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Should We Pay Attention to Indicators of Fiscal Impact on Demand?

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This paper looks at five different ways in which the effect of fiscal policy on aggregate demand in the short term can be empirically estimated, and asks two questions: First, given the assumption that fiscal policy has the same effect across countries, which of the five indicators is the empirically best measure of fiscal impact on demand? Second, is it reasonable to interpret fiscal policy indicators similarly across countries, or does the effect of fiscal policy on demand differ to a degree that makes this unreasonable? Running a panel regression of changes in aggregate demand on the five measures of fiscal policy in turn for OECD countries, the conclusion is that OECD's structural budget balance measure seems to be the more plausible measure of fiscal impact on demand. Moreover, testing the restriction that the five measures have identical parameters across OECD countries is rejected in five all cases.

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Keywords: Fiscal policy; Fiscal indicators; Demand; Fiscal impulse; Structural budget balance; Fiscal Impact

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INTRODUCTION

The effect of fiscal policy on demand is very complex and not easily measurable. In many situations, however, it may nevertheless be important to have a notion of how fiscal policy is affecting demand in the short term. Several fiscal indicators are used interchangeably for this purpose. Moreover, these measures are often given the same interpretation across countries, in that way disregarding that the effect of fiscal policy on demand may depend on the country in question.

The aim of the paper is two-fold. First, given the assumption that fiscal policy has the same effect across countries, which of a set of often used indicators is the empirically best measure of fiscal impact on demand? Second, is it reasonable to interpret fiscal policy indicators similarly across countries, or does the effect of fiscal policy on demand differ to a degree that makes this unreasonable?

Section II outlines five indicators commonly used as measures of fiscal impact on demand. The empirical literature on fiscal multipliers, presented in Section III, often uses structural budget balances as measures of fiscal policy in short term growth regressions for individual countries. There are no studies using cross-country data to identify a common impact of fiscal policy on demand, and more importantly, there are no studies which directly compare different indicators of the impact of fiscal policy on demand. Section IV provides such a comparison of five different indicators of fiscal policy for a panel of 20 OECD countries, and subsequently puts the hypothesis that the fiscal multipliers are the same across countries to a test. The results of the analysis show that, given the assumption that the demand effect of fiscal policy is similar across countries, the OECD measure of the change in the structural budget balance seems to be preferable to the four other measures as general indicators of fiscal impact on demand. However, when testing the hypothesis of cross-country similarity of fiscal impact on demand, this hypothesis is rejected. Regressions for individual countries show that the size, sign and timing of fiscal multipliers differ substantially across the panel of

OECD countries, implying that a similar interpretation of fiscal impact indicators across countries is empirically unwarranted. Section V concludes.

INDICATORS OF FISCAL IMPACT ON DEMAND

This paper sets out to compare the five fiscal policy indicators listed below.

1. The change in the total budget balance (TBB)
2. The change in the IMF calculated structural balance (SBB_{IMF})
3. The change in the OECD calculated structural balance (SBB_{OECD})[2]
4. The change in the EU calculated structural balance (SBB_{EU})
5. The Fiscal Impulse (FI))

Using these summary measures as indicators of fiscal impact on demand have been criticized from many angles[3]. One such criticism is that as measures of the impact of fiscal policy on demand, none of the indicators listed above can be derived from a theoretical model. They are as such ad hoc measures. Moreover, using the total budget balance (TBB) as a measure of fiscal impact, the problem arises that part of the total budget is determined by the cycle, due

[2] The OECD's measure of the SBB is also referred to as the CAB (the Cyclically Adjusted Balance).

[3] First and most prominently, the single indicator approach is discredited when using the simple IS model, which implies that the revenue and the expenditure sides of the budget have different multiplier effects and hence should not be treated as equal. More sophisticated models imply that also expectations and foresight assumptions are important and should be incorporated, not to mention the tax structure, composition of spending, and level of public debt (for a theoretical treatment of fiscal impact on demand, see Chouraqui (1990) or Blanchard (1990)), all of which are ignored by the change in the deficit approach. Furthermore, fiscal indicators do not take into account that the impact of fiscal policy on demand depends on the economic environment in which fiscal policy operates. The reaction of monetary policy to fiscal changes, which exchange rate regime prevails, whether there is excess capacity in the economy etc. all affect how fiscal policy affects demand, but these issues are abstracted from when using a single indicator. Another problem with the use of indicators is that there is no "correct way" of measuring the government budget, implying that any measure of fiscal impact becomes dependent on what accounting method is used. In addition, the fiscal and national accounting data used to form the fiscal indicators may be subject to revisions over time, implying that the recently published fiscal indicators may be uncertain and subject to revisions over time (the version of the indicators used in the empirical analysis below are not subject to this uncertainty since they are based on historical data.). These and other reasons have often been raised against using summary measures of fiscal impact on demand. There are, however, no easily implementable alternatives.

to automatic stabilizers. Hence, if it is the case that the budget has an effect on the cycle, and thus on demand, it is not straightforward to separate out what part of the change in demand has affected the budget and what part has been determined by the budget. Using the structural budget balance (SBB) as an indicator of fiscal impact in theory eliminates this problem of endogeneity, since the structural budget balance is an indicator of the budget that would prevail were the economy at full, or trend, employment[4]. A change in the SBB is hence an indicator of non-cyclical change in fiscal policy. If correctly computed, the SBB should therefore be orthogonal to the cycle. There are several sources of uncertainty in the derivation of the three structural budget balances, however, which may result in the cyclical component not being completely removed, or alternatively, over-removed, such that the calculated SBB turns out still to be correlated with the cycle. The Fiscal Impulse[5] (FI) is also a measure which corrects for the effect of the cycle, although in a slightly simpler, but hence less uncertain, way. The same risk of over or under-correction for the effect of the cycle persist, however. Appendix lays out the exact formulas for the Fiscal Impulse (FI) and the three structural budget balance indicators calculated by the IMF (SBB_{IMF}), the European Commission Services (SBB_{EU}) and the OECD (SBB_{OECD}). The procedures used for calculating the three SBBs differ only in detail[6].

THE EMPIRICAL LITERATURE

Several studies use fiscal indicators as measures of fiscal policy when estimating the size of fiscal multipliers in short run regressions of demand, and usually find that selected fiscal indicators significantly explain part of the variation in aggregate demand. The main results of the empirical literature are summarized in Table 1.

[4] See Banca d'Italia (1999) for a thorough overview of the Structural Budget Balance measure.

[5] See Heller et al. (1986) for an introduction to the Fiscal Impulse measure.

[6] The SBB_{OECD} is usually reported as a primary balance measure while the SBB_{IMF} and the SBB_{EU} are reported as actual balance measures. Appendix lays out the formula for the primary SBB_{OECD}, but the measure used in the empirical analysis is the actual SBB_{OECD}.

