EPRU Working Paper Series 2010-01

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Fiscal Transparency and Procyclical Fiscal Policy

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ISSN 0908-7745

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Abstract

This paper examines why fiscal policy is procyclical in developing as well as developed countries. We introduce the concept of fiscal transparency into a model of retrospective voting, in which a political agency problem between voters and politicians generates a procyclical bias in government spending. The introduction of fiscal transparency generates two new predictions: *1)* the procyclical bias in fiscal policy arises only in good times; and *2)* a higher degree of fiscal transparency reduces the bias in good times. We find solid empirical support for both predictions using data on both OECD countries and a broader set of countries.

JEL Classification: D72; E32; E62

Keywords: Fiscal Transparency; Fiscal Policy; Procyclicality; the Business Cycle; Political Economy

1 Introduction

Fiscal policy is often procyclical: cyclical increases in real income are often accompanied by increases in government spending and/or tax cuts.[1] Such a policy may amplify fluctuations

* We thank David Dreyer Lassen and Jim Alt for valuable comments and for sharing their data on fiscal transparency with us. We also thank Jacob Svensson and Torsten Persson for providing us access to their data. Finally, we thank seminar participants at the University of Copenhagen, the EEA Milan 2008 conference and the Harvard University Political Economy and Macro lunch seminars.

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in real output, thereby leading to prolonged recessions in bad times and inflationary pressures in good times. Moreover, a procyclical fiscal policy is in conflict with the tax smoothing principle (Barro [1979]), which prescribes that tax rates should be unrelated to business cycle fluctuations. Finally, a procyclical fiscal policy may lead to excessive volatility in private- and public consumption, thus violating the principle of consumption smoothing. Thus, most economists would agree with the view that a procyclical fiscal policy is a harmful policy that adds to macroeconomic instability. Nevertheless, procyclical fiscal policies occur frequently in reality. In this paper we provide economic theory as well as empirical evidence in an attempt to explain the occurrence of such procyclical policies.

The empirical literature on the cyclicality of fiscal policy has found that fiscal policy is typically procyclical in developing countries, and especially Latin America.[2] Gavin and Perotti (1997) suggest that procyclical fiscal policies in these countries arise because of binding borrowing constraints. According to their hypothesis, governments in developing countries are likely to become credit constrained in times of economic slowdown, which may force them to run a procyclical fiscal policy. Other authors, such as Tornell and Lane (1999), Talvi and Végh (2005) and Alesina, Campante and Tabellini (2008), have proposed political economy explanations of the occurrence of procyclical fiscal policies.

The studies mentioned above take the view that fiscal policies in developed countries are typically acyclical or even countercyclical. However, a number of studies have found evidence of procyclicality in subcomponents of government spending and in overall discretionary government spending in developed countries (see for instance Hallerberg and Strauch (2002), Gali and Perotti (2003) and Lane (2003)). Few studies have attempted to

[1] Following Kaminsky, Reinhart and Végh (2004), we define a procyclical fiscal policy as a policy where increases in real output lead to discretionary increases in spending and/or tax cuts.

[2] See for instance Gavin and Perotti (1997), Catão and Sutton (2002) or Talvi and Végh (2005).

explain this procyclical pattern. Battaglini and Coate (2008) present a real business cycle model in which elected representatives attempt to target public spending to their own home districts. Their model predicts that government spending increases in booms and decreases in recessions, while tax rates fall in booms and increase in recessions.

The empirical analyses in this paper reveal an asymmetry in the reaction of fiscal policy to output fluctuations: fiscal policy is generally more procyclical in good times than in bad times, especially in developed countries. Other authors have also found such an asymmetry. [3] None of the above-mentioned theories are able to explain this result. It is particularly problematic for the borrowing constraints hypothesis, according to which we should expect fiscal policy to be procyclical in bad times when the credit constraints are most likely to become binding.

This paper offers a new explanation of the procyclical nature of fiscal policy. We set up a model in which fiscal policy is set by an incumbent politician who faces a trade-off between pleasing voters and abusing her powers for personal gain. The model builds on the tradition of retrospective voting models, which have their roots in Barro (1973), Ferejohn (1986) and Persson and Tabellini (2000 ch. 4). In particular, our model is closely related to the political agency model of Alesina, Campante and Tabellini (2008). In their model procyclicality comes from voters' attempt to "starve the Leviathan". When income increases voters demand more government consumption or tax cuts, fearing that the extra revenue that the economic upturn generates would otherwise be wasted on political rents. The key assumption behind this result is a complete lack of fiscal transparency: politicians are assumed to be able to hide the true size of the government deficit to voters, who are therefore also unable to observe the level of political rents.

[3] See for example Gavin and Perotti (1997), Persson and Tabellini (2003), Hercowitz and Strawczynski (2004) or Manasse (2006).

It is this restrictive assumption that we relax in our model. Specifically, we allow a positive degree of fiscal transparency, such that voters may detect an excessive deficit with some positive probability. This generates two new predictions. First, fiscal policy becomes asymmetric: departing from a low initial level, an increase in output will not lead to increased consumption demands. The reason is that the positive degree of transparency reduces the incentive for politicians to cheat voters, since there is now a positive risk of being exposed. Voters therefore rationally trust the incumbent to deliver a responsible fiscal policy, where increases in income are transmitted on to increases in the government surplus. As a consequence, fiscal policy becomes acyclical. When initial output is high, on the other hand, the reaction of fiscal policy to a further increase in output is different: the higher the level of income, the greater is the potential gain that the incumbent can obtain by cheating voters. In strong booms the incumbent can therefore not be trusted to deliver a responsible fiscal policy. The voters know this and the procyclical pattern of fiscal policy driven by voters' attempt to "starve the Leviathan" emerges. Thus, the model can explain the stylized fact from the empirical literature that fiscal policy is more procyclical in good times than in bad times. This is in contrast to Alesina, Campante and Tabellini (2008) where fiscal policy is always procyclical. The second main prediction from the model is that the higher the degree of fiscal transparency, the stronger the boom must be before fiscal policy becomes procyclical. Thus, we expect fiscal policy to be less procyclical in high-transparent countries. Alesina, Campante and Tabellini (2008) note that the procyclicality of fiscal policy is driven by politicians' ability to collect rents so fiscal policy should be more procyclical in more corrupt countries. However, their model does not explain which institutional factors influence the scope for corruption and, hence, the procyclicality of fiscal policy. The model in this paper suggests one such candidate, namely the degree of fiscal transparency. It is exactly through a

reduced incentive to collect rents that fiscal transparency diminishes the procyclicality of fiscal policy.

Fiscal transparency is the extent to which the general public can access truthful information about government budget matters. This issue has received increasing attention in recent years. Both the OECD and the IMF have implemented *Codes of Best Practice for Fiscal Transparency*, and The IMF and the World Bank publish Reports on Observation of Standards and Codes (ROSC) for the *Code of Best Practice for Fiscal Transparency* on a regular basis for a broad range of countries. We are not the first to introduce fiscal transparency into a model of fiscal policy. Milesi-Ferretti (2004) analyses the interaction of fiscal transparency and fiscal rules in the determination of fiscal policy. Shi and Svensson (2006) and Alt and Lassen (2006a, 2006b) have highlighted the role of fiscal transparency in the occurrence of political budget cycles. Fiscal transparency, so the argument goes, reduces the scope for manipulating the budget around election time, since the risk that such manipulations are detected is higher. The link described above between fiscal transparency and the cyclical behaviour of fiscal policy is something that we have not come across in the existing literature, however.

We then turn to the empirical evidence and test our model's predictions on two panel data sets: a sample of OECD countries and a sample of a broader range of countries. The evidence strongly confirms the asymmetry of fiscal policy in OECD countries, where government spending is much more procyclical in good times than in bad times. This does not appear to be the case in non-OECD countries. Our results indicate that fiscal transparency reduces the procyclical bias in good times in OECD countries, although the data also suggest an adverse effect in bad times. For the broad sample of countries, we find encouraging results in favour

of our hypothesis that fiscal policy is less procyclical in good times in countries where voters are better informed.

2 The Model

2.1 The Economic Environment

We consider a model with two time periods. The economy is populated by an incumbent politician in charge of fiscal policy and a number of identical voters. The utility function of the representative voter is given by

$$U = u(c_1, g_1) + \beta \cdot u(c_2, g_2) \tag{1}$$

where c_t and g_t are the per capita levels of private and government consumption in period *t*, respectively, and the parameter β is a discount factor. We assume that the period-utility is separable in private consumption and government consumption and that the utility of each type of consumption is given by a CRRA function:

$$u(c_t, g_t) = \frac{c_t^{1-\theta}}{1-\theta} + \frac{g_t^{1-\theta}}{1-\theta} \quad , \quad 0 < \theta < 1 \tag{2}$$

As in Alesina, Campante and Tabellini (2008), we assume that $c_t = (1-\tau_t)y_t$, where y_t is income per capita in period *t* and τ_t is the period *t* tax rate. Thus, we abstract from consumption smoothing via private credit markets. For simplicity, we ignore uncertainty about future income and assume that y_2 is known in period 1.

The government can issue debt in period 1 with full repayment, including interest, in period 2. Government revenue from tax- and debt financing may be spent in two different ways. First, the government can provide public consumption from which voters derive utility.

Second, resources may be spent on political rents. The most straightforward interpretation of political rents is that it is simply cash; the politician secures resources for herself by pocketing money taken from the government budget. However, the size of political rents could also be interpreted in a broad sense, namely as the extent to which the incumbent spends her time on campaigning, networking or leisure or engages in nepotism. The incumbent may also be tempted to spend resources on prestigious projects that serve no other purpose than boosting her own ego. Alternatively, political rents could be interpreted as the amount of contributions from lobbies and interest groups, which enrich the incumbent but lead to inferior policies that are hurtful to the voters. In short, political rents can be any kind of activity that is beneficial to the incumbent but directs resources away from the voters, to whom it is therefore wasteful. In this broad sense, a low level of rents should be interpreted as "good government".

With these assumptions the government budget constraints for the two periods (assuming no initial debt) become:

$$\begin{aligned} \tau_t \cdot y_1 &= g_1 - d_1 + r_1 \\ \tau_t \cdot y_2 &= g_2 + (1+\rho) d_1 + r_2 \end{aligned} \tag{3}$$

where d_1 is the budget deficit in period 1, ρ is the (constant and exogenous) interest rate and r_t denotes political rents in period t.

Like Alesina, Campante and Tabellini (2008) we assume that there is an upper limit to the size of the deficit, $\bar{d} > 0$, that cannot be exceeded. This assumption should be seen as a simplification of the general idea that even governments are restrained by some checks and balances that prevent them from driving deficits to extreme levels. It should be emphasised that these checks and balances are not necessarily imposed by financial markets. They could

also be thought of as some kind of democratic control that restrains the politicians holding office.[4]

We assume the following relationship between output in period 1 and period 2:

$$\begin{aligned} y_1 &= \bar{y} + \varepsilon \\ y_2 &= \bar{y} - (1+\rho)\varepsilon \end{aligned} \tag{4}$$

where $\bar{y}$ is a natural output level (or trend level) and ε is a short term fluctuation. This specification might seem odd at a first glance; after all, a positive output shock today does not necessarily imply a negative shock next year. However, the specification above allows us to focus on fluctuations in output, holding constant the present discounted value of life-time income. Seen from the point of view of the government, an increase in ε shifts revenue from period 2 to period 1, leaving the total discounted value of revenue unchanged. But this is exactly the kind of fluctuation we are interested in, since it allows a comparison between a flat time profile of income ($\varepsilon = 0$) against a fluctuating time profile ($\varepsilon \neq 0$). Thus, the specification in (4) should merely be seen as an easy way of focusing on what we are really interested in, namely how fiscal policy depends on the distribution across time periods of a given present discounted value of income.[5]

Obviously, the optimal policy as seen from the voters' point of view includes zero political rents, $r_1 = r_2 = 0$. Maximising voter utility with respect to g_1, g_2, c_1 and c_2, subject to (3), (4) and $c_t = (1-\tau_t)y_t$ yields the solution

$$c_1 = c_2 = g_1 = g_2 = \frac{1}{2}\bar{y} \tag{5}$$

[4] We could also interpret the upper limit on the deficit as a consequence of self-imposed fiscal rules such as the Stability and Growth Pact in the EMU or the balanced budget rules that exist in most US states.

