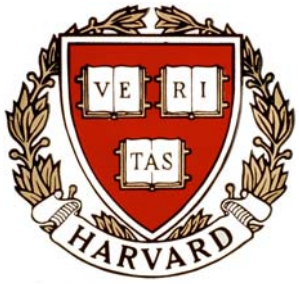

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Why Is Fiscal Policy Often Procyclical?

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Why is fiscal policy often procyclical?*

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Abstract

Many countries, especially developing ones, follow procyclical fiscal polices, namely spending goes up (taxes go down) in booms and spending goes down (taxes go up) in recessions. We provide an explanation for this suboptimal fiscal policy based upon political distortions and incentives for less-than-benevolent government to appropriate rents. Voters have incentives similar to the "starving the Leviathan" classic argument, and demand more public goods or fewer taxes to prevent governments from appropriating rents when the economy is doing well. We test this argument against more traditional explanations based purely on borrowing constraints, with a reasonable amount of success.

1 Introduction

Most economists would agree with the normative prescription that tax rates and discretionary government spending as a fraction of GDP ought to remain constant over the business cycle. If governments respected these prescriptions, we should observe a counter-cyclical pattern in fiscal policy. Namely,

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during a boom: (i) government spending as a share of GDP should go down because of automatic stabilizers (if discretionary spending remained constant in real terms, the effect would be reinforced); (ii) with constant tax rates and some degree of progressivity, government revenues as a share of GDP should go up (the effect would be reinforced by tax cuts in recessions and tax increases in boom.); (iii) as a result, budget surpluses as a share of GDP should increase. The opposite should occur in recessions.[1]

In practice, in many developing countries fiscal policy has the opposite properties: it is procyclical. In particular, government spending as a share of GDP goes up during booms and down in recessions, while deficits increase in booms and decrease in recessions. In OECD countries, instead, fiscal policy is generally counter-cyclical.[2] Gavin and Perotti (1997) were the first to point out that in Latin America fiscal policy is procyclical, but Talvi and Vegh (2005), Catao and Sutton (2002) and Kaminski, Reinhart, and Vegh (2004) noted that this is not a Latin American phenomenon only: procyclicality of fiscal policy is common in many – though not all – developing countries.

Why do many countries follow seemingly sub optimal procyclical fiscal policies that add to macro economic instability? A common answer has to do with the supply of credit. In bad times many developing countries cannot borrow, or can do so only at very high interest rates, therefore they cannot run deficits and have to cut spending; in booms they can borrow more easily and choose to do so, increasing public spending (cf. Gavin and Perotti 1997, Catao and Sutton 2001 and Kaminski, Reinhart, and Vegh 2004).

This argument is incomplete, however, since it begs two critical questions. First, why don't these countries self-insure by accumulating reserves in good times, so that they are less likely to face binding credit constraints in recessions? Second, why would lenders not provide funds to countries even in recessions, if they were convinced that the borrowing would optimally

[1] In light of the careful discussion of Kaminski, Reinhart and Vegh (2004) we want to be clear regarding our choice of words. We define as counter-cyclical a policy that follows the tax smoothing principle of holding constant tax rates and discretionary government spending as a fraction of GDP over the cycle. They define such policy as "acyclical". Both we and they would define as procyclical a policy in which tax rates go down in booms and up in recessions and spending over GDP goes up in booms. As those authors themselves note, our definition is the most common in the literature.

[2] Some countries belonging to both groups have accumulated large amounts of public debt. For a review of models that explain excessive deficits, see Alesina and Perotti (1995) and Persson and Tabellini (2000). On the cyclical property of fiscal policy in OECD countries see Perotti (2004)

smooth out the cycle?

To answer both questions one needs to consider the political arena, and this is what we do in this paper. We argue that procyclical and myopic fiscal policy stems from a political agency problem. Voters face corrupt governments that can appropriate part of tax revenues for unproductive public consumption, i.e. political rents. Rents can be thought of as direct appropriation (stealing) of tax revenues by government officials, but also favors paid to special interests such as public employees or "friends" of the government, often identified along ethnic, or religious lines etc. Voters can replace a government that abuses of his powers, but in equilibrium they generally cannot push rents all the way to zero. This agency problem interacts with lack of information: voters observe the state of the economy, but they cannot observe government borrowing, at least not at the margin; for instance, the government can accumulate hidden off-balance-sheet liabilities. Hence, when voters see the economy booming, they demand higher utility for themselves (in the form of lower taxes, or better public goods), in a way that resembles the "starve the Leviathan" argument. This forces the government to impart a procyclical bias to fiscal policy, and to borrow too much. Thus, procyclical and myopic fiscal policy (i.e. an increase in government spending during booms and excessive government borrowing) arises from voters' demands – note that voters do not demand irrational policies, they are just poorly informed about economic policy. They demand and obtain, through a reelection constraint on the government, a second-best solution to an agency problem in an environment of corruption and imperfect information. Formally, the model extends to a dynamic environment with public debt a model of moral hazard and political accountability originally formulated by Barro (1973) and Ferejohn (1986), and adapted to public finance by Persson and Tabellini (2000).

We then take the theoretical predictions to the data. First, we confirm previous evidence on the widespread procyclicality of fiscal policy. This is mainly due to government spending, that goes up in booms and down in recession as a share of GDP. Second, we show a strong positive correlation between procyclicality and measures of corruption: more corrupt countries display a more procyclical fiscal policy. Third, the correlation between corruption and procyclicality is only or mainly present in democracies, confirming the theoretical idea that procyclicality emerges because voters try to hold corrupt governments accountable. Finally, we ask how robust is the correlation between corruption and procyclicality when also taking into account the

evidence on borrowing constraints. This is not easy, because more corrupt governments might also face more binding credit constraints. As a result, many of the same variables that influence political corruption are also likely to affect the severity of borrowing constraints – indeed, corruption is highly correlated with credit ratings in the data. Nevertheless, we present some suggestive evidence that political agency problems in democracies, rather than credit market imperfections, are the underlying cause of procyclical fiscal policy. Our main conclusion is that procyclicality of fiscal policy results from a government failure, not a market failure, and takes place irrespective of whether or not the government is up against a credit limit. Fiscal policy is procyclical because rational but uninformed voters "starve the Leviathan" and demand more in good times than in bad times.

We are not the first to suggest a political explanation to the procyclicality of fiscal policy. In Talvi and Vegh (2005), the presence of surpluses increases the government propensity to spend; this distortion is assumed, however, rather than derived from an explicit political model. An alternative political explanation is the "voracity effect" of Tornell and Lane (1999) and Lane and Tornell (1998): when more resources are available (i.e. in booms), the common pool problem is more severe and the fight over common resources intensifies, leading to budget deficits. But we do not know of other papers that link fiscal myopia and procyclicality to a political agency problem.[3] Finally, the idea that voters induce debt accumulation to discipline governments that they do no trust is related to Jensen and Meckling (1976). That seminal contribution shows that debt financing (as opposed to external equity financing) can mitigate the agency problem inside the firm; but of course, the mechanism through which this happens in our political context is different.

Our idea that political agency can lead to excessive debt accumulation when voters are uninformed differs from two other political models of government borrowing in the literature. The strategic debt argument (Alesina and Tabellini (1990), Persson and Svensson (1989), Tabellini and Alesina (1990)) does not rely on an agency problem: voters are not uninformed about fiscal policy and the results are driven by different preferences amongst political parties or groups of voters. In the rational budget cycles literature (Ro-

[3]Satyanath and Subramanian (2004) show empirical evidence that democratic failure explains macroeconomic instability; but they focus on the distinction between democracies vs non-democracies, whereas we argue that procyclical fiscal policy stems from the interaction of democratic accountability and political corruption.

goff and Siebert (1989) and Rogoff (1990)), voters face an adverse selection problem and this leads to distorted fiscal policy before the election. The assumption about voters' information is similar to ours, but here the incentive problem is one of moral hazard, not adverse selection. Moreover, those papers do not discuss the reaction of economic policy to external shocks, nor do they allow for a state variable like government debt.

The paper is organized as follows. In section 2 we lay out the model. In section 3 we derive the economic and political equilibrium. Section 4 discusses the empirical evidence; the last section concludes.

2 The Model

2.1 The economy

Consider a small open economy with an infinite horizon. The private sector consists of a representative consumer that maximizes the presented discounted value of expected utility from private consumption:

$$E\sum_{t=0}^{\infty}\beta^t u(c_t) \tag{1}$$

where c_t denotes consumption in period t, E is the expectations operator, and $u(\cdot)$ is a smooth and strictly concave increasing function. For simplicity, we neglect the economic choices of the private sector, and only focus on its political role of controlling the government agency problem. Thus, we assume that private consumption in each period is just given by endowment income (y) net of taxes (τ): $c_t = y_t - \tau_t$. The model is meaningful only if government debt is non-neutral and this is the simplest way to get that property. Income is an i.i.d. random variable, drawn each period from a distribution with bounded support over $[\underline{y}, \bar{y}]$. All variables are expressed in per capita terms.[4]

Government spending in period t only takes the form of (non-negative) rents, $r_t \geq 0$, that benefit the government but not the consumer. Adding productive government spending would complicate the notation without changing the results: for all practical purposes, we can think of $u(c_t)$ as the utility

[4] Alternative but more complicated assumptions would be to allow the consumer to borrow or lend in an economy with tax distortions, or to model explicitly a liquidity constraint on private consumption.

accruing to the private sector from private and public consumption, and of τ_t as the additional taxes needed to pay for unproductive spending that benefits the government but not the consumers at large.

