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WHEN IT RAINS, IT POURS:

PROCYCLICAL CAPITAL FLOWS AND MACROECONOMIC POLICIES*

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Abstract

Based on a sample of 105 countries, we document key cyclical properties of capital flows, fiscal policy, and monetary policy. First, capital flows are procyclical (i.e., external borrowing increases in good times and falls in bad times) for developing countries and, most notably, for middle-high income countries (emerging markets). Second, fiscal policy is procyclical (i.e., government spending increases in good times and falls in bad times) for the majority of developing countries. Third, this feast and famine cycle of fiscal spending is positively linked to the capital flows cycle (with spending rising markedly when capital is plentiful). Fourth, there is evidence to suggest that, in emerging markets, monetary policy is also procyclical. In sum, for most developing countries and particularly for middle-high income economies, the business, capital flow, monetary and fiscal policy cycles all reinforce one another. For such countries, when it rains, it does indeed pour.

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I. INTRODUCTION

Any expert on financial crises in emerging markets could cite ample anecdotal evidence to support the view that macroeconomic policies are highly procyclical, at least in moments of extreme duress. At the time that economic activity is contracting (often markedly) amidst a crisis, the fiscal authority cuts budgets deficits while the central bank raises interest rates—possibly risking exacerbating the economic contraction. Procyclical policies, however, do not appear to be limited to crises periods in many developing countries. The roots of most of the debt crises in emerging market are all too often found in governments that go through bouts of high spending and borrowing when the times are favorable and international capital is plentiful.[1]

Gavin and Perotti (1997) first called attention to the phenomenon of procyclical fiscal policy by showing that fiscal policy in Latin America tends to be expansionary in good times and contractionary in bad times. Talvi and Végh (2000) argued that, far from being a phenomenon peculiar to Latin American, procyclical fiscal policy seems to be the norm in the developing world just as fiscal policy is acyclical in the advanced economies. Using a different econometric approach, Braun (2001) reaches a similar conclusion for developing countries, though he finds evidence that fiscal policy is countercyclical in OECD countries. Lane (2003a) also provides evidence on the procyclicality of fiscal policy in developing countries compared to OECD countries.

Several explanations have been advanced to explain the procyclicality of fiscal policy in developing countries compared to industrial countries. Gavin and Perotti (1997), among others, have argued that developing countries face credit constraints that prevent them from borrowing in bad times. Hence, they are "forced" to repay in bad times, which requires a contractionary fiscal policy. In contrast, Tornell and Lane (1999) develop a political-economy model in which competition for a common pool of funds among different units (ministries, provinces) leads to the so-called "voracity effect," whereby expenditure could actually exceed a given windfall. Taking as given such a political distortion, Talvi and Végh (2000) show how policymakers would find it optimal to run smaller

[1] See Reinhart, Rogoff, and Savastano (2003) for an analysis of borrowing/default cycles.

primary surpluses in good times by increasing government spending and reducing tax rates. Lastly, Riascos and Végh (2003) show how incomplete markets could explain procyclical fiscal policy as the outcome of a Ramsey problem without recourse to imposing any additional frictions.

In terms of monetary policy, while the impression certainly exists that developing countries often tighten the monetary strings in bad times (see Lane, 2003b), systematic empirical work is scant.[2] This is probably due to the notorious difficulties (present even for some advanced countries) in empirically characterizing the stance of monetary policy.[3]

Relying on data for 105 countries for the period 1960-2003, this paper revisits the evidence on the procyclicality of fiscal policy and, as far as we know, presents a first systematic effort to document empirically the cyclical properties of monetary policy in developing countries. It departs from earlier efforts investigating fiscal policy cycles in several dimensions. First, it provides an analytical framework for how to interpret the behavior of a broad variety of fiscal and financial indicators, which leads to a reinterpretation of some earlier results in the literature. Second, it analyzes countries grouped by income because it is obvious that wealthier countries have continuous access to international capital markets, low-income countries are almost exclusively shut out at all times, and middle-income countries have a precarious and volatile relationship with international capital. Third, it examines closely the interaction between the business cycle, international capital flows, and macroeconomic policy.[4] Our premise is that the capital flow cycle is tied to the business cycle and may even influence macroeconomic policies, particularly in middle income countries. Fourth, it offers an eclectic approach toward defining "good" and "bad" states of the economy and measuring the stance of fiscal and monetary policy by employing a broad range of indicators. Fifth, it

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[2] Of course if 'bad times" are defined exclusively as currency or banking crises, then there is a small but growing theoretical literature on monetary policy in general and interest rate defenses in particular (see, for instance, Aghion, Bacchetta, and Banerjee (2001) and Lahiri and Vegh (2003)). The empirical evidence in this area is, however, rather inconclusive.

[3] For a discussion of some of the challenges in estimating monetary policy rules for industrial countries, see Clarida, Gali, and Gertler (1999).

[4] Throughout this paper, "business cycle" refers to the real GDP cycle.

disaggregates the sample along a variety of dimensions, by (i) differentiating crises episodes from tranquil periods, (ii) treating the more rigid exchange rate arrangements separately from the more flexible ones, and (iii) comparing earlier and more recent periods to assess whether the degree of capital market integration has altered cyclical patterns and relationships. Lastly, the analysis offers more comprehensive country coverage than earlier efforts.

The paper proceeds as follows. The next section discusses the underlying conceptual framework used to interpret the data on capital flows and fiscal and monetary policy and describes the approach followed to define business cycles. Section III presents a broad brush view of our main findings while Section IV provides greater detail of the main stylized facts by country groups according to income per capita levels, by type of exchange rate arrangement, and other relevant subsamples. The last section discusses some of the policy implications of our findings and identifies some possibilities for future research.

II. CONCEPTUAL FRAMEWORK

This section lays out the conceptual framework used to interpret our empirical findings in the following sections. Specifically, we will discuss how to think about the cyclical properties of capital flows, fiscal policy, and monetary policy. A thorough reading of the blossoming literature in the area of policy cyclicality in developing countries reveals a somewhat loose approach to defining basic concepts, which often renders the discussion rather imprecise. For instance, countercyclical fiscal policy is often defined as running fiscal deficits in bad times and surpluses in good times (i.e., as a positive correlation between changes in output and changes in the fiscal balance). As we will argue, however, this is an unfortunate way of defining the concept since running a fiscal deficit in bad times may be consistent with rather different approaches to fiscal stabilization. In the same vein, considering fiscal variables as a proportion of GDP – as is most often done in this literature--could yield misleading results since the cyclical behavior of output may dominate attempts at fiscal stabilization.