[5] All results of the model still hold qualitatively if we assume no relation between y_1 and y_2. But then we get an additional effect of an increase in y_1 on fiscal policy, namely a wealth effect of higher total discounted revenue. Since this is not what we are interested in, we prefer the specification in (4).

where we have assumed $(1+\rho)^{-1} = \beta$.[6] The important point to note here is that the shock variable ε is nowhere present in the solution. The optimal consumption profile depends only on the present discounted value of income, not on the distribution across time periods. In this sense, the optimal fiscal policy is acyclical: because of voters' desire for consumption smoothing, private- and government consumption should not vary over the business cycle. Tax rates are then given by $\tau_t = 1 - \bar{y} \cdot (2y_t)^{-1}$. Thus, in response to a shift in output from period 2 to period 1, a social planner would raise taxes in period 1 and lower taxes in period 2 to keep private consumption unchanged. Finally, the optimal policy implies $d_1 = -\varepsilon$, so that all fluctuations in output are fully absorbed by the deficit.

2.2 The Political Environment

In the first period the incumbent chooses fiscal policy and the voters decide whether or not to re-elect her for period 2. After period 2, the incumbent has no possibility of re-election. Voters are backward-looking and condition their voting strategy on already observed outcomes only. Further, since all politicians are assumed to be identical (no adverse selection), elections serve the sole purpose of allowing voters to reward or punish the incumbent. Specifically, voters can choose to punish an ill-performing incumbent by electing an identical opponent.

As in Alesina, Campante and Tabellini (2008) and in most of the modern literature on electoral cycles[7] we assume that voters observe the levels of output, taxes, private consumption and government consumption before the election. Political rents cannot be observed. Further, the size of the deficit is not necessarily observable to the voters. This

[6] Assuming $(1+\rho)^{-1} \neq \beta$ does not change the results qualitatively, but complicates the algebra.

[7] See for example Alt and Lassen (2006a) or Shi and Svensson (2006).

captures the idea that the government can hide information about its borrowing needs from the public through various creative accounting techniques. For instance, the government may manipulate the official size of the deficit by strategically picking out which items should be kept in and out of the budget. In other words, there is a lack of transparency in the budget process. However, this lack of transparency is not complete: we assume that a deviation between the true deficit and the officially reported deficit is detected with a positive probability *p*, which is known to everyone. This is an important difference compared to Alesina, Campante and Tabellini (2008) who implicitly assume $p = 0$. Following Alt and Lassen (2006b), we interpret *p* as a measure of the degree of fiscal transparency.

The objective function of the incumbent is:

$$V = r_1 + \delta \cdot \frac{r_2}{1+\rho} \tag{6}$$

where δ is the probability that the incumbent is re-elected. Thus, the incumbent maximises the expected, discounted value of political rents.

The voters realise that the incumbent has an incentive to increase the deficit, raise taxes or lower government consumption in period 1 to increase political rents. They therefore condition re-election on observed performance by choosing reservation levels for government consumption, the tax rate and the deficit, g^*, τ^* and d^*, respectively. The probability that the voters will re-elect the incumbent is then given by:

$$\delta = \begin{cases} 1 & if\ g_1 \geq g^*, \tau_1 \leq \tau^*\ and\ no\ detection\ of\ d_1 > d^* \\ 0 & otherwise \end{cases} \tag{7}$$

Note that not detecting $d_1 > d^*$ can either mean that the incumbent did actually obey voter demands (so that $d_1 \leq d^*$), or that an excessive deficit ($d_1 > d^*$) went undiscovered, which

happens with probability 1-*p*. The key point is that voters cannot distinguish these situations from each other.

The strategy above differs from a traditional voting strategy in the literature of retrospective voting models, in which voters usually formulate their re-election rule in terms of a reservation *utility* level. Here, voters instead condition re-election directly on fiscal policy variables.[8] In comparison with Alesina, Campante and Tabellini (2008) the inclusion of a reservation level for the government deficit is also new. The reason is that in their model there is no chance of detecting an excessive deficit, since $p = 0$; setting a reservation level for the deficit is therefore pointless. Thus, allowing a positive value of p opens up for a more sophisticated voter strategy.

The incumbent observes voter demands and sets fiscal policy to maximise (6) subject to (7), the government budget constraint and the restriction $d_t \leq \bar{d}$. The incumbent has three options: she can (i) satisfy the voters' demands for government consumption and the tax rate as well as the size of the deficit and secure herself re-election, (ii) satisfy the demand for government consumption and the tax rate only, run an excessive deficit and hope that this will go undetected, or (iii) satisfy none of the demands and forego re-election with certainty. In the latter case we assume that there is a maximum level of rents, $\bar{r} > 0$, that the incumbent can extract without being caught and immediately exempt from office.[9] We further assume that $\bar{r}$ is sufficiently small relative to $\bar{y}$, such that $y_t - (1+\rho)\bar{d} \geq \bar{r}$, $t = 1, 2$ for all possible

[8] Persson and Tabellini (2000, ch. 4) consistently formulate the voters´ strategy in terms of utility. However, in a footnote they note that voters could actually do better if they formulate their strategy in terms of policy variables. The same is true in our model. By conditioning re-election on the size of the deficit, voters are implicitly choosing a reservation level for utility in period 2 also, since the deficit has direct consequences for the level of consumption in period 2.

[9] Alesina, Campante and Tabellini (2008) assume that the maximum amount of rents depends positively on the current level of output, such that the restriction is $r_t \leq \bar{r} + \gamma y_t$. Setting $\gamma = 0$ only has minor implications for our results, so we stick with this simpler version here. We solve the model with $\gamma > 0$ in the appendix.

realizations of ε. This assumption ensures that the incumbent always has the option of extracting maximum rents without driving private- or public consumption below zero.

The timing of the model is now as follows: (I) At the start of period 1 voters observe trend output $\bar{y}$ and the output shock ε. They then select the reservation values g^*, τ^* and d^* and the strategy in (7) is known by everyone hereafter. (II) The incumbent observes g^*, τ^* and d^* and chooses fiscal policy for period 1. (III) Voters observe the size of g_1 and τ_1. If the incumbent has set $d_1 > d^*$ this becomes known to everyone with probability p. (IV) Elections are held and the voters now vote according to their declared strategy in (7). In period 2 the elected politician chooses fiscal policy and the model ends.

2.3 Equilibrium Strategies

We start by looking at the optimal strategy for the incumbent, given the voters' reservation levels g^*, τ^* and d^*, using backwards induction. After the election the victorious politician has no re-election motive, so she will ignore any voter demands set political rents at the maximum value, $r_2 = \bar{r}$. We assume that once the incumbent has secured maximum rents, she ensures an optimal balance between public and private consumption with the remaining resources in period 2. This implies equality between the marginal utilities of public and private consumption, which in our case means $g_2 = c_2$. Coupled with the government budget constraint, this implies that $g_2 = c_2 = \left(\bar{y} - (1+\rho)(d_1 + \varepsilon) - \bar{r}\right)/2$.

We now look at each of the incumbent's three options in period 1: in option (i) the incumbent satisfies all voter demands and sets $g_1 = g^*$, $\tau_1 = \tau^*$ and $d_1 = d^*$. Using the government budget constraint in (3), this gives us that political rents are $r_1 = \tau_t(\bar{y} + \varepsilon) - g^* + d^*$. In option (i) the incumbent is re-elected with certainty, which has a

present value of $\bar{r}/(1+\rho)$. Thus, defining V_1 as the expected discounted value of political rents in option (i), we get:

$$V_1 = \tau^*(\bar{y}+\varepsilon) - g^* + d^* + \frac{\bar{r}}{1+\rho} \tag{8}$$

In option (ii) the incumbent does not satisfy the voters' demand for the size of the deficit. The incumbent will in this case set the deficit at its maximum value, $\bar{d}$, since this allows more rents to be extracted. Re-election now only occurs if the excessive deficit is undiscovered, which happens with probability $1-p$. Defining V_2 as the expected discounted value of political rents in option (ii) we have

$$V_2 = \tau^*(\bar{y}+\varepsilon) - g^* + \bar{d} + (1-p)\frac{\bar{r}}{1+\rho} \tag{9}$$

Finally, the incumbent always has the option of completely disregarding the voters' demands. In this case she will set rents and the deficit at their maximum values in period 1 and forego re-election. Defining V_3 in the same way as V_1 and V_2:

$$V_3 = \bar{r} \tag{10}$$

Voters must now choose optimal values of g^* and d^* such that the incumbent chooses option (i).[10] We can then state the problem of the voters as:

$$\underset{g^*,\tau^*,d^*}{Max} \ \frac{\left((1-\tau^*)(\bar{y}+\varepsilon)\right)^{1-\theta}}{1-\theta} + \frac{g^{*1-\theta}}{1-\theta} + 2\beta \cdot \frac{\left(\left(\bar{y}-(1+\rho)(d^*+\varepsilon)-\bar{r}\right)/2\right)^{1-\theta}}{1-\theta} \tag{11}$$

$$s.t.\ V_1 \geq V_2 \ \ and \ \ V_1 \geq V_3$$

where we have inserted the expressions for c_2 and g_2 found above. Using equations (8)-(10) and $(1+\rho)^{-1} = \beta$ we can write the two constraints in this problem as

[10] It is never optimal for the voters to choose reservation values such that the incumbent chooses option (ii) or option (iii). A proof of this claim can be obtained upon request.

$$V_1 \geq V_2 : \tau^*(\bar{y}+\varepsilon) - g^* + d^* + \frac{1}{1+\rho}\bar{r} \geq \tau^*(\bar{y}+\varepsilon) - g^* + \bar{d} - p\frac{1}{1+\rho}\bar{r} \Leftrightarrow p\beta\bar{r} \geq \bar{d} - d^*$$
$$V_1 \geq V_3 : \tau^*(\bar{y}+\varepsilon) - g^* + d^* + \frac{1}{1+\rho}\bar{r} \geq \bar{r} \Leftrightarrow \tau^*(\bar{y}+\varepsilon) - g^* + d^* \geq (1-\beta)\bar{r} \qquad (12)$$

It is fairly easy to see that the constraint $V_1 \geq V_3$ must be binding in equilibrium. If this constraint were satisfied with strict inequality the voters could raise g^* or lower τ^* without violating either of the constraints and we must therefore have $V_1 = V_3$ in equilibrium. In contrast, it is of great importance to the equilibrium outcome whether the constraint $V_1 \geq V_2$ becomes binding or not.