In period t the government can issue public debt, b_{t+1}, at a market price β. Government debt is bought by foreign residents and there is full repayment of debt next period.[5] Thus, exploiting the government budget constraint, we can write private consumption in period t as:

$$c_t = y_t - r_r + \beta b_{t+1} - b_t \tag{2}$$

We assume that there is a limit to how much resources a government can appropriate for his own exclusive benefit: $r_t \leq R_t$. The upper bound R_t denotes what the government can steal from the public coffers without ending up in jail. We consider two alternative assumptions about R_t. In the simplest case, it is a constant: $R_t = \bar{r}$. Alternatively, we assume that the upper bound on rents is a decreasing and concave function of public debt outstanding: $R_t = R(b_t)$, with $R_b < 0$, $R_{bb} < 0$. Thus, if the previous legislature accumulated a large amount of government debt, there is less room to steal today. As discussed in the next subsection, debt is only observed by the public at large in the subsequent period, when it has to be repaid. Thus, this second assumption says that, if the government accumulated large liabilities in the previous legislature, it is under more careful scrutiny today, both from the domestic voters and international organizations, and as a result the upper bound on rents is more severe. As we shall see, the assumption that there is an upper bound on rents plays a role even if this constraint is not binding in equilibrium, because it determines the strength of out-of-equilibrium threats. But the policy response to income shocks is the same irrespective of whether the upper bound R_t is a constant or a function of debt outstanding.

Finally, we assume that government debt can be issued only up to a maximum amount $\bar{b}$. Up to this amount, debt is always repaid in full and there is no default risk nor any credit market imperfection. This upper limit on government debt is low enough (compared to the possible realizations of per capita income), so that the non-negativity constraints on consumption

[5] The assumption of a small open economy is appropriate for our empirical work, in which we consider this kind of countries. Without default risk there is no risk premium, but in our empirical analysis we allow for the effects of risk premia on government-issued liabilities.

and rents are not violated in equilibrium:

$$\underline{y} - \bar{b} > \bar{r} \tag{3}$$

$$R(\bar{b}) > 0 \tag{4}$$

The first inequality guarantees that, even if the upper bound on rents is a constant and income is lowest, outstanding debt can always be repaid in full without pushing private consumption to zero. The second inequality implies there is always something to steal, even if the upper bound on rents is a decreasing function of debt, and debt is maximal. These assumptions play no role, other than to make sure that the equilibrium does not violate some non-negativity constraints.

In this simple environment, the optimal policy for the voters is of course $r_t = 0$ and a debt policy that smooths private consumption in the face of income shocks. Such a policy would typically induce the consumer to spend only a fraction of any income increase, since by assumption income is i.i.d. and hence income increases are temporary. Conversely, negative income shocks would lead to some debt accumulation and consumption would fall less than one for one with income.

2.2 The political system

Elections are held at the end of each period. The incumbent government only cares about grabbing rents for himself. Thus, he maximizes:

$$E \sum_{t=0}^{\infty} \beta^t v(r_t)$$

where it is understood that he can get rents only while in office (if the incumbent is not reappointed, then future political rents will be enjoyed by another politician in office). The utility function $v(\cdot)$ is smooth, increasing and strictly concave.

The political environment is adapted from Barro (1973), Ferejohn (1986) and Persson and Tabellini (2000, ch. 4). Specifically, government policy is chosen after the elections, by the incumbent, and there is no commitment to electoral promises. Thus, there is an element of "contract incompleteness" in the political environment, and the government can only be held accountable ex-post through backward-looking voting strategies. This accountability is

made possible by assuming that, at each election, the incumbent is challenged by an identical opponent, whose role is to provide an alternative. Voters choose the optimal voting strategy that minimizes their loss of welfare from this agency problem. Relative to the models of Ferejohn (1986) and Persson and Tabellini (2000), we have added government debt. This makes the model truly dynamic, while the previous literature on political agency had static economic environments.

Voters observe their own current utility as well as their income (and hence how much they are paying in taxes). But they do not observe how much government debt is being accumulated in the current period. This is equivalent to saying that the government can incur off-balance-sheet liabilities with which to pay for rents. The size of these liabilities only becomes known to the voters after the elections. This assumption is consistent with the vast literature that has emphasized the size and significance of creative accounting and lack of transparency of the budget especially in developing countries; it has the same flavor of the information assumptions of the literature or rational political business and budget cycles.[6] Note how an ex post "discovery" of large government liabilities may trigger more control over the government and therefore make it more difficult for the government to appropriate rents in the future, which is one of the cases we examine below.

Thus, the sequence of events is as follows: (i) At the start of each period, before government policy is chosen, voters observe their income before taxes in the current periods, y_t, and debt outstanding, b_t; they select a reservation level of private consumption, c_t^*, and promise re-election to the incumbent conditional on attaining at least that level of consumption. (ii) The government observes the reservation level demanded by voters as well as their current income, and sets policy for the current period, namely rents (r_t) and government debt (b_{t+1}). (iii) Voters observe their utility from private consumption and vote according to their promise This sequence of events is

[6]See in particular Von Hagen and Harden(1994), Alesina and Perotti (1995), Milesi Ferretti (2003), amongst others, on the role of lack of transparency in the budget process, and Rogoff (1990), Rogoff and Siebert (1990) and Persson and Tabellini (2000) for rational political cycles. Note that there is an asymmetry: while voters do not observe b_{t+1} until period $t+1$, foreign lenders do not lend to the government past the point $\bar{b}$; hence international financial markets have better information about the debt policy compared to national voters. Qualitatively, this assumption is not implausible, although here for simplicty it is formulated in a very stark form: voters are totally ignorant, while foreign investors are perfectly informed. As we shall see, however, the upper bound $\bar{b}$ plays no role in the case in which the ceiling on rents is a function of debt outstanding: $R_t = R(b_t)$.

repeated in each period.

An equilibrium is a reservation level of private consumption that is optimal for the voters in the current period, given the initial conditions and taking into account subsequent equilibrium outcomes, and a policy that is optimal for the government, given the voting strategy and subsequent equilibrium outcomes. Note that this definition of sequential equilibrium rules out pre-commitment by the voters to a sequence of voting rules. Voters can punish the government for bad behavior during the current legislature. But we do not allow voters to punish the government for the policy chosen before the previous election, once they discover how much public debt was accumulated during the previous legislature. In other words, we restrict attention to Markov-perfect equilibria. Since the government is fully informed and there is no asymmetric information, rational voters can fully predict government policy, even if they do not observe it. Hence, in equilibrium no government change occurs and the incumbent is always re-elected, although the threat of out of equilibrium events is a major determinant of the voters' and of the government's decisions.

3 Equilibrium policies

In this section, we characterize the equilibrium and then we discuss its properties. Since it is simpler, we start with the case in which the upper bound on rents is a constant irrespective of public debt outstanding: $R_t = \bar{r}$. The appendix describes the equilibrium under the alternative assumption that $R_t = R(b_t)$. Suppose that the incumbent chooses to forgo re-election. In this case, he will certainly grab as many rents as possible, and obtain utility $v(R_t) = v(\bar{r})$.[7]

Next, suppose that the incumbent government seeks to please the voters. Let $W(b, y, c)$ be the incumbent's maximal utility in this case, given current income y, debt outstanding b, and voters demands c. Let a $\prime$ in front of a variable denote next period values. Then $W(b, y, c)$ is defined by:

$$W(b, y, c) = \underset{r,b'}{Max}[v(r) + \beta EV(b', y')] \tag{5}$$

[7]Under our assumptions, government debt policy in this out-of-equilibrium outcome is not well defined (in the sense that the government is indifferent about b_{t+1}). But we don't need to specify the out-of-equilibrium debt to determine the equilibrium outcome, so we leave it at that.

subject to the budget constraint, $r = y - c + \beta b' - b$ and to the upper bounds on rents and government debt. The function $V(\cdot)$ is the equilibrium value of reappointment for the incumbent, in the future state (b', y').

The incumbent can always choose to forego re-election. Hence, voters cannot push government utility below the threshold $v(\bar{r})$ (what he can achieve by grabbing maximal rents once). In other words, for any values of b and y, voters' demands have to satisfy the following incentive constraint:

$$W(b, y, c) \geq v(\bar{r}) \tag{6}$$

Clearly, it is optimal for the voters to demand private consumption up to the point where (6) holds as equality. Not doing that would simply enable the government to grab more rents for itself, without increasing voters' utility in current and future periods. Hence, equilibrium demands by the voters, c^*, are a function $c^* = C(b, y)$, defined implicitly by the condition:

$$W(b, y, c^*) = v(\bar{r}) \tag{7}$$

We can then define the equilibrium value of reappointment, namely the function $V(b, y)$ introduced above, as:

$$V(b, y) = W(b, y, c^*) = v(\bar{r}) \tag{8}$$

where the last equality follows by (7).

