direct tax rate, GBR is the government surplus target and actual surplus. The feedback parameter ϕ is designed to remove an excess deficit in less than five years. If fiscal solvency is 'off', it is turned back on again after our experiment.

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[6] The perpetual inventory attempts to take account of countries like Italy and Belgium where there are large proportions of short-term public debt.

Section III – Fiscal Developments in Europe

In the face of recent stagnant global economic activity, the UK has experienced higher rates of GDP growth than the major economies of the euro zone. The resilience of the UK economy is, in part, attributable to the depth and duration of the fiscal easing and the stimulative impact it has had on domestic demand and on consumption in particular.[7] However, despite similar fiscal efforts by the EMU countries, the net effect on domestic demand and real GDP growth has been less favourable across these countries.

Table 1: Annual Real GDP Growth (percent)

	France	Germany	Italy	UK
1998	3.59	1.7	1.75	3.12
1999	3.23	1.89	1.65	2.80
2000	4.22	3.09	3.16	3.78
2001	2.08	1.01	1.67	2.13
2002	1.21	0.22	0.37	1.64
2003	0.17	-0.12	0.36	2.22
2004[*]	1.81	1.51	1.40	2.97

*NIESR forecast

In the late 1990s and in the early part of this decade fiscal policy was loosened in all of the four major European economies. However, there is a noticeable difference in both the timing and magnitude (as a percentage of GDP) of the fiscal manoeuvring amongst these countries. Looking at Table 2 below, it is clear (from the negative values) that the UK adopted and sustained a policy of fiscal easing in the early part of this decade, while France, Germany and Italy embarked on smaller and shorter-lived stimulative efforts which began in the late 1990s.[8]

Table 2: Discretionary Changes in Budget Deficits[*]

	France	Germany	Italy	UK
98-97	-0.12	0.47	-0.29	2.31
99-98	0.58	0.42	1.51	1.10
00-99	-0.34	-0.51	-0.74	0.11
01-00	-0.54	-1.45	-0.84	-0.60
02-01	-0.69	-0.17	0.61	-2.04
03-02[**]	0.01	0.20	0.42	-1.61
04-03[**]	0.17	0.32	-0.29	-0.38

*A negative number implies a larger deficit

**Based on NIESR forecasts

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[7] Other positive contributions to domestic demand in the UK have come through sustained growth in house prices and the recent movements in the Euro vis-a-vis Sterling, both of which contribute to overall household wealth and consumption (see Barrell, Metz, and Riley (2004)).

[8] Table 2 lists the discretionary increase in the budget deficit where changes in the cycle have been removed with estimates of both changes in the output gap and the impacts that these changes have on the deficit.

Barrell et al (2004) note that in the UK, and to a lesser extent France, much of the change in the discretionary stance was due to changes in government spending whilst in France and Germany programmes of tax cuts were put in place. The apparent lack of fiscal traction in the euro zone prompts us to examine the composition and effectiveness of discretionary changes adopted by these countries. In particular, we investigate the *multiplier effects* implied by changes in both taxes and government spending and relate these to our estimated consumption functions.

Section IV – Fiscal Policy Simulations

Using the NiGEM we examine the effectiveness of alternative fiscal instruments – direct tax, indirect tax, and government consumption – for the four major European economies. This is done by providing quantitative measures of the *fiscal multiplier effect* implied by each of these instruments. We find that government spending yields a larger impact than do changes in taxes. Moreover, we attribute, in part, larger multipliers to the evidence on liquidity constrained agents. The analysis is conducted under a set of newly estimated consumption functions for these economies and we briefly discuss the estimation results before examining the fiscal multipliers in detail (see Table A1 in the Appendix for full estimation results).

Consumption Estimation

Financial deregulation throughout the 1970s and 1980s in most OECD countries has increased borrowers' access to financial markets and, thus, (allegedly) reduced or eliminated the number of consumers facing liquidity or credit constraints (see Boone et al (2001)). Theoretically, an easing of liquidity constraints should affect consumption through household wealth (both financial and housing) and allow agents to "smooth consumption" intertemporally reducing any "excess sensitivity" to current income. However, recent empirical literature finds mixed evidence for this life-cycle/permanent income view prompting us to examine the impact that such constraints (might) have on consumption and, therefore, on the transmission mechanism of fiscal policy in Europe.[9]