In light of these critical conceptual issues – and at the risk of perhaps appearing sometimes obvious – we will be very specific as to how we define countercyclicality, procyclicality, and acyclicality.

2.1 Capital flows

We start in Table 1 by defining the cyclical properties of capital flows:

TABLE 1. CAPITAL FLOWS: THEORETICAL CORRELATIONS WITH THE BUSINESS CYCLE

	Net capital flows	Net capital flows/GDP
Countercyclical	-	-
Procyclical	+	+/0/-
Acyclical	0	-

i. Capital flows into a country are said to be countercyclical when the correlation between the cyclically adjusted component of net capital flows and output is negative. In other words, the economy borrows from abroad in bad times (i.e., capital flows in) and lends/repays in good times (i.e., capital flows out).

ii. Capital flows are procyclical when the correlation between the cyclical components of net capital flows and output is positive--the economy borrows from abroad in good times (i.e., capital flows in) and lends/repays in bad times (i.e., capital flows out).

iii. Capital flows are acyclical when the correlation between the (cyclical components of the) net capital flows and output is not statistically significant—that is, the pattern of international borrowing and lending is not systematically related to the business cycle.

While this may appear self evident, the mapping between the cyclical properties of net capital flows as a share of GDP (a commonly used measure) and the business cycle is not clear cut. As the third column of Table 1 indicates, in the case of countercyclical capital flows, this ratio should also have a negative correlation with output since in good (bad) times, net capital flows fall (increase) and GDP increases (fall). In the case of procyclical capital flows, however, this ratio could have any sign since in good (bad) times, capital flows increase (fall) and GDP also increases (falls). In the acyclical case, the behavior of the ratio is dominated by the changes in GDP and therefore has a negative

correlation. Thus, the ratio of net capital flows to GDP will only provide an unambiguous indication of the cyclicality of capital flows if it has a positive sign (or is zero) in which case it would be indicating procylical capital flows. However, if it has a negative sign, it does not allow us to discriminate among the three cyclical patterns.

Our definition of the cyclical properties of capital flows thus focuses on whether capital flows tend to reinforce or "stabilize" the business cycle. To fix ideas, consider the standard endowment model of a small open economy (with no money). In the absence of any intertemporal distortion, households would want to keep consumption flat over time. Thus, in response to a temporary negative endowment shock, the economy would borrow from abroad to sustain the permanent level of consumption. During good times, the economy would repay its debt. Saving is thus positively correlated with the business cycle. Hence, in the standard model with no investment, capital flows would be countercyclical and would tend to stabilize the cycle. Naturally, the counterpart of countercyclical borrowing in the standard real model is a procyclical current account.

Conversely, if the economy borrowed during good times and lent during bad times, capital flows would be procyclical as they would tend to reinforce the cycle. In this case, the counterpart would be a countercyclical current account. Among plausible theoretical explanations for procyclical capital flows would be the following. First, suppose that physical capital is added to the basic model described above and that the business cycle is driven by productivity shocks. Then, a temporary and positive productivity shock would lead to an increase in saving (for the consumption smoothing motives described above) and to an increase in investment (as the return on capital has increased). If the investment effect dominates, then borrowing would be procyclical as the need for financing profitable investment more than offsets the saving effect.

A second explanation -- particularly relevant for emerging countries -- would result from intertemporal distortions in consumption imposed by temporary policies (like inflation stabilization programs or temporary liberalization policies (see Calvo, 1987, and Calvo and Végh, 1999). An unintended consequence of such temporary policies is that they make consumption relatively cheaper during good times (by reducing the effective price of consumption), thus leading to a consumption

boom which is financed by borrowing from abroad. In this case, saving falls in good times which renders capital flows procyclical.[5]

A third possibility –also relevant for emerging countries -- is that the availability of international capital varies with the business cycle. If foreign investors respond to the evidence of an improving local economy by bidding down country risk premiums (perhaps encouraged by low interest rates at financial centers), residents of the small economy may view this as a temporary opportunity to finance consumption cheaply and, therefore, dissave.[6] We should remember that the consumption booms financed by capital inflows in many emerging market economies in the first part of the 1990s were seen at the time as an example of the "capital inflow problem," as in Calvo, Leiderman, and Reinhart (1993, 1994).

Finally, notice that, in practice, movements in international reserves could break the link between procyclical borrowing and current account deficits (or countercyclical borrowing and current account surpluses) that would arise in the basic real intertemporal model. Indeed, recall the basic balance of payments accounting identity:

Change in international reserves = Current account balance + capital account balance.

Hence, say, positive net capital flows (a capital account surplus) would not necessarily be associated with a negative current account balance if international reserves were increasing. Therefore, the cyclical properties of the current account are an imperfect indicator of those of capital.

2.2 Fiscal policy

Since the concept of policy cyclicality is important to the extent that it can help us understand or guide actual policy, it only makes sense to define policy cyclicality in terms of policy instruments, as opposed to outcomes (i.e., endogenous variables). Hence, we will define the cyclicality of fiscal policy in terms of government consumption (g) and tax rates (τ). Given this definition, we will then

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[5] Lane and Tornell (1998) offer some empirical evidence that shows that saving in Latin American countries has often been countercyclical (i.e., saving falls in good times and vice versa).

[6] Section IV presents evidence in support of this hypothesis. See also Neumeyer and Perri (2004) who examine the importance of country risk in driving the business cycle in emerging economies.

examine the cyclical implications for important endogenous variables such as the primary fiscal balance, tax revenues, and fiscal variables as a proportion of GDP. We define fiscal policy cyclicality as follows:

i. A procyclical fiscal policy involves higher (lower) government consumption and lower (higher) tax rates in good (bad) times. We call such a policy procyclical because it would tend to reinforce the business cycle (i.e., fiscal policy is expansionary in good times and contractionary in bad times). [7]

ii. A countercyclical fiscal policy involves lower (higher) government consumption and higher (lower) tax rates in good (bad) times. We call such a policy countercyclical because it would tend to stabilize the business cycle (i.e., fiscal policy is contractionary in good times and expansionary in bad times).

iii. An acyclical fiscal policy involves constant government consumption and constant tax rates over the cycle. We call such a policy acyclical because it neither reinforces nor stabilizes the business cycle.

The correlations implied by these definitions are shown in the first two columns of Table 2.