Since (8) must hold for any values of b and y, it must also hold in all future periods. Thus, $V(b', y') = v(\bar{r})$ for all possible values of y' and b'. Based on (5) and (8), equilibrium rents in the current period are then implicitly defined by the following condition:

$$v(r) + \beta v(\bar{r}) = v(\bar{r}) \tag{9}$$

The left hand side of (9) is the incumbent's utility if he pleases the voters, given the equilibrium continuation value of being reappointed tomorrow. The right hand side is his utility if he steals as much as possible today, but is then thrown out of office. In equilibrium, the incumbent must be indifferent between these two options. Equation (9) can be easily solved to obtain equilibrium rents:[8]

$$r^* = v^{-1}\left[v(\bar{r})(1 - \beta)\right] \tag{10}$$

[8]Implictly, we are assuming that equilibrium rents are strictly positive.

It remains to determine optimal public debt, b', for a government seeking re-appointment. Using the previous notation, this is the solution to the following optimization problem:

$$\underset{b'}{Max}[(y - c^* + \beta b' - b) + \beta EV(b', y')] \tag{11}$$

subject to $b' \leq \bar{b}$. The expression inside the round brackets corresponds to rents in the current period, given the voters equilibrium request, c^*. The last term is the expected equilibrium continuation value (i.e. what the government expects to get from next period onwards if he is re-appointed).

By the argument above, $EV(b', y') = v(\bar{r})$ for any value of b'. This means that, from the perspective of a government seeking reappointment, issuing public debt in the current period entails no future costs. The costs are fully borne by the consumers. But by assumption, consumers do not observe government debt. Hence, the incumbent can pocket the proceeds from issuing government debt in the form of higher rents. Indeed, the optimal debt policy that solves (11) is to always borrow as much as possible: $b'^* = \bar{b}$. Equilibrium private consumption is then easily obtained by inserting all these results in the budget constraint, (2).

We summarize all this in the following:

Proposition 1 *Suppose that the upper bound on rents is a constant, $R_t = \bar{r}$. Then the equilibrium stochastic steady state has:*

$$\begin{aligned} c^* &= y - r^* \\ r^* &= v^{-1}\left[v(\bar{r})(1-\beta)\right] \\ b^* &= \bar{b} \end{aligned}$$

The steady state is reached after one period.

The appendix solves the case in which the upper bound on rents depends on debt outstanding: $R_t = R(b_t)$. The solution procedure is very similar, the only difference being that issuing government debt now is costly for the government, because it reduces the value of its out-of-equilibrium threat next period. As a result, equilibrium debt is now at an interior optimum lower than the upper bound $\bar{b}$, and the steady state is reached gradually rather than at once. But throughout the adjustment to the steady state, and once the steady state is reached, consumption moves one for one with income. Equilibrium debt and rents are not affected by income shocks. More specifically, the appendix proves:

Proposition 2 *Suppose that the upper bound on rents depends on debt outstanding, $R_t = R(b_t)$. Then the equilibrium stochastic steady state has:*

$$\begin{aligned} c^* &= y - r^* \\ r^* &= v^{-1}\left[v(R(b^*))(1-\beta)\right] \end{aligned}$$

and steady state debt is at an interior optimum $b^* < \bar{b}$. Under the conditions stated in the appendix, the steady state is locally stable. During the adjustment to the steady state, income shocks only affect consumption, that changes one for one with income.

3.1 Discussion

According to Propositions 1 and 2, income shocks change consumption one for one: positive income shocks are not saved through the government budget to bring about higher utility for tomorrow; and negative income shocks do not lead to more government borrowing. This happens irrespective of whether the government is up against its debt ceiling or not. This failure to smooth income shocks with fiscal policy is due to an agency problem, not to a credit market imperfection. The intuition is straightforward: consumers do not observe debt accumulation. They also know that they cannot trust the government. Thus, when they see better macroeconomic conditions, they demand higher utility for themselves. If they did not do that, the government would simply appropriate more rents, and they would not receive any higher consumption in the future anyway. The converse happens when income is seen to go down.

To keep the model simple, here the government can only deliver utility to the voters through tax cuts. Thus, literally the model predicts that the tax revenue to GDP ratio goes down in booms and up in recessions. But as already noted, it would be easy to add productive government spending to the model (that also yields utility to the voters). In such a case, during an economic boom voters would demand both higher private and public consumption. Depending on the specific assumptions, either government spending would go up or tax rates would go down when income increases, or both. But either way, voters would demand immediate welfare gains, and would not trust the government to save resources for the future.

Finally, note that in the model as we have it written, the degree of "corruption" is a zero-one variable: either the government can appropriate rents,

in which case fiscal policy is procyclical, or it cannot, in which case fiscal policy is optimal. This stark contrast comes form the strong assumptions on government preferences. We also solved a two-period version of this model with a relative weight capturing how much the government cares about rents relative to consumer welfare. In such a model, the degree of procyclicality is a function of the weight given to consumer welfare: the more government cares about rents, the larger is the reaction of private consumption to income shocks (i.e., the more procyclical fiscal policy is, in the sense described above).

4 Empirical Evidence

4.1 Estimation strategy

The model of the previous sections explains procyclical fiscal policy as the result of a political agency problem. Voters do not trust the government, and demand higher utility (in the form of lower taxes or higher productive government spending) when they see aggregate output going up. Thus, the model predicts that procyclical fiscal policy should mainly be observed in countries where political corruption is widespread. In countries where the government is subject to checks and balances, and political rents are negligible or difficult to capture, voters have no reason to mistrust the government and impart a procyclical bias to fiscal policy. Moreover, procyclical fiscal policy results from a corrupt government which is nevertheless accountable to the voters. If the government were totally unaccountable (say in a stable dictatorship), then corruption would be high but voters could not influence what the government does, and hence the procyclical bias should not be observed or be less prevalent.

To take these predictions to the data, we estimate a cross-country regression of the following type:

$$Beta_i = \phi_0 + \phi_1 Control\_of\_corruption_i + \phi_2 X_i + u_i \qquad (12)$$

where the i subscript denotes countries, the dependent variable, $Beta$, is a measure of *counter*-cyclicality in fiscal policy, the variable $Control\_of\_corruption$ is a measure of (the absence of) political corruption, and X denotes other control variables described below. The coefficient of interest is ϕ_1, which we expect to be positive: fiscal policy is more counter-cyclical when there is less

corruption. Moreover, we expect ϕ_1 to be positive in democracies, but not in dictatorships: corruption imparts a procyclical bias in democracies (where the government is accountable to the voters), but not in dictatorships (where accountability is not an issue).

Finally, it is not obvious that the relationship between political corruption and procyclicality in fiscal policy is linear and continuous (a tiny amount of more corruption leads to slightly more procyclicality). On the contrary, the version of the model which we presented implies that there are two groups of countries: those where political checks and balances are not working well and corruption is rampant, and those to which this does not apply. The former is more likely to be the case in less developed economies, given the well known positive correlation between quality of institutions and per capita income. In fact, previous studies have shown that procyclical fiscal policy is a big problem in some developing countries, but not among industrial democracies (cf. Kaminski, Reinhart and Vegh 2004). To allow for a non-linear relationship between corruption and procyclicality in fiscal policy, we also estimate a probit version of (12), where the dependent variable is 1 if $Beta_i > 0$ (counter-cyclical fiscal policy) and 0 if $Beta_i < 0$ (procyclical fiscal policy). Thus, we estimate the probability of observing procyclical fiscal policy in country i. The regressors are the same regressors that appear on the right hand side of (12).

4.2 Data

4.2.1 Cyclicality of fiscal policy

We construct a measure of cyclicality of fiscal policy following Catao and Sutton (2002), who in turn adapt Gavin and Perotti's (1997) specification.

Our measure of procyclicality is the coefficient β from the following regression estimated separately for each country in the sample (t subscripts denote years):

$$\Delta S_t = \alpha + \beta GDPGAP_t + \gamma TOT_t + \theta S_{t-1} + \varepsilon_t \tag{13}$$

where: S_t refers to the central government's overall budget surplus as a percentage of GDP(obtained from the World Bank's Global Development Network Growth Database (GDNGD), based on data originally from the International Monetary Fund's *Government Financial Statistics*); $GDPGAP_t$ is the output gap, defined as the log deviation of GDP from its Hodrik-Prescott

trend; TOT_t is a measure of the gap in terms of trade, also defined as the logarithmic deviation from a Hodrick-Prescott-filtered series. The source for the GDP and terms of trade series is the World Development Indicators (WDI). A *negative* coefficient on $GDPGAP$ implies that a cyclical boom is associated with a decrease in the budget surplus, meaning that the behavior of fiscal policy is *procyclical*. We also consider the same specification but redefine the dependent variable as either spending or tax revenue as a share of GDP, rather than the budget surplus. In choosing the specification for our computation of procyclicality we had to be parsimonious, to have as large a sample of countries as possible. We have data on 87 countries, in a sample that goes from 1960 to 1999 but, despite the parsimonious specification, only for a small number of countries we have data for the whole period, with a few countries having as little as five years of data. As a robustness check, we have also run the regressions limiting the sample to those countries with at least ten years of data, and the results are similar.

