Procyclical Fiscal Policy and Political Economy Determinants

by

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Abstract

Research has shown that most developing countries do not follow the consensus prescriptions on fiscal policy, but a sub-optimal procyclical pattern instead. This paper tries to carefully analyze the issue of procyclical fiscal policy and its political economy determinants. We evaluate the available empirical evidence on procyclicality and its robustness. Following, in part three we present the available political economy models and evaluate how well they explain this policy failure. Then, in part four we develop an extension of a political agency model to add another dimension in explaining this phenomena. Lack of social and democratic institutional development in emerging democracies, resulting in 'expensive', low levels of political engagement and control of politicians by the voters is discussed as a potential source of the problem in the emerging countries.

So what did the program - intended, remember, for a country with a slowing economy and no inflation to speak of - involve? Higher taxes, reduced government spending, and a continuation of extremely higher interest rates. ... At the core of the policies ***imposed by*** *Washington over the last few years, on one country after another, is an almost perfect inversion of the Keynesian compact: faced with an economic crisis, countries are* ***urged*** *to raise interest rates, slash spending, an increase taxes.*

Paul Krugman, 1999, p.112 [24] (emphasis added)

In the real world, individuals, as such, do not seem to make fiscal choices. They seem limited to choosing 'leaders,' who will, in turn, make fiscal decisions.

James M. Buchanan, 1967, p.v [14]

I think that one thing that people will conclude ... is that they have not asked enough, they have not expected enough, or demanded enough in the way of boldness, in the way of responsibility from their public servants.

Daniel Ellsberg, July 13, 1971, on the *Dick Cavett Show* [1]

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Chapter 1

Introduction - What's at Stake

The purpose of this introduction is to motivate the discussion about the importance, reasons and explanations of the cyclical properties of fiscal policy mainly in developing countries. The behavior of fiscal policy over the business cycle is important since it informs us about the constraints facing governments in forming and successfully carrying through certain policies. Stabilization policy figures prominently among those.

At any given time of impending economic slowdown, certainly what the world economy experienced in the past three years, a renewed discussion emerges about the appropriate fiscal response. Such challenges are hotly debated in the developed countries among research economists. In the developing economies similar debates exist. However, because of the specific 'emerging' nature of those economies they contain several factors and challenges irrelevant for the debate and its conclusions in developed countries.

The agreed upon models of business cycle call for fiscal policy to play a countercyclical role, stabilizing the income volatility and lowering the costs of (severe) business cycle downturns. Developed countries for the most part adhere to those prescriptions and the debate is centered around fine-tuning questions. Despite the rationale for countercyclical fiscal behaviour being agreed upon, developing countries

are at a loss of simply following and adopting the fine-tuning countercyclical fiscal policy implemented in developed countries or at least have it acyclical and not aggravate the cycle. There is a fundamental difference: they often follow sub-optimal procyclical fiscal policy that exacerbates the business cycle, creates social unrest and instability. It is a puzzle for economists. The inability to adopt countercyclical or acyclical fiscal policies in part potentially stems from some exogenous factors: foreign credit markets constraint, foreign financial contagion, size and persistence of business cycle fluctuations of trading partners, public and private liabilities denominated in foreign currencies. Others are of a domestic nature, such as relative underdevelopment of domestic financial sector and certainly domestic institutional and policy preferences. This paper will concentrate on the explanations and models of the latter group of factors, specifically on the political economy models only recently being developed and coming to a richer explanation.

It is accepted almost as conventional wisdom among economists, financial and emerging markets experts, and political analysts, that fiscal policy in the developing countries over the last 30 years had procyclical properties. In fact, macroeconomic policies in general have been (and still are) highly procyclical in the emerging markets.

It was initially a stylized fact, but it is now well established and verified by the empirical literature as "true" that while the fiscal policy in the high-income, or developed, countries is countercyclical or acyclical, fiscal policy conducted by governments' of the developing countries is indeed procyclical.[1]

Variation in fiscal policy conduct over a business cycle in different countries is almost inevitable because of the difference in political institutions and their determinants. What is of interest to economists here is the observation that countries' fiscal policies vary not just in the structure and magnitude, but in the direction with

[1]To be more clear, the country income classification most often employed is the World Bank one. A country that has an annual GDP/capita of $11,115 is considered as high-income. That classification began in 1989, and prior to that year it would have been difficult to establish who was a low-income, developing country. A cutoff level for high-income countries often used in some studies is $3000 and above PPP GDP/capita in 1970.

respect to the business cycle, across income lines.[2]

A brief overview of some empirical findings on the cyclicality of fiscal policy in developing countries turns up a positive correlation between the cyclical component of real government expenditure and the cyclical component of real GDP. Ilzetzki (2009) [21] finds a correlation of 0.37 for 81 developing countries for the 1970-2003 period. For the 21 high-income countries the correlation is -0.12. In Talvi and Vegh's (2005) [32] study the average correlation between the cyclical component of government consumption and GDP is 0.53 for the 36 developing countries, while for G7 countries it is zero. In the Kaminsky, Reinhart and Vegh(2004) [23] study the correlations between the cyclical components of government expenditure and GDP for all developing countries (total of 83) are positive. In fact, correlations are produced over six different governments expenditure series and irrespective of which one is used, the correlations with real GDP reported are always *positive* for developing countries and *negative* for OECD ones.

Simple bivariate relationships are not strong empirical evidence, but they are indicative that while the conduct of fiscal policy in the developed countries follows the conventional prescription, developing countries fiscal policy is showing procyclical behavior almost as a rule. In line with the above quotation from Paul Krugman, even today we can observe, in the case of Greece for example, that when the economic activity is sharply contracting government spending is being cut and tax rates are being raised to cut the budget deficit, sometimes very sharply. True, the strength and direction of Greece's current procyclical fiscal policy is being reinforced by external factors of closed foreign credit markets and institutional dictates of the EU and IMF, but country level actions such as not saving enough in good times, institutional and failures of government behaviour as well as political conflicts during the course of the *whole* business cycle are an unavoidable and probably the most important part of the explanation.

[2]As in the other studies considered here business cycle means real GDP cycle and cyclical components of GDP are measured as deviations from the trend.

Thus, the occurrence of PFP is not usually limited to the crisis periods and it should not be attributed solely to foreign markets and "imposed" programs. All too often, when the economic activity is expanding, government's expenditure is also sharply increased (sometimes with increased borrowing too) and taxes are cut. In fact, several studies established that fiscal policy in developing countries is often more procyclical in times of economic expansion than contraction.

A larger question then, of more than just academic interest, is why is it that fiscal policy is countercyclical in developed countries, but procyclical in developing countries? Why would any country pursue a procyclical fiscal policy (PFP from now on) that could exacerbate the business cycle? Where, when and how does the policy shift occur? What are the political and fiscal institutions needed to bring about the incentives and constraints that result in credible and stable fiscal policy? When and how did that happen in today's developed countries? The answers, not all which can be presented here, are of direct relevance for the public policy in developing countries, since being able to conduct a countercyclical or acyclical fiscal policy (and monetary policy as well even though it is not addressed here) is a mark of belonging to the club of countries with sound macroeconomic policies, a right of passage in the eyes of foreign capital/credit markets that distinguish between mature and sound economies and.[3]

The rest of the paper is organized as follows. Chapter 2 contains a discussion of some underlying conceptual and normative issues surrounding fiscal policy to aid us in interpreting its cyclical stance. An extensive and critical review of the empirical and theoretical literature follows in chapter 3. Consistent with the goal of this paper, it is mainly concentrated on the political economy strand of explanation of the PFP phenomena. Chapter 4 contains a model with endogenous fiscal transparency as an extension of one of the models. Concluding the essay is chapter 5.

[3]Any questions the reader might have about the presence of reverse causality, which would make this question irrelevant, will be addressed shortly.

Chapter 2

Setting procyclical fiscal policy

The purpose of this section is to present some critical underlying definitions, conceptual and methodological issues surrounding the cyclicality of fiscal policy. Mainly, (a) what should we expect fiscal policy over the business cycle to be and (b) what are good measures of cyclical behavior/stance of fiscal policy?

How should fiscal policy be managed over the business cycle? What, if any, should be the stabilizing effects of government size or spending on output? These are some of the questions that occupied generations of economists and numerous theories develop the normative prescription for the cyclical behavior of fiscal policy. Concentrating on government spending, two answers immediately come to mind.

Keynesian or Neo-Keynesian models tell us that fiscal policy should be conducted countercyclically: in a (deep) recession, governments should increase spending and/or cut taxes to boost aggregate demand and pull the economy out of the recession. Government expenditure should be a stabilizing force moving in the opposite direction with output and private consumption.

Unlike the Keynesian view that is clear on the role and direction of government spending, the neoclassical framework is weak in its prediction on the cyclical behavior of government spending. It is usually assumed that public expenditure determination is exogenous to the model. If it is endogenous, the level of substitution with private

spending in the utility function becomes important. Government spending should be countercyclical if it is a substitute with private spending; if they are complements, government spending should be procyclical. But, to note is that government spending is more interesting and probably more useful for the study of fiscal cyclicality because it allows greater discretionary policy. Tax revenues as a financing source involve a great deal of autonomous behavior over the business cycle.

The most widely cited theoretical position in the neoclassical literature is the tax-smoothing hypothesis. The tax-smoothing model by Barro (1979) [8] advocates holding tax rates constant over the business cycle and fiscal policy neutral. Budget surplus should move in a a procyclical way. Only in the case of unanticipated shocks affecting the government budget constraint should the tax rates change, otherwise deficits are varied to keep the expected tax rates constant.[1]

For our purposes in evaluating whether fiscal policy is behaving procyclically the two dominant views above indicate that if the government followed the Keynesian prescription over the business cycle the correlation between tax rates and output would be positive, and between government spending and output negative, i.e. fiscal policy would be countercyclical. If it followed Barro prescription both of those correlations would be essentially zero indicating acyclical fiscal policy. Both of those theoretical prescriptions are in line with a (consensus) normative view that fiscal policy should be countercyclical, such that the deficit increases during downturns and surplus increases during upturns.

For a long time, however, these two views where held as opposites. Debate among economists signified the uncertainty about stabilizing fiscal action; is discretionary fiscal intervention by the government desirable, effective and timely in stabilizing the economy or should we just relay on automatic stabilizers in the tax and transfer part of the fiscal system? Recently, the debate about these arguments has resurfaced with

[1]Some other prominent neoclassical models of optimal fiscal policy are Lucas and Stokey's (1983) tax-smoothing theory in an economy without capital and Chari, Christiano and Kehoe's (1994) optimal fiscal policy in a Real Business Cycle model.

vigour. It essentially has to do with how fiscal policy affects the output and economic growth. In both Keynesian and neoclassical models fiscal policy is expansionary.

Does the evidence on the behavior of fiscal authorities correspond to these normative prescriptions? Not exactly, as it will still be discussed in more detail below. In fact, the idea of this paper is to show that in order to explain fiscal policy deviations we need to depart from the normative benchmark for the cyclical conduct of fiscal policy. As we will show, governments and their administrations, especially in developing countries, are not creating fiscal policy as a 'benevolent dictator' and to explain the cyclical behavior of fiscal policy we need to look into "the political determinants that lead to variations in fiscal cyclicality across countries." [25, p.2663] In other words, we need 'positive' models to explain the PFP phenomenon.[2]

All too often it seems the discussion of fiscal policy takes a loose approach in defining the basic concepts of its cyclical stance. A critique could include other macroeconomic policies, but they are not the scope of this paper. Even though some of the underlying properties and concepts may seem obvious and familiar, in order to avoid an ambiguous discussion it is best to be as specific and precise as possible in our definitions of the basic cyclical concepts regarding fiscal policy. It is important we have an unambiguous understanding of what procyclical and countercyclical fiscal policy is. A careful choice of words and concepts will aid us in interpreting empirical findings presented later.

This conceptual framework is carefully laid out by Kaminsky, Reinhart and Vegh[3] (2004) [23]. It is probably the most precise and useful one in defining the cyclical stance and, more importantly, it was adopted as a standard by most subsequent studies on the cyclicality of fiscal policy. A very obvious way in which we can define fiscal policy cyclicality is in terms of policy *instruments*, as opposed to policy *outcomes*. Yet

[2]Barro's (1979) paper actual maintains that the tax-smoothing model is a positive as well as a normative theory.

[3]As we will come back to this study often, from now on we will refer to it as simply KRV

it is probably the later that is more often used, most prominently when defining countercyclical fiscal policy as running a government budget deficit during a recession and a surplus during a boom. An econometric study that focuses on the fiscal balance to determine the cyclical stance of fiscal policy might reach erroneous conclusions. Furthermore, in developing countries it is particularly problematic to define business cycle points that mark the beginning and end of recessions and booms. To avoid the unsettled nature of defining recessions (being unsettled even in developed countries) it is best we make use of the KRV's (2004) definition of economic conditions as good and bad times.

What we would like is to have an unambiguous indicator of the cyclical stance of fiscal policy. To that end, the stance of fiscal policy in relation to good and bad times is better defined by fiscal instruments of government spending (g) and tax rates (τ) rather than endogenous variables such as tax revenue or budget balances, which represent outcomes.

- A procyclical fiscal policy is then clearly defined by increased g and decreased τ during good times and the other way around during bad times. Such fiscal policy is procyclical as it moves in the same direction as the underlying business cycle and reinforces it.[4]

- A countercyclical fiscal policy is defined by decreased g and increased τ during good times. The opposite happens during bad times, i.e. what we familiarly call recession during which we expect higher g and lower τ to stabilize the business cycle. Accordingly, fiscal policy during good times is respectively either expansionary or contractionary. It can either amplify the business cycle or stabilize it.

- Fiscal policy that is acyclical is defined as a constant, unchanging g and τ over

[4]As KRV (2004) point out, this definition of procyclicality means a *negative* correlation between τ and output, which differs from the RBC literature where a negative correlation of any variable with the output is considered countercyclical.

the business cycle; the two instruments do not vary with the business cycle. Accordingly, in theory, the correlation with the business cycle is 0.

By analyzing the behaviour of various fiscal indicators often employed in the discussion of the cyclicality of fiscal policy (tax revenue, primary budget balance, their ratios to GDP, ratio of g to GDP) the implications of these definitions are clear. The government spending and tax rates are the only two indicators of the cyclical stance of fiscal policy that leave us with an unambiguous correlation with the business cycle. Consider that

$Tax\ Revenue = \tau \times tax\ base$
$Primary\ balance = Tax\ Revenue - g$ (net of interest payments)

For example, by the above definitions of procyclical fiscal policy g increases (or it is increased) during good times, the correlation of g/GDP with the business cycle can take on any value. The τ goes down during good times, but the tax base increases, which makes the correlation of tax revenue with the business cycle very ambiguous. Considering countercyclical fiscal policy we know that τ are high during good times, implying that tax revenue will move positively with the business cycle. Since g falls in good times and tax revenues increase, the primary balance will move positively with the business cycle as well.

If we look at the tax revenues or the primary balance/GDP ratio as indicators, they will have an ambiguous correlation with the business cycle. In fact, they are ambiguous indicators of the cyclical stance according to all three definitions above. As KRV (2004) point out, "the cyclical behavior of the primary balance as a proportion of GDP will never provide an unambiguous reading of the cyclical stance of fiscal policy." Most of the literature, unfortunately, makes conclusions about the cyclicality of fiscal policy based on this indicator alone. Looking at the g/GDP ratio, it is an unambiguous indicator of PFP only if it is positively or not at all correlated with the business cycle. A negative correlation with the business cycle is indicative of all three cyclical behaviours given above.