We assume that planned consumption does not always equal actual consumption so taking into account the discussion of the necessity of taking logs in Barrell, Byrne and Dury (2003) can first derive the following long run relationship (2) for desired consumption (C_t) which depends on real personal disposable income (RPDI$_t$, and

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[9] See Jappelli and Pagano (1989), Campbell and Mankiw (1991), Patterson and Pesaran (1992), Blundell-Wignall et al (1995), and de Bondt (1999) for similar liquidity constraint analysis based on estimated consumption equations.

total wealth, which we divide into net financial wealth (NFW$_t$) and net tangible wealth (NTW$_t$)

$$\log C_t = a * \log RPDI_t + b * \log(NFW_{t-1} + NTW_{t-1}) + \varepsilon_t \qquad (5a)$$

and then set this into an equilibrium correction form (3) following Davidson et al (1979) .

$$d\log(C_t) = a + b*(\log C_{t-1} - c*\log(RPDI_{t-1}) - (1-c)*\log(NFW_{t-1} + NTW_{t-1})) + d*RR_{t-1}$$

$$(5b)$$

$$+ d1*d\log(RPDI) + d2*d\log(NFW) + d3*d\log(NFW) + other-dynamics$$

We estimate country-by-country consumption functions with the relationship between consumption (C) and income (RPDI) augmented by a split between changes in real tangible wealth (NTW) and financial wealth (NFW) in the short term but common coefficients on both components of real net total wealth (W) in the long term. The equations also test for a real interest rate effect (RR) at a current or once lagged value, consistent with the common Euler approach to consumption used for instance in Brunila, Buti and in't Veld (2002). If the error correction term b were to be zero, and the other coefficient except that on the real interest rate were also zero, then we would have uncovered an Euler equation, and the coefficient on RR$_{t-1}$ could be interpreted as the inverse of the intertemporal elasticity of substitution.

In terms of the life cycle/permanent income approach , *a priori*, one might expect to find very small or insignificant coefficients on current income terms ($\beta_{c,i}$ and $\beta_{rpdi,i}$) in addition to significant (positive) coefficients on wealth term(s) ($\beta_{rfw,i}$), including any form of housing wealth ($\beta_{rhw,i}$ or $\beta_{rph,i}$). Significant coefficients $\beta_{c,i}$ and $\beta_{rpdi,i}$ suggest that agents are consuming out of *current income* while significant $\beta_{rfw,i}, \beta_{rhw,i}$, or $\beta_{rph,i}$ suggest consumption out of *total wealth*. The data do not tell us whether this is by choice, habit, or necessity. However, this type of *ad hoc* interpretation is the "industry standard" insofar as exercises of this nature are concerned (see Campbell and Mankiw (1991) and Blundell-Wignall (1995), among others, for this approach). Furthermore, a negative and significant coefficient on the level of the real interest rate ($\beta_{rr,j}$) implies intertemporal substitution and is consistent with the standard Euler equation approach to consumption (see Muellbauer and Lattimore (1995) for an overview).

Table 3 below lists the estimation results. Consistent with evidence of liquidity constraints, short-run income growth (RPDI) effects are strong and significant in all

cases, however, there is a distinct grouping among the countries. In particular, France, Italy and the UK yield similar elasticities where a 1 percent rise in real current income increases real consumption by 0.13 percent in Italy and 0.21 percent in France, with the UK roughly in between. Germany, however, shows a much stronger effect with current real income increasing consumption by around 0.78 percent (in the same manner). This latter observation may indicate a larger portion of liquidity constrained agents in both Germany relative to the other countries.

Further evidence of liquidity constrained behaviour is found in significant dynamic terms for lagged consumption in France, Italy and Germany suggesting that such constraints may be more binding in these countries than in the UK. Moreover, this view is supported by the significance of short run financial and housing wealth terms for the UK. Indeed, these findings are in line with values derived in the similarly oriented studies mentioned above and are indicative of the degree of financial sector development in these countries (see Boone et al (2001) on this last point).