In the appendix we show that the values of the deficit, consumption and tax rates that solve the problem in (11) are given by

$$\begin{aligned} c_1 &= c_2 = g_1 = g_2 = \left(\bar{y} - (1+\beta)^{-1}\bar{r}\right)/2 \\ d_1 &= -\varepsilon - \beta^2(1+\beta)^{-1}\bar{r} \\ \tau_1 &= 1 - \left(\bar{y} - (1+\beta)^{-1}\bar{r}\right)\left(2(\bar{y}+\varepsilon)\right)^{-1} \\ \tau_2 &= 1 - \left(\bar{y} - (1+\beta)^{-1}\bar{r}\right)\left(2(\bar{y}-\beta^{-1}\varepsilon)\right)^{-1} \end{aligned} \qquad \text{if} \quad \varepsilon < \left(p - \frac{\beta}{1+\beta}\right)\beta\bar{r} - \bar{d} \qquad (I)$$

and

$$\begin{aligned} c_1 &= g_1 = \left(\bar{y} + \varepsilon + \bar{d} - (1-(1-p)\beta)\bar{r}\right)/2 \\ c_2 &= g_2 = \left(\bar{y} - \beta^{-1}(\varepsilon + \bar{d}) - (1-p)\bar{r}\right)/2 \\ d_1 &= \bar{d} - p\beta\bar{r} \\ \tau_1 &= 1 - \left(\bar{y} + \varepsilon + \bar{d} - (1-(1-p)\beta)\bar{r}\right)\left(2(\bar{y}+\varepsilon)\right)^{-1} \\ \tau_2 &= 1 - \left(\bar{y} - \beta^{-1}(\varepsilon + \bar{d}) - (1-p)\bar{r}\right)\left(2(\bar{y}-\beta^{-1}\varepsilon)\right)^{-1} \end{aligned} \qquad \text{if} \quad \varepsilon \geq \left(p - \frac{\beta}{1+\beta}\right)\beta\bar{r} - \bar{d} \qquad (II)$$

Using the government budget constraint, we then find that political rents are in both of the above solutions given by $r_1 = (1-\beta)\bar{r}$. If the shock to output in period 1 is sufficiently small, such that relative to period 2 the economy is in a recession or a modest boom, the solution in

(I) applies. This solution is similar to the solution of the social planner: fluctuations in output are transmitted directly into the budget surplus, with no effect on the time profile of government consumption. Tax rates increase with output in order to smooth private consumption. Thus, fiscal policy is acyclical. Compared to the solution of the social planner, the only difference is the lower level of government consumption, which is due to a positive level of political rents. This is necessary to keep the incumbent from choosing option (iii) above.

The solution in *(II)*, which applies in case of a high value of ε, is very much different from the social planner's solution, however. Fluctuations in output are not smoothed at all. An increase in ε now has no effect on the deficit. The tax rate in period 1 may go up or down as output increases, depending on the initial level, but private consumption increases unambiguously. Government consumption also rises in period 1 as ε increases. The lower level of revenue in period 2 then implies that private- and government consumption in period 2 falls. The timing of output now matters for the time profile of consumption and fiscal policy becomes procyclical.

So when does which solution apply? Technically, the difference between solution *(I)* and solution *(II)* is that the constraint $V_1 \geq V_2$ is binding in solution *(II)*, whereas it is satisfied with strict inequality in solution *(I)*. On a more intuitive level, the decisive condition on ε reveals an interesting prediction: fiscal policy becomes procyclical only when the economy is in a boom. Consider a shift in output from period 2 to period 1, i.e. an increase in the shock variable ε. Ideally, this should have no effect on the time profile of consumption, since such a shift does not affect the intertemporal government budget constraint. To smooth consumption, voters would therefore prefer a smaller deficit in period 1 when ε increases. This is exactly what happens when the economy is in a recession: departing from a low value,

a small increase in ε makes voters require a smaller budget deficit and unchanged levels of private- and government consumption in exchange for their vote. To secure herself re-election, the incumbent willingly satisfies the voters' demands and fiscal policy becomes acyclical.

If the economy is in a boom things are different: ideally, voters would now like to run a budget surplus in order to smooth consumption over the two time periods. But the high level of revenue during a boom provides the incumbent with an alternative that is too tempting to resist: since there is a chance an excessive deficit will go undetected, the incumbent will be tempted to drive the deficit to its maximum and pocket the bulk of the extraordinarily high revenue. In technical terms, the temptation to choose option (ii) instead of option (i) is too big. The constraint $V_1 \geq V_2$ now becomes binding. Realising this, voters will adjust their demands in such a situation. So when output increases further, voters now demand higher levels of consumption instead of a deficit reduction. The result is that fiscal policy now reacts strongly to output fluctuations in a procyclical manner. In sum, the model predicts that there is an asymmetry in the cyclical behaviour of fiscal policy: during recessions fiscal policy is acyclical. During booms, however, the political agency problem becomes more severe and fiscal policy becomes procyclical.

We now focus on the transparency variable *p*. The condition on ε for the solution in *(I)* to apply can be rewritten as $p \geq (\bar{d} - d_1)\beta\bar{r}$, where $d_1 = -\varepsilon - (1+\beta)^{-1}\beta^2\bar{r}$ is the solution for the deficit given in *(I)*. First, as a benchmark, consider the case $p = 0$: since d_1 is by definition smaller than $\bar{d}$, the inequality above is never satisfied for $p = 0$. Thus, we conclude that fiscal policy is always procyclical when fiscal transparency is completely absent, which is also the case in Alesina, Campante and Tabellini (2008). However, with a positive value of *p* the inequality may be satisfied. Let $\tilde{\varepsilon} \equiv (p - \beta(1+\beta)^{-1})\beta\bar{r} - \bar{d}$ be the maximum value of the

shock ε that is consistent with solution *(I)*. A higher value of p increases this critical value, such that for any distribution of ε, a higher p increases the probability that solution (I) applies. A higher degree of transparency makes procyclical fiscal policy occur less frequently, as illustrated in Figure 1 below. To understand this result, remember that fiscal policy becomes procyclical in good times because voters rationally adjust their consumption demands upwards, fearing that the incumbent would otherwise waste the high level of revenue on political rents and run an excessive deficit. But a higher degree of transparency makes it less attractive to run an excessive deficit for the incumbent, since it increases the risk of being exposed. Thus, the higher the degree of transparency, the stronger must the boom be before the incumbent falls into temptation and runs a maximum deficit. This implies that voters will be willing to trust the incumbent with a larger amount of resources before they alter their consumption demands. In countries with a high degree of fiscal transparency we should therefore expect to see a procyclical reaction of fiscal policy in strong booms only. In countries with a low degree of transparency, on the other hand, procyclical fiscal policy could occur at a much higher frequency.

[Figure 1 about here]

2.4 Discussion

The reason that fiscal policy is only procyclical in good times according to our model is that the temptation to cheat voters is stronger in booms. This is due to the fact that the amount of available resources is higher in booms than in recessions. For this to be a convincing story for developed countries we must emphasise the broad interpretation of political rents: when the level of income rises the incumbent can deliver the same levels of consumption with less effort, requiring a less careful conduct of fiscal policy, and with more room for superfluous

spending on "ego-boosting" projects etc. Moreover, the model captures a general mechanism, which we believe is important in developed countries, namely that the pressure on the government from outside watchdogs such as the media, the opposition, international organisations and various interest groups is plausibly much stronger in recessions than in booms. Thus, the major benefit to the incumbent of a strong economy is the quiet life: with attention removed from budgetary issues it becomes easier to engage in all the activities that we have previously labelled as "extracting rents". The result, just as in our model, is that the temptation to increase rent extraction at the expense of a deficit reduction is higher in booms than in recessions. This is exactly what drives the asymmetric cyclical response of fiscal policy, since rational voters will then only demand a procyclical pattern in good times, when the temptation to cheat would otherwise dominate the fear of not earning re-election.

2.5 Discretionary versus automatic responses

In the empirical analyses in the following sections we distinguish discretionary fiscal policy responses from the effects of "automatic stabilisers". We must therefore be precise about what our model predicts for each of these two types of responses to output fluctuations.

In our model, economic fluctuations has an "automatic" impact on the government budget through the revenue side only, so all changes in government spending are by definition discretionary. On the other hand, changes in government revenue consist of an automatic effect, which occurs even in the absence of changes to the policy variables, and a discretionary response, which is entirely due to changes in the tax rate. We can break down the total period 1 revenue response to an increase in ε as follows:

$$\frac{\partial(\tau_1 y_1)}{\partial \varepsilon} = \frac{\partial \tau_1}{\partial \varepsilon} \cdot (\bar{y} + \varepsilon) + \tau_1 = \begin{cases} \dfrac{\bar{y} - (1+\beta)^{-1}\bar{r}}{2(\bar{y}+\varepsilon)} + \left(1 - \dfrac{\bar{y} - (1+\beta)^{-1}\bar{r}}{2(\bar{y}+\varepsilon)}\right) = 1 \ \text{if} \ \varepsilon < \tilde{\varepsilon} \\ \dfrac{\bar{d} - (1-(1-p)\beta)\bar{r}}{2(\bar{y}+\varepsilon)} + \left(1 - \dfrac{\bar{y} + \varepsilon + \bar{d} - (1-(1-p)\beta)\bar{r}}{2(\bar{y}+\varepsilon)}\right) = \dfrac{1}{2} \ \text{if} \ \varepsilon \geq \tilde{\varepsilon} \end{cases}$$

The first term in each line corresponds to the discretionary response, while the second term corresponds to the automatic effect. According to our model, total revenue always increases when output rises, but less so in good times. The discretionary revenue response is positive in bad times because the tax rate goes up when output goes up. In contrast, it may be positive or negative in good times, reflecting the ambiguous effect on the tax rate in this case. Table 1 summarizes the model's predictions for discretionary as well as total responses of three key fiscal variables.

[Table 1 about here]

The category "surplus" corresponds to the primary surplus, which is defined as the difference between total revenue and total government expenses (consumption plus rents), excluding interest payments. The discretionary response of the primary surplus is equivalently defined as the difference between the discretionary revenue response and the discretionary expenditure response. It is worth noting that although the tax rate may in good times go up in response to an increase in output, the effect from the expenditure side dominates, so that the discretionary response of the surplus is unambiguously negative in good times.

We expect a higher degree of fiscal transparency to pull all fiscal variables in a countercyclical direction in good times. For spending variables this means that the positive sign in good times should become weaker as the degree of transparency increases. The model predicts that there is no effect of fiscal transparency on the cyclicality of fiscal policy in bad

times. In practice, the validity of this prediction depends on how we define good times and bad times. But the essential message from the model is that the effect of fiscal transparency should be stronger in good times than in bad times, for any reasonable definition of these terms.

3 Empirical Methodology

We next turn to the data to test the implications of the model presented in the previous section. We do this on two different panel data sets: the first data set consists of annual observations for 21 OECD countries in the period 1989-2003.[11] The second data set broadens the sample of countries and the time period considered, covering 59 countries in the years 1980-1998. The sample of countries corresponds to Persson and Tabellini's (2003) data set.