Table 1 reports our estimate of the parameter β in our 87 countries; the fiscal policy variable in the left hand side of (13) is the budget surplus. Our estimates confirm previous results by others. In the OECD countries fiscal policy is countercyclical: in all but three countries the coefficient beta has the correct (i.e. positive sign) and so does the average β for the OECD. In 36 out of 64 non-OECD countries in the sample the coefficient β has the incorrect sign (i.e. it is negative). The two regions with the most procyclical fiscal policy are Sub-Saharan Africa and (especially) Latin America, which is the "worst" region. This is in fact the region that had originally attracted the interest of economists about procyclicality of fiscal policy (see Gavin and Perotti (1997), for instance). Note that most countries in Eastern Europe have very few years of observations, so results on this region have to be taken cum grano salis.[9]

Table 2 reports the β coefficient obtained in regressions where on the left hand side of (13) we have spending and tax revenues as a percentage of GDP. Here, procyclicality corresponds to $\beta > 0$ for expenditures, and $\beta < 0$ for

[9]We have dropped from our sample two outlier countries: Israel and Yemen. These countries have coefficients that exceed 1 in absolute value (Israel negative, Yemen positive). Note that Israel is a country with relatively low corruption and a very procyclical fiscal policy (according to the estimated coefficient). Therefore excluding Israel would help finding the relationship between procyclicality and corruption derived from the model. The same applies to Yemen in the opposite direction. Including both countries in our sample does not affect the results.

revenues. In OECD countries most of the counter-cyclical "action" is on the spending side. In Latin America both the spending side and the revenue side are procyclical, with the size of the spending side being twice as large in absolute value. In Sub-Saharan Africa all the procyclicality comes from the spending side. Thus, in these two regions which are especially procyclical the "incorrect" timing of fiscal policy seems to be driven almost exclusively by spending.

Many of the β coefficients have large standard errors and are not significantly different from zero. However, in OECD countries the positive coefficients in the surplus regression and the negative one on spending are almost all significantly different from zero. In Latin American and Sub-Saharan Africa several of the coefficients with the wrong sign are statistically different from zero, but a majority of the coefficients in non-OECD countries are not statistically different from zero. To cope with likely measurement error, below we also report regressions were we weight observations with the (inverse of) the estimated standard errors of the β coefficients.

4.2.2 Control of corruption

To measure the degree of corruption, we use the *Control of Corruption* index from Kaufman, Kraay and Mastruzzi's (2004) aggregate governance indicators, which aggregates several scores and ratings from different sources on a scale of -2.5 to 2.5. This index is decreasing in the amount of corruption and it is available for 1996, 1998, and 2000, and we take the average of the three years. We repeated the exercise using data on perceptions from corruption from ICRG (available for the whole period years 1982-97) and from Transparency International (available from 1996 onward). The results were very similar, since these corruption indicators are highly correlated with each other and move slowly over time. In the end, we only report results using the Kaufman, Kraay and Mastruzzi (2004) data, since they are available for a larger number of countries.

4.2.3 Other regressors

We also control for other regressors that may determine the cyclical response of fiscal policy (the variable X in (12)). To allow for differences in the level of economic development, we control for real per capita income; we measure it as real GDP per capita in international prices (PPP adjusted) in the first

year of the sample over which the measure of procyclicality of fiscal policy is computed for each country. The source is the WDI. This variable is called *Initial GDP (per capita)*. To capture how *democratic* a country is, we rely on the variable *Polity2*, which subtracts the country's score in an "Autocracy" index from its score in a "Democracy" index (resulting in a range from -10 to 10), from the Polity IV Project database. We average this variable over the sample used to compute the fiscal policy measure, and use the result to construct two different measures: a coarser *Democracy* dummy, which equals one if the average Polity2 score is strictly positive, and zero otherwise; and the average *Polity2* measure itself.

The cyclical properties of fiscal policy may differ across countries because the size of government spending is different. Hence we also control for this feature of a country's public sector, with a variable *Government size* defined as the share of central government's expenditure in real GDP, also from the GDNGD.

Finally, as others have noted (e.g. Gavin and Perotti 1997), procyclical fiscal policy may also result from tight credit constraints. We make use of two variables to proxy for the degree of *financial constraints* facing a country's government. One of them is an average of the existing sample of ratings attributed by Standard & Poor's to a country's long-term foreign-denominated sovereign debt (*S&P Rating*).[10] We interpret this average as an inverse measure of the degree of financial constraints facing a country's government. The other variable is the logarithm of the spread (in basis points) of a country's sovereign debt over U.S. Treasury bonds at the time of issuance (*Spread*), which comes from Capital Data Bondware and SDC Platinum.[11] This constitutes a direct measure of financial constraints. It should be noted that both of these variables are limited in terms of the number of countries in our sample for which they are available (70 and 47, respectively) and of the

[10] Adapting Cantor and Packer's (1996) approach, we attribute numbers from 0 to 6 to S&P's letter-based system: C (default or selective default); B (high-risk obligations); BB (likely to fulfill obligations, ongoing uncertainty); BBB (adequate payment capacity); A (strong payment capacity); AA (high quality); AAA (highest quality). Countries rated at BBB or better are said to have "investment-grade" ratings.

Since changes in ratings occur at irregular intervals, we computed the average by weighing a given rating by the first integer greater than the number of years over which it was kept.

[11] Similarly to the case of ratings, the issuance of new debt occurs at irregular intervals. We thus use a similar weighting system to compute the average spread, taking into account the length of of the period between emissions.

period over which they are available: for most countries the sample starts in the 1990s, which means that, unlike the democracy variables, the average is *not* taken over the sample used to compute the fiscal policy variable.

4.3 Procyclicality and corruption

We now examine the correlation between the cyclical properties of fiscal policy and political corruption. Table 3 reports some simple statistics. Latin America and Sub-Saharan Africa have the lowest score on control of corruption and they are the most procyclical regions.

Table 4 presents some multivariate regressions estimated by OLS. The dependent variable is the estimated beta coefficient on the budget surplus reported in Table 1. Columns 1 and 2 show a strongly significant relationship between *Control of corruption* and procyclicality: more corrupt countries are more procyclical, even after controlling for initial GDP per capita in log (column 2).[12] Column 3 shows that the estimated coefficient on the variable *Democracy* is not statistically significant, but Column 4 highlights the interaction between *Democracy* and *Control of corruption:* when the two variables are interacted, the estimated coefficient on corruption alone drops and becomes statistically insignificant, while the interaction term has a positive and significant estimated coefficient (of about the same size as the coefficient of corruption alone in Column 3). Thus, the effect of corruption on procyclicality is apparent only among democracies, as predicted by the theory. Columns 5 and 6 repeat the same experiment using the continuous *Polity2* variable to measure democracy; the results are very similar.

We repeated all these regressions adding the variable *Government size* on the right hand side, where this variable is averaged for the period in which the left hand side is defined. This new variable was never statistically significant, and the sign and significance of all the other estimated coefficients was unchanged relative to Table 4. We also ran these regressions excluding Eastern European countries, where the number of observations available to construct the beta coefficients were relatively small. The results are qualitatively unchanged.[13] In Table 5 we use the Probit method and we define the

[12] Initial GDP is more exogenous to cyclicality of fiscal policy than per capita income measured in the middle or at the end of the sample period. In any event, we repeated the regressions using per capita income measured in the middle of the sample period available for each country and the result are virtually unchanged.

[13] All these results are available upon request.

left hand variable (beta) as a zero-one variable (1 if positive, zero if negative). The results of this table confirm the previous one; if anything they make it even clearer that the effect of corruption on procyclicality is present only in democracies, a result consistent with the spirit of the model.

Our dependent variable (the estimated beta coefficients) is likely to be measured with error. Moreover, measurement error could vary across countries, and be larger in the countries where procyclicality is estimated from a shorter time series. To cope with this problem, in Table 6 we estimate the same specifications as in Table 4, but we weight observations by the (inverse of) the standard error of the estimated β coefficients. The estimated coefficient on *Control of corruption* is now a bit smaller, but the pattern of significance and the inferences we can draw remain the same as in Table 4.

Finally, Table 7 repeats the same exercise as in Table 4, but now the dependent variable is the β coefficient estimated from government spending regressions (and reported in Table 2). Here a positive β denotes procyclicality. Hence we expect *Control of corruption* to have the opposite sign as in Table 4: more *Control of corruption* should be associated with less procyclicality, and hence we expect a negative coefficient. This is indeed what we find. The pattern of significance is the same as in Table 4. In particular, the effect of corruption on cyclicality of spending is stronger in democracies (the interaction term between *Democracy* or *Polity2* and *Control of corruption* has a negative and significant estimated coefficient). Here we also find that the estimated coefficient on the variable *Democracy* (or *Polity2*) in isolation is positive and significant, suggesting that, aside from the interaction with corruption, democratic government on its own leads to more countercyclical government spending. This might also reflect the composition of government spending in democracies, that is likely to be more leaning towards social insurance. Repeating the same experiment for the cyclicality of tax revenues leads to inconclusive results. When the dependent variable is defined as the β coefficient on tax revenues in per cent of GDP, no robust pattern of correlations emerges, and the R^2 of the regression is of the order of 0.02: essentially we cannot explain the observed patterns of cyclicality of tax revenues. These results on taxation and spending suggest that the procyclicality of fiscal policy is driven by spending, not by taxation.

4.4 The role of borrowing constraints

The major alternative explanation of a procyclical fiscal policy, different from our own, is that of borrowing constraints. If a country is credit rationed, it can spend only in booms; moreover, in downturns the credit constraint could become more binding and the government is forced to rein in fiscal policy. How can we discriminate between these two explanations, corruption vs borrowing constraints?