Table 3: Error Correction Model Estimation Results[*]

	France	Germany	Italy	UK
Sample	**72Q1 to 00Q1**	**80Q4 to 01Q4**	**81Q1 to 00Q4**	**79Q1 to 02Q2**
CONS	-0.029 (1.05)	0.338 (3.5)	-0.058 (4.16)	-0.019 (2.0)
ECM	-0.056 (2.72)	-0.044 (3.1)	-0.089 (4.42)	-0.085 (2.8)
ln RPDI(-1)	0.835 (5.46)	0.895 (24.7)	0.784 (43.35)	0.928 (28.16)
ln RNW(-1)	0.165	0.105	0.216	0.072
D ln C(-1)	-0.242 (3.27)	-0.145 (2.2)	0.312 (4.04)	
D ln RPDI	**0.214** (2.75)	**0.788** (12.3)	**0.132** (2.9)	**0.170** (3.7)
D ln RFW(-1)				0.029 (2.9)
D ln RHW(-1)	0.097 (1.56)			0.160 (5.9)
RR		-0.151E-3 (1.7)		
RR(-1)			-0.78E-3 (3.3)	
R-bar-2	0.52	0.68	0.69	0.62
SE	0.0054	0.0012	0.0035	0.00537
DW	1.98	2.2974	1.81	2.08
LM(4)	7.9	19.0682	1.88	4.4
RESET(1)	0.379	1.09	2.57	1.314
HET(1)	2.04	2.68	3.11	1.31

*T-Statistics in parentheses

What might these estimation results imply for the fiscal multipliers obtained with NiGEM? One would expect to find larger multipliers in economies which have a higher portion of liquidity constrained agents (i.e. a failure of the Ricardian Equivalence). Fiscal policies which affect disposable income should feed through to consumption behaviour and, hence, aggregate demand, more readily if agents are consuming out of current earnings. Conversely, one would expect smaller multipliers

in economies with a smaller portion of liquidity constrained agents since discretionary budget changes will be absorbed by agents who smooth their consumption over *permanent income*.

Estimating Fiscal Multipliers

Fiscal multipliers are derived with NiGEM by evaluating the impact of a 1 year fiscal expansion in each of the instruments listed above – both direct and indirect taxes and government consumption.[10] Table 4 below displays the cumulative impact over the first two years of the simulation. The findings support two conclusions. First, government spending has a much larger impact than taxes in all countries. Second, as suggested by our estimation results above, the multipliers in Germany and Italy are noticeably larger and more immediate than those for the other countries.

In general, the two-year cumulative multiplier estimates for government consumption are roughly twice as potent as tax cuts taken on their own. This is not surprising since government spending directly affects employment and, in conjunction with the evidence on liquidity constrained agents, should therefore stimulate aggregate demand more readily. Moreover, given that indirect taxes are administered through consumer expenditures, it is less likely that they will prove to be highly effective in light of anaemic aggregate demand. Additionally, direct taxes affecting incomes are likely to have little impact if they are thought to be transitory and, hence, absorbed into higher savings (Barrell et al (2004)).

Table 4: 1 Year Fiscal Expansion (output effects are 2 years)

	Indirect Tax	Direct Tax	Government Consumption
France	0.2977	0.3428	0.6518
Germany	0.3987	0.3350	0.8964
Italy	0.3810	0.2412	0.8969
UK	0.2879	0.2473	0.6352

This table also highlights differences in the size of the multipliers. In particular, the values derived for Germany and Italy are significantly larger (over indirect taxes and government consumption) relative to France and the UK. And, as anticipated, these multipliers are representative of our ECM estimation results above. The estimation results for both Germany and Italy suggest a larger degree of liquidity constrained agents, whereas France and the UK do not. Additionally, evidence on the degree of financial deregulation in these economies supports these findings. Taken together, the above results suggest that if the EMU countries are going to run budget deficits then

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[10] The simulations are based on NIESR forecasts and were conducted with the respective country's fiscal solvency rule "switched-off" for the duration of the shock period plus one quarter. In addition, monetary policy (i.e. the interest rate policy rule) is active during the simulations.

discretionary measures may benefit from a heavier weighting on spending relative to tax cuts.

Section V – Government Contributions to Growth

The role for a strengthened fiscal policy in Europe is supported by our analysis above. However, it is instructive to quantify the government's contributions to growth and to assess the impact of these discretionary measures on governmental balances. This will enable us to comment on both the timing and nature of fiscal policy. First, looking at Table 8 below, total discretionary contributions to real GDP growth are seen. As with the multiplier analysis above, Germany distinguishes itself with government contributions consistently below those of the other countries. The exception comes from Italy, which over the last two years has actually inhibited growth. Nonetheless, German contributions are roughly one-third that of France and the UK over this period.