Chapter 3

Literature review

In this section we introduce and discuss current and relevant literature on the issue of procyclical fiscal policy in emerging markets. The bulk of the work has been concentrated on documenting whether fiscal policy is procyclical and how procyclical it is. I will present the findings of those empirical studies, known issues with them and general, well accepted conclusions.

But the subject matter of this paper is about understanding the *why* explanation of the PFP. There are two main but rather different strands of the theoretical literature that attempt to explain this PFP puzzle, particularly developing countries. The first is the earliest approach, an explanation relying on the foreign credit channel distortions via imperfect (incomplete) international credit markets. The observation during many recessions and crisis in emerging countries during past two decades was that the supply of credit gets cut off by foreign lenders. Not being able to borrow to finance their growing budget deficits and some stimulus programs, governments in those countries are forced to slash spending and raise tax rate.

It is an observation and not a satisfactory explanation of fiscal procyclicality in practice. As Alesina et al. [3] ask, why these countries did not self-insure during good times so they do no have to face binding credit constraints? Also, why foreign credit lenders would not extend loans to pull the country out of the recession sooner and

smooth the business cycle? Do they know something about the country that makes them unconvinced that borrowing would help?

The second strand is the political economy explanation. Namely, as Battaglini and Coate (2008) [10] point out, the majority of work on the cyclicality of fiscal policy has been normative. The theoretical framework is the one of a benevolent social planner with perfect foresight employing tax smoothing. The positive aspects of cyclicality of fiscal policy have been under-studied. If, however, we want to have a meaningful explanation of a sub-optimal PFP that developing countries are implementing, I believe, as others do, we need to incorporate the political arena in our framework. Government is an *endogenous* part of the economic system and certainly economic policy.[1] With that in mind we introduce and evaluate the existing literature of political economics models to uncover possible reasons behind the PFP.

It is important to point out that the positive literature on the PFP phenomena in developing countries is fairly new, as opposed to the normative issue of the cyclical behavior of fiscal policy. As mentioned in the introduction and as it will soon be clear, there are strong indications that developing economies followed a procyclical fiscal policy for decades, compared to industrial countries that typically followed the normative prescriptions. However, the reasons underlying such policy behavior are not very clear and the research that is trying to understand it has been emerging only over the last ten years. Because of that, it is difficult to discern a dominant explanation as of now. Furthermore, to my knowledge based on readings in this area, no comprehensive surveys of the literature of PFP in developing countries exists. This section will attempt to partially fill that gap.

[1]Neoclassical positive theory of fiscal policy is clear that fiscal policy is determined exogenously.

3.1 Empirical Literature

A review of empirical findings on PFP phenomena is important as besides just informing us about the established evidence on the extent of PFP, it will also tell us something about the factors that influence or reduce procyclicality and thus about the direction of research that can explain its causes.

It is difficult to find a comprehensive discussion of the PFP phenomena before 1997. In fact, most likely because of poor data availability, there was a lack of a serious positive analysis of fiscal policy in developing countries. Gavin and Perotti's (1997) [19] paper pointed out that "under-studied" aspect of fiscal policy, relative to the monetary policy, in developing countries.[2]

The goal was to establish some basic facts on fiscal policy in 13 Latin American countries through a straightforward examination of the data over the 1968 - 1995 period. They built a new database of fiscal outcomes in those countries, including local government data as well as central, and non-financial public companies. Their approach was to examine the data and then compare the results to fiscal policy outcomes in the developed countries as a benchmark, rather then impose "conditions implied by a specific theoretical model" for an optimal fiscal policy as a standard of comparison. Thus, they effectively compared positive analysis of fiscal policy outcomes in the developed world with the ones in the developing world. It would appear that is done at least in part because the theoretical framework for optimal fiscal policy was created with (only) developed countries in mind. They uncovered some new and puzzling empirical regularities of fiscal policy outcomes in Latin America and in sharp differences to the developed countries. Through that they provide us a background against which to evaluate existing normative theories on optimal fiscal policy. Needless to say, some well accepted normative theories/hypothesis of fiscal policy are

[2]Gavin and Perotti study only Latin America, but (a) even today it can hardly be disputed that all the countries on the continent, with a possible exception of Brazil, are developing/emerging countries and (b) based on the World Bank definition mentioned above they all *are* developing-emerging economies.

under strain in the case of Latin American.

What did Gavin and Perotti exactly find? First, they establish a "striking difference" between fiscal outcomes in Latin America and developed countries in their volatility (the second moments). Latin America countries exhibit two times higher volatility in their budget surpluses and three to four times higher volatility in their revenue and expenditure growth. Also, that volatility increased sharply in the 1980s. Even though it is difficult to establish the reason behind such volatility for Latin America countries with the often employed technique of cyclically adjusted fiscal aggregates, they provide some "tentative" intuition for their results; "fiscal volatility... is more than a passive response to macroeconomic fluctuations." [19, p.xx]

Next, they show that the volatility of the covariation of fiscal outcomes with macroeconomic cycles is even greater. In short, they conclude that fiscal policy is procyclical in Latin America, especially during downturns, and countercyclical in the developed economies. The authors establish that result through three different regressions. First, they report and discuss the results of regressing general government's surplus as a share of GDP (S_{GG}) onto real GDP growth, terms of trade and lagged fiscal balance. The coefficient on GDP growth is interpreted as an impact on the fiscal balance from a change in real output, "incorporating both automatic stabilizers and any discretionary policy responses to output shock." [19, p.x] The results show that for a 1% increase in the rate of output growth, fiscal surplus increases by 0.37 in industrial, but only 0.042 (not statistically significant from zero) in Latin American countries. The suggested explanation for such a weak relationship in Latin America is that some procyclical *discretionary* fiscal policy must be present, because without it fiscal surplus would automatically improve in good times and deteriorate in bad times.

In the second regression they explicitly distinguish *good times* and *bad times*. It turns out that fiscal response to output shock is more responsive during bad times in developed countries, but *less responsive* in Latin countries. In fact, during the times

of deep recession of 3.5% decline in real GDP, fiscal balance of developed countries moves into a deficit of around 4.4% of GDP, but in Latin countries during an even greater decline of real GDP, more than 10%, fiscal balance moves into a *surplus* of 2% of GDP. The findings are statistically significant.

Even more important than fiscal balance findings (outcomes) are the findings on cyclical properties of public expenditure (instruments) from regressing the growth rate of expenditure aggregates and real GDP growth. In the third regression analysis, the focus is on the relationship between real GDP growth and revenue and expenditure items. While developed countries show no correlation between total spending and output fluctuations, and show countercyclical behaviour of subsidies and transfers, Latin countries show highly procyclical total expenditure in all of its components. Again, with bad times and good times made explicit in the regression the results are more interesting. During good times we observe a slightly positive relationship of expenditure and output growth, with a coefficient of 0.277. But during bad times, the coefficient of -0.892 (at 1% confidence level) shows a marked countercyclical behavior of government spending. Latin countries' expenditure during good times is also procyclical, but with a larger coefficient of 0.77. During bad times, however, the government spending becomes even more procyclical with a 1.58 coefficient at 10% confidence. With such highly procyclical behavior of Latin countries' expenditure during bad times, Gavin and Perotti conclude: "Recessions are thus associated with exaggerated collapses in public spending" - opposite of what we would expect to observe based on the normative prescription.

Talvi and Vegh (2005) [32] expand the inquiry of PFP phenomena into countries outside Latin America. In their sample of 56 countries, 20 developed and 36 developing,[3] they find that all 36 developing countries exhibit procyclicality, defined as increased government consumption and reduction in taxes in good times and the

[3]Industrial countries are grouped in G7 (6), non-G7 (14) and developing ones into Africa (11), Latin America (17) and other (8).

other way around during bad times. Even some non-G7 industrial countries are procyclical. Talvi and Vegh do not analyze the data by way of refined econometric work, but simply present business cycle properties of fiscal policy by measuring the volatility of output and consumption (which then translates into volatility of the tax base) and correlation of cyclical component of output and fiscal variables. For our purpose the correlation measures are the most interesting ones.

The correlations between cyclical government consumption and output in all but G7 countries are significantly positive, i.e. government consumption is procyclical, with 0.25 coefficient in non-G7 countries, much higher 0.53 coefficient in developing countries, and close to zero for all G7 countries. This reflects a much higher procyclicality in the sample of 36 developing countries. To verify if these correlations are different between regions and countries they perform a series of F-tests. They establish that the average correlations between developing countries are most likely the same, suggesting that the procyclicality of government consumption is prevalent in developing countries. Also, it is rejected at the 1% level that the average correlations between developing and industrial countries are equal and even within developed countries there is some evidence, albeit weak, that average correlations are not the same.

Data on conventional tax rates[4] is unavailable, so it is proxied by the inflation tax,[5] showing that the inflation increases during good times and falls during bad in developed countries, but opposite happens in the developing countries. The correlation between output and inflation tax is 0.23 in developed countries, but -0.09 in developing, albeit with significance only at the 10% level. The hypothesis that these correlations are the same for developing and developed countries is rejected at the 1%

[4]The authors point out some casual evidence of procyclicality in the case of Mexico and Argentina that increased the VAT during a severe recession in 1995 and reduced tax rates during the 1991-1994 economic boom, respectively. Argentina actually reduced tax rates with an explicit intention to avoid budget surpluses, and as we will see later, Talvi and Vegh (2005) are able to build a model that explains why Argentina would do that. In the case of a G7 country, we can look to, for example, Canada where the government lowered the federally administrated GST from 7 % to 6% and then to 5% during 'good' economic times of 2006-2007.

[5]The consensus, however, on the issue that the inflation tax is just another tax is missing.

level. It all sums up to an indication of fiscal policy in many developing countries, not just Latin, being procyclical and thus different from what we observe in developed countries and what we would expect based on the normative prescriptions.

Building mainly on these two previous studies, Kaminsky, Reinhart and Vegh (2004) [23] document comprehensive results on the cyclicality of fiscal policy in 104 countries for the period 1960-2003.[6] The analytical framework on fiscal policy variables discussed in chapter 2 is the key to interpreting the PFP results. By relying on it, KRV (2004) are able to review some previous findings on procyclicality in the literature. The authors create four groups of countries; one developed (OECD) and three developing split in Middle-High, Middle-Low and Low Income.

For all three groups of developing countries fiscal policy is mainly procyclical, while in developed countries it is countercyclical or acyclical. As some previous studies have done, KRV look at the correlation between the cyclical component of real GDP and real government spending (six different measures of spending), using the Hodrick-Prescott filter and the bandpass filter to estimate the cyclical components. Reported correlations for OECD countries are very low and all negative, with 8 out of 12 never significantly different from zero. For the three groups of developing countries, the same correlations are all positive, larger than the OECD ones, and 27 out of 36 (18 per filter) are statistically significant at the 10% level.

In addition, an interesting result they establish is the amplitude of fiscal policy cycle defined as "the difference between the change in real government spending when GDP growth is above the median and when it is below the median. Under this definition, a positive amplitude indicates procyclical government spending." A negative number on the other hand indicates countercyclical policy as it implies government spending is higher during bad times. For the same six government spending measures,

[6]Kaminsky et al. (2004) discuss facts and results regarding cyclical behavior of monetary policy and capital inflows, as well as fiscal policy. For example, KRV present a "first systemic effort to document empirically the cyclical properties of monetary policy in developing countries." But since our interest lies with the behavior of fiscal policy over the business cycle, the results for these other macroeconomic variables are not presented here.

the amplitude is positive for all four groups of countries, but it is much larger for the three developing countries. While the OECD countries show the measure of amplitude in between 0.3 and 1.4 percent, suggesting on average an acyclical fiscal policy, the non-OECD countries' analogous figures reach 6, 7, 8, 9 and even 10 percent, indicative of a strong procyclical fiscal policy. In sum, looking at real central government spending only, over 90% of non-OECD countries have a positive amplitude, with a 100% measure for middle-high income countries.

Similar to the previous studies, KRV measure the correlation of the cyclical component of inflation tax[7] and GDP, since, as they claim, the inflation tax and government spending are the most indicative of fiscal policy cyclical stance. The coefficient is positive and significant in OECD countries and negative and significant in all developing countries, indicating procyclical fiscal policy. Also, a negative measure of the amplitude of the inflation tax rate is registered for all four groups, indicating procyclicality of the tax rate, where it is the highest for low-income countries (-3%), and lowest for OECD countries (-0.9%).

Finally, KRV (2004) explore the notion that capital inflows affect fiscal policy[8] in developing countries, especially in highly volatile economies. They explore the correlation of cyclical component of government expenditure and net capital inflows. Out of 36 coefficients for non-OECD countries, 21 are positive and significantly different from zero. For OECD countries, the coefficients are also positive, albeit smaller, but they are also statistically not different from zero. These results suggest that, as much as it can be read from a pairwise correlation, fiscal spending is expansionary when capital is pouring in, a phenomena they dub "when it rains, it pours", while no such relationship between net capital inflow and fiscal spending cycle can be made for the OECD countries. This link is particularly strong for middle-high income countries, but it is also important for low income countries that have little access to foreign capital markets.

[7]Inflation tax is defined as $\frac{\pi}{1+\pi}$, where π is the actual inflation rate.

[8]And other macroeconomic policies that we do not explore here.

While acknowledging that more refined analysis needs to be done, KRV are able to conclude, with a certain penchant for weather condition depiction, that "macroeconomic policies in developing countries seem mostly to reinforce the business cycle, turning sunny days into scorching infernos and rainy days into torrential downpours." [23, p.46]

3.2 Endogeneity Issue

Kaminsky et al.'s (2004) [23] documentation of procyclical behavior of fiscal policy was substantial and convincing in that there is clear evidence that emerging economies exhibit procyclical policies in several dimensions. As well, their most valued contribution is the analysis of which macroeconomic indicators, policies rather than outcomes, are better as measures of cyclical stances of macro policies.

In the insightful comments following KRV (2004), Roberto Rigobon [30] focuses our attention on the possible explanations for such behavior. Even though the correlations (average and country by country as Rigobon computes them) between cyclical components of output and government expenditure have different signs for developed and developing countries, we cannot simply conclude that "countries react differently to output shocks, which is usually the claim in the literature." The endogenous response of fiscal policy to an output shock possibly differs in developing countries, and we should try to uncover the reasons behind it, but before reaching a conclusion we must be aware that fiscal expenditure affects output as well. In other words, procyclicality (i.e. causal effect of output on fiscal policy) might be captured by the positive correlations the empirical literature has established, but they might also simply reflect reverse causality (i.e. effect of government spending on output.)

Similarly, in the 2005 issues of the *NBER International Seminar on Macroeconomics* following Darvas, Rose and Szapary (2005) [15], Rigobon [31] points out: "even a casual reader will find that the reasons behind the pro-cyclicality of fiscal policy are not clear at all. The main problem is the endogeneity of fiscal policy." Important endogeneity issue needs to be clarified least we get a misleading picture.