The key difficulty in addressing this issue is that corruption and credit ratings are very highly correlated. As shown in Table 8, the correlation coefficient between the variables *S&P Rating* and *Control of corruption* is 0.92. *Control of corruption* is also highly correlated with available data on interest rate spreads (*Spread*), a correlation of -0.82. Needless to say the two variable measuring credit rationing are highly correlated between each other (-0.89). In fact, some of these variables are correlated by construction. For instance Standard and Poor may look (directly or indirectly) to perception of corruption as one of their input in assigning ratings to countries. And perceptions of corruption may be influenced by foreigners' views of a country credit worthiness. The credit variable and corruption are all correlated with the expected sign with our measure of procyclicality.

The first observation relates to the results on the interaction between democracy and corruption. As discussed in the previous subsection, the correlation between corruption and procyclicality is stronger in democracies. This is a direct implication of our model. To be also consistent with a borrowing constraint story, corrupt democracies would have to be worst borrowers than corrupt dictatorships (while less corrupt governments would be equally trustworthy in democracies and autocracies). A priori one can think of many reason why it might be the opposite, or at least why the interaction between democracy and corruption would not be relevant in determining credit worthiness.[14]

The second rough test we performed is the following. In Table 9 we report the β on the budget surplus estimated on two sub-samples: pre and post 1982, the year of the Mexican debt crises that opened up two decades of debt crises, defaults etc. It is fair to say that, before 1982, concerns about default and credit worthiness were much less important than afterwards. In

[14] We repeated the same procedure using the probit specification for the left hand side variable. The general picture of the results that we obtained is similar to the one presented in the text.

general this table shows no evidence that procyclicality increased after 1982. In fact the opposite seems to be the case; in Latin America and Sub-Saharan Africa, the two most procyclical regions, we observe less procyclicality after 1982 than before. This seems rather inconsistent with a purely borrowing costs story.

This interpretation is also confirmed by re-estimating the regressions of procyclicality on corruption with the beta coefficients estimated before 1982. As shown in Table 10, *Control of corruption* retains a positive and statistically estimated coefficient even when the measure of cyclicality refers to the pre-1982 period (although here the interaction between *Democracy* and *Control of corruption* is no longer statistically significant). These regressions ought to be interpreted with caution, both because cyclicality is likely to be measured with error (the sample is rather short for many countries), and because our measure of corruption refers to a rather distant period in time. Nevertheless, these estimates suggest that the correlation between procyclicality and corruption is a robust feature that pre-dates the years of sovereign debt crises.[15]

We have also added the measure of Standard & Poor's credit worthiness into our basis regressions of Table 4. The results are displayed in Table 11. In Column 1, where control of corruption and credit rating are introduced together, they are both insignificant given how highly correlated they are. Column 2 however highlights a suggestive result: the interaction of *Control of corruption* with democracy is still significant and positive even when we control for the *S&P Rating* variable. Columns 3 and 4 repeat the same experiments of Columns 1 and 2 with two other measure of democracy (Polity 2)with similar results. Columns 5 to 8 repeat the same regressions from Columns 1 to 4 using the *Spread* measure of credit rating rather than the *S&P Rating* variable. What we find here is that the *Spread* measure is statistically significant but so is the interaction of democracy with the measure of control of corruption. We have also repeated the same regressions weighting observations by the (inverse of) the standard errors of the β coefficients, and using the Probit method, obtaining similar results.

Note also that if credit constraints were the main cause of procyclicality, the latter should be especially evident in recessions, when governments can-

[15] In all these regressions we have excluded the outliers of Israel and Yemen but none of our result depend on including or excluding them. Also we have excluded any country with fewer than 5 observations usable to compute the β coefficient. The variable *Democracy* has been redefined to correspond to the pre-1982 period.

not borrow and thus have to tax more or spend less in order to overcome recession-induced deficits. In booms instead the governments have resources, and not only can they be anticyclical (i.e. reduce spending as a share of GDP or increase tax revenues as a share of GDP) but, expecting constraints in recessions, they should be especially keen on accumulating surpluses in booms; thus they should be especially anticyclical in booms. It turns out that governments are more procyclical in booms than in recessions; in fact in more than 2/3 of the countries that are procyclical they are more so in booms than in recessions. This observation casts some doubts on a simple borrowing constraint interpretation of procyclicality.

In fact, we have reestimated equation (13) separately for each country, allowing the β coefficient to take on different values in positive vs negative output gaps. Our agency model predicts no asymmetry: there is no reason why fiscal policy ought to react very differently in booms vs recessions. According to the credit market imperfection hypothesis, instead, if anything procyclicality should be stronger during recessions, as discussed above. Table 12 lists the 39 countries with procyclical fiscal policy (i.e. with negative estimated β coefficients in Table 1). The first column (*Beta Recession*) reports the estimated β coefficient during recessions; the second column (*Beta Boom*) reports the estimated β coefficient during booms. Remember that the beta coefficients should be positive both in recessions (GDPGAP negative) and in booms (GDPGAP positive). In 21 out of 39 countries, *Beta Boom* is negative and *Beta Recession* positive, indicating that only in booms we observe procyclicality. Moreover in 28 out of 39 countries *Beta Boom* is lower algebraically than *Beta Recession*. In other words, only in 11 out of 39 countries procyclicality seems to be driven mostly by recession periods. Given the large standard errors, the difference between *Beta Boom* and *Beta Recession* is almost never statistically significant, but nevertheless this evidence is suggestive, since the credit constraint hypothesis would imply a significant difference in which procyclicality emerges especially or only in recessions.

As a further check, in Table 13 we have regressed *Beta Recession* (i.e. the reaction of the surplus to recessions) against our variables of interest. According to the credit market imperfection hypothesis, the variables measuring credit constraints (*S&P Rating* and *Spread*) should have more explanatory power in these regressions than against the overall measures of procyclicality, and conversely the variable *Control of corruption* should have less explanatory power here: as argued above, credit market imperfections are more likely

to lead to distorted fiscal policy at the time of recession than during booms. But this is not what we find. In column 1, *Control of corruption* is generally highly significant and with the expected sign. Columns 2 and 3 show that also the measures of *Spread* and *S&P Rating* are significant, but the last two columns show that when control of corruption and the credit market variables are entered together the *Control of Corruption* variable dominates. In column 4 it is the only one which is significant, in the last one it is borderline insignificant but much closer to significance that the credit constraint variable.

In summary, it is difficult to disentangle clearly the effects of credit constraints per se from political variables such as measure of corruption. However the tests presented above suggest at least tentatively that corruption and political imperfections play a major role in explaining procyclicality of fiscal policy, and perhaps more so than credit constraints.

5 Conclusions

In many developing countries fiscal policy is procyclical. Our explanation is that voters do not trust corrupt government with resources and demand tax cuts or increase in productive government spending or transfers when positive shocks hit the economy. Otherwise they fear that the available resources would be "wasted" in rents. For the same reasons the voters do not "allow" government to accumulate reserves of assets, on the contrary they demand a level of government debt that forces the government to use resources to pay interest rather than steal them. Therefore this political distortion, related to the "starve the Leviathan"argument, leads to a higher-than-first-best accumulation of government debt and procyclical fiscal policy.

Credit constraints come into play indirectly because the political distortion may push the government towards levels of debt that are at the limit of what they can repay and therefore at the limit of what borrowers can lend. The literature that focuses on credit constrains reviewed above, implicitly or explicitly suggests that the "malfunctioning" of credit markets makes it hard or impossible for developing countries to borrow exactly when they need it more, in bad times. But this argument fails to explain why welfare maximizing governments don't take this into account, building up reserves in good times, so as to avoid being credit constrained in bad times. Moreover, our evidence suggests that procyclicality is more often driven by a distorted

policy reaction to booms, rather than to recessions. And whatever procyclical policy response there is to recessions, does not seem to be explained by available measures of credit constraints.

6 Appendix

Proof of Proposition 2

Now consider the case in which the upper bound on rents is a decreasing function of debt outstanding: $R_t = R(b_t)$, with R_b, $R_{bb} < 0$. Going through the same steps as in section 3, in equilibrium the government must be indifferent between pleasing the voters and being reappointed (taking into account the future equilibrium continuation value), or grabbing as many rents as possible today. This indifference condition (the analogue of (9) in section 3) here can be written as:

$$v(r) + \beta v(R(b')) = v(R(b)) \tag{14}$$

Hence, equilibrium rents are determined jointly with equilibrium government debt. Repeating the steps of Section 3, a government seeking reappointment chooses public debt so as to maximize (11). But here, $EV(b', y') = v(R(b'))$. Hence, equilibrium public debt is determined by the following optimality condition:

$$v_r(r) = -v_r(R(b'))R_b(b') \tag{15}$$

the left hand side of (15) is the marginal benefit of borrowing, namely the additional rents that the government can grab today with the debt proceeds. The right hand side is the marginal cost of issuing debt, namely the reduction in the upper bound of rents tomorrow, which in turn reduces the value of the incumbent's future out-of-equilibrium threat. Together, (9) and (15) determine the equilibrium time paths of rents and public debt.