TABLE 2. FISCAL VARIABLES: THEORETICAL CORRELATIONS WITH THE BUSINESS CYCLE

	g	τ	Tax revenues	Primary balance	g/GDP	Tax revenues/GDP	Primary balance/GDP
Procyclical	+	-	+/0/-	+/0/-	+/0/-	+/0/-	+/0/-
Countercyclical	-	+	+	+	-	+/0/-	+/0/-
Acyclical	0	0	+	+	-	+/0/-	+/0/-

We next turn to the implications of these cyclical definitions of fiscal policy for the behavior of tax revenues, the primary fiscal balance, and government expenditure, tax revenues, and primary balance as a proportion of GDP, the observed outcomes relied upon by empirical researchers.[8] In doing so, we will make use of the following two definitions:

[7] It is important to notice that, under this definition, a procyclical fiscal policy implies a *negative* correlation of tax rates and output over the business cycle. Our terminology thus differs from the one in the real business cycle literature in which any variable positively (negatively) correlated with the output cycle is referred to as procyclical (countercyclical).

[8] It is worth emphasizing that, in deriving the theoretical correlations below, the only assumption made is that the tax base (output or consumption) is high in good times and low in bad times. This is true by definition in the

(continued)

Tax revenues = Tax rate x *tax base*

Primary balance = Tax revenues - government expenditures (excluding interest payments)

Consider first an acyclical fiscal policy. Since the tax rate is constant over the cycle and the tax base increases in good times and falls in bad times, tax revenues will have a positive correlation with the business cycle. This, in turn, implies that the primary balance will also be positively correlated with the cycle. The ratio of government expenditure (net of interest payments) to GDP will be negatively correlated with the cycle because government expenditure does not vary and, by definition, GDP is high (low) in good (bad) times. Given that tax revenues are higher (lower) in good (bad) times, the correlation of the ratio of tax revenues to GDP with the cycle is ambiguous (i.e., it could be positive, zero, or negative as indicated in the table). As a result, the correlation of the primary balance as a proportion of GDP with the cycle will also be ambiguous.

Consider procyclical fiscal policy. Since, by definition, the tax rate goes down (up) in good (bad) times but the tax base moves in the opposite direction, the correlation of tax revenues with the cycle is ambiguous. Since *g* goes up in good times, the correlation of g/GDP is, in principle, can take on any value between one and minus one. Given the ambiguous cyclical behavior of tax revenues, the cyclical behavior of tax revenues as a proportion of GDP is also ambiguous. The behavior of the primary balance as a proportion of GDP will also be ambiguous.

Lastly, consider countercyclical fiscal policy. By definition, tax rates are high in good times and low in bad times, which imply that tax revenues vary positively with the cycle. The same is true of the primary balance since tax revenues increase (fall) and government consumption falls (increases) in good (bad) times. The ratio g/GDP will vary negatively with the cycle because g falls (increases) in good (bad) times. Since tax revenues go up in good times, the behavior of tax revenues as a proportion of GDP will be ambiguous and, hence, so will be the behavior of the primary balance as a proportion of GDP.

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case of output and amply documented for the case of consumption. Aside from this basic assumption, what follows is an accounting exercise that is independent of any particular model.

Several important observations follow from Table 2 regarding the usefulness of different indicators in discriminating among the three cases:

i. From a theoretical point of view, the best indicators to look at would be government consumption and tax rates. By definition, these indicators would clearly discriminate among the three cases. As Table 2 makes clear, no other indicator has such discriminatory power. In practice, however, there is no systematic data on tax rates (other than perhaps the inflation tax rate), leaving us with government consumption as the best indicator.

ii. The cyclical behavior of tax revenues will be useful only to the extent that it has a negative or zero correlation with the business cycle. This would be an unambiguous indication that fiscal policy is procyclical. It would signal a case in which the degree of procyclicality is so extreme that in, say, bad times, the rise in tax rates is so pronounced that it either matches or dominates the fall in the tax base.

iii. The cyclical behavior of the primary balance will be useful only to the extent that it has a negative or zero correlation with the business cycle. This would be an unambiguous indication that fiscal policy is procyclical. It would indicate a case in which, in good times, the rise in government consumption either matches or more than offsets a possible increase in tax revenues or a case in which a fall in tax revenues in good times reinforces the effect of higher government consumption on the primary balance. Given our definition of fiscal policy cyclicality, it would be incorrect to infer that a primary deficit in bad times signals countercyclical fiscal policy. A primary deficit in bad times is, in principle consistent with any of three cases.[9]

iv. The cyclical behavior of the primary balance a proportion of GDP will never provide an unambiguous reading of the cyclical stance of fiscal policy. Interestingly, most of the literature (Gavin and Perotti (1997), Braun (2001), Lane (2003b), and Calderon and Schmidt-Hebbel (2003)) has drawn conclusions from looking at this indicator. For instance, Gavin and Perotti (1997) find that

[9] By the same token, it would also seem unwise to define procyclical fiscal policy as a negative correlation between output and the fiscal balance (as Braun (2001) does in the first paragraph of his paper)) since a zero or even positive correlation could also be consistent with procyclical fiscal policy, as defined above.

the response of the fiscal surplus as a proportion of GDP to a one-percentage-point increase in the rate of output growth is not statistically different from zero in Latin America and take this as an indication of procyclical fiscal policy. Calderon and Schmidt-Hebbel (2003), in contrast, find a negative effect of the output gap on deviations of the fiscal balance from its sample mean and interpret this as countercyclical fiscal policy. Given our definitions, however, one would not be able to draw either conclusion (as the last column of Table 2 makes clear).

v. The cyclical behavior of the ratio g/GDP will be useful only to the extent that it has a positive or zero correlation with the business cycle. This would be an unambiguous indication that fiscal policy is procyclical. In other words, finding that this ratio is negatively correlated with the cycle does not allow us to discriminate among the three cases. Once again, this suggests caution in interpreting some of the existing literature which relies on this indicator for drawing conclusions.

vi. Lastly, the cyclical behavior of the ratio of tax revenues to GDP will not be particularly useful in telling us about the cyclical properties of fiscal policy since its theoretical behavior is ambiguous in all three cases.