Table 8: Government Contribution to Real GDP Growth[*]

	France	Germany	Italy	UK
1998	0.04	0.40	0.28	0.36
1999	0.53	0.28	0.33	0.59
2000	0.97	0.13	0.32	0.43
2001	0.63	0.15	0.80	0.47
2002	0.89	0.24	-0.33	0.57
2003	0.60	0.19	-0.05	0.69

*Annual percent

This observation, coupled with slower rates of GDP growth and a larger reliance on tax versus spending initiatives, suggests that German fiscal policy was not as effective as it might have been. However, in order to support this idea further, we must investigate the contributions of expenditures and revenues for each country. By decomposing discretionary measures into expenditures and revenues we are able to determine the contributions of these components to both real GDP growth and the government balance. We proceed by conducting a series of fiscal policy simulations where we isolate the net effect of public expenditures (consumption and investment) as well as tax measures (direct, indirect, and corporate).

In NiGEM, public expenditure rises in line with trend GDP growth and, therefore, any increase (decrease) relative to trend is taken as discretionary in nature.[11] By isolating

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[11] Given the processes governing the evolution of expenditures, we isolate discretionary actions by taking the base model residuals for this component over the sample and applying them as endogenous

this discretionary measure we are able to impose these values as shocks to determine their impact on both real GDP growth, Y, and the overall government balance, GBR.[12] Table 10 below summarizes the findings.

Table 10: Impacts of Government Spending on Growth and Budget Deficits[*]

	France		Germany		Italy		UK	
	Y	GBR	Y	GBR	Y	GBR	Y	GBR
1998	-0.36	0.37	0.37	-0.17	0.00	-0.02	-0.10	0.09
1999	0.03	-0.04	-0.07	0.05	-0.10	0.09	0.01	0.09
2000	0.17	-0.21	-0.08	0.04	-0.01	-0.02	0.03	-0.06
2001	0.02	-0.03	-0.24	0.09	0.28	-0.27	-0.11	-0.01
2002	0.19	-0.24	-0.21	0.12	-0.35	0.37	-0.08	0.24
2003	0.03	-0.05	0.09	-0.04	0.03	-0.02	0.14	-0.35

*Y is real GDP and GBR is the government balance

The impact from expenditures on government balances shows that discretionary fiscal policies in France, Germany and Italy were procyclical in nature while those in the UK retained traction over the cycle. This view is supported by estimates of the output gap (seen below in Table 11) where it appears that France, Germany and Italy were engaged in stimulative fiscal policies at the height of the cycle and contractionary policies on the downside of the cycle. This observed fiscal manoeuvring in the Euro Area is essentially the opposite of what one might have expected given the economic climate. However, these observations are partly reflected in the regulations encompassed in the SGP.[13] For the UK, however, the mix of discretionary fiscal policies, and an additional boost from rising house prices, proved fortunate as well as fortuitous over this period.[14] The combination of stimuli encouraged consumption demand and helped to sustain real GDP growth.

Table 11: UK and Euro Area Output Gap Estimates[*]

	UK	France	Germany	Italy	EMU Average
1998	-0.03	-0.435	-0.503	-0.130	-0.28
1999	-0.19	0.273	-0.130	-0.513	0.36
2000	0.71	1.883	1.565	0.783	1.56
2001	0.33	1.708	1.210	0.908	1.16
2002	-0.25	0.803	0.225	0.138	0.26
2003	-0.39	-0.898	-1.100	-0.585	-0.92

*NIESR estimates (annual percent)

shocks on a quarter-by-quarter basis. This technique enables us to draw on the cumulative impact over each year.

[12] It is desirable to isolate the impacts of discretionary tax changes as well. However, it difficult to discern between random variations in tax receipts and discretionary measures over the cycle and, therefore, we abstract from analysing these revenue components here.

[13] Although, it is well know that pre-Maastricht treaty fiscal policies in the current EMU countries often lacked discipline and were highly procyclical.

[14] Barrell et al (2004) note that recent house price developments and their impact could also be the consequence of a realisation that supply-side improvements will raise future household incomes.