The question central to explaining the issues of PFP is whether PFP is reflecting different shocks hitting the economy or whether it is the outcome created through wrong policymakers' choices? If the reasons behind the PFP behavior lie in the first explanation, our concerns about procyclicality are unfounded. And Rigobon shows some preliminary evidence that suggests the variance in output shocks and

not coefficients are the most important source of the different fiscal policy behavior across countries. Developing countries are procyclical because "they are hit by shocks that create positive co-movement among the variables of interest." [30, p.62] On the other hand, if PFP is an endogenous choice of fiscal policymakers, we should strive to uncover the roots of it and see if something could be done about it.

Put differently, in all these papers, with few if any exceptions, the issue centres around the sign of the coefficient β in the following fiscal policy reaction equation.

$$g_t = \beta y_t + \varepsilon_t \tag{3.1}$$

The empirical literature reviewed so far - Gavin and Perotti (1997), followed by Talvi and Vegh (2005), KRV (2004) - favors the explanation that the coefficients in the above policy reaction function are different between developed and developing countries. But, as Rigobon points out, another equation is simultaneously in play as well.

$$y_t = \alpha g_t + \eta_t \tag{3.2}$$

Simply put, it cannot be claimed that only the first equation describes the economy and that the causality runs from the business cycle to fiscal policy only. Rigobon in fact points out that, because of the variety of shocks in developing countries, it is more likely that fiscal policy drives output and thus that reverse causality is at play.

In line with Rigobon's critique, Jaimovich and Panizza (2007) [22] explicitly question the results obtained by Gavin and Perotti (1997) and Kaminski et al. (2004). They tackle the endogeneity problem and check if the standard results of PFP are due to reverse causality, since the government expenditure does in fact have an effect on the growth of output, at least in the short run They use a more sophisticated methodology than OLS regressions used in the previous literature and one than can solve a simultaneous equations problem as specified above. Namely, they estimate a policy reaction function

$$e_t = \alpha + \beta y_t + u_t \tag{3.3}$$

where e is public expenditure, by using a 'good' standard instrumental variable for the output growth. The interpretation on β is the same as in the equation 3.1 above and indicates the degree of cyclicality of fiscal policy. A positive (negative) β would indicate a procyclical (countercyclical) fiscal policy. They claim that using a real *external shock* consisting of the weighted average of growth of output in country i's export partners does the job. They show it is a good instrument because it is *correlated* with the instrumented variable, *exogenous* with respect to it, and has no *direct* effect on the dependent fiscal indicator variable.

Through an IV estimation they show "dramatically different" estimates of the cyclical properties of fiscal expenditures. Whereas OLS estimate on the β for developed countries is close to zero implying acyclical fiscal policy, the IV estimation now gives a negative β of -0.840, implying countercyclical fiscal policy. In the full sample of developing countries, PFP completely disappears with the coefficient of 0.009 implying a de facto acyclical fiscal policy. It is not, however, a statistically significant result. Breaking down the sample of developing countries in the manner of KRV (2004) shows different signs on middle-low and low income countries, but they are statistically not significant, so the authors do not infer that one group might be driving the behavior of the whole sample.

These IV results clearly shake the importance of KRV's (2004) study as well as Gavin and Perotti's (1997). Is PFP an empirical regularity in the developing countries or does accounting for endogeneity make the procyclicality go away? Do we have a case of misinterpreting reverse causality? Jaimovich and Panizza (2007) certainly seem to reach those conclusions.

Ilzetzki and Vegh (2008) [21] appear to have the final verdict on the evidence on PFP in developing countries to date. In their in-depth empirical study they use a

quarterly database (whereas most of the previous literature uses annual) of 27 developing and 22 developed countries, with data sometimes even going back to 1960. Only the countries with 8+ years of quarterly data from the IMF are included. Fiscal policy is measured with real central government spending, real general government consumption and real GDP. They break down government spending, into government consumption, transfers, debt repayment and public investment. The results on cyclicality are for the behavior of real general government consumption, an instrument under direct control of fiscal policymakers and thus in accordance with KRV's concept of good indicators of fiscal policy cyclicality discussed in section 2. In fact, Ilzetzki and Vegh (2008) are critical towards studies that use the fiscal deficit or the fiscal balance as a measure of fiscal policy cyclicality. Tax rates are not the focus because of lack of time series data for most countries.

Unlike the previous studies, this one first develops empirical models to formalize the equations and guide the empirical estimation of the cyclicality.[9] As other studies have done, they estimate equation 3.1, while equation 3.2 that captures the effect of government consumption on output is ignored. Equation 3.1 cannot be estimated by OLS since y_t and ε_t are not independent, i.e. $\text{Cov}(y_t, \varepsilon_t) > 0$ and regression results from such analysis would be misleading. To deal with the question of causality they estimate equation 3.1 with their data using the same approach as Jaimovich and Panizza (2007) - 2SLS, and instrument for change (log) in real GDP. The results of this 2SLS regression are inconclusive and the estimate is not statistically different from the OLS one. A comparison of the results to Jaimovich and Panizza's (2007) yields estimates "too imprecise to make robust inference about the cyclicality of fiscal policy." As we know, Jaimovich and Panizza (2007) use such results to claim that the fiscal policy cyclicality is driven by reverse causality.

Using an alternative instrument, GDP growth in year $t-1$ for growth in year t and the 2SLS strategy, Ilzetzki and Vegh (2008) find, robust to an IV estimation,

[9]They include a contemporaneous fiscal rule, a lagged fiscal rule, an expectational fiscal rule, a political economy and a simple VAR approach. Not all of the empirical models are estimated.

procyclical government spending in developing and acyclical spending in developed countries. Contrasted to Jaimovich and Panizza's (2007), this shows the mixed results nature of an IV estimation. Thus, they propose a more robust strategy using a GMM estimator. They again estimate fiscal reaction function 3.1 using panel data:[10]

$$g_{i,t} = \alpha_1 + \beta y_{i,t} + \varepsilon_{1,i,t}$$

where $g_{i,t}$ is real government consumption and β its cyclicality. Estimating this by OLS does yields procyclicality in developing countries, but the estimate is biased. To fix the bias in β we would employ IV and 2SLS, which is what they did in the previous section and got mixed results.[11] Since 2SLS is a special case of a GMM estimator, and not the most efficient one, they improve the estimation strategy by including an additional valid instrument (real interest rate on 6-month U.S. T-bill) and replacing the 2SLS estimator by a more general GMM one. Both changes improve the efficiency of the estimates. Relative to the OLS estimates, the GMM estimates of β now show procyclical government consumption in developing countries and countercyclical or mildly procyclical in high-income ones. They are able to reject, with 95% confidence, that developing and high-income country estimates are the same.

Another model is estimating simultaneous equations where government consumption responds to output with a one-quarter lag and output is determined by lagged output and government spending. Output follows an AR(1) process.

$$g_t = \beta y_{t-1} + \varepsilon_t$$
$$y_t = \alpha y_{t-1} + \phi g_t + \mu_t$$

[10]This equation is directly from the Ilzetzki and Vegh (2008) paper. The parameter α is not the same as in equation 3.2.

[11]Some other studies that perform a similar strategy and acknowledge the problem of endogeneity are Braun (2001), Gali and Perotti (2003), Lane (2003). Braun's (2001) is a PhD dissertation that is unfortunately unavailable even though its results would have been valuable to include in this empirical review.

By using OLS with fixed effects they show government consumption in developing countries reacting in a "highly-statistically-significant" procyclical way to the lagged output. Finally, times series analysis is used to determine the reaction of fiscal policy to the business cycle. Here output and government consumption follow a vector-autoregressive process. By conducting a Granger causality test[12] they are able to reject the hypothesis that "the business cycle does not Granger-cause government consumption," with 99% confidence level for developing and high-income countries. [21, p.] The opposite hypothesis is rejected only for high-income countries. This shows that the two variables of interest, g_t and y_t, move together, but likely because of a policy response and not because of a "reverse effect" of government consumption on output.

They were also able to test whether government spending affects output, which was only implicitly taken as the case in this literature so far. They confirm, without doubt again, that KRV's (2004) when-it-rains-it-pours premise is relevant; PFP exacerbates the business cycle and it is therefore sub-optimal. The fiscal multipliers are 0.63 and 0.91 for developing and developed countries respectively. Furthermore, a surprising result they uncover is the presence of PFP in the developed countries. In fact, the results for developed countries are mixed based on the econometric technique used, but even that is in contrast to the conventional wisdom of countercyclical fiscal policy in high-income countries.[13]

In conclusion, Ilzetzki and Vegh's (2008) empirical study of 49 countries, using various econometric techniques and considerably improving on previous studies' strategies, is able to show that previous literature is correct in uncovering PFP in developing countries. There is indeed a causal effect of output on fiscal policy (measured by government consumption) in developing countries, and not just a mistaken case of reverse

[12] A note to keep in mind, as Roberto Perotti pointed out in a recent study, is that "Many studies resort to the use of Granger causality as a substitute for a careful identication. It is instead well known that Granger causality is a purely statistical definition, that has little to do with our notion of causality in an economically meaningful sense." [28, p.7]

[13] Another work that provides some evidence of PFP in developed countries is Lane (2003). [25]

causality. As they conclude, there is "no doubt that fiscal policy is indeed procyclical in developing countries." [21, p.26]

3.3 Political Economy

The purpose of this section is to provide a critical survey of the literature that tries to explain the phenomena of procyclical fiscal policy and builds on the empirical research documenting the extent of it. We introduce the political economy models currently available and evaluates how well they uncover the occurrence of PFP in developing countries. In other words, how do the currently established models of political friction and distortion fare in explaining the roots and reasons behind procyclical fiscal stances?

The common theme in this strand of explanation is that procyclical fiscal policy is an outcome of a conscious policy choice because of political frictions. In other words, theories that suggest PFP is an outcome forced by external factors (incomplete credit markets) are considered insufficient explanations because they cannot explain procyclical behavior over the whole business cycle, including boom times, not just during times of a sever downturn. Various political economics frameworks are used to model conflicts:

- conflict between divergent factions within a unified government - Tornell and Lane (1999) [33], Talvi and Vegh (2005) [32].
- conflict of interest between government and the electorate (political agency) - Alesina, Campante and Tabellini (2008) [3], Anderson and Nielsen (2010) [5].
- conflict of interest between districts in the legislature (legislative bargaining) - Battaglini and Coate (2008) [9].
- conflict of preference polarization within the society (arising from income inequality) - Woo (2009) [34].

- conflict of interest between successive fiscal decision-makers - Ilzetzki (2009).

I will introduce and discuss these models in a chronological order of their appearance in the literature.[14] All of these papers contain an empirical part too, with the goal to test and potentially confirm the strength of the models' predictions. The goal is to illustrate most mechanisms of the models by which the PFP result arises. A detailed exposition of all the equations and technical detail is beyond the space constraint.

To help organize readers' thoughts, it is worth to keep in mind that the basic framework present in most of these political economy models consists of a private economy environment and a political one. The political process is usually modeled as a game[15] and the interaction between political actors - maximizing voters and politicians - allows us to gain insights into the formation of policy.

3.4 The Voracity Effect

Tornell and Lane's (1999) [33] model does not deal primarily with the occurrence of PFP, but it is probably the first one that provides a plausible mechanism for PFP to occur that does not originate in any sort of international markets induced credit rationing and focuses on political economy determinants. One of the questions they ask is why do countries "frequently respond in a perverse fashion to favourable shocks?" [33, p.22] The answer is in the fiscal process characterized by weak legal and political institutions and multiple powerful blocs that "appropriate national resources for themselves" through discretionary fiscal redistribution. [33, p.22]These powerful groups could be provincial governments or different branches of government, parties within a governing coalition, public sector unions, protectionist businesses and other socio-economic interest groups with claims on fiscal resources.

[14]Some of the mentioned papers are not yet published in a journal, but are available as working or pre-publication papers.

[15]Talvi and Vegh's (2005) [32] is an exception.

Their framework[16] tries to capture how powerful interest groups and weak political institutions affect the economy's growth rate and welfare, but the corollary result is that fiscal policy is determined by powerful interest groups and also has a procyclicaly biased response to shocks through discretionary fiscal redistribution.[17] Central to their model is the existence of multiple groups that have the power to (competitively) extract fiscal transfers from the rest of society. Competition for a share of fiscal resources between non-cooperative powerful groups is an infinite-horizon dynamic game.[18]

During boom times[19] the competition among these groups for the share in fiscal revenues intensifies, leading to a voracity effect. The 'voracity effect' means that in response to a windfall, discretionary redistribution is forced to increase since now each group demands a greater share of revenues by demanding more transfers from the government. The incentive for prudence is basically non-existent since each group knows that if it forgoes an increase in its share the government will not run a budget surplus, but that other groups will be able to appropriate an even greater share. The result is a non-cooperative equilibrium with more than proportional increase in government spending relative to the increase in income, i.e. procyclical government spending.

Accordingly, countries with a number of powerful groups would have a higher degree of procyclicality, but an increase in the number of groups will reduce power concentration and discretionary redistribution - a result analogous to the Cournot competition. Furthermore, if in the presence of powerful groups strong institutional barriers, which limit the extent of discretionary fiscal redistribution and make it

[16]For a discussion of this framework and the 'voracity effect' see also Lane (2003) [25]

[17]The mathematical detail of the model is mainly concentrated on illustrating how the 'voracity effect' affects the misallocation of resources and as a result a reduction in the equilibrium growth rate of the economy and no welfare gains from a positive productivity shock.

[18]A dynamic setup is important since without it the groups would have the incentive to only extract as much rent as possible at one time, with no relevance of productivity shock on the intensity of extraction. Also, history dependent strategies are not permitted.

[19]Characterized as an increase in the rate of return - positive productivity shock - in the efficient, formal sector of the economy.

difficult for groups to extract transfers, are absent, a country will also exhibit a higher degree of procyclicality.[20]

Also, with no powerful groups discretionary redistribution does not happen, but a shift from a unitary system (a single group) to two or more leads to diffusion of power, higher competition for redistribution and a "deterioration in economic performance." [33, p.32]

3.5 Tax Base Variability

The fundamental contribution of Talvi and Vegh's (2005) paper [32]to the PFP literature is that the evidence of procyclicality for developing countries is pervasive and not limited to just Latin America. They present evidence that it is a "a more widespread phenomena related to some fundamental characteristic of fiscal policy in developing countries." [32, p.157] Talvi and Vegh's (2005) paper finds that fiscal policy for G7 countries is acyclical, but in developing and some non-G7 countries it is procyclical, defined as increased government consumption and reduction in taxes in good times and the other way around during bad times. A more detailed discussion of their results was presented in section 3.1.

To explain PFP they build a type of political economy model which makes full consumption smoothing difficult. Political pressures to allocate spending, especially during good times when more resources are available, rather than to "retire debt," together with distortionary taxation make running budget surpluses costly. Also, a crucial empirical observation that the "fluctuations in the tax base are much larger in developing countries than in the G7 countries," because they depend on volatile sources of revenue, means governments in those countries and facing political distortions for higher public spending will choose to lower taxes and increase spending

[20]As will be discussed later on, these institutions can range from legal rules and constraints on budget deficit, to independent fiscal agencies or a simple notion of the level of political participation stemming from strong civil society institutions.

as an optimal response to positive shocks. In other words, the model predicts that procyclical fiscal policy is the *optimal* response.