To uncover the causal effect from business cycle fluctuations to fiscal policy we regress a fiscal indicator variable on a cyclical indicator interacted with variables of interest and a range of control variables. Moreover, we include a lag of the dependent variable to take into account any lags in the political decision process. We also include time- and country fixed effects. Thus, the baseline specification of the fiscal policy equation that we estimate is

$$F_{i,t} = \alpha_0 + \alpha_1 \cdot F_{i,t-1} + \boldsymbol{\beta' Y_{i,t}} + \boldsymbol{\gamma' X_{i,t}} + \eta_i + \lambda_t + v_{i,t} \quad , \quad i = 1,2,...,N \, , \, t = 2,....T \qquad (13)$$

where $F_{i,t}$ is our indicator of fiscal policy. $\boldsymbol{Y_{i,t}}$ denotes a vector containing one or more interaction terms between the cyclical indicator and some variable of interest. The vector $\boldsymbol{X_{i,t}}$ denotes a set of control variables. We estimate equation (13) using OLS and Within. However, it is well known that both these estimators are biased in the presence of a fixed

[11] The countries are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland Ireland, Italy, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and USA.

effect and a lagged dependent variable. To account for this we also use the GMM system estimator developed in Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998). In addition, to account for the possible reverse causality running from fiscal policy to macroeconomic conditions we always instrument the cyclical indicator with its own lags.

4 The Data

Indicator of Fiscal Policy: As our measures of fiscal policy we focus on government expenditure.[12] To isolate the discretionary part of fiscal policy we use cyclically adjusted current disbursement excluding interest (from the OECD EO data base)[13] as our fiscal indicator for the OECD sample. To allow for comparisons across countries we express our fiscal variables relative to trend GDP. We use trend GDP instead of actual GDP to avoid ambiguities with the interpretation of the $\boldsymbol{\beta}$ coefficients, which occurs when dividing the fiscal indicator with a variable that fluctuates over the business cycle.[14] For the broader sample of countries only unadjusted fiscal data is available and so we use government spending relative to GDP from the Persson and Tabellini data set. When using unadjusted data, a note of caution is in order: the working of automatic stabilizers will pull our estimates in a countercyclical direction. We therefore concentrate on the relative size of the coefficients

[12] Corresponding results for government surplus and revenue are not reported but are available upon request.

[13] All fiscal variables used in the OECD sample are general government budget variables from the OECD Economic Outlook (EO) database

[14] Remember, that we defined a procyclical fiscal policy as a policy where an increase in economic activity leads to discretionary policy changes in the form of a higher level of government spending and/or tax cuts. If expenditure increases with economic activity the expenditure to GDP ratio may increase, decrease or stay unchanged when income rises. Thus, any sign of β could be consistent with a procyclical policy when expenditure is expressed relative to actual GDP. Dividing with trend GDP solves this problem, since trend GDP does not vary over the business cycle. For trend GDP we use OECD's calculation of potential GDP (using the production function method) available in the OECD EO database. For the Persson and Tabellini sample potential GDP is not available and so we divide with actual GDP, keeping in mind the caveats that arise from doing so.

within the $\boldsymbol{\beta}$ vector, and not so much on the actual signs of the individual $\boldsymbol{\beta}$ coefficients in this case.

Cyclical Indicator: For the OECD sample we use the output gap (OECD EO database) as our cyclical indicator. For the broader sample of countries we use the output gap from the Persson and Tabellini data set (based on HP filtering). Our model predicts that the response of fiscal policy to economic fluctuations during good times differs from the response in bad times. We therefore interact the output gap with dummy variables for good times (positive output gap) and bad times (negative output gap). We also include the dummy for positive output gap (d^{pos}) in the regression to control for any level differences in government spending.[15]

Fiscal transparency: In addition we also include a measure of fiscal transparency interacted with the output gap (in both good and bad times). For our OECD sample we use the fiscal transparency index developed in Alt and Lassen (2006b). This index ranges from 0 to 11 where each point represents an affirmative answer to a question concerning fiscal transparency sent to all budget directors of OECD member countries. The questions are presented in table 3.[16] For the broader sample of countries no explicit index for fiscal transparency is available. However, our theoretical prior is that a higher degree of fiscal transparency reduces the procyclicality of fiscal policy through an improvement of the voters' ability to monitor the actions of the incumbent. Such an improvement of the monitoring technology may come about through other channels than direct reforms of the budget procedure. First of all, we expect the media to play a key role in this respect. Greater popular

[15] A similar approach is used in Hercowitz and Strawczynski (2004) and Persson and Tabellini (2003). However, these authors do not include the level dummy for positive output gap.

[16] Compared to Alt and Lassens's index we drop the question shown in column (6) in Table 3 due to missing observations for Greece, Portugal and Spain. Further, we also include the question in column (11). Note that the index is constant over time.

access to independent media is likely to enhance the general public's insight into fiscal affairs. Shi and Svensson (2006) develop an indicator to proxy for the share of informed voters in the population. The indicator is the product of the number of radios per capita and a dummy variable equal to one if the country is classified as having freedom of broadcasting (based on information from Freedom House). We use this indicator, which is available for 54 countries in our sample in the years 1980-1995.

Exogenous control variables: The vector $X_{i,t}$ contains the control variables used in our benchmark specification, of which many have become standard in cross-sectional and panel data studies of fiscal policy. We use the following benchmark control variables: the demographic dependency ratio, the sum of exports and imports as a ratio to GDP, the inflation rate, a dummy for election year, a measure of trend or structural unemployment, the government debt to GDP ratio in the previous year, a dummy for majoritarian electoral system and the natural log of trend real GDP per capita. In the broad sample we also include a dummy for democracy and a dummy for presidential form of government. By default we include time dummies to control for sample-wide exogenous shocks. However, we sometime remove these dummies to restore degrees of freedom. For the OECD sample the data for inflation, NAIRU and government debt are from the OECD EO database, the dummies for election year and majoritarian systems are taken from the Persson and Tabellini data set and the IEFS election guide[17]. The data for trend income, openness to trade and the dependency ratio are from WDI (2005). For the broader sample we use the Persson and Tabellini data set as the source except for inflation and trend income, which is taken from WDI (2005). Due to lack of data availability trend unemployment and debt are omitted from the regressions based on this sample.

[17] Data for elections after 1998 are taken from the IEFS Election guide.

5 Empirical Evidence from OECD Countries

5.1 Fiscal Policy and Asymmetric Responses to Economic Activity

Columns (1) to (6) in Table 2 show estimation results for cyclically adjusted government spending for the OECD countries. Columns (1)-(3) report the results using a specification where the output gap is included without any interaction terms. The coefficient on *gap* is statistically insignificant in all three columns, indicating that government spending is acyclical. This is in line with what previous studies have found for the OECD countries (e.g. Talvi and Végh (2005) and Alesina, Campante and Tabellini (2008))[18]. However, this result comes about from mixing up two regimes. Columns (4)-(6) split the output gap into good and bad times and include a dummy for positive output gap. The result from doing so is striking. The coefficient on the output gap interacted with a dummy for good times ($gap \cdot d^{pos}$) is clearly positive and highly significant for all estimators considered. The corresponding coefficient for bad times is insignificant and very close to zero. Thus, government spending seems to be procyclical in good times and acyclical in bad times, which is in line with our model's predictions.[19] Our estimates suggest that, during good times, the increase in government spending in reaction to a one percentage point increase in the output gap could be as large as one percent of potential GDP. The lowest estimate (GMMSYS) suggests an increase of about

[Table 2 about here]

[18] Previous studies obtaining this result often use cyclically unadjusted variables as well as using dependent variables relative to GDP, rather than trend or potential GDP.

[19] Looking at government revenue we do not find the same clear asymmetric response, in fact, revenue seems acyclical or counter cyclical in good times. The results for the government surplus are similar to the spending results, only weaker, and we therefore conclude that this procyclical result comes from the spending side of the government budget.

0.25 percent of potential GDP. The level dummy d^{pos} is negative, indicating that spending drops a little in level when the output gap becomes positive, however, the coefficient is not significant. [20]

In Column (7) we consider the unadjusted current disbursements as the dependent variable. This serves as a robustness check since as explained above, we expect the results to be pulled in a countercyclical direction due to the presence of automatic stabilisers. The result is the same clear profile as with the adjusted data: government spending is significantly more procyclical in good times than in bad times. In columns (8) to (10) we look at subcomponents of (unadjusted) government spending. Government consumption is procyclical in good times, and more so than in bad times, although the difference is less pronounced than for overall spending. Even Social Security Benefits, which we would expect to be heavily influenced by automatic stabilisers, display a procyclical behaviour in good times (and countercyclical behaviour in bad times).

5.2 Fiscal Transparency

The next step of our analysis is to include a measure of fiscal transparency in our econometric specification. We start by interacting the output gap in good and bad times with each of the dummies used to construct the transparency index in Alt and Lassen (2006b), using one dummy at a time.[21] The results are summarised in

[20] To test whether our results are affected by the introduction of the EMU, we experimented with including an interaction term between a dummy for EMU participation (equal to 1 after 1994) and the output gap in good and bad times. The results suggested that the procyclical response in good times is halved from EMU membership, but the coefficient on $gap \cdot d^{pos}$ was in all cases still positive and significant. The effect of EMU participation in bad times was insignificant for OLS and Within, however, GMMSYS suggested that spending policies are more countercyclical in bad times in EMU countries.

[21] We present the results for 12 questions on transparency (the dummies are equal to 1 in case of transparency). The index used in Alt and Lassen (2006b) includes 11 of these questions, since the question in column 11 in

Table 3 is not included in their original index.

Table 3 below: using the GMMSYS estimator we find that most of the fiscal transparency dummies reduce the procyclicality of cyclically adjusted spending in good times. Some questions have a very clear significant effect: a legal requirement of an ex post comparison between projected and actual expenditures (question [5]) reduces the procyclicality of spending in good times, and this effect is significant at the 1% level. The same strong effect appears if the government is required to produce actuarial estimates for social security spending (question [11]). The first of these results fits particularly nicely with our theoretical priors: large discrepancies between projected and actual spending seem like a strong warning sign that the government may be trying to hide a large deficit. Thus, a legal requirement of an ex post comparison makes it quite likely that "cheating" governments will be exposed. We therefore believe that this question picks up the idea behind our model parameter of fiscal transparency, p, quite accurately and the accordance with our theoretical priors is encouraging.

Next we move on to consider the aggregation of the dummies in Table 3 into a full index ($transp^{11}$).[22] Columns (1)-(3) in Table 4 show the results for cyclically adjusted government spending. The coefficient on $transp^{11}$ interacted with the output gap in good times is negative and significant at a 10% level. This is in nice accordance with our theory: a back-of-the-envelope calculation suggests that in a country scoring zero in the transparency index, government spending increases by 0.32 percent of potential GDP in reaction to an increase of 1 percentage point in the output gap during good times. The corresponding reaction in a country at the other end of the transparency scale is an increase of $0.32 - 11 \cdot 0.029 = 0.00$. Thus, going from a complete lack of transparency to full disclosure eliminates the procyclical reaction of government spending in good times.

[22] We drop question 6 in all cases due to missing observations.

One result that apparently goes against our model's predictions is the result for the question in column 9 in Table 3, which suggests that fiscal policy becomes *more* procyclical in good times if the budget discusses the impact of variations in key economic assumptions on the budget outcome. However, we are not convinced that this unambiguously reflects a higher degree of fiscal transparency: discussions of key economic assumptions may be used to divert attention from the most likely outcome by side ordering several different scenarios. Stating such multiple budget scenarios without a proper weighting of relevance can be seen as a move away from the principle of 'one bottom line' (Poterba and von Hagen [1999]). In this way, a "discussion of key economic assumptions" can be a convenient euphemism for submitting multiple scenarios, with the purpose of clouding, rather than clarifying, the actual budgetary prospects. In light of this ambiguity, we tried removing this question from the

[Table 3 and Table 4 about here]

transparency index. The resulting index is labeled $transp^{10}$ in Table 4. We obtain a negative and significant (at a 5% level) coefficient on the term interacting this transparency index with the output gap in good times. Thus we confirm the above spending profile and effect of transparency, but with question 9 omitted from the index the statistical significance is much stronger.