As far as short term multiplier effects of fiscal policy are concerned, the bulk of the analysis has been carried out for US data, and thus tends to use the US Congressional Budget Office (CBO) measure of the US structural budget balance, called the standardized- or high-employment surplus, as a measure of fiscal policy. Eisner (1989) estimates a simple regression of real GNP growth on a constant and the lag of the level of the high-employment surplus in percent of GNP. He finds that a one percentage point drop in the high-employment surplus results in a 1.7 to 2.5 percentage points increase in growth the year after. Other studies of US data have included additional explanatory variables in the regression, which have resulted in more moderate estimates of the fiscal multiplier. As an example, Perry and Schultze (1993), using quarterly data from 1956 to 1992, regress the change in the log of GDP on lags of the dependent variable, current and several lags of the change in the high-employment surplus share of GDP and the change in the federal funds rate, and find that a one percentage point fall in the high-employment surplus increases growth by 0.66 percentage points.

The multipliers estimated in the Eisner (1989) and the Perry and Schultze (1993) may be even larger than what the results of their estimations suggest, due to a potential negative bias stemming from the endogeneity of fiscal policy to the cycle. If the structural budget surplus is not perfectly rinsed of cyclical effects, some of the correlation between the structural budget balance and demand may be due to a residual effect of automatic stabilizers. Two overall methods have been employed in the recent literature to control for this simultaneity bias: Instrumental Variables estimation (IV) and VAR modeling, both with shortcomings[7]. Romer and Romer (1994), in a regression similar to that of Perry ands Schultze, using quarterly data from 1957 to 1988 find that a one percentage point drop in the high-

[7] It is a challenge to find good exogenous instruments for fiscal policy. Thus, when using the IV estimator, a substantial amount of information is usually lost. Employing the VAR approach requires imposing restrictions for identification. Finding the right restrictions is not obvious and may end up being somewhat arbitrary. Moreover, VAR cannot be used for cross country analyses, and literature on how to apply VAR to panel data is only barely being written.

employment surplus to GDP ratio leads to a 1.1 percentage point increase in growth over about ten quarters from when the increase took place. Recently, studies of fiscal multipliers using VAR modeling have addressed some of the shortcomings of the simple regression analysis approach, such as the potential endogeneity of policy to the business cycle mentioned above, in addition to improving on the dynamic specification of the models. Most VAR studies, however, use the revenue and expenditure sides of the budget separately (see for example Bayoumi (1999) and/or Blanchard and Perotti (1999) in Table 1). An exception is Bruneau and de Bandt (1999), who use the level of the primary budget deficit in addition to the change in the log of output, the short term interest rates and other variables in two VAR models (one on French data and one on German data). They find a positive fiscal multiplier for Germany, which is significant for three quarters after the shock to the budget balance. Shocks to the primary budget deficit are found to have no statistically significant effect on output in France.

In conclusion, the literature shows that measures of the change in the structural budget balance have significant explanatory power in regressions on US data, while the primary budget balance has explanatory power for German data, but not for France. There are no cross-country studies of short-term fiscal impact on demand or output. The literature hence does not indicate whether any fiscal policy indicator can explain variation in demand in a consistent fashion across countries. There are also no comparisons of different measures of fiscal impact allowing us to compare the power of such measures to other measures in explaining the variation in demand. The next section sets out to estimate at panel data regression for short term fiscal impact on demand in OECD countries, with the aim of providing an empirical comparison of the five indicators of the impact of fiscal policy on demand discussed in Section II, and testing whether this impact effect can reasonably be considered similar in timing and magnitude across OECD countries.

Table 1. A Summary of The Empirical Literature on Fiscal Multipliers

Study	Dependent Variable	Fiscal Indicator	Estimation Method and Sample	Results

Eisner (1989)	Annual Growth rate of GDP	First lag of the annual real high employment surplus[a]	**OLS** – US data	A percentage point drop in the High-employment surplus results in a 1.7 to 2.5 percentage points increase in growth the year after
Perry and Schultze (1993)	Quarterly change in the log of GDP	Current plus eight lags of the change in the high employment surplus[a] share of GDP	**OLS** – US data. Monetary policy is controlled for.	A percentage point drop in the High-employment surplus results in a 1.1 percentage points total increase in growth
Romer and Romer (1994)	Quarterly growth rate of real GDP	Current plus eight lags of quarterly change the high employment surplus[a]	**OLS and IV** – US data. Monetary policy is controlled for	The OLS regression implies that a percentage point drop in the High-employment surplus results in a 1.1 percentage points total increase in growth. The IV regression is inconclusive but no importance is attached to this results due to the poor quality of the instruments
Bayoumi (1999)	Quarterly change in actual GDP share of potential GDP	The change in structural direct government spending and structural taxes net of transfers[b]	**VAR.** Japanese data. Including monetary policy and domestic asset price variables	A 100 Yen increase in structural spending[b] has the immediate effect of increasing output by 65 Yen, but the effect is back to zero after already one year. An increase of 100 Yen in the structural taxes decreases output by 20 Yen at the peak, at stays significant for a longer time period before returning to zero impact.
Bruneau and de Bandt (1999)	Quarterly change in the log of real GDP	Government primary surplus share of GDP	**VAR**. Data for France and Germany. Monetary and external shock variables	France: There is no statistically significant impact of the budget balance on output. Germany: There is a significantly negative impact on growth from shocks to the primary budget balance, but it is only significant for three quarters.
Blanchard and Perotti (1999)	Quarterly log of real GDP	Log of real government spending excl. transfers and log of real government revenue excl. transfers, both in shares of GDP	**VAR**. US data.	an increase in spending will result in a multiplier of GDP by between 0.9 and 1.3 at the peak (which occurred between the first and the 15th quarter, depending on the specification), after which it declines. An increase in taxes will result in a GDP multiplier of -0.8 to -1.3 at the peak (after 5 to 7 quarters), after which it declines.

a) The US congressional budget office measure of the US structural budget balance, referred to in their statistics as the high-employment or standardized-employment surplus.
b) The IMF structural budget balance formula was used.

EMPIRICAL PART

The following empirical analysis aims at answering two questions. First, given the assumption that the effect of fiscal policy on demand is similar across countries, which fiscal indicator(s) is(are) the best and which indicator(s) should not be used as measures of fiscal impact on demand. The second question is whether the assumption that fiscal impact on demand is similar across countries is a reasonable one. To answer the first question, a time series cross country equation for demand changes is estimated for 20 OECD countries and the explanatory power and robustness of each fiscal indicator is tested. The second question is answered by testing the pooled specification of the regression equation against the unconstrained alternative, in which parameter estimates are allowed to vary across countries. Before outlining a methodology, it is important to stress that this paper does not estimate an equation derived from a structural model. Assuming an overall keynesian framework, where changes in fiscal policy affect changes in demand, it simply sets out to estimate partial correlations between fiscal indicators and changes in demand in order to evaluate and compare their explanatory power.