A small open economy is populated by many identical, infinitely lived consumer, all with perfect foresight. Their problem is basically the standard representative-agent optimization of the consumption and labour supplied in each period t to maximize their lifetimes utility function, given the path of the consumption tax θ_t, preference shock q_t, and productivity shock α_t. What is important here for fiscal policy implementation is that "household's optimality conditions will simply restrict the set of allocations that the government can choose from." [32, p.168] There are two such conditions: first is the distortionary consumption tax - government's revenue source, but a function of households' labour supply and consumption, and the second is that marginal productivity of labour is proportional to marginal disutility of labour.

Like other standard fiscal policy models, Talvi and Vegh focus on perfect foresight equilibrium path of optimal fiscal policy. But, the deviations now arise because of the departure from the standard case of optimal fiscal policy where government spending path is determined exogenously (for example Lucas and Stokey (1983), as a formalization of Barro (1979)). Now government spending also includes an endogenous component, in the form of a non-negative, increasing and convex function of the primary surplus, $f(PS)$. Primary surplus is defined as $PS_t \equiv \theta_t c_t + z_t - g_t$ where, for period t, θ_t is the consumption tax, c_t is the consumption, z_t is the value of the endowment of a tradable natural resource the government owns, and g_t is government consumption. The government spending rule is:
$g_t = \overline{g} + f(PS_t)$ where $f' > 0$ and $f'' > 0$ and $\overline{g}$ is the exogenous component.

The presence of political distortions in government spending rule plays a crucial role in the deviation of the model from Barro's optimal tax-smoothing prescription. That way, $f(PS) = 0$, i.e. no political distortions, is a special case of the optimal fiscal policy response here, equivalent to the "Barro case" and used as a benchmark. In such an economy, spending would be determined based on social costs and benefits and full

tax smoothing is optimal. With $f(PS) > 0$, however, the government spending rule reflects the presence of political pressures from a variety of socioeconomic and business interest groups. Convexity of the spending pressures function indicates that pressures increase as more resources are available (higher primary surplus) and increase faster, meaning they "multiply in response to revenue booms." [32, p.170][21]

Even though the $f(PS)$ function in the spending rule attempts to reflect the politics of public spending and does the job of explaining the deviations from the Barro-type tax smoothing, it is without explicit microfoundations. Talvi and Vegh discuss the variety of factors that account for political pressures on spending[22], but they are all taken as "given." formulation of . In other words, the $f(PS)$ formulation is not explicit about the political forces at work.

The solutions to the government's optimization problem are a perfect-foresight equilibrium paths of consumption c_t, labour l_t, and government spending g_t for given paths of the value of the natural resource endowment the government owns z_t, preference shock q_t, and productivity shock α_t. The optimal path of the consumption tax θ_t is determined by the optimal paths of c_t and l_t.

The idea is to establish and evaluate how shocks to non-tax, exogenous, revenue source z_t and to the tax base q_t[23] affect the optimal fiscal policy response. As already mentioned, in the absence of political distortions, i.e. without the $f(PS)$ in the government spending rule, the optimal policy response to such shocks is equivalent to Barro's full tax smoothing rule and procyclicality does not arise. A positive shock to the value of government's natural resource endowment, *z-shock*, is fully reflected in the increased primary surplus and tax rates remain constant. A positive shock to the tax base, *q-shock*, increases tax revenue and it shows in a higher primary surplus

[21] As Talvi and Vegh argue, it is not necessary that the $f(.)$ function is convex for the results to hold. Including a linear $f(.)$ directly in the household's utility function produces the same results.

[22] See section 3.2 of their paper.

[23] Remember, q_t represents preference shocks that affect consumption directly and are therefore, for the case of a consumption tax θ_t, translated as shocks to the tax base. With the labour tax is in place instead, the productivity shock α_t would translate as a shock to the tax base.

one-to-one.[24]

With a political distortion included in the government spending rule, the optimal fiscal policy response is procyclical. For an exogenous increase in revenue, a positive z-shock in good times, government's optimal response is to lower taxes and raise spending. During bad times, i.e. negative z-shock, it reduces spending and raises taxes. Why does this happen? If taxes did not change, the higher revenue would produce a higher PS as in the Barro case. However, because political distortions are present, and recall that $f(PS)$ is convex, "the higher primary surplus increases the fraction of additional revenues that will be lost to wasteful government spending." [32, p.171] Thus, the government will reduce tax rates to try to reduce the higher primary surplus and avoid (wasteful) spending pressures. Also, it will choose to increase spending to avoid the intertemporal distortions of non-constant path of taxes. The overall result is that the primary surplus rises "by less than it would in the Barro case." A positive q-shock increases consumption and output and thus the tax base. Government's optimal response is again to lower tax rates and increase government spending.[25] The same result of PFP reaction is obtained if the labour income tax is substituted for the consumption tax. It is important to point out that PFP does not arise *just* because of political pressures represented by $f(PS)$, but because of variable government revenue together with the interaction of political distortions and distortionary (consumption or labour income) taxation.

In conclusion, PFP is the optimal reaction in the presence of political distortions and distortionary taxes, whether consumption-based or income-based, leading to the prediction that the contrasting behavior of fiscal policy in developing and developed

[24]A formal characterization of these shocks is considering a perfect-foresight equilibrium path of z_t and q_t along which $z_{t+1} > z_t$ and $q_{t+1} > q_t$ for some t. When $z_{t+1} > z_t$, then $c_{t+1} = c_t$, $l_{t+1} = l_t$, $\theta_{t+1} = \theta_t$, $T_{t+1} = T_t$, $R_{t+1} > R_t$, and $PS_{t+1} > PS_t$, where T_t is consumption tax revenue and R_t is total revenue.
When $q_{t+1} > q_t$ then $c_{t+1} > c_t$, $l_{t+1} > l_t$, $\theta_{t+1} = \theta_t$, $T_{t+1} > T_t$, $R_{t+1} > R_t$, and $PS_{t+1} > PS_t$.

[25]Again, these results are formally shown as a non-constant path of z_t and q_t. For a z-shock, i.e. $z_{t+1} > z_t$, then $c_{t+1} > c_t$, $l_{t+1} = l_t$, $g_{t+1} > g_t$, $\theta_{t+1} < \theta_t$, $T_{t+1} < T_t$, $R_{t+1} > R_t$, and $PS_{t+1} > PS_t$, where T_t is the consumption tax revenue and R_t is total revenue.
For a q-shock, i.e. $q_{t+1} > q_t$, then $c_{t+1} > c_t$, $l_{t+1} > l_t$, $g_{t+1} > g_t$, $\theta_{t+1} < \theta_t$, $T_{t+1} > T_t$, $R_{t+1} > R_t$, and $PS_{t+1} > PS_t$.

countries is not due to the difference in the tax systems.[26] To avoid such a sub-optimal outcome that does not conform to the Keynesian or Barro prescriptions, it is necessary to reform country's fiscal institutions and allocation mechanisms to ensure that budget surpluses are actually saved.

3.6 Political Agency and 'Starve the Leviathan'

The model that stands out for now and is the most cited in the literature is a rather simple but intuitively powerful model developed by Alesina, Campante and Tabellini (2008) [3, ACT from now on.] ACT are the only ones that intentionally address the view that the imperfect credit channel explanation for the PFP outcome is "incomplete." They ask two questions: (a) why don't the countries with PFP self insure during good times, so they are less exposed to binding credit constraints during a recession and (b) why don't the lenders provide the loans if the borrowing government would optimally smooth the cycle and help pull the economy out of the recession?

According to them, political conflict between the voters and a corrupt government is where the answers to both questions are. Their model follows closely and builds on the political agency model with moral hazard and political accountability initially developed by Barro (1973) [7] and Ferejohn (1986) [18] and modulated to public finance in Persson and Tabellini (2000) [29] and Besley (2006) [11].

Unlike Besley's (2006) setup where the political agency model contains adverse selection as well as moral hazard, Alesina et al.'s voters do not face an adverse selection problem, only a moral hazard one. In that, their political agency formulation is more limited since now there are only 'bad' politicians.[27] In addition, their political agency model can co-exist with the voracity effect previously explained.

Voter maximizes her utility over private and public consumption and her only

[26]It is documented that "poor countries rely heavily on international trade taxes, while income taxes are only important in developed economies countries." See Easterly and Rebelo (1993) [17]. For Talvi and Vegh trade taxes are equivalent to consumption taxes.

[27]For a political agency model adopted to public finance see also Besley and Smart (2007) [13]

"job" is the political control of the government agency through voting. There is no labour-leisure choice and income y is simply given as an i.i.d. random variable. Income shocks can then be interpreted as temporary business fluctuations. The government provides public consumption g_t but it also extracts rents r_t for its own benefit. There is a limit in the amount of rents being extracted from the available resources and ACT consider two assumptions: rents depend linearly on income or they are a (decreasing) function of public debt outstanding. Solving for both cases produces the same result. Government can also issue debt at time t in the foreign markets only, and it is fully repaid in the next period.[28]

Even though the assumption on the lack of information by voters is very important in the model, it might appear somewhat egregious and "stark." The voters know *nothing* about the accumulation of debt b_{t+1} in the current period, while foreign credit markets, where the government debt is being issued, are perfectly informed.[29] They can observe g_t, y_t, and τ_t taxes they are paying. Liabilities accumulated become known to the voters only after the election. Voters can punish the politicians for bad behavior during the current period, but cannot punish the politicians for debt being accumulated during the legislature before the last election.

Incumbent politicians, caring only about stealing rents and nothing else, maximize the present discounted value of their rents while in office.[30] At the beginning of each period voters observe y_t and b_t and set the reservation level of utility x_t and condition reelection on attaining at least that level of current utility. In other words the politician will be reelected if

$$u(c_t) + h(g_t) \geqslant x_t \tag{3.4}$$

[28]Lack of a default risk is obvious.

[29]An earlier version of the paper, available as an NBER working paper, simply assumes a constant for the upper bound on rents. In addition, it also postulates no useful government spending implying that all taxes are needed for is unproductive spending.

[30]An interesting issue that can be raised here is the very point of having politicians such as these in the first place. Here, such a utility function arises because the degree of corruption variable is one: governments can extract rents and fiscal policy is procyclical. A more realistic approach, which ACT discuss, is assigning relative weights to the corruption variable and consumer welfare.

Incumbent politicians deduce[31] this reservation level of utility and set policies (b_{t+1} and r_t) for the current period. As we shall see, values for g_t, τ_t are not really set but "pinned down" by an optimality condition and the government's budget constraint. Elections are then held at the end of each period, after voters observe their utility but not b_{t+1} or r_t. The equilibrium consists of voters' reservation utility and the government's optimal policies. The incumbent has two options.

He can forgo reelection and grab maximal rents in which case he receives utility from the upper bound on rents by stealing everything, i.e. $\nu(q_t) = \nu(\overline{q} + \rho y_t)$.

Otherwise, he can try and please the voters. In that case, he is seeking re-election and has to determine fiscal policy variables to maximize his utility $W(b, y, x)$ determined as

$$W(b, y, x) = \max_{\tau, g, r, b'} (\nu(r) + \beta EV(b', y')) \tag{3.5}$$

Where $V(.)$ is the next period equilibrium re-election value. Voters cannot push the value of W lower than what the politician can get by "grabbing maximal rents once." [3, p.1014] In fact, it is *desirable* they don't push it lower since the politician will then have no incentive to seek reelection and will simply steal maximum rents. Thus, the reelection incentive constraint is

$$W(b, y, x) \geqslant \nu(\overline{q} + \rho y) \tag{3.6}$$

In other words, the utility politicians get by pleasing the voters (left hand side) has to be at least as great as what they can get by grabbing maximum rents and forgoing reelection (right hand side). The optimal strategy for voters is to avoid higher appropriated rents by the government without receiving higher utility for themselves. That part is intuitive and crucial for understanding the reasons of procyclicality.

Thus, the equilibrium utility demanded, x^* as a function $x^* = X(b, y)$, will be set by voters to have the incentive constraint 3.6 hold with equality. The value of

[31] ACT use the word 'observe', but it is not an entirely proper word as the politicians cannot observe voters utility. Incumbent politicians are able to 'calculate' voters demands.

being re-elected in the next period, $V(.)$ will be equal to 3.6 and with always positive rents the incumbent determines equilibrium rents r^* in the current period from the condition:

$$\nu(r^*) + \beta E\nu(\overline{q} + \rho y) = \nu(\overline{q} + \rho y) \tag{3.7}$$

The equilibrium debt is $b^* = \overline{b}$, i.e. always borrowing as much as possible, and equilibrium government consumption g^* and tax rates τ^* are jointly determined by the optimality condition $u_c[(1-\tau^*)y] = h_g(g^*)$.

ACT perform a comparative statics analysis to evaluate the reaction of equilibrium[32] fiscal policy variables to income shocks. The equilibrium rents $r^* = R(y)$ are procyclical ($R_y > 0$) implying that with every increase in income, voters must accept an increase in equilibrium rents. The change in tax rate with income is ambiguous ($T_y \lesseqgtr 0$), as well as G ($G_y \lesseqgtr 0$) but together with R_y

$$R_y + G_y > 0 \tag{3.8}$$

so total public expenditure in this model always increases with income.

The intuitive explanation behind this model is as follows. There is a lack of trust between the voters and the government. The government is corrupt (strictly in this model) and extracts rents from the tax revenue. Furthermore, voters lack information about government policies. Specifically, public debt being accumulated in the current period is unobservable to voters. Even though they cannot observe government's policy, they are rational and can predict it. Hence, when a positive income shock hits the economy they will immediately demand higher utility for themselves knowing well that the newly available income will otherwise simply go to the politicians pockets. Voters would prefer to "starve the Leviathan" than knowingly allow the government to extract more wasteful rents without receiving higher total consumption in the future.

[32]Equilibrium values are now being denoted by uppercase letters.

Faced with such a myopic attitude and procyclical demands by voters the government administers a procyclical fiscal policy, not saving but borrowing too much during the good times. In fact, the result from solving for an optimal debt policy is to always borrow as much as possible. "and pocket the proceeds from issuing government debt in the form of higher rents." [3, p.1015] Equilibrium debt being issued in the current period is always at the maximum, i.e. $b^* = \overline{b}$.

In the political equilibrium that ACT derive the debt policy is suboptimal as it does not respond to a change in income at all. Specifically, a positive income shock is not saved through an increase in the budget surplus and a negative income shock is not met with more borrowing. In contrast, in the benchmark socially optimal policy a benevolent government discussed by Aiyagari (1994) [2] would always increase the budget surplus and accumulate unbounded assets (not incur debt) and reduce the budget surplus in respective situations. Also, total public expenditure increases with income as mentioned above, more than socially optimal. The optimal policy for the voters is $r_t = 0$, but in this political equilibrium voters "must accept an increase in equilibrium rents."

However, it is worth pointing out the seemingly artificial way in which the procyclical policy arises. As the authors point out:

> *...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 until next period. Hence, the incumbent can pocket the proceeds from issuing government debt in the form of higher rents.*
> [3, p.1015]

The assumption that the voters cannot observe debt accumulation in the current period is fairly plausible. As the authors mention and as it is commonly known, governments, in developing countries especially, are very capable of major creative accounting techniques to hide the true size of the the budget and borrowing needs. In addition, in many developing countries and probably more pronounced in Latin America, persistent high inflation rates make it difficult for the voters to observe the

true size on the public debt outstanding. That all makes it a credible assumption that voters are indeed unable to observe the debt policy in the current period. However, the additional assumption "artificially" imposed is that voters are "not allowed 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.[33]" [3, p.1013] The artificiality lies in that, if we remember the equilibrium rents function $x^* = X(b, y)$, the current level of debt outstanding b influences the cutoff value of utility, but voters still cannot use the level of debt b in their voting decision. Voters are "giving up" on consumption smoothing and receive a second best solution. But they are not "giving up" in the exact sense, but simply being "prevented" from using the available information to set a higher cutoff value of utility.