In sum, our discussion suggests that extreme caution should be exercised in drawing conclusions on policy cyclicality based either on the primary balance or on the primary balance, government spending, and tax revenues as a proportion of GDP. In light of this, we will only rely on indicators that, given our definition of procyclicality, provide an unambiguous measure of the stance of fiscal policy: government spending and -- as a proxy for a tax rate -- the inflation tax rate.[10]

From a theoretical point of view, there are various models that could rationalize different stances of fiscal policy over the business cycle. Countercyclical fiscal policy could be rationalized by resorting to a traditional Keynesian model (in old or new clothes) with an objective function that penalizes deviations of output from trend since an increase (reduction) in government spending and/or a reduction (increase) in tax rates would expand (contract) output. An acyclical fiscal policy could

[10] We are, of course, fully aware that there is certainly no consensus on whether the inflation tax should be thought of as "just another tax". While the theoretical basis for doing so goes back to Phelps (1973) and has been greatly refined ever since (see, for example, Chari and Kehoe (1999)), the empirical implications of inflation as an optimal tax have received mixed support (see Calvo and Vegh (1999) for a discussion).

be rationalized by neo-classical models of optimal fiscal policy which call for roughly constant tax rates over the business cycle (see Chari and Kehoe (1999)). If government spending is endogeneized (by, say, providing direct utility), it would optimally behave in a similar way to private consumption and hence would be acyclical in the presence of complete markets (Riascos and Vegh (2003)). Procyclical fiscal policy could be rationalized by resorting to political distortions (Tornell and Lane (1999) and Talvi and Vegh (2000)), borrowing constraints (Gavin and Perotti (1997) and Aizeman, Gavin, and Hausmann (1996)), or incomplete markets (Riascos and Vegh (2003)).

2.3 Monetary policy

Performing the same conceptual exercise for monetary policy is much more difficult because ***(i)*** monetary policy instruments may depend on the existing exchange rate regime and ***(ii)*** establishing outcomes requires the use of some (implicit) model.

For our purposes, it is enough to define two exchange rate regimes: fixed or predetermined exchange rates and flexible exchange rates (which we define as including any regime in which the exchange rate is allowed some flexibility). By definition, flexible exchange rate regimes include relatively clean floats (which are rare) and dirty floats (a more common type, as documented in Reinhart and Rogoff (2004)).

Under certain assumptions, a common policy instrument across these two different regimes would be a short-term interest rate. The most prominent example is the federal funds rate in the United States, an overnight interbanking interest rate that constitutes the Federal Reserve's main policy target, in that changes in the Federal Reserve's monetary policy can be calibrated in terms of the federal funds rate. Theoretically, under floating rates, monetary policy can be thought of in terms of some short-term interest rate. Under fixed or predetermined exchange rates, the only assumption needed for a short-term interest rate to also be thought of as a policy instrument is that there be some imperfect substitution between domestic and foreign assets (see Flood and Jeanne (2000), and Lahiri and Végh, (2003)). In fact, it is common practice for central banks to raise some short-term interest rate to defend a fixed (or more rigid) exchange rate.

In principle, then, observing the correlation between a policy-controlled short-term interest rate and the business cycle would indicate whether monetary policy is countercyclical (the interest rate is raised in good times and reduced in bad times, implying a positive correlation), procyclical (the interest rate is reduced in good times and increased in bad times, implying a negative correlation) or acyclical (the interest rate is not systematically used over the business cycle, implying no correlation), as indicated in Table 3.

The expected correlations with other monetary variables are more complex. In the absence of an active interest rate policy, we expect – as any standard model would predict—real money balances (in terms of M1) to be high in good times and low in bad times (i.e., positively correlated with the business cycle) and real interest rates to be lower in good times and high in bad times (i.e., negatively correlated with the cycle).[11] A procyclical interest rate policy would reinforce this cyclical pattern.[12] A countercyclical interest rate policy would in principle call for lower real money balances and higher real interest rates relative to the benchmark of no activist policy. In principle, this leaning-against-the wind policy could be so effective as to render the correlation between real money balances and output zero or even negative and the correlation between real interest rates and the cycle zero or even positive (as indicated in Table 3). In sum and as Table 3 makes clear--the cyclical behavior of real money balances and real interest rates will only be informative in a subset of cases:

TABLE 3. MONETARY INDICATORS: THEORETICAL CORRELATIONS WITH THE BUSINESS CYCLE

	Short-term interest rate	Rate of growth of central bank domestic credit	Real money balances (M1 and M2)	Real interest rate
Procyclical	-	+	+	-
Countercyclical	+	-	+/0/-	+/0/-
Acyclical	0	0	+	-

[11] The latter implicitly assumes that supply shocks predominate. Demand shocks, in and of themselves, would lead to higher real interest in good times and viceversa.

[12] If, as part of a procyclical monetary policy, policymakers were lowering reserve requirements, this should lead to even higher real money balances.

i. A negative or zero correlation between (the cyclical components of) real money balances and output unambiguously indicates countercyclical monetary policy. In this case, real money balances would fall in good times and rise in bad times. In contrast, a positive correlation is, in principle, consistent with any monetary policy stance.

ii. A positive or zero correlation between (the cyclical components of) the real interest rate and output unambiguously indicates countercyclical monetary policy. In this case, policy countercyclicality is so extreme that real interest rate increases in good times and fall in bad times. In contrast, a negative correlation is, in principle, consistent with any monetary policy stance.

Unfortunately, in practice, even large databases typically carry information on overnight or very short-term interest rates for only a small number of countries. Hence, the interest rate that one observes in practice are of longer maturities and so include an endogenous cyclical component (for instance, the changes in inflationary expectations, term premiums, or risk premiums over the cycle). To the extent that the inflation rate tends to have a small positive correlation with the business cycle in industrial countries and a negative correlation with the business cycle in developing countries, there will be a bias towards concluding that monetary policy is countercyclical in industrial countries and procyclical in developing countries. To reduce this bias, we will choose interbank/overnight rates whenever possible.

A second policy instrument under either regime is the rate of growth of the central bank's domestic credit. Naturally, how much a given change in domestic credit will affect the monetary base and, hence, interest rates will depend on the particular exchange rate regime. Under predetermined exchange rates and perfect substitution between domestic and foreign assets, the monetary approach to the balance of payments tells us that the change in domestic credit will be exactly undone by an opposite change in reserves. However, under imperfect substitution between domestic and foreign assets, a, say, increase in domestic credit will have some effect on the monetary base. The same is true under a dirty floating regime, since the change in reserves will not fully offset the change in domestic credit.

In this context, a countercyclical monetary policy would imply reducing the rate of domestic credit growth during good times and vice versa (i.e., a negative correlation). A procyclical monetary policy would imply increasing the rate of domestic credit growth during good times and vice versa (i.e., a positive correlation). An acyclical policy would not systematically vary the rate of growth of domestic credit over the business cycle. [13] Of course, this can be seen as the counterpart of the movement in short-term interest rates: during good times, a reduction (an increase) in domestic credit growth should lead to an increase (reduction) in short-term interest rates.

In addition to computing the correlations indicated in the above table, we will attempt to establish whether monetary policy is procyclical, acyclical, or countercyclical by estimating Taylor rules for every country for which data are available. Following Clarida, Gali, and Gertler (1999), our general specification takes the form:

$$i_t = \alpha + \beta_1(\pi_t - \underline{\pi}) + \beta_2 y^c_t, \qquad (1)$$

where i_t is a policy-controlled short-term interest rate, $\pi_t - \underline{\pi}$ captures deviations of actual inflation from its sample average, $\underline{\pi}$, and y^c_t is the output gap, measured as the cyclical component of output (i.e., actual output minus trend). The coefficient β_2 in equation (1) would indicate the stance of monetary policy over the business cycle – over and above the monetary authority's concerns about inflation.