A. Methodology

Assume that demand is affected by changes in fiscal policy and that the indicator of change in fiscal policy explains demand changes according to

$$\frac{\Delta Y_{i,t}}{Y_{i,t}} = f\left(\Delta\left[\frac{FP_{i,t}}{Y_{i,t}}\right], X_{i,t}\right)$$

where $Y_{i,t}$ is real demand in country i in year t, $FP_{i,t}$ is one of the five fiscal policy indicators and $X_{i,t}$ is a vector of other variables determining demand. Assume also that the effect of fiscal policy on demand is stable across OECD countries and time, such that the relationship can be estimated for a panel of OECD countries.

Real demand is measured by real GDP. All indicators of fiscal impact on demand are measured such that a positive change in the measure implies a higher deficit as a percent of GDP and hence an expansionary fiscal policy[8]. In order to allow for lags in the implementation and effect of fiscal policy, the first lag of the fiscal policy variable is included in the regression. As an indicator of monetary policy, the central bank discount rate prevailing at the beginning of the period is included[9]. The one year lag of average real oil price proxies for external supply shocks[10].
We thus estimate the equation:

$$\dot{Y}_{i,t} = \alpha + \beta_1 \cdot \Delta \frac{FP_{i,t}}{Y_{i,t}} + \beta_2 \cdot \Delta \frac{FP_{i,t-1}}{Y_{i,t-1}} + \beta_3 r_{i,t} + \beta_4 OIL_{t-1} + \lambda_i + \mu_{i,t}$$

where λ_i is included to allow a component of the error term to be country specific and time invariant and non-stochastic. The regression is estimated correcting for cross sectional heteroskedasticity and contemporaneous correlation[11]. First-order autocorrelation is tested for using the DW test for panel data[12].

The analysis is carried out for annual data for a panel of 20 OECD countries for the time period 1972 to 1999. Data comes from IMF's World Economic Outlook database, International Financial Statistics and the OECD Economic Outlook database. Since all data

[8] The real budget deficit in percent of real GDP is proxied by the nominal budget deficit measure divided by nominal GDP due to lack of a price deflator for budget items.

[9] It makes no difference for the parameter estimates whether the level or the change in the interest rate is included.

[10] Including the current value results in an insignificant parameter estimate and does not otherwise change the results.

[11] FGLS is used as estimation procedure. The coefficients of contemporaneous correlation and cross sectional heteroskedasticity used in the transformation of the data are iterated to convergence

[12] See Baltagi (1995), p 94 or Bhargava et al. (1982).

are not available for the entire period for some countries and some series, an unbalanced panel sample is used, i.e. the time period is allowed to vary across countries according to data availability. This amounts to a sample period of an average of 15 years per country, spread out on the 28 years of the entire sample period. The three structural budget balances and the fiscal stance are calculated using the formulas provided in Appendix. To avoid problems of comparability and to simplify the computations, the IMF's World Economic Outlook Database (WEO) measure of potential output and the Giorno et al. (1995) elasticities[13] have been applied to all structural budget balance indicators. The choice of trend or potential output should not make a substantial difference since we are concerned with changes, and not levels, of the measures. All other data used for the indicator calculations are taken from WEO except budget item weights, which are from the OECD Economic Outlook database. The SBB_{OECD} is calculated gross of interest payments on the public debt, in spite of it being published as a primary balance measure, in order to ensure that the results be comparable for the three structural budget balances[14]. Table A and B in Appendix summarize the main empirical properties of the levels and first differences of the indicators in percent of GDP for the largest common sample (1988-1999).

Using simple FGLS does not take into account the problem that some of the fiscal policy measures may be endogenous to the cycle. Not correcting for this endogeneity may bias the parameter estimates negatively, since higher growth leads to lower budget deficits, all else equal. If this is the case for the structural budget balance measures, it would be a reason for not using the SBB "raw" as fiscal indicators, i.e. without taking into account the cycle. In order to compare the results of the basic regressions with regression results corrected for the endogeneity, each equation is also estimated using instrumental variables for the current

[13] More recent estimates of output elasticities of the budget have been provided in van den Noord (2000), but since the calculations go back to 1972, we found it more appropriate to use elasticities based on data going further back.

[14] It turns out not to be important for the conclusions whether the primary measure or the actual measure of the SBB_{OECD} is used.

fiscal policy measure[15]. It is important to stress, however, that the relevant parameter estimates remain the actual and not the IV results since policymakers use the actual budget balance and not an instrumentalized budget balance as indicator. Finding exogenous instruments likely to capture annual fluctuations in fiscal variables is not an easy task. As instruments are used the change in the fiscal variable itself[16], the beginning of period and lagged discount rate, the current and lagged real oil price, and a linear time trend. The instruments are not very successful in explaining the fiscal variables which is another reason for not attaching much importance to the instrumental variable (IV) regression results.

Whether the fiscal variable has the right sign (i.e. a positive parameter estimate) and is significant is a first criterion by which to evaluate and rank the tested indicators. Second, the robustness of the parameter estimates is investigated. This is done by testing whether the results change when the sample period is changed or when other variables are included in the regressions[17,18]. Finally, whether the pooled specification is statistically significant, i.e. whether fiscal multipliers can be accepted as being similar across countries is tested.

[15] The first stage regressions used to estimate the fitted values of the explanatory variables are carried out unconstrained, such that the coefficients of the instruments are allowed to vary across countries.

[16] i.e. the change in the change in the budget deficit measure. It would provide more explanatory power to use the lag of the fiscal variable itself and not the change in this as an instrument. Regrettably, using predetermined endogenous variables may introduce a bias in the presence of fixed effects, since these variables are correlated with the fixed component of the error term. Taking the change in the fiscal variable eliminates this problem since the fixed effect is differenced away. However, due to this bias correction, the instruments explain a relatively small fraction of the total variation in the fiscal variable, rendering the instrumental variable regressions less reliable.

[17] As other variables that might effect the relationship are included the effective exchange rate, which is another monetary policy target which can be controlled for, and the export to GDP ratio, which is often controlled for in the empirical growth literature over the longer term.

[18] The R^2 of the regressions are not compared directly since this is meaningless when FGLS is used as estimation procedure. See Greene (1997), pages 508-509.