The steady state is obtained imposing $b' = b = b^*$ in (14), to yield an expression for equilibrium rents that closely resembles equation (10) in Section 3:

$$v(r^*) = v(R(b^*))(1 - \beta) \tag{16}$$

By (16), equilibrium rents are below the upper bound in the steady state: $r^* < R(b^*)$. With strictly concave preferences, equation (15) then implies that the steady state is at an interior optimum (i.e. $b^* < \bar{b}$) only if $R_b(b^*) > 1$. Intuitively, for the government to borrow less than the maximum $\bar{b}$, the cost

of issuing government debt must be high enough. With $r^* < R(b^*)$, the marginal utility of current rents is higher than the marginal utility of rents evaluated at the upper bound; hence the government finds it optimal not to issue more debt only if the upper bound on rents shrinks more than one for one as more debt is issued: $R_b(b^*) > 1$. Assuming that this condition holds for some $b < \bar{b}$, then the steady state can correspond to an interior optimum for government debt.

We now show that the steady state is locally stable (i.e. that $\frac{db'}{db} < 1$ in a neighborhood of the steady state). Equation (15) implicitly defines equilibrium rents as a function of government debt: $r = F(b')$. Applying the implicit function theorem to (15), we also have:

$$F_b(b') = \frac{v_{rr}(R(b'))R_{bb}(b')}{v_{rr}(F(b'))} < 0 \tag{17}$$

Replacing $r = F(b')$ in (14), the equilibrium law of motion of government debt is implicitly defined by:

$$v[F(b')] + \beta v[R(b')] - v[R(b)] = 0 \tag{18}$$

Now use (18) to compute $\frac{db'}{db}$ in a neighborhood of the point $b' = b = b^*$. After some simplifications we have:

$$\frac{db'}{db} = \frac{1}{\beta - F_b(b^*)} > 0 \tag{19}$$

Thus, recalling that $F_b(b) < 0$, that $F(b) < R(b)$ and that $R_{bb} < 0$, and using (17), we have that $\frac{db'}{db} < 1$ provided that $v_{rrr} \geq 0$ and that R_{bb} is not too close to 0 in absolute value.

Finally, note that in equilibrium (on and off the steady state) neither rents nor public debt depend on income. The budget constraint then implies that temporary income shocks change consumption one for one.

7 References

References

[1] Alesina Alberto and Roberto Perotti (1995) "The Political Economy of Budget Deficits" *IMF Staff Papers* 42: 1-31.

[2] Alesina, Alberto and Guido Tabellini (1990) "A Positive Theory of Fiscal Deficits and Government Debt" *Review of Economic Studies* 57: 403-14.

[3] Barro, Robert (1973) "The Control of Politicians: An Economic Model", *Public Choice,* 13: 19-42.

[4] Cantor, Richard and Frank Packer (1996). "Determinants and Impact of Sovereign Credit Ratings," *Federal Reserve Bank of New York Economic Policy Review*, 20: 37-54.

[5] Catao, Luis A. and Bennett W. Sutton (2002). "Sovereign Defaults: The Role of Volatility," IMF Working Papers 02/149, International Monetary Fund.

[6] Ferejohn, John (1986) "Incumbent Performance and Electoral Control" *Public Choice,* 50: 5-25.

[7] Gavin, Michael and Roberto Perotti (1997). "Fiscal Policy in Latin America," in Bernanke, Ben and Rotemberg, Julio, *NBER Macroeconomics Annual 1997*, Cambridge, MA: MIT Press.

[8] Global Development Network Growth Database (compiled by William Easterly and Mirvat Sewadeh), available on: http://www.worldbank.org/research/growth/GDNdata.htm

[9] Jensen, Michael C., and William H. Meckling (1976), "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics*, 3: 305-360.

[10] Kaminski, Graciela, Carmen Reinhart, and Carlos Vegh (2004) "When it Rains it Pours: Procyclical Capital Flows and Macroeconomic Policies" in Mark Gertler and Kenneth Rogoff (eds) *NBER Macroeconomic Annual 2004,* , Cambridge, MA: MIT Press.

[11] Kaufman, Daniel, Aart Kraay and Massimo Mastruzzi (2004), "Governance Matters III: Governance Indicators for 1996-2002," World Bank Policy Research Working Paper 3106.

[12] Lane, Philip and Aaron Tornell (1998) "Why Aren't Latin American Saving Rates Procyclical?" *Journal of Development Economics*, 57: 185-200.

[13] Milesi Ferretti, Gian Maria (2003) "Good Bad or Ugly? On the Effects of Fiscal Rules on Creative Accounting" *Journal of Public Economics,* 88: 377-94.

[14] Perotti, Roberto (2004) "Estimating the Effects of Fiscal Policy in OECD Countries", mimeo, IGIER-Bocconi.

[15] Persson, Torsten and Lars Svensson (1989) "Why a stubborn conservative would run a deficit: Policy with time-inconsistent preferences", *Quarterly Journal of Economics*, 104: 325-345

[16] Persson, Torsten and Guido Tabellini (2000) *Political Economics: Explaining Economic Policy,* Cambridge, MA: MIT Press.

[17] Polity IV Project, available on: http://www.cidcm.umd.edu/inscr/polity/#data

[18] Rogoff, Kenneth (1990) "Equilibrium Political Budget Cycles" *American Economic Review,* 80: 21-36.

[19] Rogoff, Kenneth and Ann Siebert (1988), "Elections and Macroeconomic Policy Cycles", *Review of Economic Studies* 55: 1-16.

[20] Satyanath, Shanker and Arvind Subramanian (2004) "What Determines Long-Run Macroeconomic Stability? Democratic Institutions", IMF Working Paper No. 04/215, International Monetary Fund.

[21] Standard and Poor's Credit Ratings, available on: http://www2.standardandpoors.com/

[22] Tabellini, Guido and Alberto Alesina (1990), "Voting on the budget deficit", *American Economic Review* 80: 37-49.

[23] Talvi, Ernesto and Carlos Vegh (2005) "Tax Base Variability and Procyclicality of Fiscal Policy" *Journal of Development Economics,* forthcoming.

[24] Tornell, Aaron and Philip Lane (1999) "Voracity and Growth" *American Economic Review,* 89: 22-46.

[25] Von Hagen, Jurgen and Jan Harden (1994) "National Budget Process and Fiscal Performance" *European Economy Reports and Studies* 3: 311-44.

Table 1
Beta Coefficients

Country	Beta	Initial Year	Final Year
Australia	0.319	1970	1996
Austria	0.192	1970	1996
Belgium	0.120	1970	1996
Canada	0.359	1969	1996
Denmark	0.840	1970	1996
Finland	0.264	1960	1996
France	0.401	1972	1996
Germany	-0.086	1991	1996
Greece	0.136	1960	1996
Iceland	0.240	1972	1996
Ireland	-0.333	1960	1996
Italy	0.419	1960	1996
Japan	0.278	1960	1993
Luxembourg	-0.267	1975	1996
Netherlands	0.209	1960	1996
New Zealand	0.206	1960	1996
Norway	0.536	1972	1996
Portugal	0.425	1975	1996
Spain	0.265	1962	1996
Sweden	0.788	1960	1996
Switzerland	0.078	1960	1996
United Kingdom	0.216	1960	1996
United States	0.389	1960	1996
OECD	**0.261**		
Bulgaria	0.432	1988	1997
Croatia	0.001	1991	1996
Hungary	0.248	1981	1997
Romania	0.140	1989	1997
Turkey	-0.262	1987	1997
Eastern Europe	**0.112**		
India	-0.019	1965	1998
Indonesia	0.181	1972	1997
Malaysia	-0.003	1960	1997
Nepal	0.013	1973	1999
Pakistan	0.095	1973	1998
Papua New Guinea	-0.094	1975	1993
Philippines	0.043	1960	1998
Singapore	-0.027	1975	1995
South Korea	0.002	1972	1996
Thailand	0.129	1960	1997
Asia and Pacific	**0.032**		
Egypt	-0.028	1975	1997
Iran	0.145	1974	1990

Country (*continued*)	Beta	Initial Year	Final Year
Morocco	-0.032	1972	1995
Tunisia	0.021	1972	1999
Middle East and North Africa	**0.027**		
Botswana	0.224	1982	1996
Burkina Faso	-0.071	1973	1993
Burundi	0.016	1974	1999
Cameroon	0.017	1975	1998
Chad	-0.044	1972	1991
Congo	-0.124	1980	1998
Ethiopia	-0.021	1981	1992
Gabon	-0.384	1973	1991
Gambia	0.012	1966	1993
Ivory Coast	-0.219	1979	1998
Madagascar	0.139	1972	1996
Mali	0.064	1977	1988
Mauritius	-0.313	1974	1999
Namibia	-0.243	1986	1993
Rwanda	-0.035	1973	1993
Senegal	0.035	1972	1984
Seychelles	-0.413	1985	1997
South Africa	0.133	1972	1998
Togo	-0.739	1977	1987
Zambia	0.166	1972	1988
Zimbabwe	0.280	1976	1996
Sub-Saharan Africa	**-0.072**		
Argentina	-0.011	1973	1996
Belize	-0.262	1977	1997
Bolivia	0.278	1980	1997
Brazil	-0.104	1960	1997
Chile	-0.060	1960	1999
Colombia	0.087	1960	1999
Costa Rica	-0.264	1970	1997
Dominican Republic	0.048	1960	1998
Ecuador	-0.098	1960	1997
El Salvador	0.023	1960	1999
Guatemala	-0.461	1960	1998
Haiti	0.188	1979	1987
Honduras	0.033	1960	1997
Jamaica	-0.517	1975	1985
Mexico	-0.094	1971	1997
Nicaragua	-0.145	1960	1996
Panama	-0.164	1980	1998
Paraguay	-0.038	1960	1993
Peru	-0.037	1965	1999
St. Lucia	-0.058	1980	1991
St. Vincent & Grenadines	-0.515	1980	1996