So far we have avoided the results for transparency in bad times. The story is not quite as we expected: in most estimations we find that the coefficient on the interaction between the output gap in bad times and the transparency indices are positive and significant (on a 1% level). This suggests that fiscal policy in bad times becomes more procyclical when transparency increases. This does not square with our theory. Taken at face value, our results indicate that the countries that have a high degree of fiscal transparency are also the countries that have been most prone to running procyclical policies during bad times. However, it is

likely that the high degree of fiscal transparency is caused by the exact same procyclical policies, rather than the other way around. In other words, we suspect that the counterintuitive sign arises due to a problem of reverse causality. Procyclical fiscal policies during recessions can be extremely damaging and may trigger reforms that increase the degree of fiscal transparency. If this is indeed the case, and we estimate an equation like (13) with a time invariant measure of fiscal transparency, we may falsely conclude that the causation runs in the opposite direction, that is, that a higher degree of fiscal transparency leads to a procyclical fiscal policy during periods of low economic activity. In the lack of obvious candidates for instrumental variables we do not attempt to correct this problem. Rather, we advice that the potential endogeneity of fiscal transparency should be kept in mind when interpreting our results. Note however, that the main driver behind this result seems to be question 3 in Table 3, whereas the effect seems much weaker for the other questions. Also note that this type of bias is also likely to affect our results for good times. This cannot explain the obtained results, however. On the contrary, the presence of such reverse causality in good times would work against our theoretical priors and pull the coefficient on $transp^{j} \cdot gap \cdot d^{pos}$ in a positive direction. On this background, the obtained negative coefficients are even more noteworthy.

As another robustness check we also consider the effect of transparency when using the unadjusted current disbursements as the dependent variable. From Table 4 we see now that we obtain a negative and significant coefficient (at a 1% level) on $transp^{11} \cdot gap \cdot d^{pos}$. The results are only further confirmed when using $transp^{10}$. The same effect is present in the subcomponents of spending, although it seems to be somewhat weaker for social security benefits (insignificant but with the correct sign). The effect of fiscal transparency on the procyclicality of fiscal policy in good times seems to be stronger when using unadjusted data

than when using adjusted data. This suggests that the degree of fiscal transparency matters not only for the discretionary part of fiscal policy, but also for the strength and magnitude of automatic stabilisers.[23]

6 Evidence from a Broader Sample of Countries

We next move on to consider the evidence of asymmetric spending policies and the effect of voter information in a broad sample of countries. Having a sample of both developed and developing countries enables us examine whether fiscal policy is inherently less procyclical in developed countries than in developing countries, as claimed in some studies.[24]

6.1 Asymmetries in Fiscal Policy

In Table 5 we look at the cyclical response for government expenditure. The coefficients on the output gap in columns (1)-(3) are all positive, albeit only mildly statistically significant in column (2). Remember that the sign of the coefficient on the output gap generally does not have an unambiguous interpretation when the dependent variable is cyclically unadjusted and in percent of actual GDP. However, a positive coefficient when the dependent variable is government spending to GDP provides a single exception from this rule, since the positive relationship can neither be caused by automatic stabilisers, nor by the division by actual GDP (both should pull in the direction of a negative relationship). Thus, there is in fact evidence of a procyclical spending pattern among the countries considered in this section.

[23] Large automatic stabilisers make the government budget more sensitive to fluctuations in economic activity. In good times this implies that a larger amount of resources are left at the discretion of the incumbent. Our theory suggests that voters will only accept this if fiscal policy is sufficiently transparent. Thus, it is possible that greater fiscal transparency makes voters more willing to accept large automatic stabilisers (more generous unemployment benefits and higher tax progression), yielding a more countercyclical fiscal policy. In this sense, fiscal transparency could also have a long term effect by altering the legislation that governs the automatic stabilisers, which again has an effect on the short term stabilisation of the economy.

[24] See e.g. Gavin and Perotti (1997) and Talvi and Végh (2005).

Splitting the output gap variable into positive and negative values as in columns (4)-(7) only provides very weak evidence of an asymmetry in the spending pattern – unlike in the OECD sample. The coefficient on the output gap in good times is in all columns except (7) higher than the coefficient on the output gap in bad times, but in all cases a t-test fails to reject the hypothesis that they are in fact equal.

6.2 OECD Countries versus Non-OECD Countries

Judging from the results in the previous section, it seems that the results that we obtained for the OECD countries do not apply to a more heterogeneous group of countries. We now explore this issue in further detail, explicitly distinguishing OECD countries from non-OECD countries. In Table 6 columns (1)-(3) we find indications of a procyclical pattern in OECD countries which does not seem to be present in non-OECD countries. This is in contrast to earlier results in the literature, e.g. the results in Talvi and Végh (2005). Note however, that the hypothesis of equal output gap coefficients in the spending equation for the two groups of countries is only rejected in column (1).[25] In columns (4)-(8) we dig deeper into the spending policy differences between OECD and non-OECD countries. In addition to separating OECD countries from non-OECD countries we now also distinguish good times from bad times. Since the Within estimates in column (5) are very large and imprecisely determined, we report results from a Within estimation where the level dummies for positive output gaps have been removed in column (6). The GMMSYS estimates in column (7) have high standard errors and we therefore also report GMMSYS estimates omitting time dummies in column

[25] Looking at the surplus we find that in OECD countries, the budget surplus in percent of GDP seems to be unrelated to the output gap, whereas there is a clear negative relationship between these variables in non-OECD countries, despite the presence of automatic stabilisers in the dependent variable (note, this difference might be due to differences in the size of automatic stabilisers for the two groups, since we expect automatic stabilisers to have a stronger effect on overall fiscal policy in the OECD countries). Looking at revenue, we find solid evidence of a more procyclical pattern of government revenue in non-OECD countries than in OECD countries. Hence the procyclical pattern for the surplus in non-OECD countries stems from the revenue side.

(8). The coefficient on $gap \cdot d^{pos} \cdot OECD$ is positive in all cases and statistically significant in all other columns than (5) and (7). The coefficient on $gap \cdot (1 - d^{pos}) \cdot OECD$, on the other

[Table 5 about here]

hand, has an alternating sign and is never statistically significant. We are able to reject a null hypothesis that the two coefficients are equal against a one-sided alternative (again, with the exception of columns (5) and (7)). Hence, the data suggest that government spending policies are procyclical in good times in OECD countries. There is no solid evidence of the same procyclical pattern in bad times. This confirms the results from the OECD sample. A similar asymmetry does not seem to be present in non-OECD countries. The coefficients on $gap \cdot d^{pos} \cdot nonOECD$ and $gap \cdot (1 - d^{pos}) \cdot nonOECD$ are never statistically significant and we fail to reject the hypothesis that they are equal in all cases.[26]

6.3 Fiscal Policy and Voter Information

In Table 6 columns (9) and (10) we interact the Shi and Svensson (2006) indicator, *INFO,* with the output gap in good and bad times to explore the effect of voter information on the cyclicality of government spending. *INFO* is highly correlated with the dummy variable for OECD countries, with a correlation coefficient of 0.54. Thus, to obtain reliable estimates of the effect of increased media access we must control for OECD membership, since we have seen that the cyclical pattern of fiscal pattern is very different in OECD countries than in non-

[26] The results for the budget surplus are very similar to the ones for spending. We do not find any solid evidence of an asymmetric cyclical pattern in government revenue, neither among OECD countries, nor among non-OECD countries. It is worth noting, however, that there are weak signs of a negative relationship between government revenue and the output gap in bad times in non-OECD countries. Thus, the negative relationship between the surplus to GDP ratio and the output gap in this group of countries (see note 25) seems to work through the revenue side of the government budget in bad times, rather than the expenditure side in good times.

OECD countries.[27] This involves a great number of interaction terms with the output gap. At the same time, the inclusion of *INFO* means that the number of observations available for analysis falls. Combining these two things, we fear that we may be stretching the data too far and we therefore choose to omit time dummies in order to restore degrees of freedom. The OLS estimates in column (9) and the GMMSYS estimates in column (10) both suggest that high-information countries run less procyclical spending policies in good times. The effect of a higher value of *INFO* is quite large and statistically significant at the five percent level in both cases. There does

[Table 6 about here]

not seem to be a similar effect in bad times, at least not of the same magnitude. Further, the positive coefficients on $gap \cdot d^{pos} \cdot nonOECD$ indicate that low-information countries among the non-OECD members also run procyclical spending policies in good times.[28]

A final note concerns the role of voter information versus the role of corruption. Alesina, Campante and Tabellini (2008) find evidence that fiscal policy is more procyclical in countries with widespread corruption. In column (11) of Table 6 we confirm this finding, using the same control of corruption measure as Alesina, Campante and Tabellini.[29] However, the results in column (12) show that the significant sign on the control of corruption measure vanishes when we also control for voter information. The effect of *INFO* is largely unaffected by the inclusion of control of corruption and still significant in good times. These observations are consistent with the argument of this paper: a higher degree of

[27] We have also tried running estimations with *INFO* included without controlling for OECD membership. The results were similar to the results in section 6.2, with *INFO* playing the same role as *OECD* did in section 6.2. We suspect that this merely reflects the strong correlation between *INFO* and *OECD*, rather than a true causal effect of *INFO*.

[28] As a robustness check we included terms of trade as exogenous variable as done in e.g. Gavin and Perotti (1997). All our main results were roughly unaffected.

[29] See Kaufmann, Kraay and Mastruzzi (2006) for details on the World Bank corruption measure.

voter information reduces the scope for corruption and thereby also reduces the degree of procyclicality.

7 Interpreting the Results

Panel A in Figure 2 illustrates the impact of output fluctuations on the level of government spending in a typical OECD country, based on the coefficients reported in Table 2. The figure is constructed such that an output gap equal to zero corresponds to a neutral effect on government spending. The picture drawn here is in many ways reminiscent of figure 1, which illustrated the profile of government spending according to the model that we presented in section 2: fiscal policy is more or less acyclical when the output gap is negative, but reacts procyclically to changes in income when the output gap is positive. Panel A shows a level drop in government spending at a zero output gap in OECD countries, which we do not model theoretically, but this is quite small and statistically insignificant.[30] We interpret the similarity between the two figures as evidence in favour of our theory of fiscal policy. In advanced economies, such as the OECD countries, a strong economy does in fact seem to generate spending pressures that intensify as the output gap increases further. The same dependency between fiscal policy and output is absent in bad times.

The asymmetric spending pattern found for the group of OECD member states does not apply directly to a broader sample of countries. The econometric analyses in section 6 shed some light on the differences between the highly developed group of OECD countries versus the heterogeneous group of non-OECD countries. The results are illustrated in panel B in Figure 2. For the OECD countries, we confirm the results from section 5: fiscal policy is

[30] In estimations not reported, we tested out the level difference between good and bad times. Doing so pulls the positive coefficient in good times closer to zero. However, the coefficients are still large, positive and clearly significant.

procyclical in good times but not in bad times. The picture is slightly more blurred in the group of non-OECD countries, where government spending does not appear to react to fluctuations in output. However, in results not reported we

[Figure 2 about here]

find some evidence on the revenue side of the government budget, which indicate that fiscal policy is more procyclical in bad times in this group of countries.