B. Empirical Results

The results of the regressions are given in Table C and D in Appendix. All variables are in percentages, except for the lagged oil price, which is an index. The parameter estimate of the current and lagged fiscal variable can thus be interpreted as the predicted percentage point change in growth from a one percentage point increase in the respective deficit to GDP ratio[19]. The parameter estimates of the fiscal variables of the six basic regressions are presented in Table 2 below. Column 1 gives the results of the basic regression using the actual variables. Column 2 gives the results current and lagged fiscal variable using IV for the current fiscal variable and column three gives the results when only the lag of the fiscal variable is included in the regression. F-tests of all parameter estimates of the explanatory variables being equal to zero are rejected for all basic regressions. The within–group DW test statistics for first order autocorrelation are given in Table E in Appendix for the six basic regressions. There is a tendency toward positive autocorrelation[20], implying a specification problem, but since the focus is on the partial correlation between demand and fiscal policy indicators, this potential problem is disregarded.

[19] Moreover, the parameter estimate of the interest rate can be interpreted as the predicted percentage point change of a one percentage point increase in the interest rate.

[20] The 5% critical values the DW for panel data given in Bhargave et al (1982) imply that positive autocorrelation cannot be rejected for SBB_{IMF}, SBB_{EU}, SBB_{OECD} and FI, although it is on the border of being rejected for TBB on a five percent significant level.

Table 2. Parameter estimates of fiscal indicators from the regression of real growth rates on fiscal and monetary and external shock variables.

Explanatory variable	Basic Regression Current	Basic Regression Lagged	IV Current	IV Lagged	Lag only
ΔTBB	-1.77*	-0.04	-1.88*	-0.04	-0.14
ΔSBB_{IMF}	-0.00	0.12	1.32*	-0.15	0.12
ΔSBB_{OECD}	0.28*	0.22	0.38*	0.11	0.17
ΔSBB_{EU}	-0.34*	0.08	-0.74*	0.10	0.10
FI	-0.05	0.09	1.53*	0.13	0.10

*) Significant at a 5% significance level.

Basic empirical results

First, it is important to notice that the lagged fiscal variables are insignificantly different from zero for all fiscal measures. Hence, only the contemporaneous parameter estimates will hence be discussed in the following. The parameter estimate for total budget balance is significant but has the wrong sign, which is not unexpected: the total budget balance is obviously endogenous to the cycle. Using instrumental variables should control for this endogeneity by decreasing the size of the negative parameter estimates, and the fact that this does not take place could be due to the poor quality of the instruments. The data thus suggests that empirically the total budget balances does not provide a good indicator of fiscal impact on demand. The OECD structural budget balance measure has the expected significant contemporaneous effect on demand. The parameter estimate of the IMF measure is insignificant while that of the EU measures is significantly negative. Instrumenting the current value of the change in the three SBB results in the parameter estimate of the SBB_{IMF} turning positive, significant and greater than one, while the parameter estimate of the SBB_{EU} becomes even more negative. The parameter estimate of the instrumentalized SBB_{OECD} becomes slightly higher and stays significant. The results for the FI measure are relatively similar to those of the SBB_{IMF}. These observations point to the SBB_{OECD} as the relatively more reliable measure of demand impact of fiscal policy across countries, but before a final conclusion can be drawn, the robustness of the measures has to be evaluated.

Table 3. Current parameter estimates of fiscal indicators. Robustness across time and including other explanatory variables

Explanatory variable	Sub-sample 1972-1990	Sub-sample 1980-1999	Other variables included
ΔTBB	-1.66*	-1.56*	-1.68*
ΔSBB_{IMF}	-0.52*	0.00	0.15
ΔSBB_{OECD}	0.48*	0.38*	0.56*
ΔSBB_{EU}	-0.32*	-0.22	-0.23
FI	-0.48	-0.02	1.12

*) Significant at a 5% significance level.

Robustness

To evaluate the robustness of the parameter estimates of the five fiscal variables in explaining short term growth rates, the basic regression was estimates excluding observations from the 1990s, then excluding observations from the 1970s and finally including other explanatory variables in the regression. A full account of the results is giving in table D in Appendix. A summary is provided in Table 3 above. The results show that the parameter estimates of the SBB_{OECD} and the TBB are fairly robust across time and with other variables included in the regression. The parameter estimates of the SBB_{IMF}, SBB_{EU} and the FI change signs and are only significant when the sub-sample excluding the 1990s is used. A little curiosity worth noting is that the lagged SBB_{OECD} and SBB_{EU} turn significant when observations from the 1990s are excluded, which is also the case for the lagged SBB_{OECD} when other variables are included in the regression.

Conclusions of the panel data regression

To conclude on the panel data regression analysis, the contemporaneous change in the structural budget balance as calculated using the OECD method mounts from the empirical analysis as the best general cross country measure of demand impact of fiscal policy. A one percentage point change in the SBB_{OECD} is predicted to result in between 0.28 and 0.56 percentage point increase in growth in the same year. There does not seem to be lagged

effects of fiscal policy as measured by the SBB_{OECD}[21]. The total budget balance is not useful as an indicator of fiscal impact on demand, largely due to endogeneity. The structural budget balances calculated using the EU is significantly negatively explaining the variation in demand, which is opposite to the expected effect of fiscal policy. Moreover, the parameter estimate does not stay significant and positive across time and when other variables are included. The structural budget balance calculated using IMF's methodology and the fiscal impulse measures both prove to be insignificant in explaining the variation in demand. The parameter estimates are furthermore unstable across time and when other explanatory variables are included in the regression.

An interesting result which is worth mentioning, although it is not of importance in the present context, is that the most robustly estimated parameter is that of the central bank interest rate, which is and between –0.46 and -1.13 and significant in *all* regressions. The beginning of period discount rate set by the central bank clearly affects short term growth negatively.

Should the effect of fiscal policy on demand be treated as similar across OECD countries?

The F and Chi-square statistics for the hypothesis that all four explanatory variables of the basic regression equation have the same parameter estimates are laid out in Table F in Appendix. The hypothesis is rejected for all five fiscal policy indicators[22]. The effect of fiscal policy on demand cannot be empirically accepted as similar across OECD countries. Table G of Appendix lays out the parameter estimates of the fiscal variables of the individual country regressions. The contemporaneous change in the total budget is consistently negatively correlated with the real growth rate. The signs and significance of the fiscal impulse and the change in the three structural budget balances range from negative to positive and from

[21] Disregarding the parameter estimate of the lagged SBB_{OECD} when observations from the 1990s are excluded from the sample.