According to ACT, it is clear that this is an agency problem, and not a product of credit market malfunctioning. A PFP bias arises from a "political distortion related to the starve the Leviathan argument." [3, p.1033] In other words, it is a deliberate, rational choice by the electorate to demand lower tax rates and/or higher consumption during boom times rather than leave more resources in the hands of the less-than-benevolent government.

3.7 Social Polarization

Woo's (2009) [34] paper is probably the latest one in the PFP literature that studies the theoretical link of fiscal policy and political economy and presents empirical evidence for a large sample of countries. He studies the interaction of cyclicality of fiscal policy and social polarization in a two period model. A valuable finding of the paper, for our interest here and compared to other determinants of PFP, is that "social polarization of preferences is a key to explaining the procyclicality." [34] Social polarization is measured/proxied by income inequality and education distribution, and the

[33]Restriction is on Markov-perfect equilibrium and in equilibrium no government change occurs.

econometric evidence Woo (2009) presents establishes a strong positive relationship between them and fiscal procyclicality. He also tests a potential negative impact on economic growth from procyclical fiscal policy. I will briefly present the model, its main implications and then the empirical findings.

There are two fiscal policymakers representing two different socioeconomic groups. They both face the same budget constraint, but each decide how much to spend on only one public good, g_t and f_t respectively. In optimizing their objective function each take in consideration what the other policymaker chooses. Since they have different preferences for the two public goods they may disagree on the optimal public goods combination. Each policymaker has a preference for public good α_i where it is assumed that $0 \leqslant \alpha_i \leqslant 1$ for both, and $\alpha_2 \leqslant 1/2 \leqslant \alpha_1$. The degree to which the two policymakers' preferences differ, the degree of preference polarization, is captured by $\theta = \alpha_1 - \alpha_2 \ \in [0, 1]$. With $\theta = 1$ there is total disagreement about the public goods composition and full agreement with the value zero. The intuition is that more unequal society would have higher level of disagreement. The point of the model is to determine how the level of θ affects the behavior of fiscal spending over a business cycle and the volatility of fiscal outcomes.

Through backward induction, the game between two policymakers is solved as a Nash equilibrium. First, in the second period it is simply assumed that "each policymaker gets an equal share of the remaining government resources after government debt is paid off." (Woo, 2009, p.853) Then, spending by the two policymakers on public goods in the first period, with the assumption from the second period incorporated, is a subgame-perfect Nash equilibrium spending g_1^* and f_1^*. Total government spending in period 1 in the model is the sum of those two which gives us[34]

[34]The way Woo gets g_1^* and f_1^* functions is by solving the FOCs, assuming an interior solution and with an iso-elastic utility functional form for the policymaker to be $v(g) = ln(g)$. We concentrated on the main results here. For full and detailed specifications of the model see Woo (2009, p.852) and Woo (2005) from which this two-period model is adapted originally.

$$G_1 = g_1^* + f_1^* = \frac{(1+\theta)(2+r)}{(1+r)[\delta + (1+\theta)]}T$$

where $T = \tau\overline{Y}$ is tax revenue, r is the interest rate on debt and $0 < \delta < 1$ is policymakers' subject discount rate.

What Woo studies is "how polarization θ affects the cyclicality of fiscal spending and volatility of fiscal outcomes." Taking the derivative of the above G_1 function with respect to tax revenue T results in

$$\frac{dG_1}{dT} = \frac{(1+\theta)(2+r)}{[(1+r)[\delta + (1+\theta)]} = h(\theta, \delta, r) \geqslant 1$$

and h is an increasing function of the degree of polarization θ, and decreasing of δ. The intuition on those two is as follows. An increase in income and thus tax revenue T leads to a higher than proportional increase in spending with $\theta > 0$. If $\theta = 0$ the above equation holds with equality. Therefore, with some socioeconomic polarization present (due to income inequality) fiscal spending exhibits procyclical behavior, i.e. fiscal spending increases (decreases) more than tax revenue does during a boom (recession).

In addition, political uncertainty which is related to polarization "plays a distinct role" in procyclical behavior of fiscal spending. Political uncertainty here is represented by policymakers' discount factor δ. A higher level of polarization of preferences in the society makes it more unlikely for policymakers to agree on collectively optimal spending policies which in turn "makes the downfall of the existing government more likely." Politicians are more impatient since they face higher uncertainty, a constant positive probability of being removed from office, which results in lowering their δ. Thus, with an increase in income (boom) that brings higher tax revenue, spending is an increasing function of θ and political uncertainty, which is inversely related to δ. In the case of δ the equality in the above equation holds when $\delta = 1/(1+r)$.

In sum, this model predicts higher level of PFP in a society with a higher degree

of social polarization. Higher polarization increases political uncertainty which then leads to "procyclical behavior of fiscal spending by shortening policymakers expected tenure in office and providing incentives to engage in short-term policies." [34, p.856]

In the comprehensive empirical study, not all of which is reviewed here, Woo (2009) confirms this model's predictions. In a panel data of 96 countries, for which there is at least 25 years of data, over the 1960-2003 period, he runs time series regressions to determine the cyclicality of fiscal policy and cross-country regressions to determine the link between procyclicality and social polarization.[35] Woo is very aware of the arguments presented by KRV's (2004) study and so he uses government spending as an indicator of fiscal policy since it is an instrument and not an endogenous fiscal outcome. He is aware of the potential endogeneity issue with the standard OLS regressions, and addresses it by running more robust IV and GMM regressions. The findings on cyclical stance are in line with KRV's (2004). OECD countries exhibit lower procyclicality than developing, and among developing countries Latin America is more procyclical than East Asian or Sub Saharan regions.

The established results on the link between social polarization and procyclicality show that fiscal procyclicality is greater in a more socially polarized societies. Social polarization is measured by income inequality and in the regression analysis Woo uses the well known Gini coefficient. The coefficients on Gini variable from the OLS regressions suggest that "a 10 point increase in Gini coefficient is associated with an increase in fiscal procyclicality of 0.19 to 0.21." (Woo 2009, p.855) The coefficients on Gini are all significant at a 1% level.

Alternatively, using inequality in education as an indicator of social polarization gives very similar results. It is often pointed out through various human capital models that education is a major factor in determining income distribution. Coefficients from regressing fiscal cyclicality on educational inequality are positive and significant at a 5% level indicating, just like the Gini coefficients, that a 10 point increase in

[35]For a much more detailed discussion of econometric techniques, data sources and issues than it is presented here see Part II of Woo (2009).

educational inequality is associated with procyclicality increasing by 0.19 to 0.20.

Using his database, Woo (2009) considers several other determinants of fiscal procyclicality in the empirical part of the study. For example, he looks at the size of the cabinet as a factor, which corresponds to the common pool fiscal problem. When there are more participants in the decision process (number of ministries) coordination is less likely and PFP can arise in response to a increase in government revenue. However, the OLS coefficients on the cabinet size are not significant and of the wrong sign (negative).

Another prominent theory of PFP Woo (2009) tests is the loss of foreign credit markets during bad times. Keeping in mind it is not easy to have a good measure of credit constraint or capital market incompleteness, Woo uses sovereign debt default risk, terms of trade growth and capital flow volatility, but fails to find a significant coefficient on any of them, as well as some are of the wrong expected sign. Basically, Woo (2009) with his data refutes any foreign credit market cutoff argument theory as an explanation of PFP.

Interestingly, the results from Talvi and Vegh's (2005) theory of PFP discussed previously, where greater tax base variability is associated with higher degree of PFP, also does not find much support in Woo's (2009) study. Here, coefficients on GDP volatility are all insignificant except for some robust regressions, and of the wrong expected sign (negative).

In conclusion, fiscal procyclicality is consistently and positively associated with social polarization as measured by income and educational inequality. While those coefficient remain consistently significant at various levels and of the right sign (positive), Woo (2009) study does not show any significant evidence for many other potential determinants of PFP.

3.8 Some other political economy explanations

Several other papers not reviewed here explore the procyclicality phenomena. For example, a rich and dynamic theory, part of a second generation of political economy modeling, that among other predictions shows how procyclical fiscal policy can arise in the short run in developing and developed countries is Battaglini and Coate's (2008) [10] theory of fiscal policy over the RBC. The original approach Battaglini and Coate take is to evaluate how collective decision making "adjusts fiscal policies in response to changes in productivity?" [10, p.1] yet it is"complementary" to two previously reviewed models, Lane and Tornell's 'voracity effect' and ACT's 'starve the Leviathan.' Even though it is not published yet, the model is an extension of the previously published political economy theory of fiscal policy by the same authors, but here is sheds light on the cyclical behavior of fiscal policy. [9]

The authors take issue with the perfect foresight tax-smoothing framework as a benchmark to study fiscal policy cyclicality in developed and developing countries. According to them, the tax smoothing approach is not very good at explaining long-run cyclical behavior of fiscal policy with a "more palatable assumption that cyclical variations are not perfectly foreseen" [10, p.5] and with political friction introduced in the fiscal policy decision making. Here, fiscal policy decisions are made by a legislature. Specifically, pork-barrel spending through legislative bargaining is integrated with the key assumptions of tax smoothing. Superimposing the well known Baron and Ferejohn (1989) [6] legislative bargaining setting on a general equilibrium model provides a rich and dynamic *positive* theory of how legislative bargaining politics distorts fiscal policy making.

The distortion of the efficient solution arises as legislators target public spending to their districts and create (fiscal) policy in a non-cooperative bargaining, which leads "policy to depart from the normative ideal." [10, p.5] With low debt levels, legislators choose to divert fiscal resources to their districts instead of government savings. The prediction arising is a procyclical patter for both public spending and

tax rates, in both the short and long run. However, public debt shows procyclical behavior only in the short run, while in the long run debt is countercyclical, increasing in recessions and decreasing in booms.

While Battaglini and Coate model a conflict of districts in a legislature, Ilzetzki's (2009) theory (also yet unpublished) finds the explanation of PFP in the conflict "between successive fiscal decision-makers with different distributive objectives." [20, p.4] The political friction that leads to procyclicality arises because of the disagreement between successive governments about the distribution of public spending. Political frictions are introduce as a result of alternating governments (which is in a way different from models where being thrown out of office is a threat, but government change does not occur) and incumbent's uncertainty if his "successor will value the same constituency as he does." [20, p.3] Thus, the incumbent decides to spend more and save less for the benefit of its own constituency, especially when more tax revenue is available, making fiscal policy procyclical.

In it basic contours the theory is similar to the polarization of Woo (2009), except here procyclicality will be greater in a more polarized *political* environment. Through such polarization Ilzetzki (2009) attempts to not just explain PFP, but account for difference between fiscal policy conduct between developed and developing countries. His conclusion is also that frictions in the political process can explain the occurrence of PFP better than the imperfections in the foreign credit markets.

Chapter 4

Endogenous Fiscal Transparency and Procyclicality

Here we discuss and adapt a model of fiscal transparency and procyclical fiscal policy developed by Andersen and Nielsen (2010) [5]. The model is closely related to the political agency model in ACT (2008) and proposes an explanation of the PFP phenomena in developing and developed countries.

As discussed previously, a key element of the political agency in ACT is an extreme informational asymmetry, just as in Ferejohn's (1986) first generation political agency model. On the one hand, citizens-voters are sophisticated political principals, but on the other hand they are completely ignorant about government's rent taking, how much public debt is being accumulated in the current period, or budget matters. The incumbent politicians, agents to whom fiscal policy making has been delegated, enjoy an informational advantage and are able to hide the true size of the deficit (i.e. debt being issued to cover it) from voters. For the reasons mentioned in the discussion of Alesina et al. (2008), it might not be a completely implausible assumption, but it is highly restrictive, allowing the politicians to have a much stronger incentive/leeway to extract higher rents by hiding truthful information about the budget process or the true size of the deficit.

The situation corresponds to the problem of monitoring[1] (moral hazard) where the politician acts opportunistically. Voters must determine whether rent taking or deviating has happened and punish/reward the behavior accordingly. It is a way of minimizing opportunistic, rent seeking, behavior. However, this is particularly difficult to accomplish if access to the information about the budget practices or the true size of the deficit is unavailable. Furthermore, it is even harder if the ability and interest of voters to gain such information is (artificially) curtailed.

In other words, both correspond to complete lack of fiscal transparency. Fiscal transparency as Andersen and Nielsen interpret it is "the extent to which the general public can access truthful information about government budget matters" (p. 5). Here we formulate it as the probability p of observing excess deficits.

It is worth keeping in mind that voters are postulated as rational and therefore, even though they are "ignorant" about the level of rent taking it is seemingly conceivable that they would be interested in curtailing those activities through which rent taking is occurring, i.e. high levels of deficit and debt issuance. That is why we introduce, as an extension of the Andersen and Nielsen model, the transparency variable p as voters' choice variable. Including fiscal transparency as some $p > 0$ variable in the model yields contrasting predictions to the ACT predictions that fiscal policy is *always* procyclical. Now there are two new predictions. First, PFP arises only if the shock to output (ε) is relatively high, in other words, if the initial output is high. For modest or negative shocks and low initial levels of output, PFP will not arise. Alesina et al. themselves discuss how PFP arises because of the ability of politicians to grab rents. But, if that rent taking activity is restrained with some checks and balances by the voters, the occurrence of PFP would be diminished. The second prediction says that high levels of transparency insure against PFP, i.e. for fiscal policy to become procyclical the boom must be stronger for a given higher degree of fiscal transparency.

In our case, we will be considering an endogenized version of the fiscal transparency

[1]See Besley (2006) [11, Ch.3]

variable, such that voters have the ability to increase it, but at a cost. Their choice of higher transparency (increased p) will be based on the observed income shock value ε. Voters are able to influence the probability that a deviation from the true size of the deficit will be detected and that is the main difference between our formulation and Andersen and Nielsen's (2010).

4.1 Political Participation and Fiscal Transparency

The rationale behind endogenous fiscal transparency, as a variable determined by voters and not a value given exogenously, rests on the notion of political participation.

First, it is worth pointing out that any functioning democracy, consistent with its level of development, will have political participation by individuals as an important characteristic. Voting is a necessary but not a sufficient condition to characterize a country's political system as a democracy. Political participation is an important political institution in a representative democracy. As already discussed in previous sections, political factors are crucial determinants of cyclicality of fiscal policy.

Second, there are things any individual can do in a democracy to become a more engaged citizen and try to curtail the ruler's power if it is being inappropriately used. Political participation is something practical and existing in many of the world's (successful) democracies. It can consist of paying closer attention to the news and policy announcements, which increases the probability of noticing unfavorable or "odd" policies. As a reaction, voters could choose to engage in demonstrations, write petitions for or against a certain policy and engage in public debates. Another way is establishing grassroots organizations, think-tanks and NGOs to expose certain political issues and to which in turn other citizens could devote some of their income and time.

Lobbying and contacting their representatives in the legislature are also activities the voter can take to check politician's power and incentives to pass unfavourable

policies.[2] All of this can amount to demanding more information, or revealing the incumbent's private information to the public, in order to check the ability of politicians to pursue unfavourable policies.