Country (*continued*)	Beta	Initial Year	Final Year
Trinidad & Tobago	-0.801	1976	1995
Uruguay	-0.041	1965	1999
Venezuela	-0.144	1974	1999
Latin America and Caribbean	**-0.132**		

Regression: $\Delta Surplus_t = \alpha + \beta OutputGap_t + \gamma TOTGap_t + \theta Surplus_{t-1} + \varepsilon_t$

Table 2
Beta Coefficients – Expenditures and Revenues

Country	Beta (exp.)	Beta (rev.)
Australia	-0.105	0.104
Austria	0.256	0.260
Belgium	-0.488	-0.314
Canada	-0.136	0.173
Denmark	-0.469	0.354
Finland	-0.285	-0.071
France	-0.267	0.034
Greece	0.107	-0.067
Iceland	0.105	0.182
Ireland	0.137	-0.193
Italy	-0.322	-0.022
Japan	0.154	0.612
Luxembourg	-0.643	-0.578
Netherlands	-0.528	-0.263
Norway	-0.299	0.371
Portugal	0.195	0.167
Spain	-0.217	-0.127
Sweden	-0.760	0.635
Switzerland	-0.166	-0.071
United Kingdom	-0.803	-0.304
United States	-0.270	0.098
OECD	**-0.229**	**0.047**
Bulgaria	0.544	0.561
Croatia	0.002	0.003
Hungary	-0.155	0.207
Romania	-0.560	0.158
Turkey	0.316	-0.015
Eastern Europe	**0.029**	**0.183**
India	-0.029	0.077
Indonesia	-0.119	0.029
Malaysia	-0.022	0.174
Nepal	0.005	0.025
Pakistan	0.270	0.108
Singapore	-0.163	0.245
South Korea	0.013	0.089
Thailand	-0.092	0.231
Asia and Pacific	**-0.017**	**0.122**
Egypt	-0.116	0.014
Iran	0.004	0.050
Morocco	-0.157	-0.050
Tunisia	0.003	-0.008
Middle East and North Africa	**-0.066**	**0.001**

Country	Beta (exp.)	Beta (rev.)
Burkina Faso	-0.039	-0.106
Burundi	0.159	0.061
Cameroon	0.108	0.078
Chad	-0.333	-0.078
Congo	0.878	0.152
Ethiopia	0.252	0.172
Gabon	0.200	-0.022
Gambia	0.495	0.154
Ivory Coast	0.105	-0.205
Madagascar	-0.161	0.090
Mali	-0.321	-0.090
Mauritius	0.136	-0.047
Namibia	0.517	0.172
Rwanda	-0.115	0.012
Senegal	-0.180	-0.008
Seychelles	0.517	-0.063
South Africa	-0.027	0.022
Togo	0.516	0.275
Zambia	0.044	0.243
Zimbabwe	-0.122	0.005
Sub-Saharan Africa	**0.132**	**0.041**
Argentina	0.016	0.015
Belize	0.179	-0.142
Bolivia	0.389	-0.315
Brazil	0.265	0.161
Chile	0.037	0.047
Colombia	-0.211	-0.088
Costa Rica	0.206	0.010
Dominica	3.270	0.061
Dominican Republic	0.056	0.033
Guatemala	0.553	0.080
Haiti	0.155	-0.196
Honduras	-0.424	-0.084
Jamaica	-0.199	-0.323
Mexico	-0.086	-0.121
Nicaragua	0.073	-0.035
Panama	0.203	0.116
Paraguay	0.033	-0.002
Peru	-0.081	-0.092
St. Lucia	-0.104	-0.094
Trinidad & Tobago	0.482	0.143
Uruguay	0.265	-0.036
Venezuela	0.141	-0.073
Latin America and Caribbean	**0.093**	**-0.047**

Table 3
Beta Coefficients and Control of Corruption

Region	Beta	Beta (exp.)	Beta (rev.)	Control of Corruption
OECD	0.261	-0.229	0.047	1.813
Eastern Europe	0.112	0.029	0.183	-0.056
Asia and Pacific	0.032	-0.017	0.122	-0.008
Middle East and North Africa	0.027*	-0.133	-0.038	-0.073
Sub-Saharan Africa	-0.072	0.132	0.041	-0.339
Latin America and Caribbean	-0.132	0.093	-0.047	-0.237

Table 4
OLS Estimates: cyclicality of budget surplus
(Dependent variable: Beta of budget surplus)

	(1)	(2)	(3)	(4)	(5)	(6)
Control of Corruption	0.107***	0.149***	0.142***	0.024	0.145***	0.076**
	(0.027)	(0.037)	(0.040)	(0.034)	(0.044)	(0.036)
Initial GDP (per capita)		- 0.062	- 0.049	- 0.059	- 0.048	- 0.055
		(0.040)	(0.039)	(0.041)	(0.038)	(0.041)
Democracy			- 0.013	0.022		
			(0.057)	(0.046)		
Democracy*Control of Corruption				0.146***		
				(0.046)		
Polity2					- 0.002	- 0.001
					(0.006)	(0.006)
Polity2*Control of Corruption						0.011**
						(0.004)
R-squared	0.17	0.20	0.21	0.24	0.21	0.25
n	87	83	81	81	81	81

Robust standard errors in parenthesis; intercepts not reported.
* significant at 10%
** significant at 5%
*** significant at 1%

Table 5
Probit Estimates: cyclicality of budget surplus
(Dependent variable: Probability of Beta>0)

	(1)	(2)	(3)	(4)	(5)	(6)
Control of Corruption	0.289**	0.486**	0.446**	- 0.288	0.418*	- 0.037
	(0.130)	(0.205)	(0.210)	(0.388)	(0.226)	(0.272)
Initial GDP (per capita)		- 0.298	- 0.290	- 0.352	- 0.310	- 0.369
		(0.236)	(0.245)	(0.248)	(0.254)	(0.256)
Democracy			0.139	0.362		
			(0.371)	(0.382)		
Democracy*Control of Corruption				0.927**		
				(0.413)		
Polity2					0.019	0.024
					(0.037)	(0.035)
Polity2*Control of Corruption						0.080***
						(0.030)
Pseudo R-squared	0.04	0.06	0.06	0.10	0.06	0.12
n	87	83	81	81	81	81

Robust standard errors in parenthesis; intercepts not reported.
* significant at 10%
** significant at 5%
*** significant at 1%

Table 6
Weighted Estimates: cyclicality of budget surplus
(Dependent variable: Beta of budget surplus)

	(1)	(2)	(3)	(4)	(5)	(6)
Control of Corruption	0.093***	0.118***	0.115***	0.017	0.110***	0.065
	(0.021)	(0.029)	(0.030)	(0.060)	(0.033)	(0.042)
Initial GDP (per capita)		- 0.038	- 0.037	- 0.050	- 0.039	- 0.050
		(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Democracy			0.013	0.051		
			(0.051)	(0.054)		
Democracy*Control of Corruption				0.124*		
				(0.066)		
Polity2					0.002	0.004
					(0.005)	(0.005)
Polity2*Control of Corruption						0.008*
						(0.004)
R-squared	0.19	0.21	0.23	0.26	0.23	0.26
n	87	83	81	81	81	81

Robust standard errors in parenthesis; intercepts not reported. The weights are the inverse of the standard errors of the estimated beta coefficients.
* significant at 10%
** significant at 5%
*** significant at 1%

Table 7
OLS Estimates: cyclicality of government spending
(Dependent variable: Beta on central government spending)

	(1)	(2)	(3)	(4)	(5)	(6)
Control of Corruption	- 0.117***	- 0.144***	- 0.171***	- 0.086**	- 0.179***	- 0.107***
	(0.029)	(0.041)	(0.048)	(0.036)	(0.052)	(0.037)
Initial GDP (per capita)		0.038	- 0.010	- 0.003	- 0.004	0.005
		(0.047)	(0.044)	(0.046)	(0.045)	(0.048)
Democracy			0.243***	0.222***		
			(0.087)	(0.077)		
Democracy*Control of Corruption				- 0.109*		
				(0.058)		
Polity2					0.015**	0.015**
					(0.008)	(0.007)
Polity2*Control of Corruption						- 0.012**
						(0.005)
R-squared	0.15	0.16	0.24	0.25	0.19	0.22
n	83	79	77	77	77	77

Robust standard errors in parenthesis; intercepts not reported.
* significant at 10%
** significant at 5%
*** significant at 1%

Table 8
Partial correlation coefficients

	Beta (surp.)	Beta (exp.)	Control of Corruption	S&P Rating	Spread
Beta (surp.)	1				
Beta (exp.)	-0.50	1			
Control of Corruption	0.26	-0.39	1		
S&P Rating	0.40	-0.45	0.92	1	
Spread	-0.49	0.39	-0.82	-0.89	1