[22] The unrestricted models are estimated as a system, correcting for contemporaneous correlation. The hypothesis that all parameter estimates are equal across countries is tested. When, alternatively, the hypothesis that only the parameter estimates of the two fiscal variables are the same across countries is tested, this hypothesis is equally rejected.

significant to insignificant, depending on the country in question, but the results are relatively similar across fiscal measures. For example, the contemporaneous and lagged partial correlation of all fiscal policy indicators except the TBB are significantly positive for Germany, while the SBB_{IMF}, SBB_{EU} and the FI have significant negative parameter estimates for Finland. In contrast, all three structural balances and the fiscal impulse are insignificant for Japan. These results may be taken to imply that the structural balances and the fiscal impulse have different degrees of endogeneity across countries, and hence that the parameter estimates are biased to the degree which depends on the country. Alternatively, and more realistically, the results imply that the impact of fiscal policy on demand differ substantially across countries. Irrespective of the interpretation given to the results, the conclusion necessarily is that more than choosing the best general indicator of demand impact of fiscal policy, it is important to look at how fiscal policy affects demand in the country under investigation, and in turn how this might or might not be captured by the fiscal indicators used to measure this impact.

CONCLUSION

Five fiscal measures, the change in the total budget balance, the change in three measures of the structural budget balance and the fiscal impulse, are all commonly used as indicators of fiscal impact on demand. These fiscal indicators are usually applied in the same manor across countries, disregarding that fiscal policy is likely to affect demand differently in different countries. With that observation in mind, this paper has attempted to answer two questions. First, assuming that the effect of fiscal policy is in fact similar across OECD countries, which fiscal indicator(s) *best* capture(s) the demand effect of fiscal policy and should be preferred for policy analysis, and which indicator(s) should not be considered for this job? A pooled cross country time series regression of data for 20 OECD countries showed that the contemporaneous measure of the structural budget balance calculated by the OECD (the SBB_{OECD}) clearly does the best job out of the five tested indicators in explaining short term changes in demand. A one percentage point increase in the SBB_{OECD} when defined as a deficit was estimated to increase short term growth by between 0.28 and 0.56 percentage points. The total budget deficit proved to be unfit as an indicator of fiscal impact on demand

since it was shown to be negatively correlated with growth, most likely due to the cyclical effect of growth on the budget deficit. The parameter estimates of the structural budget balances calculated using the IMF and the EU methods and the fiscal impulse measure either had wrong signs and/or proved to be unstable over time or sensitive to the variables included in the regression.

The second question that this paper attempted to answer was whether the demand effect of fiscal policy reasonably can be viewed as similar across OECD countries in the first place. If not, the panel data regression only captures significant average effects which may be driven by a small subset of countries in the panel, without bringing information about how fiscal policy affects demand in individual countries. When testing whether the unconstrained country estimates of the regression could be accepted as equal, this was rejected for all five measures of fiscal policy included in this study. Individual country regressions show that depending on the country, the empirical effect of fiscal policy ranges from significantly positive to significantly negative, while in some countries being insignificant. The results indicate that fiscal policy indicators should be chosen and interpreted in the light of which country is being investigated. More country specific analyses of fiscal impact on demand would be helpful in determining more exactly how this should be done.

Appendix

Formulas for constructing the Fiscal Indicators used in the panel data regression analysis.

European Commission's Cyclically Adjusted Budget Balance (SBB_{EU})

$$SBB_{EU} = R_t \cdot \left[1 - \varepsilon_R \cdot \frac{Y_t - Y_t^{\,p}}{Y_t} - \varepsilon_{Rlag} \cdot \frac{Y_{t-1} - Y_{t-1}^{\,p}}{Y_{t-1}}\right] - \left[E_t - \frac{\upsilon}{\sigma} \cdot \frac{Y_t - Y_t^{\,p}}{Y_t}\right]$$

See European Commission (1995), Braconier and Holden (1999) and Hernández de Cos (1998)

IMF's Structural Budget Balance (SBB_{IMF})

$$SBB_{IMF} = R_t \cdot \left(\frac{Y_t^{\,p}}{Y_t}\right)^{\varepsilon_R} \cdot \left(\frac{Y_{t-1}^{\,p}}{Y_{t-1}}\right)^{\varepsilon_{Rlag}} - \left[E_t - UIB_t + UIB_t \cdot \frac{U_{s,t}}{U_t}\right]$$

See Hagemann (1998), WEO, October 1993. Annex 1: "Structural Budget Indicators for the Major Industrial Countries", and Braconier and Holden (1999)

OECD's Structural Budget Balance (SBB_{OECD}) (primary balance measure)

$$SBB_{OECD} = T_{c,t} \cdot \left(\gamma \cdot \left[\frac{Y^P{}_t}{Y_t}\right]^{\varepsilon_c} + (1-\gamma) \cdot \left[\frac{Y^P{}_{t-1}}{Y_{t-1}}\right]^{\varepsilon_c}\right) +$$
$$\sum_i T_{i,t} \cdot \left[\frac{Y^P{}_t}{Y_t}\right]^{\varepsilon_i} - \left[\left[E_t - GI - CSV\right] \cdot \left(\frac{Y^P{}_t}{Y_t}\right)^{\varepsilon_E}\right]_t - NCA_t$$

See Van den Noord (2000), Suyker (1998) and OECD (2000). *GI* should be subtracted to arrive at the actual (i.e. not primary) balance measure.

IMF's Cyclically Neutral Budget Balance (CNB), Fiscal Stance (FS) and Fiscal Impulse (FI)

Cyclically Neutral Balance:

$$CNB_{IMF\ s,t} = t_0 \cdot Y_t - g_0 \cdot Y_t^{\ p}$$

Fiscal Stance:

$$FS_t = -(TBB_t - UIB_t) - CNB_t)$$

Fiscal Impulse:

$$FI_t = \frac{FS_t}{Y_t} - \frac{FS_{t-1}}{Y_{t-1}}$$

where

$$t_0 = \frac{R_0}{Y_0}$$

$$g_0 = \frac{E_0 - UIB_0}{Y_0}$$

For more information on the cyclically neutral balance and fiscal stance, see Heller et al 1986, Schinasi (1986 and 1991).

Definitions of variables used:

$$\varepsilon_R = \gamma \cdot \frac{R_c}{R} \cdot \varepsilon_c + \sum_i \frac{R_{i,}}{R} \cdot \varepsilon_i$$

$\varepsilon_{Rlag} = (1-\gamma) \cdot \varepsilon_c$ is the elasticity of current revenue to lagged output.

ε_i = Tax revenue elasticity of the i'th tax base

ε_E = Government expenditure elasticity at time t

i = personal income tax revenue, indirect tax revenue and social security contributions,

γ = the proportion of corporate taxes paid in the year in which the tax is levied,

ε_c = Corporate tax revenue elasticity

$\frac{R_i}{R}$ are calculated as averages over the years1980 to 1992

R_t = Government revenue at time t.

$R_{s,t}$ = Structural government revenue at time t.

E_t = Government expenditure at time t.

$E_{s,t}$ = Structural government expenditure at time t.

$Y^{p}{}_{t}$ = Potential output at time t

Y_t = Actual output at time t

σ = Okun's coefficient derived (by regression analysis) from

$$\frac{Y_t - Y_t^{\,p}}{Y_t^{\,p}} = \alpha + \sigma \cdot (U_{s,t} - U_t) + e_t$$

$U_{s,t}$ = structural (or trend) unemployment.