These differences lead us to believe that we need two different explanations for the occurrence of procyclical fiscal policies, depending on which group of countries we consider. For the middle- and low income countries in the group of non-OECD members, our results are consistent with Gavin and Perotti's (1997) explanation of procyclical fiscal policiy: when the economy hits a slump, falling government revenue may necessitate a procyclical fiscal contraction due to binding credit constraints. Fiscal policy is therefore likely to become procyclical in bad times. In the high income OECD member states, on the other hand, governments are not credit constrained, and the above-mentioned explanation cannot account for the occurrence of procyclical fiscal policies among these countries. Instead, the model presented in this paper can explain the observed pattern of government spending in OECD countries.

An interesting question is then, why the same spending pattern appears to be absent (or at least not very strong) among the non-OECD countries in good times. A natural point to make here is that the average quality of democracy among the OECD countries is higher than in the remainder of countries in the broad country sample. Unless the populations in less democratic countries have some alternative means of holding the incumbent accountable (such as revolts or strikes), we expect spending *pressures* to have limited impact on actual spending *policies*

in countries where the political accountability mechanism imposed by the electoral process is not as strong as in mature democracies.

We find that in good times both a higher degree of fiscal transparency and voter information decrease the procyclical bias found in government spending. This is in nice accordance with our theory and it confirms that what is important is the ability of the electorate to monitor the actions of the incumbent. This can come about through a higher degree of fiscal transparency, but also through a free and active press that facilitates the propagation of information about fiscal policy to the public.

8 Conclusions

Procyclical fiscal policies occur in OECD countries as well as in less advanced economies. However, the exact way in which the procyclical patterns occur differs between these groups of countries. In OECD countries we find a strong asymmetry between good and bad times. A procyclical fiscal policy is a phenomenon that is typically associated with times of economic prosperity in these advanced economies. During times of economic slowdown, on the other hand, fiscal policy is typically acyclical or countercyclical. Matters are different in less advanced economies where procyclicality is a phenomenon that is more likely to occur in bad times.

This paper offers a novel explanation of these observations by highlighting the role of fiscal transparency: a lack of fiscal transparency gives scope for rent seeking behaviour in fiscal policymaking. In times of economic slowdown or moderate economic activity, voters can restrain such rent seeking behaviour by conditioning re-election of the politicians holding office on observed performance. However, when the economy is booming it becomes easier for politicians to extract rents. The abundance of resources provides the incumbent with a

temptation that is too great to resist. Fully aware of this change in circumstances, voters increase their consumption demands in good times. Voters not only tolerate, but actually demand a seemingly suboptimal procyclical fiscal policy in good times. These demands are not a result of irrational or myopic thinking. Rather, the strategy of the voters ensures a second-best solution to the fiscal policy problem.

This argument can explain why fiscal policy is more procyclical in good times than in bad times in advanced economies. However, it cannot explain why the opposite would be true, i.e. that fiscal policy is more procyclical in bad times than in good times, as is the typical case in middle- and low-income countries. This is in line with the borrowing constraints hypothesis, as proposed by Gavin and Perotti (1997).

Our model of fiscal policy also generates an original auxiliary prediction: the procyclical bias in good times should be less severe in countries where fiscal transparency is high, since a transparent budget practice alleviates the moral hazard problem between voters and politicians by improving voters' ability to monitor the actions of their elected representatives. We find empirical evidence in support of this prediction in OECD countries as well as in a broader sample of countries: better access to information about government policies does reduce the procyclical bias in government spending in good times.

9 References

Alesina, A., Campante, F. and Tabellini, G. 2008. Why is fiscal policy often procyclical? Journal of the European Economic Association, Vol. 6, No.5: 1006–1036

Alt, J. E. and Lassen, D. D., 2006a. Transparency, Political Polarization, and Political Budget Cycles in OECD countries American Journal of Political Science, vol. 50, No. 3,

530-550

Alt, J. E. and Lassen, D. D., 2006b. Fiscal transparency, political parties and debt in OECD countries. European Economics Review, 50, 1403 – 1439

Arellano, M. and Bond, S., 1991. Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. The Review of Economic Studies, vol. 58, No 2

Arellano, M. and Bover, O., 1995. Another look at the instrumental variable estimation of error-components models. Journal of Econometrics, 68

Barro, R. J., 1973. The Controls of Politicians: An Economic Model. Public Choice, 14, 19 – 42

Barro, R.J., 1979. On the Determination of Public Debt. Journal of Political Economy 87, 940-971

Battaglini, M. and Coate, S., 2008.Fiscal Policy over the Real Business Cycle: A Positive Theory. NBER working paper No. 14047

Blundell, R. and Bond, S., 1998. Initial conditions and moments restrictions in dynamic panel data models. Journal of Econometrics, 87

Catao, L. and Sutton, B., 2002. Sovereign Defaults: The Role of Volatility. IMF WP/02/149

Ferejohn, J., 1986. Incumbent Performance and electoral control. Public Choice, 50, 5 – 25

Gavin, M and Perotti, R., 1997. Fiscal Policy in Latin America. NBER Macroeconomics Annual, Vol. 12, pp. 11-61

Gali, J. and Perotti, R., 2003. Fiscal Policy and Monetary Integration in Europe. Economic Policy, vol 18, issue 37, 533-572

Hallerberg, M. and Strauch, R., 2002. On the Cyclicality of Public Finances in Europe. Empirica 29, 183-207

Hercowitz, Z. and Strawczynski, M., 2004. Cyclical Ratcheting in Government Spending. The Review of Economics and Statistics 86(1), 353-361

Kaminsky, G, Reinhart, C. and Vegh,C. A., 2004. When it rains, it pours: Procyclical Capital Flows and Macroeconomic Policies. NBER Working Paper No. 10780

Kaufmann, D., Kraay, A. and Mastruzzi, A., 2006. Governance Matters V: Governance Indicators for 1996-2005. World Bank Policy Research # 4012 September 2006

Lane, P. R.., 2003. The cyclical behaviour of fiscal policy: evidence from the OECD. Journal of Public Economics 87 2661-2675

Lane, P. R. and Tornell, A., 1998. Why aren't savings rates in Latin America procyclical? Journal of Development Economics, Vol. 57, 185 – 199

Manasse, P., 2006. Procyclical Fiscal Policy: Shocks, Rules, and Institutions—A View From MARS. IMF Working Paper, WP/06/27

Milesi-Ferretti, G. M., 2003. Good, Bad or Ugly? On the effects of fiscal rules with creative accounting. Journal of Public Economic, 88, 377-394

OECD, 2005. Economic Outlook database 79. OECD

OECD, 2006. Economic Outlook Database Inventory. Economic Outlook 79, August 2006, OECD

Persson, T. and Tabellini, G., 2003. The economic effect of constitutions - What do the data say? MIT Press, August 2003

Persson, T. and Tabellini, G., 2000. Political Economics: Explaining Economic Policy. Zeuthen lecture book series, MIT Press, MIT, Cambridge, MA,

Poterba, J.M. and Von Hagen, J., 1999. Introduction in Fiscal Institutions and Fiscal

Performance, ed. Porteba, J. M. and von Hagen, J. University of Chicago Press, pp. 1 - 12, Chicago

Shi, M and Svensson, J., 2006. Political Budget Cycles: Do they differ across countries and why? Journal of Public Economics, 90, 1367 – 1389

Talvi, E and Vegh, C. A., 2005. Tax base variability and procyclical fiscal policy in developing countries. Journal of Development Economics 78 156-190

Tornell, A. and Lane, P. R., 1999. The Voracity Effect. The American Economic Review, 89, 22-46.

WDI, 2005. World Development Indicators – 2005 CD-ROM, World Bank, Washington DC

10 Appendix

In this appendix we present the solution to the voters' problem. We allow for the possibility that the maximum level of rents in option (iii) depends positively on the level of income, so that $r_t \le \bar{r} + \gamma y_t$, where $\gamma \ge 0$. Rent collection in period 2 now becomes $r_2 = \bar{r} + \gamma y_2$, and consumption in period 2 is given by $g_2 = c_2 = ½\left((1-\gamma)y_2 - (1+\rho)d_1 - \bar{r}\right)$.

Turning to period 1, the expected discounted values of political rents in the three options become $V_1 = \tau^* y_1 - g^* + d^* + (1+\rho)^{-1}(\bar{r} + \gamma y_2)$, $V_2 = \tau^* y_1 - g^* + \bar{d} + (1-p)(1+\rho)^{-1}(\bar{r} + \gamma y_2)$ and $V_3 = \bar{r} + \gamma y_1$, respectively. The voters' problem is then to choose values of g^*, τ^* and d^* so as to maximize their utility given in (1), subject to the constraints $V_1 \ge V_2$, $V_1 \ge V_3$, $d^* \le \bar{d}$ and the expressions for c_2 and g_2 given above. Rearranging the two incentive constraints and using $\beta(1+\rho) = 1$, we can write the Lagrangian for this problem as

$$L = \frac{\left((1-\tau^*)y_1\right)^{1-\theta}}{1-\theta} + \frac{g^{*1-\theta}}{1-\theta} + 2\beta \cdot \frac{\left(½((1-\gamma)y_2 - \beta^{-1}d^* - \bar{r})\right)^{1-\theta}}{1-\theta}$$
$$-\lambda_1\left(\bar{d} - d^* - \beta p(\bar{r} + \gamma y_2)\right) - \lambda_2\left(g^* - d^* - \tau^* y_1 + (1-\beta)\bar{r} + \gamma(y_1 - \beta y_2)\right) - \lambda_3(d^* - \bar{d})$$

The Kuhn-Tucker first-order conditions are then given by

$$\frac{\partial L}{\partial \tau^*} = 0 \Leftrightarrow \left((1-\tau^*)y_1\right)^{-\theta} = \lambda_2$$
$$\frac{\partial L}{\partial g^*} = 0 \Leftrightarrow \left(g^*\right)^{-\theta} = \lambda_2$$
$$\frac{\partial L}{\partial d^*} = 0 \Leftrightarrow c_2{}^{-\theta} = \lambda_1 + \lambda_2 + \lambda_3$$

and the complementary slackness conditions are

$$\lambda_1\left[\bar{d} - d^* - p\beta(\bar{r} + \gamma y_2)\right] = 0\ ,\ \lambda_1 \geq 0$$
$$\lambda_2\left[g^* - d^* - \tau^* y_1 + \bar{r}(1-\beta) + \gamma(y_1 - \beta y_2)\right] = 0\ ,\ \lambda_2 \geq 0$$
$$\lambda_3\left[d^* - \bar{d}\right] = 0,\ \lambda_3 \geq 0$$

We are mainly interested in situations where the constraint $d^* \leq \bar{d}$ is unbinding. A binding borrowing constraint would give rise to a procyclical fiscal policy as originally described by Gavin and Perotti (1997). Since that is not our focus in this paper, we assume for now that $d^* < \bar{d}$ in optimum and that λ_3 is zero. We shall later derive a condition on the time profile of output that ensures that this is satisfied.