The value of this sort of political participation is obvious when the politicians (government) are known to be corrupt and dishonest, and the voters want to improve the situation rather than just being content with it from election to election. In other words, instead of simply being just voters, they would be 'citizen-voters.' In our case, and it is not an implausible real life case, such political participation would influence the level of fiscal transparency p. Our political setting, which follows the ACT (2008) one of corrupt politicians that do not care about voters' welfare and an extreme informational asymmetry, strongly influences the demand for fiscal transparency.[3]

We can take the logic of the argument a step further and point out the design of formal fiscal rules and fiscal responsibility laws to shape and constrain policymakers' incentives and ensure fiscal policy conduct consistent with macroeconomic stability. Another institutional concept involves establishment of 'independent fiscal agencies' which go beyond increasing fiscal transparency and aim to "help inform, analyse, assess and implement fiscal policy", all with the goal of improving fiscal discipline and social efficiency.[4]

Citizen-voters must devote some resources towards controlling politicians' behaviour. In a more complex setting they would devote some human capital and/or productive labour effort towards political participation, and that is ultimately the cost they would bear for being more politically involved and checking executive's activities. In a potentially even more realistic and insightful case, their involvement would entail participating in the election for the public office and thus entirely giving up on their productive labour income. In such a setting, which is opposite from the one

[2]It should be acknowledged that lobbying contributions might also be the source of rents that benefit incumbents' pockets in exchange for policies that are hurtful to the voters.

[3]For a good survey and empirical study of the causes and evolution of fiscal transparency see Alt et al.(2006). [4]

[4]For a detailed survey of the literature on independent fiscal agencies see Debrun et al. [16] For a theory of efficient and inefficient government policy making see Majumdar and Mukand [26]

where political actors are already present, we would get political outcomes originating directly from citizens' preferences, since they are now elected as representatives deciding on fiscal policy issues. In other words, they would become citizen-candidates.[5] For our purposes we will just label it as a cost they are incurring for every unit of fiscal transparency p they choose to increase.

4.2 Economic and Political Environment

There are only two time periods in the model. Voters are identical and derive utility in each period t from private (c_t) and public (g_t) consumption. The per period utility is separable in those two. Accordingly, the utility function of a representative voter is given by

$$\mathcal{U} = \frac{c_1^{1-\theta}}{1-\theta} + \frac{g_1^{1-\theta}}{1-\theta} + \beta\Big(\frac{c_2^{1-\theta}}{1-\theta} + \frac{g_2^{1-\theta}}{1-\theta}\Big) \tag{4.1}$$

The parameter β is a discount factor. Their per-period consumption follows Andersen and Nielsen (2010) and ACT's (2008) as $c_t = (1-\tau_t)y_t$, where τ_t is the tax rate and y_t is the income in period t. However, here we are allowing the voter to choose at a cost the variable p. The choice of p occurs only in the first period, before the elections. Accordingly, voters' first period consumption is modified to include the cost the voters must bear for increasing of p.

$$c_1 = (1-\tau_1)y_1 - \phi(p) \tag{4.2}$$

where $\phi(p)$ is a cost incurred for engaging in political participation and increasing

[5] See Osborne and Slivinski (1996) [27], Besley and Coate (1997) [12] as two primary works on citizen-candidate and representative democracy models. Mueller (2003) [**?**, Ch.11] also has a good discussion of those theories. In a citizen candidate model, citizens are only concerned about policy outcomes. They receive no reward from running for office and the only benefit of being elected is to implement their preferred policy. Being a candidate, however, involves a fixed cost, which is similar to our idea of citizen-voters incurring a cost for political participation.

fiscal transparency p. The $\phi(p)$ cost function is strictly convex, smooth and an increasing function of its output p ($\phi' > 0$ and $\phi'' > 0$).

The fiscal transparency variable p increases with total political participation, but more output requires more input which has to be paid for. The ϕ function specifies how effort (time, resources) devoted to political participation translates into higher fiscal transparency. It also encapsulates how much effort is required to increase fiscal transparency, i.e. how much it costs to increase one unit of p. The level of development of a democracy affects the ability and the cost of voters to increase p. Thus, for example, in a democracy with a more developed pre-existing institutional landscape, better access to the media and a more evolved civil society, it is less costly to increase p. In other words, there is more bang for the buck. With a lower level of democratic development it is more costly and there is a smaller increase in p for every unit of political participation. In period 2 the model ends, there are no more elections and politicians cannot be controlled in any way, so voters do not choose p anymore and accordingly $c_2 = (1 - \tau_2)y_2$, without the cost $\phi(p)$.

As Andersen and Nielsen (2010) assume, y_2 is known in period 1 since there is no uncertainty about the future. Furthermore, as we are interested in fiscal policy behavior in face of fluctuating income, we specify the relationship between y_1 and y_2 that will allow us to focus on just that. The relationship between output in the two periods is postulated as

$$\begin{aligned} y_1 &= \overline{y} + \varepsilon \\ y_2 &= \overline{y} - (1 + \rho)\varepsilon \end{aligned} \tag{4.3}$$

where $\overline{y}$ is output's trend level, ε is the income shock, or short term fluctuation, and ρ is the interest rate. With $\varepsilon = 0$ there would be no income fluctuations over time, but we are interested in "how fiscal policy depends on the distribution across time periods of a given present discounted value of income." [5, p.8]

The variable ε is the key one in the analysis. It is not just a fluctuation in the time profile of income, but, since we have only two periods and we are holding constant the PDV of lifetime income, it represents a measure of the size of the shock which then translates into the shift of revenue from one period to another. A positive shock then means a shift of revenue from period 2 to period 1 for the government.

Furthermore, in the benchmark case of a benevolent social planner, ε does not appear in the solution for the voters' optimal consumption profile, which depends on the PDV of income and not on its distribution across periods. Voters' desire for full consumption smoothing (neither private nor government consumption changes in response to an income shock) means in the case of a positive ε the benevolent social planner would raise the tax rate in period 1 and lower it in period 2 to keep private consumption unchanged. Thus, the optimal fiscal policy follows Barro's (1979) argument and is acyclical. This implies $d_1 = -\varepsilon$, i.e. all income fluctuation is absorbed by the deficit.

The incumbent politician is in control of fiscal policy. He sets the tax rates τ_t and can also issues debt in period 1 which is fully repaid in period 2, including the interest rate. The revenue is divided, just as in ACT (2008), between useful government spending g_t from which the voters benefit, and appropriated rents $r_t \geqslant 0$, which benefit only the politicians. The government budget constraints are accordingly

$$\begin{aligned} \tau_1 y_1 + d_1 &= g_1 + r_1 \\ \tau_2 y_2 - (1+\rho) d_1 &= g_2 + r_2 \end{aligned} \tag{4.4}$$

The political environment here follows Ferejohn's (1986) [18] original setup, adopted by ACT (2008) [3] and modified by Persson and Tabellini (2000) [29, Ch.4]. Specifically, in ACT (2008), the equilibrium and the reelection rule is based on the reservation level of utility voters demand in the *current* period (period 1 here). However, in this setting as it follows Andersen and Nielsen closely, our voters condition reelection

in terms of policy variables. That way they can do better as they can observe g and τ and have a chance to observe d. Since the size of the deficit has implications for the level of consumption in the second period, by conditioning reelection on the size of the deficit they indirectly demand that the incumbent delivers a policy consistent with voters' optimal level of reservation utility in *both* periods.[6]

The politicians are assumed to be all the same so there is no adverse selection problem. The incumbent maximizes the expected, discounted value of political rents and accordingly his objective function is

$$V = r_1 + \delta \frac{r_2}{1+\rho} \tag{4.5}$$

where r_t are political rents in period t, δ is the probability of being reelected and ρ is an exogenous and constant interest rate.

The politician's objective function reflects the strong assumption on their preferences: they do not care about consumer welfare and only care about grabbing rents. This, as discussed in ACT (2008), implies the level of corruption is one, and the procyclicality of fiscal policy arises because politicians are able to grab rents by increasing the deficit, raising taxes or lowering government consumption in period 1. In general then, countries that are more corrupt should then have a more PFP. Lower corruption means lower 'demand' for rents, but it could also mean less ability to grab rents because of higher fiscal transparency: with more attention on budgetary issues it is harder to engage in rent extraction, resulting in a lower or non-existent asymmetric cyclical response of fiscal policy.

With higher fiscal transparency, politicians are less able to use creative accounting techniques, off-balance-sheet liabilities and manipulate the true size of the deficit. The voters are more likely to observe such deviations from the true size of the deficit and would accordingly make sure that politicians have a reduced incentive for rent taking. If no rents are being appropriated (same as zero corruption), fiscal policy is socially

[6]See the discussion in Persson and Tabellini [29, p.81] and Andersen and Nielsen [5, p.11]

optimal. As Andersen and Nielsen point out "It is exactly through a reduced incentive to collect rents that fiscal transparency diminishes the procyclicality of fiscal policy." We try to model that reduction in incentive to steal rents.

Reduced or no rent taking is equivalent to having good politicians together with the bad ones or only good politicians, respectively. That is in line with the previous critique of ACT (2008) and similar models where only bad politicians exist and the only obvious way to improve fiscal policy conduct is by getting rid of the bad politicians.

Fiscal policy is set by the politician before the election. As it is common to many political agency models, it is assumed that voters observe the level of output y, taxes τ, private and government consumption before election, c and g respectively, but do not observe rents taken by politicians r. As discussed above there is only a probability p to observe the true size of the deficit and they can choose to increase that probability at a cost. Through election, voters choose to reward or punish the incumbent and base their decision to reelect the incumbent on observed outcomes.

They do not trust the politician and know, even if they cannot fully observe it, that the incumbent would like to increase rents by increasing the deficit d_1. Also, the incumbent could decrease useful government expenditure g_1 or increase τ_1 and divert the revenue towards rents, but voters can observe those levels and do not want lower g_1, higher τ_1 and especially higher rent extraction. Therefore, they set the reservation levels for g^*, τ^*, and d^* and base their re-election decision on the observed values of those variables in period 1. The probability that they will re-elect the incumbent is then:

$$\delta = \begin{cases} 1 & \text{if } \; g_1 \geqslant g^*, \tau_1 \leqslant \tau^* \text{ and not detecting } \; d_1 > d^* \\ 0 & \text{with any other case} \end{cases}$$

As Andersen and Nielsen point out, voters cannot differentiate between the situation where the incumbent actually obeyed the voter ($d_1 \leqslant d^*$) or that a higher deficit went undiscovered ($d_1 > d^*$) which has the probability $(1 - p)$. By having p as a choice

variable now, voters could potentially increase the probability of the former and lower the probability of the latter by increasing p. That way, they force the incumbent to actually obey rather than gamble on not being discovered.

The sequence of events follows directly from Andersen and Nielsen's (2010) model. At the start of period 1 voters observe, or rather know, trend output $\overline{y}$ and observe the income shock ε. Following that, they determine their reservation value for g^*, τ^*, d^* variables and the level of p through political participation. Including the choice of p, the probability that they observe a deviation between the true deficit and the reported one, is the only difference from the model setup of Andersen and Nielsen. The value of p, once determined, is known to everyone. The incumbent observes these reservation values and sets fiscal policy for period 1. Voters then observe the size of g_1 and τ_1 set and $d_1 > d^*$ is observed with chance p. elections are held. Voting follows the strategy above. Model ends in the second period.

4.3 Equilibrium Strategies

We start by evaluating the the most general case where maximal political rents, what the government can steal without being caught and thrown in jail, are a linear function of income[7], so $r_t = \overline{r} + \gamma y_t$, where the parameter $\gamma \geqslant 0$ "captures the extent to which the upper bound of rents varies with income." (ACT (2008), p.1016) Thus, as the tax base rises there are more resources that the politicians can steal. Later, for a simpler analysis, we will drop γ, i.e. make it zero. The upper bound on rents, $\overline{r}$ is small enough so that maximum rents can always be extracted without c_t or g_t being less than zero. Specifically, $y_t - (1+\rho)\overline{d} \geqslant \overline{r}$ for t=1,2 and all income shocks ε.

Using backwards induction, we begin with the optimal strategies for the incumbent. The world ends after the second period and the incumbent politician will, not having to worry about reelection, collect maximum rents in the last period and not

[7] Alesina et al. discuss the upper bound on rents in three different ways: linear function of income, debt issued or just a constant.

care about voters' demands. We assume that with the remainder of income he will adjust private and public consumption so that it satisfies the voter's optimality condition. In our case that means marginal utility of public consumption equals marginal utility of private consumption, which together with the government budget constraint implies,

$$g_2 = c_2 = \frac{y_2(1-\gamma) - (1+\rho)d_1 - \overline{r}}{2}$$

In the first period the incumbent has three options. In option one he can satisfy all of the voters' requirements for optimal fiscal policy variables in which case he will be reelected with certainty, so $\delta = 1$. Accordingly he sets $d_1 = d^*$, $g_1 = g^*$ and $\tau_1 = \tau^*$. Using government's budget constraint in (1) his political rents are $r_1 = \tau_t y_1 - g^* + d^*$.

With all that and defining V_i as the expected, discounted value of political rents in option i, (his utility in i) his value of rents in option one, is

$$V_1 = \tau^* y_1 - g^* + d^* + \frac{\overline{r} + \gamma y_2}{1+\rho} \tag{4.6}$$

There is an upper bound on the size of the debt issued to cover the deficit. Up to that amount the debt is always repaid in full in period 2. In a sense, that can be interpreted as some checks and balances on the government to prevent it from issuing extreme amounts of debt.[8] In ACT (2008) those checks and balances are imposed by foreign lenders; past $\overline{d}$ there is default risk, credit markets imperfection emerge or foreign lenders do not extend any more credit. But as Andersen and Nielsen (2008) point out but, they could also be some form of democratic control (and they do not elaborate what kind) that restrains policymakers, or self-imposed fiscal rules. In a way, "democratic control" as a form of checks and balances is the direction we explore here without transparency modification. Otherwise, in option two he can set $g_1 = g^*$ and $\tau_1 = \tau^*$, but run an maximum deficit $\overline{d}$, thus extract more rents, and gamble that he will not be discovered.

[8]In a case of an infinite horizon model this would serve to prevent dynamic inconsistency where the government would always be able to issue more and more debt without repaying fully.

He is reappointed only if $\overline{d} > d^*$ is not discovered. With this option he has the probability $(1-p)$ of being re-elected. It is obvious that a higher level of p, fiscal transparency, makes it less likely the incumbent will be re-elected. In this case with the same definition as V_1, his value of rents in option two, is

$$V_2 = \tau^* y_1 - g^* + \overline{d} + (1-p)\frac{\overline{r} + \gamma y_2}{1+\rho} \tag{4.7}$$

Debt issued again must be fully repaid in the second period. However, if he decides to run a maximum deficit and has to issue more debt to cover it, it follows that with $\gamma > 0$ and $r_2 = \overline{r} + \gamma y_2$ he will have less left for rents after repaying the debt.