υ = increase in unemployment insurance benefits due to a one unit increase in unemployment, derived (by regressions analysis) from

$UIB_t - UIB_{t-1} = \alpha + \upsilon \cdot (U_t - U_{t-1}) + e_t$

UIB_t = total unemployment insurance benefits at time t

NCA = Net capital outlays

GI = Gross interest payments

CSV = Country specific variable

$T_{c,t}$ = Corporate tax revenue

$T_{i,t}$ = Tax revenue from the i'th tax base,

i = social security contributions, indirect taxes and personal income taxes

R_0 = Government revenues in the base year where $Y=Y^P$

E_0 = Government expenditure in the base year where $Y=Y^P$

Y_0 = Output in the base year, deemed close to potential GDP

Tables

Table A. Summary Statistics for the Six Budget Balance Indicators (1988-1999)

		TBB	SBB_{IMF}	SBB_{OECD}	SBB_{EU}	FS
Austria	Mean	-3.09	-3.03	-3.19	-3.09	0.16
	Maximum	-1.86	-0.85	-1.08	-1.00	2.53
	Minimum	-5.08	-5.30	-5.30	-5.32	-1.88
	Std. Dev.	1.12	1.37	1.38	1.33	1.40
Australia	Mean	-1.31	-0.90	-1.98	-1.07	1.73
	Maximum	1.20	0.60	1.59	0.61	3.14
	Minimum	-4.65	-3.23	-4.97	-3.77	-0.43
	Std. Dev.	2.07	1.45	2.19	1.66	1.32
Belgium	Mean	-5.03	-4.17	-3.95	-4.20	2.45
	Maximum	-0.86	0.00	0.01	-0.21	6.29
	Minimum	-7.94	-8.03	-7.81	-7.81	-1.15
	Std. Dev.	2.62	3.18	3.08	2.91	2.91
Canada	Mean	-3.41	-1.76	-1.67	-1.88	2.50
	Maximum	2.75	3.28	3.27	3.25	7.06
	Minimum	-7.98	-4.50	-4.60	-4.65	0.19
	Std. Dev.	3.52	3.11	3.19	3.12	2.71
Denmark	Mean	-0.72	-0.43	-0.54	-0.42	-0.94
	Maximum	2.87	2.06	2.66	2.57	0.66
	Minimum	-2.85	-1.83	-1.88	-1.89	-2.28
	Std. Dev.	1.84	1.16	1.41	1.41	0.94
Germany	Mean	-2.26	-2.06	-2.17	-2.18	-1.94
	Maximum	0.12	0.57	0.63	0.24	0.72
	Minimum	-3.38	-4.40	-4.21	-4.08	-4.57
	Std. Dev.	1.01	1.57	1.58	1.40	1.65
Finland	Mean	-0.68	0.34	-0.18	0.20	-1.48
	Maximum	6.31	3.55	3.61	3.78	1.48
	Minimum	-7.13	-2.02	-3.28	-2.73	-3.72
	Std. Dev.	4.66	1.98	2.19	2.32	1.57
France	Mean	-3.05	-2.25	-2.80	-2.46	-0.67
	Maximum	-0.50	-0.80	-0.89	-0.93	0.53
	Minimum	-5.90	-3.79	-4.04	-4.09	-2.15
	Std. Dev.	1.95	1.12	1.15	1.18	0.96
Greece	Mean	-9.66	-9.61	-9.55	-9.61	6.48
	Maximum	-1.72	-2.08	-1.93	-2.08	13.99
	Minimum	-16.12	-16.29	-16.54	-16.29	-0.26
	Std. Dev.	4.77	4.82	5.16	4.82	4.88
Ireland	Mean	-1.27	-1.06	-1.02	-1.09	1.00
	Maximum	3.18	1.87	1.18	2.10	3.02
	Minimum	-4.24	-3.82	-4.29	-3.82	-1.35
	Std. Dev.	2.21	1.89	1.75	1.89	1.47
Italy	Mean	-7.63	-7.24	-55.36	-7.28	3.52
	Maximum	-1.90	-0.51	-45.60	-0.58	10.58
	Minimum	-11.04	-11.81	-60.95	-11.81	-1.49
	Std. Dev.	3.31	3.96	5.44	3.93	4.19
Japan	Mean	-1.28	-1.39	-1.63	-1.38	-3.79
	Maximum	2.88	1.64	1.70	1.67	-0.68

	Minimum	-7.12	-5.54	-5.46	-5.58	-8.22
	Std. Dev.	3.40	2.63	2.72	2.66	2.71
Netherlands	Mean	-2.86	-2.64	-3.08	-2.64	1.91
	Maximum	0.50	-0.09	-0.37	-0.09	4.13
	Minimum	-4.91	-5.75	-6.74	-5.75	-1.33
	Std. Dev.	1.69	1.72	2.07	1.72	1.68
New Zealand	Mean	0.11	0.00	-0.03	0.28	1.60
	Maximum	3.30	4.01	3.07	3.63	4.79
	Minimum	-4.42	-3.74	-5.25	-4.14	-2.32
	Std. Dev.	2.63	2.40	3.20	2.71	2.48
Norway	Mean	2.58	2.73	2.77	2.75	0.95
	Maximum	7.88	5.94	6.38	6.19	4.32
	Minimum	-1.73	-0.21	-0.58	-0.46	-2.13
	Std. Dev.	2.97	1.96	2.29	2.09	2.02
Portugal	Mean	-3.95	-4.06	-4.14	-4.08	2.84
	Maximum	-1.99	-1.99	-1.85	-1.97	5.03
	Minimum	-6.11	-7.46	-7.32	-7.31	-0.60
	Std. Dev.	1.58	1.78	1.87	1.72	1.80
Spain	Mean	-4.11	-4.00	-4.34	-4.20	-0.95
	Maximum	-1.12	-0.98	-1.00	-1.02	1.18
	Minimum	-7.02	-6.57	-6.32	-6.09	-2.99
	Std. Dev.	1.80	1.78	1.80	1.62	1.13
Sweden	Mean	-2.30	-1.36	-1.63	-1.42	2.96
	Maximum	5.20	5.15	4.76	4.65	8.88
	Minimum	-11.76	-7.26	-8.01	-7.85	-3.01
	Std. Dev.	5.94	4.18	4.65	4.40	4.06
US	Mean	-3.17	-2.71	-2.29	-2.71	1.71
	Maximum	0.52	0.41	0.94	0.46	4.77
	Minimum	-6.02	-4.95	-4.81	-5.07	-0.33
	Std. Dev.	2.04	1.91	2.11	1.93	1.83