It is difficult to separate the contributions of strong demand growth from the impacts on income of improved supply performance. However, Barrell et al (2004) undertake a detailed study for the Euro Area, the UK and the US. The authors find that higher growth rates in the UK and US relative to those in the Euro Area are attributable to growth in consumption demand and household wealth, which stems from stimulative fiscal policies and favourable market conditions. The ability of the UK to maintain fiscal traction over the economic cycle is reflected in both budgetary deficits and sustained GDP growth over this period and, in view of the lacklustre performance of the EMU economies, it is reasonable to suggest that greater fiscal freedom would have proved desirable in these countries as well.

Section VI – Automatic Stabilisers in Europe

If fiscal pacts operate and prevent discretionary policy then governments are left with fiscal stabilisers to help them in mild upturns and downturns. Buti, Brunila and in't Veld (2002) use the European Commission's model QUEST to quantify automatic stabilisers, and we can evaluate the properties of our model to do the same. In general automatic stabilisers increase with the size of the government sector and the share of cyclically sensitive components of taxation and spending, and hence we would expect them to vary across countries. Country specific factors such as the degree of openness and the flexibility of the labour market will affect the size of stabilisers, and in general more open economies will have lower multipliers and hence stabilisers.

Blanchard (2000) and Barrell and Hurst (2003) suggest that offsetting fiscal automatic stabilisers in the face of supply shocks could stabilise the volatility of output, and hence we only analyse the effectiveness of stabilisers in response to shocks to demand. In order to do this we evaluate the impact of demand changes on the economy and on tax revenues, and then look at the effects of tax changes on output. We may write this as (where tax is direct taxes, itax is indirect taxes, ctax is corporation, tran is transfers, C is consumption, I is investment, X is exports and Y is GDP):

$$
\begin{aligned}
Dy/DS = {} & dy/dtax * dtax/dS + dy/ditax * ditax/dS + dy/dctax * dctax/dS \\
& + dy/dtran * dtran/dS \\
& + dy/dC * dC/dS + dy/dI * dI/dS + dy/dX * dX/dS
\end{aligned}
\tag{6}
$$

The left hand side of this expression is the shock multiplier, which we evaluate for consumption, investment and exports. The last three terms represent the shock multipliers if there were no automatic stabilisers. If we have a consumption shock then dI/dS and dX/dS are set to zero by definition, and similarly for investment and

export shocks. In order to evaluate the degree of automatic stabilisation we need to evaluate the first four terms of the right hand side of this expression. This requires that we calculate the impact of each shock on tax revenues and on transfer spending, and that we calibrate the effect of an unanticipated change in tax revenues on output.

Evaluating shock multipliers

We first look a the impact of 1% of GDP changes in consumption, investment and export volumes sustained for 1 year, when they return to baseline for one quarter and subsequently the dynamics of the model are allowed to work. The fiscal authorities are assumed to leave tax rates unchanged for the year and then adjust direct taxes to achieve their budget target. The model is run with forward looking financial markets and exchange rates and long rates jump in the first period.[15] Interestingly, these multipliers are roughly consistent with those for discretionary changes in government spending on goods and services. Moreover, in line with the standard multiplier analysis above, those multipliers derived for Germany are noticeably larger than those derived for the other countries. Again, this is largely due to the existence of liquidity constrained behaviour and the nature and degree of financial sector development across these countries (see Barrell et al (2003) for further discussion).

Table 12: Multiplier Effects of a 1% of GDP impulse for one year[*]

	Consumption	Investment	Exports
France	0.643	0.628	0.596
Germany	0.803	1.039	0.964
Italy	0.659	0.688	0.612
UK	0.616	0.639	0.597

*UK in EMU. No fiscal feedbacks for the first year. The ECB uses a two pillar strategy and the exchange rate and long rate are forward looking.

Budget impacts of shocks

The impact of the shocks on the public finances will depend upon the importance of the three types of tax we model (direct, indirect and corporate) as well as the significance of transfers in the economy. We would expect shocks to consumption to have a much more significant impact on the budget as consumers expenditure is a significant part of the indirect tax base. However, the significance of indirect taxes varies between countries, and hence the impact of the consumption shock also varies. Investment and export shocks are likely to be less tax rich.

The impact of the shock on the economy also affects the Government budget. If the output effect of the shock is small then the impact on income and corporate tax revenues will be smaller, as will the impact on transfer payments. In addition the

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[15] Multipliers are generally less than one in these models, and are generally less than those given in unstructured VAR analyses such as that of Blanchard and Perotti (2002).

generosity of transfer payments differs significantly between countries, and is probably least important in Italy, for instance. Hence, small open economies with low multipliers will have lesser effects on the budget, and large countries with generous social security systems will have large effects. We can see in Table 13 that the impacts of consumption shocks on the budget is markedly higher than investment or export shocks, and in general export shocks have slightly more budgetary impacts than do investment shocks (see Appendix for tables listing the effect of each fiscal component on the budget).