TABLE 4. TAYLOR RULES

Nature of monetary policy	Expected sign on β_2
Countercyclical	+ and significant
Procyclical	- and significant
Acyclical	insignificant

Several remarks are in order regarding equation (1). First, we are assuming that current inflation is a good predictor of future inflation. Second, we are assuming that the mean inflation rate

[13] In practice, however, using domestic credit to measure the stance of monetary policy is complicated by the fact that inflation (especially in developing countries) tends to be high and variable. Hence, a large growth rate does not always reflect expansionary policies.

is a good representation of some implicit/explicit inflation target on the rationale that central banks deliver on average the inflation rate that they desire. Third, given potential endogeneity problems, the relation captured in equation (1) is probably best interpreted as a long-run cointegrating relationship. Fourth, equation (1) does not allow for the possibility of interest rate smoothing over time, based on the fact that we are working with annual data. (In the empirical section, however, we will allow for such a possibility.) Fifth, by estimating equation (1) we certainly do not mean to imply that every country in our sample has followed some type of Taylor rule throughout the sample. Rather, we see it as a potentially useful way of characterizing the correlation between a short-term interest rate and the output gap once one controls for the monetary authority's implicit or explicit inflation target.

There are by now numerous studies that have estimated Taylor rules, though most are limited to developed countries. For example, for the United States, Japan, and Germany, Clarida, Gali and Gertler (1997) report that, in the post-1979 period, the inflation coefficient is significantly above one (indicating that in response to a rise in expected inflation, central banks raised nominal rates enough to raise real rates) and the coefficient on the output gap is significantly positive except for the United States. In other words – and using the terminology spelled out in Table 4 -- since 1979 Japan and Germany have pursued countercyclical monetary policy (lowering interest rates in bad times and increasing them in good times) but monetary policy in the United States has been acyclical. In the pre-1979 period, however, the Federal Reserve also pursued countercyclical monetary policy (see Clarida, Gertler, and Gali (1999)). For Peru, Moron and Castro (2000) – using the change in the monetary base as the dependent variable and adding an additional term involving the deviation of the real exchange rate from trend – find that monetary policy is countercyclical. For Chile, Corbo (2000) finds that monetary policy does not respond to output (i.e., is acyclical).

In terms of the theoretical literature, there has been extensive work on how to derive theoretically Taylor-type rules in the context of Keynesian models (see, for example, Clarida, Gertler, and Gali (1999)). This literature would rationalize countercyclical monetary policy on the basis that increases (decreases) in the output gap call for higher (lower) short-term interest rates to reduce (boost) aggregate demand. Acyclical monetary policy could be rationalized in terms of neo-classical

models of optimal monetary policy which call for keeping the nominal interest rate close to zero (see Chari and Kehoe (1999)). Collection costs for conventional taxes could optimally explain a positive – but still constant over the cycle – level of nominal interest rates (see Calvo and Vegh (1999) and the references therein). Some of the stories put forward to explain procyclical fiscal policy mentioned above could also be used to explain procyclical monetary policy if the nominal interest rate is part of the policy set available to the Ramsey planner. Non-fiscal based explanations for procyclical monetary policy might include the need for defending the domestic currency under flexible exchange rates (Lahiri and Vegh (2004)) –which in bad times would call for higher interest rates to prevent the domestic currency from depreciating further – and models in which higher interest rates may provide a signal of the policymaker's intentions (see Drazen (2000)). In these models, establishing "credibility" in bad times may call for higher interest rates.

2.4 Defining "good" and "bad" states of nature

Not all advanced economies have as clearly defined business cycle turning points as those established by the National Bureau of Economic Research (NBER) for the United States. For developing economies, where quarterly data for the national income accounts is at best recent and most often nonexistent, even less is known about economic fluctuations and points of inflexion. Thus, to pursue our goal of assessing to what extent capital flows and macroeconomic policies are a-counter- or pro- cyclical, we must develop some criteria that breaks down economic conditions into "good" and "bad" states of nature. Taking an eclectic approach to sort out this issue, we perform three complementary exercises.

First, using GDP data for 1960-2003 we divide the sample into episodes where real GDP growth is above the median and those times where growth falls below the median. The relevant median or cutoff point is calculated on a country-by-country basis. Although growth below the median need not signal a recession, restricting the definition of recession to involve only periods where GDP growth is negative is too narrow a definition of "bad times" for countries which have rapid population growth (which encompasses the majority of our sample), rapid productivity growth, or countries that have seldom experienced a recession by NBER standards. This approach has the

appeal that it is nonparametric and free from the usual estimation problems that arise when all the variables in question are potentially endogenous.

Second, we also decompose each time series into its stochastic trend and cyclical component using two popular filters—the ubiquitous Hodrick-Prescott filter (HP) and the band-pass filter approach developed in Baxter and King (1999) and extended by others. After decomposing each series into its trend and cyclical component, we report a variety of pairwise correlations of the cyclical components of GDP, the external accounts, and the fiscal and monetary indicators for each of the four income groups. These correlations are used to establish contemporaneous comovement, but a fruitful area for future research would be to analyze potential temporal causal patterns.

III. THE BIG PICTURE

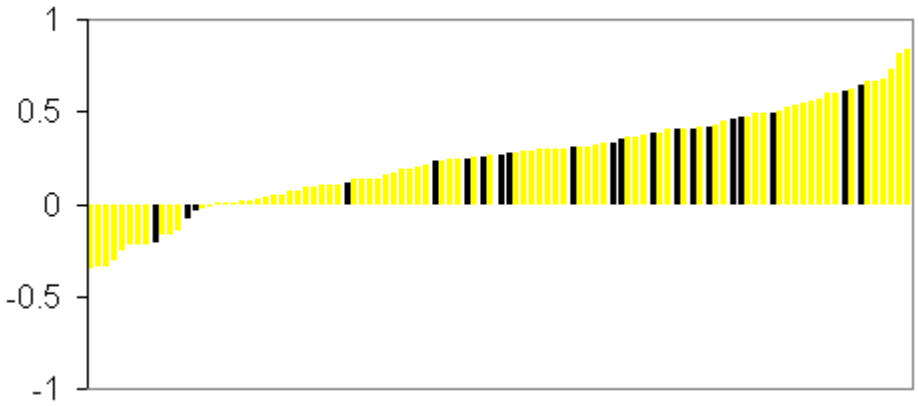
This section presents a visual overview of the main stylized facts we uncover, leaving the more detailed analysis of the results for the following section.[14] Our aim here is to contrast OECD and developing (i.e., non-OECD) countries and synthesize our findings in terms of key stylized facts. Identifying the underlying "structural" causes or "shocks" that give rise to these empirical regularities is beyond the scope of this paper. In what follows, we stress four stylized facts.