Table 9
Beta Coefficients (budget surplus)– pre- and post-1982

Country	Beta pre-82	Beta post-82
Australia	0.015	0.662
Austria	0.135	0.188
Belgium	0.469	-0.320
Canada	0.635	0.174
Denmark	0.379	1.539
Finland	0.056	0.731
France	0.437	0.243
Germany	-	-0.086
Greece	0.086	-0.896
Iceland	0.329	0.339
Ireland	-0.361	-0.037
Italy	0.478	0.086
Japan	0.216	1.232
Luxembourg	0.335	-0.473
Netherlands	0.110	0.147
New Zealand	0.023	0.538
Norway	-0.054	0.787
Portugal	-0.081	0.332
Spain	0.139	1.075
Sweden	0.009	2.128
Switzerland	0.048	0.204
United Kingdom	-0.099	0.589
United States	0.426	0.169
OECD	**0.170**	**0.407**
(excluding Denmark, Sweden)		**0.271**
India	-0.027	-0.111
Indonesia	0.002	0.292
Malaysia	-0.270	0.101
Nepal	-0.062	0.552
Pakistan	0.900	-0.045
Papua New Guinea	-0.152	-0.152
Philippines	-0.226	0.100
Singapore	0.569	0.080
South Korea	0.181	-0.035
Thailand	0.043	0.163
Asia and Pacific	**0.096**	**0.095**
Bulgaria	-	0.432
Croatia	-	0.001
Hungary	-	0.254
Romania	-	0.140
Turkey	-	-0.262
Eastern Europe	**-**	**0.113**

Country (*continued*)	Beta pre-82	Beta post-82
Egypt	1.435	-1.135
Iran	-0.093	0.497
Morocco	-0.409	-0.005
Tunisia	0.203	0.110
Middle East and North Africa	**0.284**	**-0.133**
Botswana	-	0.329
Burkina Faso	-0.221	0.048
Burundi	-0.214	0.082
Cameroon	-0.020	0.045
Chad	-	-0.223
Congo	-	-0.476
Ethiopia	-	-0.028
Gabon	-0.594	-0.157
Gambia	-0.034	-
Ivory Coast	-	-0.098
Madagascar	-	0.232
Mali	0.338	-0.015
Mauritius	-0.160	-0.058
Namibia	-	-0.243
Rwanda	-0.014	-
Senegal	-0.180	-
Seychelles	-	-0.413
South Africa	-0.350	0.525
Togo	-1.808	-0.274
Zambia	0.163	2.539
Zimbabwe	1.087	0.204
Sub-Saharan Africa	**-0.154**	**0.112**
(excluding Zambia)		**-0.031**
Argentina	-0.140	0.079
Belize	-	-0.345
Bolivia	-	1.210
Brazil	0.005	-0.343
Chile	-0.100	0.235
Colombia	-0.163	0.334
Costa Rica	-0.374	-0.206
Dominican Republic	-0.035	-0.004
Ecuador	0.005	0.041
El Salvador	-0.109	0.097
Guatemala	-0.651	-0.064
Haiti	-	3.293
Honduras	-0.019	0.356
Jamaica	0.248	-
Mexico	-0.218	0.047

Country (*continued*)	Beta pre-82	Beta post-82
Nicaragua	-0.123	-0.280
Panama	-	-0.100
Paraguay	-0.054	0.174
Peru	-0.168	0.032
St. Lucia	-	-0.442
St. Vicent & Grenadines	-	-0.535
Trinidad & Tobago	-1.350	-
Uruguay	0.010	0.013
Venezuela	-0.428	-0.020
Latin America and Caribbean	**-0.204**	**0.162**
(excluding Haiti)		**0.013**

"Excluded" countries are those with a coefficient with absolute value greater than 1.500.

Table 10
OLS estimates: cyclicality of budget surplus (Pre-1982)
(Dependent variable: Beta on budget surplus, Pre-1982)

	(1)	(2)	(3)	(4)	(5)	(6)
Control of Corruption	0.088**	0.148***	0.153***	0.258***	0.159**	0.180**
	(0.038)	(0.056)	(0.057)	(0.078)	(0.064)	(0.071)
Initial GDP (per capita)		- 0.097	- 0.089	- 0.079	- 0.085	- 0.081
		(0.078)	(0.079)	(0.080)	(0.073)	(0.076)
Democracy			- 0.046	- 0.075		
			(0.135)	(0.126)		
Democracy*Control of Corruption				- 0.131		
				(0.088)		
Polity2					- 0.005	- 0.005
					(0.012)	(0.011)
Polity2*Control of Corruption						- 0.004
						(0.008)
R-squared	0.05	0.07	0.07	0.08	0.07	0.07
n	75	74	73	73	73	73

Robust standard errors in parenthesis; intercepts not reported.
* significant at 10%
** significant at 5%
*** significant at 1%

Table 11
OLS estimates with S&P Ratings and Spread as additional regressors
(Dependent variable: Beta on budget surplus)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Control of Corruption	0.055	- 0.074	0.059	- 0.011	0.047	- 0.048	0.049	- 0.014
	(0.079)	(0.061)	(0.080)	(0.070)	(0.053)	(0.042)	(0.057)	(0.040)
S & P Rating	0.061	0.057	0.063*	0.053				
	(0.037)	(0.037)	(0.037)	(0.037)				
Spread					- 0.113**	- 090*	-0.116**	- 0.090*
					(0.051)	(0.052)	(0.052)	(0.051)
Initial GDP (per capita)	- 0.062	- 0.070	- 0.053	- 0.055	- 0.044	- 0.055	- 0.025	- 0.023
	(0.048)	(0.050)	(0.045)	(0.047)	(0.060)	(0.064)	(0.058)	(0.059)
Democracy	- 0.016	- 0.007			0.004	- 0.022		
	(0.058)	(0.045)			(0.064)	(0.056)		
Democracy*Control of Corruption		0.161***				0.142**		
		(0.041)				(0.054)		
Polity2			- 0.004	- 0.007			- 0.006	- 0.012
			(0.007)	(0.006)			(0.008)	(0.008)
Polity2*Control of Corruption				0.013***				0.014***
				(0.004)				(0.005)
R-squared	0.26	0.30	0.26	0.31	0.33	0.36	0.39	0.39
n	63	63	63	63	45	45	45	45

Robust standard errors in parenthesis; intercepts not reported.
* significant at 10%
** significant at 5%
*** significant at 1%

Table 12
Beta Coefficients - "Recession" and "Boom"
(Procyclical Countries only)

Country	Beta Recession	Beta Boom
Argentina	- 0.175	0.173
Belize	**- 0.183**	**- 0.530**
Brazil	**0.444**	**- 0.603**
Burkina Faso	**0.500**	**- 0.472**
Chad	**0.733**	**- 0.376**
Chile	**- 0.019**	**- 0.095**
Congo	**0.660**	**- 0.430**
Costa Rica	**0.140**	**- 0.878**
Ecuador	**0.120**	**- 0.388**
Egypt	**0.843**	**- 0.434**
Ethiopia	**0.145**	**- 0.392**
Gabon	**- 0.208**	**- 0.397**
Germany	**0.150**	**- 0.165**
Guatemala	**- 0.200**	**- 0.791**
India	**0.025**	**- 0.126**
Ireland	- 0.384	- 0.259
Ivory Coast	**0.107**	**- 0.554**
Jamaica	- 1.354	2.478
Luxembourg	**- 0.087**	**- 0.659**
Malaysia	- 0.148	0.174
Mauritius	- 0.461	- 0.263
Mexico	**- 0.071**	**- 0.128**
Morocco	**0.053**	**- 0.093**
Namibia	**0.408**	**- 1.161**
Nicaragua	**- 0.027**	**- 0.316**
Panama	**- 0.023**	**- 0.645**
Papua New Guinea	**0.016**	**- 0.274**
Paraguay	**0.040**	**- 0.078**
Peru	**0.254**	**- 0.242**
Rwanda	- 0.037	- 0.033
Seychelles	**1.650**	**- 4.790**
Singapore	**0.355**	**- 0.607**
St. Lucia	**0.034**	**- 0.122**
St. Vicent & Grenadines	- 0.814	- 0.223
Togo	**0.549**	**- 1.503**
Trinidad & Tobago	- 2.962	- 0.277
Turkey	- 0.473	- 0.031
Uruguay	- 0.088	- 0.014
Venezuela	- 0.421	0.186

Note: Countries where "Beta Boom" < "Beta Recession" in **bold**.

Table 13
OLS estimates: corruption and credit constraints in recessions
(Dependent variable: Beta on budget surplus in recessions)

	(1)	(2)	(3)	(4)	(5)
Control of Corruption	0.266**			0.299**	0.259
	(0.109)			(0.148)	(0.165)
Spread		- 0.305**		- 0.138	
		(0.140)		(0.147)	
S&P Rating			0.184**		0.065
			(0.073)		(0.077)
Initial GDP	- 0.133	- 0.185	- 0.184	- 0.340	- 0.247
	(0.126)	(0.186)	(0.162)	(0.207)	(0.178)
R-squared	0.10	0.16	0.14	0.21	0.16
n	82	45	63	45	63

(Robust standard errors in parenthesis. Intercepts not shown.)
* significant at 10%
** significant at 5%
*** significant at 1%