Lastly, in option three the incumbent can simply disregard voters, steal maximum rents and forgo re-election. The same way as V_1 and V_2 are defined above, his V_3 is

$$V_3 = \overline{r} + \gamma y_2 \tag{4.8}$$

The voter now chooses the optimal fiscal policy variables in period one. Her problem is to choose reservation values for g^*, τ^*, d^* and the level of p to maximize the utility function in (1), subject to the constraints $V_1 \geqslant V_2$, $V_1 \geqslant V_3$ and $d^* \leqslant \overline{d}$. The two constraints can be interpreted as value of political rents to the politicians over two periods by following voters demands and not deviating from the true size of the deficit (V_1) compared to the values of cheating and taking more rents (V_2) or completely disregarding voters and stealing maximum rents (V_3).

By rearranging them we can write $V_1 \geqslant V_2$ and $V_1 \geqslant V_3$ constraints as: $V_1 \geqslant V_2$: $p\beta(\overline{r} + \gamma y_2) \geqslant \overline{d} - d^*$

$V_1 \geqslant V_3$: $\tau^* y_1 - g^* + d^* \geqslant \overline{r}(1-\beta) + \gamma(y_1 - \beta y_2)$

Furthermore, voters want to ensure that the politician does not cheat and always chooses option one. It is not optimal to set reservation values such that the incumbent politician chooses option two or three. The incumbent should receive utility from pleasing voters at least as great as what he can get by grabbing maximum rents.

Hence, the $V_1 \geqslant V_3$ constraint must always bind in equilibrium. The reasoning is similar to Alesina's et al. (2008).[9] The incumbent can always decide to forgo reelection and just grab all the rents, meaning that voters cannot push his utility below the $\overline{r} + \gamma y_2$ level. However, at the same time, voters would not prefer that the constraint is satisfied with strict inequality. In that case they could increase g^* or lower τ^* and not violate either constraint. If they did not and the constraint is satisfied with strict inequality, they would be allowing the government/incumbent to grab more rents for itself without increasing voters' utility. The key constraint for us is then $V_1 \geqslant V_2$. As we shall see shortly, it is very important for the equilibrium outcome and the intuition behind it if that constraint becomes binding or not.

Using the rearranged $V_1 \geqslant V_2$ and $V_1 \geqslant V_3$ constraints, the expressions for $c_2 = g_2$ given above, and $\beta = \frac{1}{1+\rho}$, we write the voter's optimization problem in the Lagrangian as follows.

$$\mathcal{L} = \frac{[(1-\tau^*)y_1 - \phi(p)]^{1-\theta}}{1-\theta} + \frac{g^{*(1-\theta)}}{1-\theta} + 2\beta\frac{[\frac{y_2(1-\gamma)-(1+\rho)d^*-\overline{r}}{2}]^{1-\theta}}{1-\theta}$$
$$-\lambda_1(d^* - \overline{d} - p\beta(\overline{r} + \gamma y_2)$$
$$-\lambda_2(g^* - d^* - \tau^* y_1 + \overline{r}(1-\beta) + \gamma(y_1 - \beta y_2))$$
$$-\lambda_3(d^* - \overline{d})$$

The Kuhn-Tucker FOCs are then:

$$\frac{\partial L}{\partial \tau^*} = 0 \Rightarrow [(1-\tau^*)y_1 - \phi(p)]^{-\theta} = \lambda_2$$
$$\frac{\partial L}{\partial g^*} = 0 \Rightarrow g^{*(-\theta)} = \lambda_2$$
$$\frac{\partial L}{\partial d^*} = 0 \Rightarrow c_2^{-\theta} = \lambda_1 + \lambda_2 + \lambda_3$$
$$\frac{\partial L}{\partial p} = 0 \Rightarrow [(1-\tau^*)y_1 - \phi(p)]^{-\theta} \cdot \phi'(p) = \lambda_1\beta(\overline{r} + \gamma y_2)$$

The last FOC equation represents the optimal choice of the variable p, where the right hand side is the benefit of increasing p and the left hand side is the cost of increasing p. Following Andersen and Nielsen, we are interested in the case where the

[9] See the discussion of equations (6) and (7) in Alesina et al.

borrowing constraint $d^* \leqslant \overline{d}$ is non-binding. A binding borrowing constraint would create a PFP as a result of the loss of the foreign credit market access, which makes it impossible to run a countercyclical fiscal policy during bad times. It is what Gavin and Perotti (1997) and several other authors discussed as a cause of PFP, but we are not interested in that scenario here. Therefore, we are assuming that $d^* < \overline{d}$ in the optimum and that results in $\lambda_3 = 0$.

Furthermore, we need the constraint $V_1 \geqslant V_3$ to be binding in the optimum. That is the same constraint as the one Alesina et al. [3, p.1014] postulate to be optimal for the voters. With these two conditions, we are left with two possible cases.

4.3.1 Case (1) - Non-Binding $V_1 \geqslant V_2$ Constraint

In Case (1) $\lambda_1 = 0$ and $V_1 > V_2$, i.e. the constraint is non-binding. We can interpret it as politicians having a strictly greater expected discounted value of rents by obeying rather than cheating voters.

With $\lambda_1 = 0$, FOCs give us $c_2 = g^* = (1 - \tau^*)y_1 - \phi(p)$. Using that together with $V_1 = V_3$ and the expression for $g_2 = c_2$ we can calculate the solution candidates for the optimal levels of the deficit d^*, public spending g^*, and tax rate τ^* in this Case(1).

Solution candidate (A).

$$d^* = \tfrac{\beta}{1+\beta}[(1-\gamma)(y_2 - y_1) - \beta(\overline{r} + \gamma y_2) + \phi(p)]$$

$$g^* = \frac{(1-\gamma)y_1 + \beta y_2 + \phi(p) - \overline{r}}{2(1+\beta)}$$

$$\tau^* = 1 - \frac{(1-\gamma)y_1 + \beta y_2 - \overline{r} + \phi(3+2\beta)}{2y_1(1+\beta)}$$

(A) is a valid solution candidate for the voter's maximization problem only if the constraint $V_1 \geqslant V_2$ is satisfied with strict inequality at the same time. In other words, (A) can give us actual solutions for per-period consumption, taxes and deficit if and

only if $V_1 > V_2$ which can be written as

$$d^* > \overline{d} - p\beta(\overline{r} + \gamma y_2)$$

and with some additional rearranging, plugging in y_1 and y_2 from (3) and setting $\gamma = 0$,[10] as a condition on the shock to output in period 1 ε,

$$\varepsilon < \beta\overline{r}(p - \frac{\beta}{1+\beta}) - \frac{\beta\phi}{1+\beta} - \overline{d} \tag{4.9}$$

That is, ε is sufficiently low.

To get the actual values of consumption, tax rates in period 1 and 2 and deficit d_1 that solve voters' optimization problem when the above condition is satisfied we again set $\gamma = 0$ and use y_1 and y_2 formulations in (3). We then get:

$$c_1 = g_1 = c_2 = g_2 = \frac{\overline{y} - \frac{\overline{r}+\phi}{1+\beta}}{2}$$

$$\tau_1 = 1 - \frac{\overline{y} - \frac{\overline{r}+\phi(3+2\beta)}{1+\beta}}{2(\overline{y} + \varepsilon)}$$

$$\tau_2 = 1 - \frac{\overline{y} - \frac{\overline{r}+\phi}{1+\beta}}{2(\overline{y} - \frac{\varepsilon}{\beta})}$$

$$d_1 = -\varepsilon - \tfrac{\beta}{1+\beta}(\beta\overline{r} + \phi)$$

This solution applies whenever condition in (9) is satisfied. These results are first-best in our discussion, in the sense that the accord with the solution of the social planner.[11] First, we can see that the budget deficit (or surplus) absorbs the output

[10]We are setting $\gamma = 0$ as a simpler version. It is not necessary to get an explicit solution of course. The difference between the two solutions, besides more algebra, is that with $\gamma > 0$ a present discounted value neutral shift of output from period 2 to period 1 makes option three more attractive for the incumbent, i.e. greater output in period 1 enables more rent extraction. Analogously, less rent can be extracted in period 2, so the value of reelection is lower. Hence, voters, to keep the incumbent from choosing option three, lower their consumption demands and so both types of consumption are lower in both periods. This does not occur when we set $\gamma = 0$. In a sense, $\gamma = 0$ is a less general case, but a 'clearer' one for observing the degree/successfulness of consumption smoothing which is what we are interested here. All the results of the model are still valid with $\gamma > 0$.

[11]This is not a typicall first-best outcome where the voter or politician are fully informed. If they both were, the resulting outcome would be without a binding incentive constraint on the politician and rent taking, but it would have full consumption smoothing.

shock. Fluctuations are transmitted into the budget surplus and have no effect on government consumption. Second, private and public consumption is the same across both periods and tax rate increases with output in period 1 to smooth consumption. This corresponds to acyclical fiscal policy and full consumptions smoothing.

Whenever condition in (9) is not satisfied, Case(1) does not deliver any solution candidates and the solution is given by Case(2).

4.3.2 Case (2) - Binding $V_1 \geqslant V_2$ Constraint

In Case(2) $\lambda_1 > 0$ and $V_1 = V_2$, i.e. the constraint is binding and the incumbent politicians' expected discounted value of rents by satisfying voters vs. cheating them by running a higher deficit is equal. They are indifferent between the two options. Thus, we now have $V_1 = V_2$, $V_1 = V_3$ and from the FOCs $g^* = (1 - \tau^*)y_1 - \phi(p)$, i.e. three equations in three unknowns, d^*, g^*, and τ^*. By solving them we can calculate the second solution candidate in this Case(2).

Solution candidate (B).

$$
\begin{aligned}
d^* &= \overline{d} - p\beta(\overline{r} + \gamma y_2) \\
g^* &= \frac{y_1(1-\gamma) + \overline{d} + \beta\gamma y_2(1-p) - \overline{r}(1-\beta(1-p)) - \phi}{2} \\
\tau^* &= 1 - \frac{y_1(1-\gamma) + \overline{d} + \beta\gamma y_2(1-p) - \overline{r}(1-\beta(1-p)) + \phi}{2y_1}
\end{aligned}
$$

Case(2) delivers a unique solution only when $V_1 \geqslant V_2$ constraint is binding, which is opposite to Case(1). (B) gives us actual solutions for per-period consumption, taxes and deficit if and only if $V_1 = V_2$ which can be written as

$$d^* = \overline{d} - p\beta(\overline{r} + \gamma y_2)$$

Following the same procedure as in Case(1), by setting $\gamma = 0$, plugging in y_1, y_2 from (3) and some rearranging we get the resulting condition on the shock to output in period 1 ε as

$$\varepsilon \geqslant \beta\overline{r}(p - \frac{\beta}{1+\beta}) - \frac{\beta\phi}{1+\beta} - \overline{d} \tag{4.10}$$

That is, a sufficiently high value of ε leads to Case(2). To get the actual solutions for consumption and tax rates in both periods and the value for the d_1 in this Case(2) we use the solution expressions in (B), set $\gamma = 0$, and use y_1 and y_2 from (3). We then get:

$$c_1 = g_1 = \frac{\overline{y} + \varepsilon + \overline{d} - \overline{r}(1 - \beta(1-p)) - \phi}{2}$$
$$c_2 = g_2 = \frac{\overline{y} - \frac{\varepsilon+\overline{d}}{\beta} - \overline{r}(1-p)}{2}$$
$$\tau_1 = 1 - \frac{\overline{y} + \varepsilon + \overline{d} - \overline{r}(1 - \beta(1-p)) + \phi}{2(\overline{y} + \varepsilon)}$$
$$\tau_2 = 1 - \frac{\overline{y} - \frac{\varepsilon+\overline{d}}{\beta} - \overline{r}(1-p)}{2(\overline{y} - \frac{\varepsilon}{\beta})}$$
$$d_1 = \overline{d} - p\beta\overline{r}$$

These results are different from the first-best Case(1) solution. We observe that the deficit does not absorb any fluctuation in output as change in ε has no effect on it at all. The tax rate in period one, unlike in the Case(1), can go up or down as output increases. Consumption is not fully smoothed across both periods. Both private and government consumption in period 1 clearly increases for a high value of ε, but it is diminished for the size od ϕ. The corollary is that both type's of consumption fall in the second period.

4.4 Discussion

Which of these two is the actual solution? Technically, it depends on the condition (9) and (10). If the inequality in (9) is satisfied, and thus the $V_1 \geqslant V_2$ constraint is non-binding, then Case(1) is the *actual* solution to the voters' problem. Since the utility function is concave, this solution yields higher utility for voters than the one in Case(2).

What is important for our discussion is the interpretation of the equations (9)

and (10) and the results following it. The random variable ε is the shock value corresponding to a short-term fluctuation in the output level, and the realized value on ε is decisive for the procyclical behavior of fiscal policy to arise.

If the shock to output in period one, when it is observed by voters, is sufficiently low then solutions (A) from Case(1) apply. It is a solution close to the one of a benevolent social planner, where the deficit absorbs the shock and the consumption is smoothed across both periods. A small shock (small increase in ε) in period 1, such that the economy is experiencing a small boom shifts the output from the second to the first period. To achieve smooth consumption voters would like a reduced deficit in period 1. We can see that the deficit value d_1 in Case(1) absorbs the output shock ε. During an economic slowdown/recession, for a small increase in ε voters will demand a lower deficit value in the first period and unchanged time profile of consumption. The incumbent, interested in being reelected, will satisfy the voters' demands and run the deficit in line with voters' demands. Fiscal policy will be acyclical.

A small income shock does not change the intertemporal government budget constraint as the change in output for a positive ε is absorbed by the deficit d_1, compared to the Case(2) where the deficit does not absorb the change in output. This is visible from the two d_1 equations in two cases. If the intertemporal budget constraint is not affected, the time profile of consumption should not change, i.e. variable ε should not affect it. This is similar to the Andersen and Nielsen explanation, however they do not go into much detail.

If the value of ε is really high, and the economy is in a boom, the Case(2) solution applies. As can be seen from the solution for d_1 in Case(2), fluctuations in output are not absorbed by the deficit. In fact, the deficit does not respond to the shock at all. The incumbent is very aware of the abundant revenue in period 1 and that voters have only a chance of detecting the deficit in excess of optimal. Politicians are now tempted to cheat voters, run a maximum deficit and grab more rents from higher revenue, while the voters would like to run a budget surplus to smooth consumption

over two periods. That is how the constraint $V_1 \geqslant V_2$ becomes binding; the incumbent is indifferent between choosing option one or option two. Voters understand that the incumbent is tempted and, fearing that he will grab rents, rationally demand higher consumption for themselves. Political agency issues become more acute, the deficit is higher in booms, increases in output are transferred only into higher first period consumption, consumption is not smoothed across two periods and fiscal policy becomes procyclical.

4.4.1 Endogenous Transparency

We can now discuss the intuition (benefit) behind making the transparency variable p endogenous. It basically means to turn voters into citizen-voters, politically engaged and monitoring incumbents to check their power. It is a difference we introduced from ACT's (2008) and Andersen and Nielsen's (2010) framework where transparency variable p is given exogenously and has nothing to do with participative political system.[12] Now voters may also, after observing better macroeconomic conditions and not trusting the incumbent will not waste higher tax revenue on rents, choose to increase p by being more politically active, i.e. allocate some more income to increase the chance of observing maximum deficit. Increased transparency increases voters' ability to monitor the budget process and observe incumbent's policy action and excessive deficit, thereby making it less tempting and more risky to run a maximum deficit. Instead of only being able to demand higher consumption they have the ability to raise fiscal transparency during booms, knowing that politicians are corrupt, and achieve a preferable first-best policy of full consumption, rather than the second-best where they get higher consumption in period one and no consumption smoothing. Which case the voters prefer will depend on the cost versus the benefit of raising p enough to generate first-best Case(1). During really strong booms the cost could be prohibitively high that voters would give-up on consumption smoothing and decide

[12]In ACT (2008) it is implicitly zero.

to at least get higher consumption now. That way they still avoid the extra resources wasted in rents, but fiscal policy will be procyclical.