Stylized fact # 1. Capital flows are procyclical in most OECD and developing countries. This is illustrated in Figure 1, which plots the correlation between the cyclical components of net capital inflows and GDP.[15] As the plot makes clear, most countries exhibit a positive correlation, indicating that countries tend to borrow in good times and repay in bad times.

[14] Details on the definitions of the time series used in this analysis and the country coverage are provided in the Data Appendix.

[15] All the correlations shown in this section are based on HP-filtered data.

Figure 1. Country Correlations of the Cyclical Components of Net Capital Inflows and Real GDP: 1960-2003

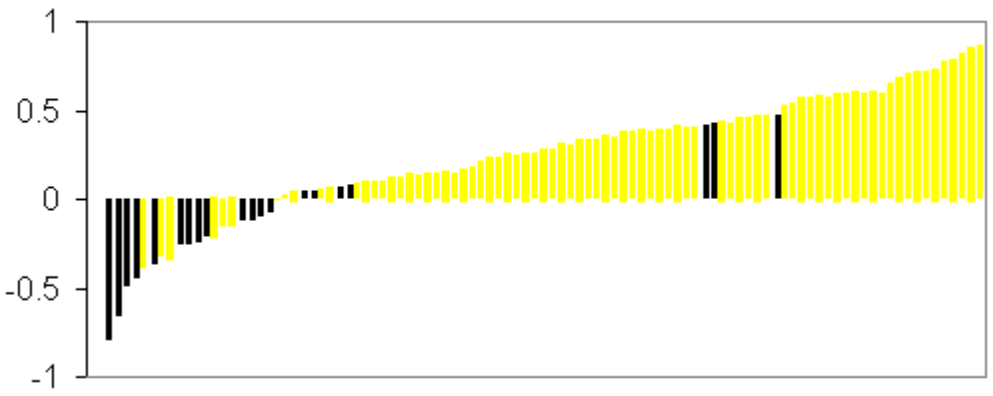


Notes: Dark bars are OECD countries and light ones are non-OECD.
The cyclical components have been estimated using the Hodrick-Prescott Filter.
A positive correlation is indicative of procyclical capital flows.
Source: *World Economic Outlook,* International Monetary Fund.

Stylized fact # 2. When it comes to fiscal policy, OECD countries are, by and large, either countercyclical or acyclical. In sharp contrast, developing countries are predominantly procyclical. Figures 2 to 4 illustrate this critical difference in fiscal policy between advanced and developing economies. Figure 2 plots the correlation between the cyclical components of real GDP and real government spending.[16] As is clear from the graph, most OECD countries have a negative correlation while most developing countries have a positive correlation.

[16] Total central government expenditure is shown in Figures 2 and 3.

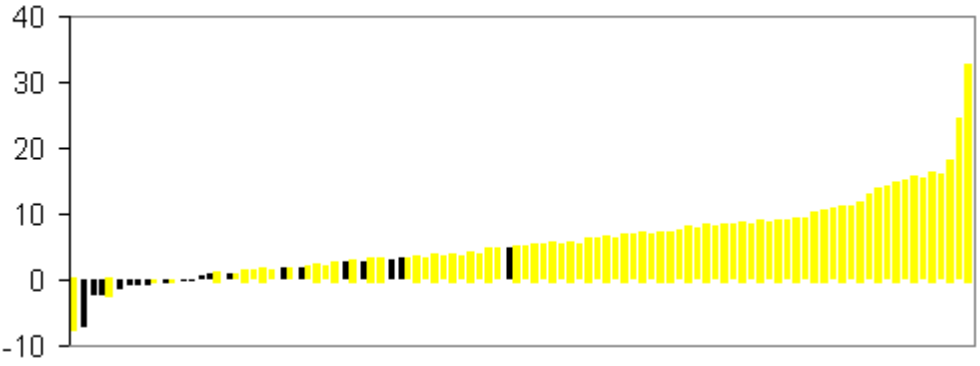
Figure 2. Country Correlations of the Cyclical Components of Real Government Spending and Real GDP: 1960-2003



Notes: Dark bars are OECD countries and light ones are non-OECD.
The cyclical components have been estimated using the Hodrick-Prescott Filter.
A positive correlation is indicative of procyclical real fiscal expenditure (defined as total central government expenditure deflated by the GDP deflator.)

Figure 3 plots the difference between the percent change in real government spending when GDP growth is above the median and when it is below the median. This provides a measure of the *amplitude* of the policy cycle; large negative numbers suggest that the growth in real government spending is markedly higher in bad states of nature (and thus policy is countercyclical), while large positive numbers indicate the opposite. In the most extreme cases of procyclicality the growth in real government spending is 32.4 percentage points higher during good years (Liberia); in the most countercyclical of the cases, real government spending growth is about 7 percentage points lower during expansions (Denmark). Given this volatility in policy, it is not surprising that emerging market economies have far more volatile output and consumption than advanced economies. Furthermore, in addition to a more volatile cycle – and as Aguiar and Gopinath (2004) show for some of the larger emerging markets -- the trend component of output is itself highly volatile, which may be also captured in this measure of amplitude.

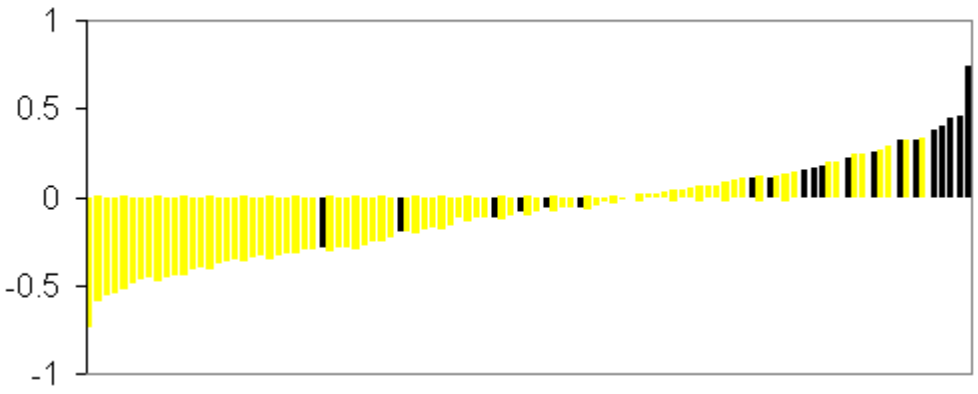
Figure 3. Difference Between the Percent Change in Real Government Spending when GDP Growth is Above the Median and Below the Median 1960-2003



Notes: Dark bars are OECD countries and light ones are non-OECD.
A positive entry is indicative of procyclical real fiscal expenditure (defined as total central government expenditure deflated by the GDP deflator.)
Source: *World Economic Outlook,* International Monetary Fund.