Table 13: Effects on Budget as a % of GDP of a 1% of GDP impulse for one year[*]

	Consumption	Investment	Exports
France	0.371	0.102	0.094
Germany	0.210	0.122	0.111
Italy	0.149	0.012	-0.018
UK	0.133	0.010	-0.005

*UK in EMU. No fiscal feedbacks for the first year. The ECB uses a two pillar strategy and the exchange rate and long rate are forward looking.

Table 14 records the rescaled impact of the shocks, so that we can see the tax richness of each shock when GDP changes by 1% as a result.

Table 14: Effects on Budget as a % of GDP when GDP Changes by 1% as a result of shocks

	Consumption	Investment	Exports
France	0.577	0.162	0.157
Germany	0.262	0.117	0.116
Italy	0.227	0.018	-0.029
UK	0.217	0.016	-0.008

*UK in EMU. No fiscal feedbacks for the first year. The ECB uses a two pillar strategy and the exchange rate and long rate are forward looking.

Scaling the impact of tax multipliers

Here we have assumed that the change in tax revenue is unanticipated because we wish to assess the ex-post impact of lower tax receipts rather than the multiplier impact of an announcement of temporarily lower tax rates.[16] A cut in the corporate or indirect tax rate now, with the announcement that the cut will be reversed in a year will lower the real interest rate facing consumers and firms that do not face liquidity constraints. This reduction will bring investment and consumption forward into this year and hence increase the impact of the change on GDP. A fiscal change of this nature is effective in stabilising the economy. However, these assumptions are not appropriate for analysing automatic stabilisers.

[16] Brunila, Buti and in't Veld (2002) assume that the tax changes are anticipated.

Table 15: Tax Multipliers
(The GDP impact of a 1% of GDP increase in each instrument)

	Direct Tax	Indirect Tax	Corporate Tax	Transfers
France	-0.16	-0.16	-0.12	0.12
Germany	-0.48	-0.45	-0.26	0.36
Italy	-0.15	-0.21	-0.05	0.11
UK	-0.15	-0.26	-0.08	0.11

* UK outside EMU. No fiscal feedbacks for the first year. The ECB uses a two pillar strategy.
The exchange rate and the long rate are forward looking.

We should note that the impacts of a change in corporate taxation are limited in the first year, although they do feed into the user cost of capital. A change in user cost feeds only slowly into the investment decision, and hence the impact on output is not great. Cyclically induced changes in corporate tax payments will take some time to influence firms, even when they are liquidity constrained. Direct taxes immediately reduce incomes, and hence output declines through the impact on consumption. The impact depends on the importance of direct taxes as a percent of personal incomes, and on the speed of response of consumption to changes in income, and hence we have impact multipliers that vary between 0.15 and 0.48.

Automatic Stabilisers
Automatic stabilisers in response to a shock are the proportion of the change in GDP that is removed by the existence of the tax system. Using equation 6 above the stabilising effect of taxes for a given shock can be described as

$$AS = dy/dtax * dtax/dS + dy/ditax * ditax/dS + dy/dctax * dctax/dS$$
$$+ dy/dtran * dtran/dS \tag{7}$$

The proportion of the shock (PS) removed can be described as

$$PS = AS/(dy/dS + AS) \tag{8}$$

Tables 12, 14 and 15 above contain the parameters we need for equations 7 and 8. The smoothing properties of the stabilisers for each shock are reported in Table 16 below.

Table 16: The Smoothing Properties of Stabilisers (GDP share-weighted)[*] [**]

	Consumption	Investment	Exports
France	-0.071	-0.007	-0.011
Germany	-0.117	-0.027	-0.053
Italy	-0.056	-0.010	-0.015
UK	-0.071	-0.008	-0.013

*Smoothing by shock – the proportionate reduction of the impact of a shock on GDP
** UK outside EMU. No fiscal feedbacks for the first year. The ECB uses a two pillar strategy and the exchange rate and long rate are forward looking. Tax changes are unanticipated, and do not bring consumption or investment forward.