Table B. Summary statistics for the first difference of fiscal indicators measured as deficits, 1988-1999

		TBB	SBB_{IMF}	SBB_{OECD}	SBB_{EU}	FS
Austria	Mean	-0.09	-0.16	-0.18	-0.15	-0.21
	Maximum	2.32	1.10	1.33	1.36	1.10
	Minimum	-1.93	-2.55	-2.51	-2.54	-2.51
	Std. Dev.	1.14	1.23	1.21	1.23	1.24
Australia	Mean	0.04	0.02	-0.19	0.03	0.04
	Maximum	2.88	1.47	1.63	1.89	1.31
	Minimum	-1.36	-1.13	-1.67	-1.19	-1.01
	Std. Dev.	1.36	0.88	1.14	1.03	0.84
Belgium	Mean	-0.53	-0.53	-0.57	-0.51	-0.49
	Maximum	0.88	1.92	1.14	1.65	1.84
	Minimum	-2.27	-2.83	-2.60	-2.52	-2.76
	Std. Dev.	0.97	1.27	1.08	1.15	1.20
Canada	Mean	-0.53	-0.70	-0.67	-0.67	-0.62
	Maximum	2.61	0.29	0.38	0.41	0.16
	Minimum	-2.57	-2.88	-2.87	-2.85	-2.73
	Std. Dev.	1.68	0.93	1.00	1.00	0.87
Denmark	Mean	-0.13	-0.11	-0.15	-0.14	-0.01
	Maximum	1.40	1.17	1.23	1.24	1.11
	Minimum	-1.99	-1.75	-1.93	-1.84	-1.65
	Std. Dev.	1.14	0.89	0.96	0.95	0.84
Germany	Mean	-0.10	-0.21	-0.13	-0.20	-0.24
	Maximum	2.17	3.07	3.13	2.95	3.20
	Minimum	-2.26	-1.72	-1.85	-1.86	-1.74
	Std. Dev.	1.19	1.37	1.42	1.31	1.39
Finland	Mean	0.10	-0.02	0.04	-0.01	-0.19
	Maximum	6.47	2.26	2.52	2.52	1.91
	Minimum	-2.97	-2.16	-1.93	-2.14	-1.87
	Std. Dev.	2.99	1.43	1.50	1.53	1.19
France	Mean	0.08	-0.04	-0.16	-0.04	-0.05
	Maximum	2.60	1.86	1.24	1.99	1.83
	Minimum	-1.36	-1.77	-1.82	-1.70	-1.69
	Std. Dev.	1.22	0.95	0.83	0.96	0.93
Greece	Mean	-0.89	-0.84	-0.86	-0.84	-0.83
	Maximum	2.88	3.58	3.74	3.58	4.10
	Minimum	-4.59	-4.15	-4.16	-4.15	-3.84
	Std. Dev.	2.50	2.41	2.45	2.41	2.40
Ireland	Mean	-0.67	-0.51	-0.37	-0.54	-0.40
	Maximum	0.54	1.87	2.34	1.69	1.86
	Minimum	-2.57	-1.77	-2.04	-1.88	-1.70
	Std. Dev.	1.07	1.28	1.50	1.20	1.18
Italy	Mean	-0.80	-0.95	-0.99	-0.95	-1.01
	Maximum	1.24	1.26	2.57	1.23	1.18
	Minimum	-4.39	-4.61	-6.34	-4.59	-4.58
	Std. Dev.	1.39	1.41	2.42	1.41	1.41

Japan	Mean	0.78	0.59	0.59	0.60	0.62
	Maximum	3.06	2.43	2.40	2.44	2.48
	Minimum	-1.00	-0.99	-1.03	-1.01	-1.02
	Std. Dev.	1.33	1.19	1.05	1.19	1.18
Netherlands	Mean	-0.45	-0.32	-0.38	-0.32	-0.23
	Maximum	0.98	1.18	1.16	1.18	1.39
	Minimum	-2.13	-2.45	-2.80	-2.45	-2.50
	Std. Dev.	1.03	1.25	1.40	1.25	1.37
New Zealand	Mean	-0.19	-0.35	-0.64	-0.34	-0.39
	Maximum	2.71	1.75	1.49	1.96	2.08
	Minimum	-3.99	-3.64	-2.55	-3.70	-3.37
	Std. Dev.	1.77	1.58	1.39	1.61	1.45
Norway	Mean	-0.18	-0.17	-0.19	-0.18	-0.19
	Maximum	3.96	4.00	4.04	3.66	3.53
	Minimum	-3.09	-2.41	-2.55	-2.54	-2.62
	Std. Dev.	2.26	2.10	2.16	2.04	1.97
Portugal	Mean	-0.14	-0.15	-0.16	-0.15	-0.19
	Maximum	3.16	3.34	3.29	3.27	3.26
	Minimum	-3.07	-3.25	-3.35	-3.32	-3.57
	Std. Dev.	1.82	1.65	1.74	1.66	1.68
Spain	Mean	-0.18	-0.25	-0.27	-0.25	-0.16
	Maximum	2.75	1.56	1.28	1.34	1.60
	Minimum	-2.07	-2.35	-2.00	-2.13	-1.84
	Std. Dev.	1.41	1.24	1.13	1.14	1.09
Sweden	Mean	0.15	-0.40	-0.28	-0.29	-0.29
	Maximum	6.41	3.08	4.17	4.04	2.94
	Minimum	-4.26	-5.28	-5.21	-5.18	-4.90
	Std. Dev.	3.66	2.54	2.80	2.74	2.50
US	Mean	-0.39	-0.41	-0.45	-0.41	-0.41
	Maximum	1.01	0.75	0.78	0.82	0.74
	Minimum	-1.32	-1.04	-1.10	-1.10	-0.95
	Std. Dev.	0.87	0.63	0.66	0.66	0.59

Table C. Parameter estimates of explanatory variables from the regression of real growth rates on fiscal and monetary and external shock variables (equation X).