Figure 4 plots the correlation between the cyclical components of output and the inflation tax. It is apparent that most OECD countries exhibit a positive correlation while most developing countries exhibit a negative correlation.

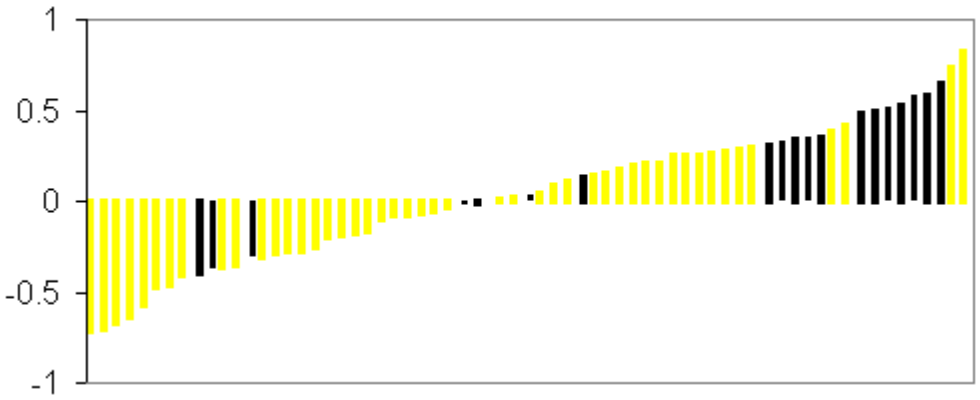
Figure 4. Country Correlations of the Cyclical Components of the Inflation Tax and Real GDP: 1960-2003



Notes: Dark bars are OECD countries and light ones are non-OECD.
The cyclical components have been estimated using the Hodrick-Prescott Filter.
A negative correlation is indicative of a procyclical inflation tax , $\pi/(1+\pi)$.
Source: *World Economic Outlook* and *International Financial Statistics,* International
Monetary Fund.

Stylized fact # 3. When it comes to monetary policy, most OECD countries are countercyclical, while developing countries are mostly procyclical or acyclical. This is illustrated in Figure 5 for nominal lending rates. This holds for other nominal interest rates (including various measures of policy rates), as described in the next section. We plot the lending rate because it is highly correlated with the policy rates but offers more comprehensive data coverage.

Figure 5. Country Correlations of the Cyclical Components of the Nominal Lending Rate and Real GDP: 1960-2003

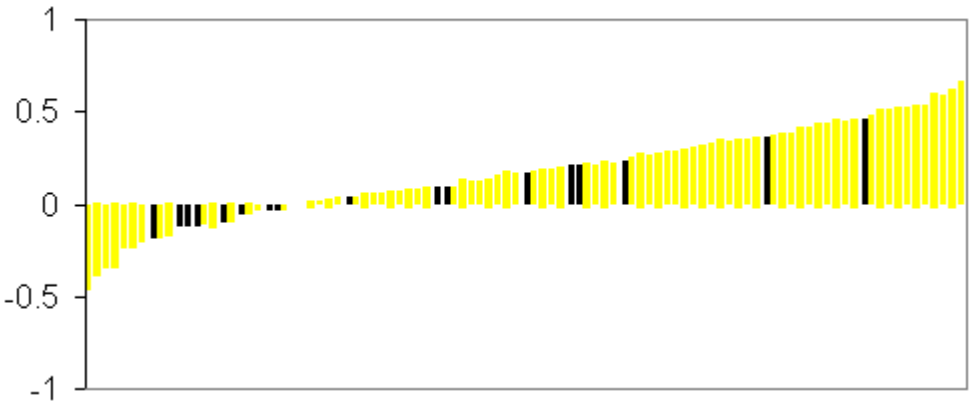


Notes: Dark bars are OECD countries and light ones are non-OECD.
The cyclical components have been estimated using the Hodrick-Prescott Filter.
A negative correlation is indicative of procyclical monetary policy.
Source: *World Economic Outlook* and *International Financial Statistics,* International Monetary Fund.

Stylized fact # 4. In developing countries, the capital flow cycle and the macroeconomic policy cycle reinforce each other (this positive relationship is what we dub the "when it rains, it pours" phenomenon). In other words, macroeconomic policies are expansionary when capital is flowing in and contractionary when capital is flowing out. This is illustrated in Figures 6 through 8. Figure 6 shows that most developing countries exhibit a positive correlation between the cyclical components of government spending and capital flows, but there does not seem to be an overall pattern for OECD countries. In the same vein, Figure 7 shows that in developing countries the correlation between capital flows and the inflation tax is mostly negative while no pattern is apparent for OECD countries. Lastly, Figure 8 shows a predominance of negative correlations between the cyclical components of capital flows and the nominal lending rate for developing countries,

suggesting that the capital flow and the monetary policy cycle reinforce each other. The opposite appears to be true for OECD countries.

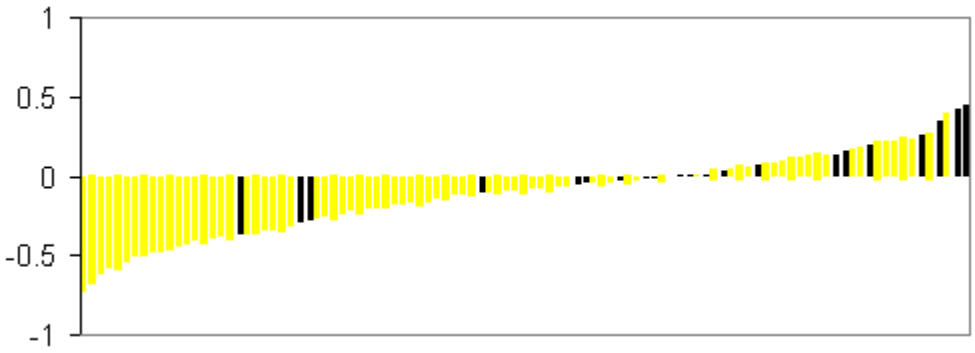
Figure 6. Country Correlations of the Cyclical Components of Real Government Spending and Net Capital Flows: 1960-2003



Notes: Dark bars are OECD countries and light ones are non-OECD.
The cyclical components have been estimated using the Hodrick-Prescott Filter.
A positive correlation indicates that the capital flow and government expenditure
(defined as total central government expenditure deflated by the GDP deflator) reinforce each other.
Source: *World Economic Outlook,* International Monetary Fund.