As we would expect, automatic stabilisers are most effective in response to consumption shocks where they take out between 10 and 23 percent of the shocks. Our estimates are below those of the Commission, in part because of the treatment of corporate and indirect taxes in their study, and also because we assume that cyclical variations in non-transfer spending are discretionary and not automatic. Their estimates are highest at 38 percent for France and lowest at 14 percent for Ireland.

Section VII – Conclusions

This paper uses NiGEM to evaluate the fiscal rules and automatic stabilisers in the four major economies in Europe. Building on a heuristic analysis of fiscal developments since the late 1990s we derive multiplier estimates for key fiscal policy instruments, isolate the impacts of government spending on growth and budget deficits, and quantify the smoothing properties of automatic stabilisers. Multipliers are shown to be small, and hence the role of discretionary policy is limited. The costs of active fiscal policy are generally high in terms of budget deficits, whilst benefits are low.

The timing and nature of fiscal policy in the UK has helped it to weather the global slowdown in recent years. A combination of fiscal easing and developments in the housing market have stimulated domestic demand and strengthened weak growth. However, the impacts of fiscal policies in the euro zone have not been as favourable during this period and it is not clear whether greater fiscal easing or different timing would have encouraged domestic demand and, hence, contributed more to growth. Though, our investigation of both consumption behaviour and alternative fiscal instruments suggests that the composition of fiscal policy provides scope for greater traction.

Fiscal multiplier estimates across countries find that government consumption is three to six times more effective than tax cuts alone. Moreover, estimates of country specific consumption functions indicate that liquidity constrained behaviour contributes positively to the size of these multipliers, and this is readily seen for Germany. We also find that increased public expenditure, and hence larger budget deficits, contributes positively to GDP growth in France and yields mixed results for both Italian and British growth. However, it appears that German spending was below trend growth over this same period and coincides with lower GDP growth.

These findings suggest that a stimulative discretionary policy mix with a relatively larger weighting on spending versus tax cuts may provide greater (countercyclical) traction. The only other instrument that might be available for stabilisation is the use of indirect tax rate changes. As Brunila, Buti and in't Veld (2002) these are much

more effective than other tax changes if the change is announced, and is clearly temporary and consumers are sufficiently forward looking and lacking in liquidity constraints.

Our estimates suggest that fiscal stabilisers are generally weak, and this is the corollary of small multipliers. The sources of crowding out are numerous, but they include the impact of fiscal policy expansions on interest rest rates, and hence on wealth and consumption as well as on investment. Interest rate crowding out is strengthened by exchange rate effects in this style of model. However, much of the crowding out comes through leakages to imports. Automatic stabilisers are difficult to strengthen at the same time as liberalising trade, increasing competition and reducing financial market constraints. We conclude that automatic stabilisers are relatively weak in France, Italy and the UK, removing between 7 and 9 percent of the potential variation in output resulting from demand shocks. In Germany, however, the stabilisers are larger and we attribute this to a larger portion of liquidity constrained behaviour in this country. This is likely to change as European financial integration proceeds.

Scope for discretionary fiscal policy must remain in the face of large demand shocks and there is a case for strengthening automatic responses to fluctuations in the economic cycle. However, measuring the cycle is difficult and any estimate of the output gap must attach an indicator of its reliability.

Appendix

Table A2: Impact of Consumption Shock on Government Balance by Fiscal Policy Instruments

	Direct Tax	Indirect Tax	Corporate Tax	Transfers
France	0.081	0.320	0.012	-0.042
Germany	0.019	0.301	0.004	-0.113
Italy	-0.023	0.310	0.012	-0.151
UK	0.063	0.183	0.010	-0.123

Table A3: Impact of Export Shock on Government Balance by Fiscal Policy Instruments

	Direct Tax	Indirect Tax	Corporate Tax	Transfers
France	0.111	0.013	0.019	-0.042
Germany	0.135	0.119	0.008	-0.141
Italy	0.109	0.027	0.020	-0.144
UK	0.103	0.008	0.025	-0.126

Table A4: Impact of Investment Shock on Government Balance by Fiscal Policy Instruments

	Direct Tax	Indirect Tax	Corporate Tax	Transfers
France	0.102	0.012	0.018	-0.038
Germany	0.124	0.108	0.007	-0.129
Italy	0.084	0.022	0.016	-0.140
UK	0.088	0.006	0.020	-0.119

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