Dependent variable	Explanatory variable	Basic Regression	IV	Lag only
1) $\dot{Y}$	ΔTBB	-1.77*	-1.88*	-
$R^2=0.256$	ΔTBB_{-1}	-0.04	-0.04	-0.14
	i_{-1}	-0.57*	-0.60*	-0.81*
	OIL_{-1}	-0.52	-0.72	-0.73
3) $\dot{Y}$	ΔSBB_{IMF}	-0.00	1.32*	-
$R^2=0.120$	$\Delta SBB_{IMF\ -1}$	0.12	-0.15	0.12
	i_{-1}	-0.77*	-0.85*	-0.77*
	OIL_{-1}	-0.72	0.14	-0.71
4) $\dot{Y}$	ΔSBB_{OECD}	0.28*	0.38*	-
$R^2=0.063$	$\Delta SBB_{OECD\ -1}$	0.22	0.11	0.17
	i_{-1}	-0.62*	-0.64*	-0.61*
	OIL_{-1}	-1.30*	-1.05*	-1.28*
5) $\dot{Y}$	ΔSBB_{EU}	-0.34*	-0.74*	-
$R^2=0.143$	$\Delta SBB_{EU\ -1}$	0.08	0.10	0.10
	i_{-1}	-0.82*	-0.83*	-0.86*
	OIL_{-1}	-0.60	-0.26	-0.58
6) $\dot{Y}$	FI	-0.05	1.53*	-
$R^2=0.122$	FI_{-1}	0.09	-0.13	0.10
	i_{-1}	-0.72*	-0.82*	-0.73*
	OIL_{-1}	-1.02*	-0.57	-1.00*

*) Significant on a 5% significance level. R^2 are for the un-weighted residuals for the basic regressions

Table D. Sensitivity the regressions of real growth rates on fiscal and monetary and external shock variables for the IV regressions.

Dependent variable	Explanatory variable	Sub-sample 1972-1990[b]	Sub-sample 1980-1999	Other variables included[a]
1) $\dot{Y}$	ΔTBB	-1.66*	-1.56*	-1.68*
	ΔTBB_{-1}	-0.02	-0.19	-0.09
	i_{-1}	-0.90*	-0.63*	-0.46*
	OIL_{-1}	-1.35*	-0.20*	-0.64
3) $\dot{Y}$	ΔSBB_{IMF}	-0.52*	0.00	0.15
	$\Delta SBB_{IMF\ -1}$	-0.01	-0.07	0.27
	i_{-1}	-0.93*	-0.79*	-0.54*
	OIL_{-1}	-1.36*	0.28	-0.72
4) $\dot{Y}$	ΔSBB_{OECD}	0.48*	0.38*	0.56*
	$\Delta SBB_{OECD\ -1}$	0.45*	0.01	0.54*
	i_{-1}	-0.55*	-0.94*	-0.72*
	OIL_{-1}	-2.10*	-0.25	-0.87
5) $\dot{Y}$	ΔSBB_{EU}	-0.32*	-0.22	-0.23
	$\Delta SBB_{EU\ -1}$	0.25*	0.01	0.20
	i_{-1}	-1.13*	-0.89*	-0.72*
	OIL_{-1}	-1.71*	-0.46	-0.53
6) $\dot{Y}$	FI	-0.48*	-0.02	0.12
	FI_{-1}	0.05	-0.04	-0.18
	i_{-1}	-0.87*	-0.75*	-0.54*
	OIL_{-1}	-1.62*	-0.77	-0.97*

a) Regression includes the effective exchange rate and export to GDP ratio. Both extra variables were significant in the regression for TBB, SBB_{IMF}, SBB_{OECD} and FI. The export to GDP ratio was significant in the regressions for SBB_{EU}.
b) 1992 for SBB_{IMF} and FI.
*) Significant on a 5% significance level.

Table E. Within-group DW Test Statistic for panel data[a]

Regression	Within-group DW statistic[b]
TBB	1.91 / 1.87
SBB_{IMF}	1.66 / 1.59
SBB_{OECD}	1.82 / 1.80
SBB_{EU}	1.79 / 1.82
FI	1.68 / 1.62

a) See Baltagi (1995) p. 94 for the test statistic and or Bhargava et al. (1982) for critical values specific to panel data. b) First number reported is for the basic regression. The second number is for the IV regression.

Table F. Test for pooling of the basic individual country regressions

	F-Statistic	P-Value	Qhi-Square	P-Value
TBB	6.373423	0.000	484.3802	0.000
SBB_{IMF}	30.60960	0.000	2326.330	0.000
SBB_{OECD}	4.629172	0.000	333.3004	0.000
SBB_{EU}	5.495817	0.000	417.6821	0.000
FI	36.12	0.000	2745.33	0.000

Table G. Regression coefficients of fiscal variables from individual country basic regressions[a].

	TBB	TBB_{-1}	SBB_{IMF}	SBB_{IMF-1}	SBB_{OECD}	SBB_{OECD-1}	SBB_{EU}	SBB_{EU-1}	FI	FI_{-1}
Austria	-0.24	-0.51*	1.05*	0.68	0.48	1.07*	0.63	0.20	1.45*	0.67
Australia	-5.75*	1.92*	-0.29	-3.12	-0.98	-3.59*	-2.07	-1.52	-0.47	-2.58
Belgium	1.20	4.72*	0.2	1.2	0.67	0.47	0.62	1.39*	0.78	1.05
Canada	-2.96*	0.37	-2.84*	1.87	-2.47*	1.32	-2.48*	1.84*	-2.04	1.14
Denmark	-4.40	2.46*	3.72	1.19	5.38	5.57	-1.88*	2.04*	5.39*	0.95
Germany	0.45	3.64*	2.61*	4.11*	2.78*	3.25*	1.90*	3.49*	2.30*	2.86*
Finland	-3.19*	1.13*	-3.01*	-3.81*	0.28	0.66	-2.26*	-1.44	-3.39*	-2.60
France	-3.58*	-0.22	-1.73*	-0.79	-0.36	0.07	-1.31	-0.14	-1.68*	-0.86
Greece	-1.94	2.52	-1.52*	0.56	1.57	-1.59	-0.05	0.98	-1.42	0.56
Ireland	-0.76	-1.21	2.72*	0.78	2.64*	-0.07	0.45	0.88	3.05*	0.33
Italy	-1.61*	-0.88	1.29*	0.61	-1.26*	0.32	0.08	0.20	1.83*	0.71
Japan	-3.59*	1.45*	-0.16	1.48	-0.52	0.75	-0.13	0.61	-0.33	1.46
Netherlands	-1.21*	-2.94*	0.47	-1.85*	-0.32	-1.82*	0.76	-1.83*	1.10*	-1.15*
New Zealand	-4.60*	0.73	-1.89	-3.51*	-2.48	-1.98	-1.25	-1.39	-4.92*	-2.05*
Norway	-1.40*	-2.12*	0.12	-1.36*	0.45	-3.08*	-2.04*	-2.96*	0.16	-1.32*
Portugal	-1.10*	1.43*	0.79	1.48*	0.50	0.08	1.08	1.94*	1.10	1.79*
Spain	-1.41*	0.12	1.17*	1.51*	1.59*	2.08*	0.71	1.43*	0.19	0.67
Sweden	-0.54*	0.36	-0.74	0.78	1.01	0.13	-.052	0.16	-1.03*	0.56
US	-5.65*	0.83	0.03	0.82	-1.81	0.44	-3.16*	0.67	-0.10	0.50

a) Same unbalanced panel size used as in the panel data regressions of Table C and D. SUR estimation technique used.

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