Let $\tilde{\varepsilon} \equiv \beta\overline{r}(p - \frac{\beta}{1+\beta}) - \frac{\beta\phi}{1+\beta} - \overline{d}$ be the maximum value of the shock variable consistent with the first best Case(1) solution where $V_1 > V_2$. It is important to understand that the value of p as a choice variable positively affects $\tilde{\varepsilon}$.

With a critical value $\tilde{\varepsilon}$ higher than the actual ε the condition in equation (9) is satisfied, i.e. $\varepsilon < \tilde{\varepsilon} \Rightarrow V_1 > V_2 \Rightarrow$ no procyclicality.

Having the ability to raise p as a choice, voters can attempt to set a higher cut-off critical value $\tilde{\varepsilon}$, therefore increasing the probability that solution of full consumption smoothing and no PFP applies. More transparency means procyclical fiscal policy occurs less frequently because the fear of being cheated is reduced.

The choice of p, however, depends on the realized value of ε, or rather more precisely its distribution, as well as the cost function ϕ. Thus, for an observed value of the output shock, voters will determine if they want, if it pays, to devote more resources towards political participation and influence the level of p. If the sequence of event is repeated infinitely, they would choose the level of p from scratch in each new cycle. As discussed before, if the realized ε shock is low, the condition in (9) and accordingly $V_1 > V_2$ will be satisfied. For a higher shock value, voters, since they do not trust the incumbents not to cheat and run a maximum deficit in order to grab more rents, would devote more resources to political participation, set a higher $\tilde{\varepsilon}$ value and increase the probability of welfare-improving Case(1) solution.

By being politically active voters are not just making it less appealing for incumbents to run a maximum deficit, but are also not having to satisfy themselves with a second-best policy whereby they "give up on consumption smoothing opportunities, but at least they avoid leaving excessive rents to corrupt governments." [3, p.1033]

For high transparency values the boom must be stronger in order for politicians to fall into temptation and run maximum deficit $\overline{d}$ as well as for voters to give up on consumption smoothing. The voters will always attempt to ensure that the politician

never runs the maximum deficit in a boom. For a very high realized ε value, however, voters can incur the cost and increase p, but they might be unsuccessful in setting a high enough level of $\tilde{\varepsilon}$ such that the condition in (9) holds and full consumption solution (A) applies. They could come 'close', but if the condition $V_1 > V_2$ is still not be satisfied the second-best solution (B) would apply. In other words, $\varepsilon > \tilde{\varepsilon} \Rightarrow V_1 = V_2 \Rightarrow$ procyclicality. In such a situation voters would demand higher consumption for themselves as well, knowing that politicians have a strong incentive to cheat them and there is a probability that they will not be caught.

Two inferences are possible from that. As discussed at the beginning, in countries with lower level of political (democratic) development as well as economic development it is more costly to increase the transparency variable p. The voters in such countries would be less able to devote more resources toward increasing p and accordingly the probability that the first best solution (A) applies is lower. Consequently, in case of a (temporary) strong boom it would be even harder for the voters in those countries to successfully increase fiscal transparency and keep politicians from grabbing more rents, making fiscal policy procyclical. We would expect to see lower transparency and its slower improvement in less developed countries.

Another prediction that follows from the model is that we could expect countries with high output volatility to generate more procyclical fiscal policies, where voters will be less successful in increasing p and ensuring that the $V_1 > V_2$ condition holds. In fact, some studies found evidence of PFP emerging in less developed countries that have higher output volatility. That corresponds to the explanation of Talvi and Vegh (2005) [32] discussed previously. On the other hand we saw that Woo (2009) found very weak evidence for Talvi and Vegh's (2005) explanation of PFP. Also, Lane (2003) [25] studies fiscal policy cyclicality in OECD countries and finds evidence that more volatile economies are more likely to have more PFP. Variable on output volatility, measured as a standard deviation of the GDP trend growth rate, is significant in explaining the variation in cyclicality across different categories of

government expenditure.

Summarizing, the critical value $\tilde{\varepsilon}$ depends on the choice of transparency p and p in turn depends on the cost vs. the benefit of a higher level of p relative to the realized ε value. Voters will decide on the $\tilde{\varepsilon}$ tolerance value consistent with the first-best solution based on the strength of the observed income shock and the cost they have to pay. If ε realized is low, raising p has only costs associated with it and no benefit. As they incur a cost for increasing p, voters will always want to have p as small as necessary that still satisfies (9). Voters will drive down the ϕ cost until (9) becomes just about, on the margin, binding. If it is reduced further, (9) will becomes binding. In that case (10) holds, $V_1 = V_2$ and Case(2) applies. In the case of a strong shock and good macroeconomic conditions, raising p has costs and benefits and voters will increase p and incur the cost consistent with the optimality condition. (last FOC on p.17). The value of p will not necessarily be zero. It is assumed that there is always some positive level of fiscal transparency in a (technically) functioning democracy where the budget has to at least go for a vote to a representative legislature, even if the level of incumbent accountability and open budget process is very low. The actual value of p in such a situation is equivalent to it being determined exogenously. It varies between democracies depending on their level of development.

Finally, Andersen and Nielsen point out that the pressure on the government from various watchdogs[13] is "plausibly much stronger in recessions than in booms." During strong booms, the politicians enjoy a "quite life" when it is easier to engage in rent extraction. An obvious prediction that follows from our model then is that the pressure on the government *should* be much stronger during booms than recessions, exactly because there is a higher temptation to extract more rents instead of run a surplus and pay down the debt. Higher watchdog activity and political participation during booms would be an obvious way to correct for an asymmetric cyclical response of fiscal policy.

[13]Such as the media, independent fiscal agencies, the opposition or international agencies.

Chapter 5

Concluding Remarks

The motivation for this paper is simple. Normative consensus on the cyclicality of fiscal policy - countercyclical or acyclical - has been established for decades now. In spite of that, we see the evidence that procyclical fiscal policy exists and it is mainly observed in the developing countries. Some evidence exists it is present even in developed ones. All the way we were careful to pin down what PFP unambiguously is, and also make clear that fiscal policy does have an effect on output as well as the other way around, so that the simultaneity issue is always carefully addressed in any further research in this area.

It is a puzzle that any country would 'sensibly' conduct a sub-optimal PFP which during good times, with high deficit and tax cuts, accentuates the business cycle, and then during bad times lower public spending and tax increases worsen the business cycle instead of ameliorating it. That is why the initial explanation was that foreign credit markets 'turn off' the supply of credit during recessions, preventing many developing countries from borrowing when they need it the most and therefore having to cut spending to reduce the budget deficit. Even though that might be the case, it does not provide a complete answer for the conduct of fiscal policy over the whole business cycle and might be only an indirect factor. From a normative point of view countries basically need to self-insure with budget surpluses during good times.

It is likely the case that at the core of the issue of PFP are internal, country specific political economy frictions. Various theories about it emerged over the past several years and most of them where presented in chapter 3. Factors that make some government's revert to PFP lay in various political distortions.

An obvious one is a political agency setting with corrupt, rent seeking politicians where the only way voter can prevent excessive rent taking when a positive income shock hits the economy is through a 'starve the Leviathan' approach by demanding higher benefits from incumbents which then leads to excessive public debt accumulation and a failure to self-insure. A possible coexisting factor is a common-pool problem where various interest groups' 'voracity' for fiscal resources leads to more spending and budget deficits whenever more fiscal resources are available. Again, the inability to accumulate reserves and self-insure is obvious.

A few author see the inability of governments to maintain (primary) budget surpluses whenever they occur in political pressures for increased state expenditure. Pressures from polarization of preferences in society or various interest groups makes it politically costly to run budget surpluses and so running a PFP is an optimal response. Another likely explanations for the emergence of PFP is integrating legislative bargaining forces with economic forces of using debt for tax smoothing goals. Basically, budget surpluses are not accumulated, in the short run, because of pork-barrel spending by legislators.[1]

The avenue we explored in chapter 4 was a political agency model with moral hazard, but with voters able to control politicians incentive for rent-seeking not just via periodical elections, but by increasing the budget transparency with active political engagement and monitoring. The result is reduced temptation of politicians to steal rents at the expense of running a surplus during boom times. It is a small improvement over previous mechanism where the inability to run budget surpluses and self-insure is a natural result. Another interpretation of this endogenous transparency

[1]See Battaglini and Coate (2008) [9] and Battaglini and Coate(2008) [10] as an extension that explores the cyclical behavior of fiscal policy.

is that in countries with low level of democratic institutional and social characteristics we could expect a difficult and more 'expensive' monitoring of the government's budget process and political rent extraction. It is obvious that those countries tend to be the less developed ones.

A likely better approach would be to consider a full political agency setting in the manner of Besley (2006) [11] with adverse selection as well, whereby the elections would serve to sort through good and bad politicians eventually getting rid of bad ones that care only about rent extraction and not the welfare of voters.

The literature survey also indicated, I believe, the need for a positive theory of determinants of cyclicality of fiscal policy and a better normative theory, one that does not relay on a simplified notion of an external benevolent social planner, but attempts to incorporate some form of representative democracy with its essential features of political competition, elections, legislative bargaining, lobbying, etc. Also, various social features, such as income inequality, social and political polarization, spill into the political processes, influence their outcomes, the level of uncertainty and distortions in fiscal policy making. It is in such political arena that fiscal policy is created and theories that appeal to political frictions to explain fiscal policy are able to better match fiscal behavior in both developed and developing countries.

Bibliography

[1] The most dangerous man in america: Daniel ellsberg and the pentagon papers. DVD, 2009.

[2] S Rao Aiyagari. Uninsured idiosyncratic risk and aggregate saving. *The Quarterly Journal of Economics*, 109(3):659–84, August 1994.

[3] Alberto Alesina, Filipe R. Campante, and Guido Tabellini. Why is fiscal policy often procyclical? *Journal of the European Economic Association*, 6(5):1006–1036, 2008.

[4] James E. Alt, David Dreyer Lassen, and Shanna Rose. The causes of fiscal transparency: Evidence from the u.s. states. *IMF Staff Papers*, 53(si):2, 2006.

[5] Asger Lau Andersen and Lasse Holbll Westh Nielsen. Fiscal transparency and procyclical fiscal policy. EPRU Working Paper Series 2010-01, Economic Policy Research Unit (EPRU), University of Copenhagen. Department of Economics, March 2010.

[6] David P. Baron and John A. Ferejohn. Bargaining in legislatures. *The American Political Science Review*, 83(4):1181–1206, Dec. 1989.

[7] J. Robert Barro. The control of politicians: An economic model. *Public Choice*, 14(1):19 – 42, March 1973.

[8] Robert J Barro. On the determination of the public debt. *Journal of Political Economy*, 87(5):940–71, October 1979.

[9] Marco Battaglini and Stephen Coate. A dynamic theory of public spending, taxation, and debt. *American Economic Review*, 98(1):201–36, 2008.

[10] Marco Battaglini and Stephen Coate. Fiscal policy over the real business cycle: A positive theory. Working Paper 14047, National Bureau of Economic Research, May 2008.

[11] Timothy. Besley. *Principled agents? : the political economy of good government.* Oxford University Press, Oxford :, 2006.

[12] Timothy Besley and Stephen Coate. An economic model of representative democracy. *The Quarterly Journal of Economics*, 112(1):85–114, February 1997.

[13] Timothy Besley and Michael Smart. Fiscal restraints and voter welfare. *Journal of Public Economics*, 91(3-4):755–773, April 2007.

[14] James Buchanan. *Public finance in democratic process : fiscal institutions and the individual choice*. University of North Carolina Press, Chapel Hill, N.C., :, 1967.

[15] Zsolt Darvas, Andrew K. Rose, and Gyorgy Szapary. *Fiscal Divergence and Business Cycle Synchronization: Irresponsibility is Idiosyncratic*, chapter 6, pages 261–313. NBER, June 2005.

[16] Xavier Debrun, David Hauner, and Manmohan S. Kumar. Independent fiscal agencies. *Journal of Economic Surveys*, 23(1):44–81, 02 2009.

[17] William Easterly and Sergio Rebelo. Fiscal policy and economic growth. *Journal of Monetary Economics*, 32(3):417 – 458, 1993.

[18] John Ferejohn. Incumbent performance and electoral control. *Public Choice*, 50(1-3):5 – 25, 1986.

[19] Michael Gavin and Roberto Perotti. Fiscal policy in latin america. In *NBER Macroeconomics Annual 1997, Volume 12*, NBER Chapters, pages 11–72. National Bureau of Economic Research, Inc, 1997.

[20] Ethan Ilzetzki. Rent-seeking distortions and fiscal procyclicality. Draft, London School of Economics, Department of Economics, October 2009.

[21] Ethan Ilzetzki and Carlos A. Vegh. Procyclical fiscal policy in developing countries: Truth or fiction? Working Paper 14191, National Bureau of Economic Research, July 2008.

[22] Dany Jaimovich and Ugo Panizza. Procyclicality or reverse causality? RES Working Papers 599 4508, Inter-American Development Bank, Research Department, 2007.

[23] Graciela L. Kaminsky, Carmen M. Reinhart, and Carlos A. Vgh. *When It Rains, It Pours: Procyclical Capital Flows and Macroeconomic Policies*, chapter 1, pages 11–82. National Bureau of Economic Research, Inc, April 2005.

[24] Paul R. Krugman. *The return of depression economics*. W.W. Norton, New York :, 1999.

[25] Philip R. Lane. The cyclical behaviour of fiscal policy: evidence from the oecd. *Journal of Public Economics*, 87(12):2661–2675, December 2003.

[26] Sumon Majumdar and Sharun W. Mukand. Policy gambles. *American Economic Review*, 94(4):1207–1222, September 2004.

[27] Martin J Osborne and Al Slivinski. A model of political competition with citizen-candidates. *The Quarterly Journal of Economics*, 111(1):65–96, February 1996.

[28] Roberto Perotti. Fiscal policy in developing countries: a framework and some questions. Policy Research Working Paper Series 4365, The World Bank, 2007.

[29] Torsten Persson and Guido Tabellini. *Political Economics: Explaining Economic Policy*. The MIT Press, 1 edition, 2002.

[30] Roberto Rigobon. *Comment on When It Rains, It Pours: Procyclical Capital Flows and Macroeconomic Policies*, chapter 1, pages 11–82. NBER, April 2004.

[31] Roberto Rigobon. *Comment on Fiscal Divergence and Business Cycle Synchronization:Irresponsibility is Idiosyncratic*, chapter 6, pages 261–313. NBER, June 2005.

[32] Ernesto Talvi and Carlos A. Vegh. Tax base variability and procyclical fiscal policy in developing countries. *Journal of Development Economics*, 78(1):156–190, October 2005.

[33] Aaron Tornell and Philip R. Lane. The voracity effect. *American Economic Review*, 89(1):22–46, March 1999.

[34] Jaejoon Woo. Why do more polarized countries run more procyclical fiscal policy? *Review of Economics and Statistics*, 91(4):850–870, 2009.