As explained in the text, the constraint $V_1 \geq V_3$ must be satisfied with equality in optimum, so that $g^* - d^* - \tau^* y_1 + \bar{r}(1-\beta) + \gamma(y_1 - \beta y_2) = 0$. Thus, we are left with two possible cases:

Case 1): $\lambda_1 = 0$ (the constraint $V_1 \geq V_2$ is unbinding). Combining the Kuhn-Tucker first-order conditions with the complementary slackness conditions then gives $(1-\tau^*)y_1 = g^* = c_2$. Using $c_t = (1-\tau_t)y_t$, $V_1 = V_3$ and the expressions for c_2 and g_2 given above, we then get

the solution candidate

$$\begin{aligned} d^* &= \beta(1+\beta)^{-1}\left((1-\gamma)(y_2-y_1)-\beta(\bar{r}+\gamma y_2)\right) \\ g^* &= (1+\beta)^{-1}\left((1-\gamma)y_1+\beta y_2-\bar{r}\right)/2 \\ \tau^* &= 1-\frac{(1-\gamma)y_1+\beta y_2-\bar{r}}{2(1+\beta)y_1} \end{aligned} \qquad \text{(A.1)}$$

The solution candidates for political rents and consumption in period 2 can then be found by substituting these expressions into the government budget constraint and $g_2 = c_2 = \frac{1}{2}\left((1-\gamma)y_2-(1+\rho)d_1-\bar{r}\right)$. For (A.1) to be a solution candidate, we must at the same time ensure that the constraint $V_1 \geq V_2$ is indeed satisfied. This implies that (A.1) is only a solution candidate if

$$d^* \geq \bar{d}-p\beta(\bar{r}+\gamma y_2) \Leftrightarrow y_1 \leq y_2+\frac{1}{1-\gamma}\left(\left(p(1+\beta)-\beta\right)(\bar{r}+\gamma y_2)-\frac{1+\beta}{\beta}\bar{d}\right) \qquad \text{(A.2)}$$

Case 2): $\lambda_1 > 0$ (the constraint $V_1 \geq V_2$ is binding). We now have $V_1 = V_2$, $V_1 = V_3$ and $(1-\tau^*)y_1 = g^*$, where the latter equation follows from the first-order conditions. This is three equations in the three unknowns, g^*, τ^* and d^*. Solving these three equations yields the solution candidate

$$\begin{aligned} d^* &= \bar{d}-p\beta(\bar{r}+\gamma y_2) \\ g^* &= \left((1-\gamma)y_1+\bar{d}-(1-(1-p)\beta)\bar{r}+\gamma(1-p)\beta y_2\right)/2 \\ \tau^* &= 1-\frac{(1-\gamma)y_1+\bar{d}-(1-(1-p)\beta)\bar{r}+\gamma(1-p)\beta y_2}{2y_1} \end{aligned} \qquad \text{(A.3)}$$

Political rents and period 2 consumption levels can again be found from the government budget constraint and the expression $g_2 = c_2 = \left((1-\gamma)y_2-(1+\rho)d_1-\bar{r}\right)/2$.

We must now determine which of the two candidates is the actual solution. First, note that if the condition in (A.2) is not satisfied *case 1)* does not deliver any solution candidate. Hence, in this situation *case 2)* gives a unique solution candidate and, given the concavity of

the objective function, this must then be the solution. On the other hand, if (A.2) is in fact satisfied, then the solution candidate in case 1) is the actual solution. This can be seen by noting that government consumption in *case 1)* is in each period a weighted average of the *case 2)* levels of government consumption in period 1 and period 2. The same is true for private consumption. The concavity of the utility function then implies that the *case 1)* candidate yields higher utility than the *case 2)* candidate.

To sum up, whenever the condition in (A.2) is satisfied, the solution to the voters' problem is given by the expressions in (A.1). Whenever (A.2) is not satisfied, the solution is given by the expressions in (A.3). Setting $\gamma = 0$ and using the formulations for y_1 and y_2 given in (4), we then get the solution presented in the text. The main difference between the solution with $\gamma = 0$ and the more general case presented here is that a change in the time profile of output that leaves the present discounted value of total output unchanged is no longer neutral for consumption in *case 1)* when $\gamma > 0$. A PDV-neutral shift of output towards period 1 now lowers both types of consumption in both periods. The reason is that such a shift makes option (iii) more attractive to the incumbent, because more rents could now be collected in period 1. At the same time, fewer rents can be collected in period 2, which lowers the value of re-election to the incumbent. To keep the incumbent from choosing option (iii) voters must therefore moderate their demands for consumption. This effect vanishes when $\gamma = 0$.

The main results of the model still hold with $\gamma > 0$, however: When output is low there is full consumption smoothing and marginal increases in period 1 output are spread out equally over the two periods via a lower budget deficit. When period 1 output becomes sufficiently high, however, further increases are transmitted into higher consumption in period 1 only, consumption smoothing breaks down and fiscal policy becomes procyclical. A higher degree

of fiscal transparency allows a higher level of period 1 output before consumption smoothing breaks down, and thus reduces the procyclical bias in good times.

It remains to make sure that the upper bound on the deficit is not violated in equilibrium. It is clear from (A.3) that $d^* \leq \bar{d}$ is always satisfied in case 2). From (A.1) we can find the appropriate condition in *case 1)* as $y_1 \geq (1-\gamma)^{-1}\left((1-\gamma(1+\beta))y_2 - \beta\bar{r} - \beta^{-1}(1+\beta)\bar{d}\right)$.

Note that this cut-off is always below the cut-off value given in (A.2) as long as $p > 0$. We implicitly assume that the condition here is always satisfied. A violation of this condition would imply a binding credit constraint in period 1. Fiscal policy would be procyclical, but for reasons that are entirely different than the ones that we focus on in this paper.

Figure 1. The reaction of government consumption to a positive output shock

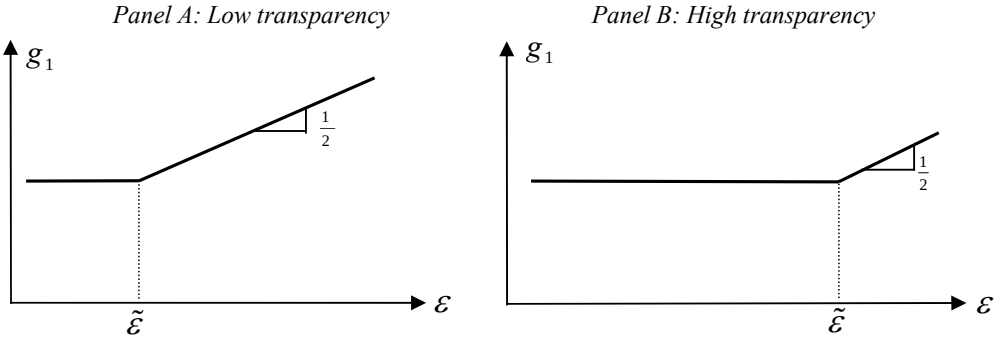
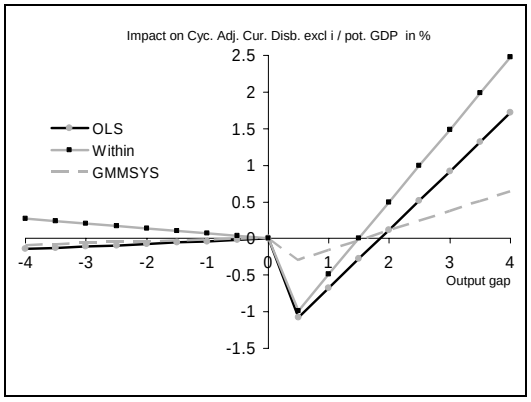
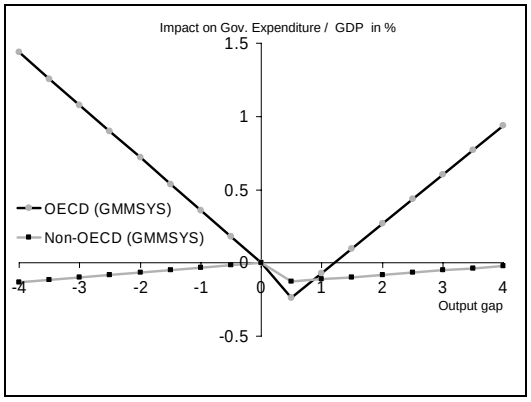


Figure 2: The impact of output fluctuations on government spending

A: OECD sample - Profile of Gov. Spending



B: Broad Sample- Profile of Gov. Spending



Notes:

(1) The graphs in Panel A are based on estimation results from Table 2, columns(4)-(6)

(2) The graphs in Panel B are based on estimation results from Table 6, column (8)

Table 1: Theoretical predictions about the effect of output fluctuations on fiscal policy

Predicted effect of an increase in the level of economic activity	***Total Effect***			***Discretionary Response***		
	Expenditure	Revenue	Surplus	Expenditure	Revenue	Surplus
Bad times	0	+	+	0	+	+
Good times	+	+	0	+	+ / -	-

Note: *"Total Effect" is the sum of an automatic effect and the discretionary response. The automatic effect is the effect that would occur in the absence of changes to the tax rate and the level of government consumption.*

Table 2: Asymmetric Response of the Spending Side of the Government Budget, OECD countries 1989-2003

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent Variable:	----- Cyc. Adj. Current Disbursements excl. interest as percentage of potential GDP -----						Cur. Dis. / pot GDP	Cons / pot. GDP	Wage Cons. / pot GDP	Soc.Sec. / pot GDP
Estimation method:	*OLS-IV*	*Within-IV*	*GMMSYS*	*OLS-IV*	*Within-IV*	*GMMSYS*	*GMMSYS*	*GMMSYS*	*GMMSYS*	*GMMSYS*
$gap_{i,t}$	0.053	0.018	0.019	-	-	-	-	-	-	-
	(0.05)	(0.05)	(0.05)							
$gap \cdot d_{i,t}^{pos}$	-	-	-	0.799***	0.990***	0.2678***	0.200***	0.135***	0.125***	0.078*
				(0.25)	(0.38)	(0.08)	(0.07)	(0.05)	(0.03)	(0.04)
$gap \cdot (1 - d_{i,t}^{pos})$	-	-	-	0.036	-0.069	0.023	-0.021	0.082***	0.067***	-0.092***
				(0.06)	(0.08)	(0.04)	(0.05)	(0.02)	(0.02)	(0.03)
$d_{i,t}^{pos}$	-	-	-	-1.478	-1.48	-0.428	-0.241	-0.255	-0.156**	-0.220**
				(0.73)	(0.93)	(0.22)	(0.19)	(0.12)	(0.06)	(0.11)
Time dummies:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of observations	257	257	257	257	257	257	257	257	244	257

Notes:

*(1) *, **, and *** indicate significance on a 10%, 5% and 1% level, respectively.*

(2) The following control variables are included in all columns: lagged dependent variable, inflation rate, NAIRU, public debt in previous year, election year dummy, log of trend income, sum of exports and imports as a share of GDP and demographic dependency ratio. A time invariant dummy for majoritarian electoral system is included in columns (1) and (4).

(3) For OLS and Within estimations all output gap variables are instrumented with their one time lagged level value.

(4) GMMSYS uses level lags from 2 to 12 of the lagged dependent variable in its differenced equation. In this equation the output gap variables are instrumented using their own two times lagged level values. For the level equation of GMMSYS the lagged dependent variable as well as the output gap variables are instrumented by their own one time lagged differenced values.

(5) In no case, except for Social Security Benefits, did the m2 test for no second order autocorrelation in the differenced equation reject. Since the m3 test for no third order autocorrelation did not reject we used the level lags 3 to 12 as instruments of the lagged dependent variable for Social Security Benefits.

(6) Columns (7) to (10) only show results using the GMMSYS estimator, however, the results using OSL and Within are roughly the same and are thus omitted.

Table 3: Interacting the output gap with single fiscal transparency dummies, OECD countries 1989-2003

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable:	---------- *Cyc. Adj. Cur. Dis. excl. interests / pot. GDP* ----------											
Estimation method: GMMSYS	Accrual accounting (yes = transparent)	Whether the government generally presents more than one supplementary budget to the legislature in each fiscal year (no = transparent)	Whether non-financial performance data is routinely included in the budget documentation presented to the legislature (yes = transparent)	Whether there is a legal requirement that the budget documentation contain a projection of expenditure beyond the next fiscal year (yes = transparent)	Whether it is a legal requirement that the budget include an ex post comparison between projected expenditure in future years and the actual expenditures in those years (yes = transparent)	Whether the in-year financial reports are audited (yes = transparent)	Whether special reports on the fiscal outlook are released prior to an election (yes = transparent)	Whether the economic assumptions used in the budget are subject to independent review (yes = transparent)	Whether the budget discusses the impact that variations in the key economic assumptions would have on the budget outturn (yes = transparent)	Whether the government regularly produces a report on the long term (10-40 years) outlook for public finances as a whole (yes = transparent)	Whether the government is required to make regular actuarial estimates for social security programs (yes = transparent)	Whether the government is required to report contingent liabilities on a regular basis (yes = transparent)
Sign on transparency dummy interacted with positive output gap	-	-	-	+	-	-	+	-	+	+	-	-
			**		***				***		***	*
Sign on transparency dummy interacted with negative output gap	+	+	+	+	+	-	+	+	+	-	+	+
	*		***	*	*							
Time dummies:	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
No of observations	*257*	*257*	*257*	*257*	*257*	*223*	*257*	*257*	*257*	*257*	*257*	*257*

Notes:

*(1) *, **, and *** indicate significance on a 10%, 5% and 1% level, respectively.*

(2) GMMSYS uses level lags from 2 to 12 of the lagged dependent variable in its differenced equation. In the difference equation the output gap variables are instrumented using their own two times lagged level values. For the level equation of GMMSYS the lagged dependent variable as well as the output gap variables are instrumented by their own one time lagged differenced values.

(3) The m2 test was performed for all estimations and in no case was the validity of the instruments rejected.

Table 4: Interacting the output gap with transparency, OECD countries 1989-2003

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent Variable:	*Cyc Adj Cur Disb / pot. GDP*		*Cur Disb / pot. GDP*		*Cons / pot. GDP*		*Wage cons / pot. GDP*		*Soc Sec / pot. GDP*	
Estimation method: GMMSYS										
$gap_{i,t} \cdot d_{i,t}^{pos}$	*0.322****	*0.396****	*0.373****	*0.418****	*0.248****	*0.278****	*0.196****	*0.201****	*0.157**	*0.164***
	(0.08)	*(0.08)*	*(0.09)*	*(0.09)*	*(0.09)*	*(0.08)*	*(0.04)*	*(0.03)*	*(0.08)*	*(0.07)*
$gap_{i,t} \cdot (1 - d_{i,t}^{pos})$	*-0.289****	*-0.29****	*-0.325****	*-0.312****	*-0.163****	*-0.147****	*-0.079****	*-0.071****	*-0.114**	*-0.129***
	(0.10)	*(0.08)*	*(0.10)*	*(0.08)*	*(0.03)*	*(0.03)*	*(0.02)*	*(0.03)*	*(0.06)*	*(0.06)*
$transp_i^{11} \cdot gap_{i,t} \cdot d_{i,t}^{pos}$	*-0.029**	-	*-0.055****	-	*-0.030****	-	*-0.021****	-	*-0.019*	-
	(0.02)		*(0.02)*		*(0.01)*		*(0.01)*		*(0.02)*	
$transp_i^{11} \cdot gap_{i,t} \cdot (1 - d_{i,t}^{pos})$	*0.066****	-	*0.065****	-	*0.050****	-	*0.031****	-	*0.006*	-
	(0.02)		*(0.02)*		*(0.01)*		*(0.01)*		*(0.01)*	
$transp_i^{10} \cdot gap_{i,t} \cdot d_{i,t}^{pos}$	-	*-0.046***	-	*-0.067****	-	*-0.036****	-	*-0.023****	-	*-0.024*
		(0.02)		*(0.02)*		*(0.01)*		*(0.01)*		*(0.02)*
$transp_i^{10} \cdot gap_{i,t} \cdot (1 - d_{i,t}^{pos})$	-	*0.081****	-	*0.073****	-	*0.056****	-	*0.034****	-	*0.011*
		(0.02)		*(0.02)*		*(0.01)*		*(0.01)*		*(0.01)*
$d_{i,t}^{pos}$	*-0.219*	*-0.268*	*-0.081*	*-0.129*	*-0.172*	*-0.229**	*-0.158****	*-0.179****	*-0.197***	*-0.206***
	(0.16)	*(0.17)*	*(0.16)*	*(0.16)*	*(0.12)*	*(0.13)*	*(0.05)*	*(0.05)*	*(0.04)*	*(0.09)*
Time dummies:	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Control variables included	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
No of observations	*257*	*257*	*257*	*257*	*257*	*257*	*244*	*244*	*257*	*257*

Notes:

(1) See notes (1) to (5) in Table 2.
(2) $transp^{11}$ is the aggregation of the dummies in Table 3 (except for question 6).
(3) $transp^{10}$ is $transp^{11}$ without question 9 from Table 3.

Table 5: Central government expenditure and the output gap, Persson and Tabellini country sample, 1980-98

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	----------	----------	*Central government expenditure in percent of GDP*			----------	----------
Estimation method	*OLS-IV*	*Within-IV*	*GMMSYS*	*OLS-IV*	*OLS-IV*	*Within-IV*	*GMMSYS*
$gap_{i,t}$	*0.275*	*0.284**	*0.050*	-	-	-	-
	(0.170)	*(0.156)*	*(0.057)*				
$gap_{i,t} \cdot d_{i,t}^{pos}$	-	-	-	*0.574*	*0.558**	*0.902*	*0.013*
				(0.455)	*(0.292)*	*(0.673)*	*(0.113)*
$gap_{i,t} \cdot (1 - d_{i,t}^{pos})$	-	-	-	*0.318*	*0.064*	*0.164*	*0.135*
				(0.382)	*(0.190)*	*(0.629)*	*(0.141)*
$d_{i,t}^{pos}$	-	-	-	*-1.377*	-	*-2.103*	*-0.156*
				(2.188)		*(3.225)*	*(0.374)*
Time dummies	*Yes*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*
Control variables included	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
No. of observations	*934*	*939*	*939*	*934*	*934*	*939*	*939*

Notes:

*(1) *, **, and *** indicate significance on a 10%, 5% and 1% level, respectively.*

(2) The following control variables are included in all columns: lagged dependent variable, inflation rate, election year dummy, log of trend income, sum of exports and imports as a share of GDP and demographic dependency ratio. The OLS estimations include time invariant dummy variables for the electoral system and democracy which limits the sample size.

(3) For OLS and Within estimations all output gap variables are instrumented with their one time lagged level value.

(4) GMMSYS uses level lags from 2 to 12 of the lagged dependent variable in its differenced equation. In this equation the output gap variables are instrumented using their own two times lagged level values. For the level equation of GMMSYS the lagged dependent variable as well as the output gap variables are instrumented by their own one time lagged differenced values.

(5) The m2 test was performed in each of the GMM estimations and in no case was the validity of the instruments rejected.

Table 6: Expenditure reactions in OECD versus non-OECD countries and effect of voter information, Persson and Tabellini country sample 1980-98

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	---------- Central gov. expenditure in % of GDP ----------											
Estimation method	*OLS-IV*	*Within-IV*	*GMMSYS*	*OLS-IV*	*Within-IV*	*Within-IV*	*GMMSYS*	*GMMSYS*	*OLS-IV*	*GMMSYS*	*GMMSYS*	*GMMSYS*
$gap_{i,t}\ OECD_i$	0.689*** (0.194)	0.429** (0.219)	0.009 (0.118)	-	-	-	-	-	-	-	-	-
$gap_{i,t}\ nonOECD_i$	0.139 (0.192)	0.235 (0.185)	0.028 (0.059)	-	-	-	-	-	-	-	-	-
$gap_{i,t} \cdot d_{i,t}^{pos} \cdot OECD_i$	-	-	-	2.724*** (0.93)	5.582 (5.11)	1.797*** (0.65)	0.231 (0.18)	0.337** (0.17)	2.835*** (1.06)	0.685* (0.37)	0.507*** (0.16)	0.718* (0.38)
$gap_{i,t} \cdot (1-d_{i,t}^{pos}) \cdot OECD_i$	-	-	-	1.005 (0.76)	4.206 (6.82)	-1.424 (0.91)	-0.03 (0.20)	-0.359 (0.23)	0.965 (1.28)	-0.376 (0.31)	-0.185 (0.20)	-0.413 (0.28)
$d_{i,t}^{pos} \cdot OECD_i$	-	-	-	-5.571* (2.98)	-18.98 (22.66)	-	-0.547 (0.61)	-0.407 (0.54)	-4.038 (3.65)	-0.066 (0.55)	-0.291 (0.48)	0.3963 (0.51)
$gap_{i,t} \cdot d_{i,t}^{pos} \cdot nonOECD_i$	-	-	-	0.252 (0.44)	0.639 (0.75)	0.514 (0.54)	-0.014 (0.17)	0.030 (0.15)	0.504 (0.50)	0.251* (0.14)	-0.018 (0.14)	0.150 (0.14)
$gap_{i,t} \cdot (1-d_{i,t}^{pos}) \cdot nonOECD_i$	-	-	-	0.402 (0.39)	-0.416 (0.96)	-0.111 (0.51)	-0.014 (0.15)	0.032 (0.16)	0.266 (0.49)	0.099 (0.13)	0.075 (0.14)	0.083 (0.13)
$d_{i,t}^{pos} \cdot nonOECD_i$	-	-	-	-1.427 (2.56)	0.562 (4.89)	-	0.392 (0.80)	-0.142 (0.78)	-1.180 (3.23)	-0.028 (0.71)	0.022 (0.62)	0.268 (0.62)
$gap_{i,t} \cdot d_{i,t}^{pos} \cdot INFO_{i,t}$	-	-	-	-	-	-	-	-	-0.937** (0.48)	-0.597** (0.25)	-	-0.558** (0.26)
$gap_{i,t} \cdot (1-d_{i,t}^{pos}) \cdot INFO_{i,t}$	-	-	-	-	-	-	-	-	-0.197 (0.65)	-0.170 (0.24)	-	-0.077 (0.23)
$gap_{i,t} \cdot Corruption_i$	-	-	-	-	-	-	-	-	-	-	-0.141** (0.07)	-0.094 (0.07)
Time dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*No*	*No*	*No*	*No*	*No*
Control variables included	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
No. of observations	*934*	*939*	*939*	*934*	*939*	*939*	*939*	*939*	*768*	*768*	*891*	*743*
$OECD_i = nonOECD_i$	2.052 [0.020]**	0.693 [0.244]	-0.148 [0.559]	-	-	-	-	-	-	-	-	-
$OECD: gap_{i,t} \cdot d_{i,t}^{pos} = gap_{i,t} \cdot (1-d_{i,t}^{pos})$	-	-	-	2.605 [0.00]***	0.486 [0.31]	2.175 [0.01]**	1.152 [0.12]	2.637 [0.00]***	-	-	-	-
$nonOECD: gap_{i,t} \cdot d_{i,t}^{pos} = gap_{i,t} \cdot (1-d_{i,t}^{pos})$	-	-	-	-0.354 [0.64]	1.004 [0.16]	0.631 [0.26]	-0.003 [0.50]	0.009 [0.50]	-	-	-	-

Notes:

(1) See Table 5.

(2) Test for nonOECD vs. OECD and gap·d^{pos} vs. gap·(1-d^{pos}) are all one-sided t-tests.