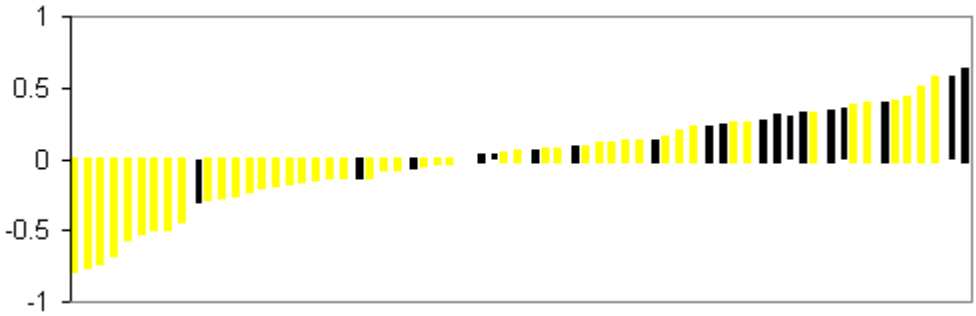
IV.

Figure 7. Country Correlations of the Cyclical Components of the Inflation Tax and Net Capital Inflows: 1960-2003



Notes: Dark bars are OECD countries and light ones are non-OECD.
The cyclical components have been estimated using the Hodrick-Prescott Filter.
A negative correlation indicates that the capital flow and the inflation tax, $\pi/(1+\pi)$, reinforce one another.
Source: *World Economic Outlook* and *International Financial Statistics,* International Monetary Fund.

Figure 8. Country Correlations of the Cyclical Components of the Nominal Lending Rate and Net Capital Inflows: 1960-2003



Notes: Dark bars are OECD countries and light ones are non-OECD.
The cyclical components have been estimated using the Hodrick-Prescott Filter.
A positive correlation indicates that the monetary policy and capital flow cycles reinforce one another.
Source: *World Economic Outlook* and *International Financial Statistics,* International Monetary Fund.

VI. FURTHER EVIDENCE ON BUSINESS, CAPITAL FLOWS, AND POLICY CYCLES

This section examines the four stylized facts presented in the preceding section in greater depth by examining alternative definitions of monetary and fiscal policy, using different methods to define the cyclical patterns in economic activity, international capital flows and macroeconomic policies, and splitting the sample along several dimensions.

4. 1 Capital flows and external factors

Tables 5 through 7 present additional evidence on our first stylized fact (i.e., capital flows are procyclical in most OECD and developing countries).

The decline in capital flows (Table 5) when growth is below the median is particularly marked for the middle-high income economies. This may owe to the fact that this group of countries are noted for having on-and-off access to private international capital markets, at least partly because many of these countries have a history of serial default.[17] On the basis of Table 5, however, it becomes evident that capital flows tend to be procyclical for both the advanced and poorer economies as well.[18] [19]

The behavior of international credit ratings, such as the Institutional Investor Index, also provides insights on capital market access. As discussed in Reinhart, Rogoff and Savastano (2003), at very low ratings (the low-income countries), the probability of default is sufficiently high that countries are entirely shut out of international private capital markets, while ratings at the high end of the spectrum are a sign of uninterrupted market access. These observations are borne out in Tables 5 and 6. There are no differences in ratings for the wealthy OECD economies or for the low-income countries whether GDP growth is above or below its median.[20] The biggest differences in ratings

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[17] See Reinhart, Rogoff, and Savastano (2003).

[18] Based on data for 33 poor countries over a 25 year period, Pallage and Robe (2001) conclude that foreign aid has also been procyclical, which is consistent with our overall message.

[19] We also found that, for both groups of middle-income countries, the current account deficit is larger in good times.

[20] Although ratings are lower for the OECD group for those years in which GDP is declining.

across better and worse states of nature are for the middle-income countries, where ratings are markedly procyclical and significantly lower for the low growth periods.

This "U-shaped" pattern is also evident in the volatility of the ratings. Table 6 presents basic descriptive statistics for growth and the Institutional Investor ratings. Not surprisingly, ratings are far more stable for OECD economies (the coefficient of variation is 0.06) but so is growth, with a coefficient of variation of 0.8. Despite the fact that output is the most volatile for the low income economies (coefficient of variation is 1.6—twice the level of the OECD group), its international ratings are much more stable than those of middle income countries (with coefficients of variation of 0.18 and 0.23, respectively).

TABLE 5. CAPITAL FLOWS AND SELECTED EXTERNAL INDICATORS IN GOOD AND BAD STATES OF NATURE: DESCRIPTIVE STATISTICS (AS A PERCENT OF GDP UNLESS OTHERWISE NOTED)

	Average when GDP Growth is:		
	Above the median (1)	Below the median (2)	Difference (1)-(2)
	OECD		
Total capital flows (net)	2.4	1.4	1.0
Institutional Investor Index (level)	78.5	78.4	0.1
	Middle-High Income		
Total capital flows (net)	4.4	3.0	1.4
Institutional Investor Index (level)	42.2	40.4	1.8
	Middle-Low Income		
Total capital flows (net)	5.3	4.3	1.0
Institutional Investor Index (level)	32.9	30.8	2.1
	Low Income		
Total capital flows (net)	6.0	4.9	1.1
Institutional Investor Index (level)	24.2	24.2	0.0

Sources: Institutional Investor, International Monetary Fund, *World Economic Outlook* and *Government Financial Statistics*, and *Institutional Investor*.

TABLE 6. VOLATILITY AND BORROWING CONSTRAINTS

	OECD	Middle-high	Middle-low	Low
	Institutional Investor Ratings: 1979-2003			
Coefficient of variation	0.06	0.22	0.23	0.18
Mean	79.9	41.5	32.0	21.8
	Real GDP Growth: 1960-2003			
Coefficient of variation	0.8	1.2	1.2	1.6
Mean	3.9	4.9	4.7	3.3

Sources: Institutional Investor, International Monetary Fund, *World Economic Outlook* and *Government Financial Statistics*, and *Institutional Investor*.

Turning to the correlations between the cyclical components of real GDP and net capital flows shown in Table 7, these are positive for all income groups irrespective of the filter used. As shown in Table 1, we interpret these positive correlations as indicative of procyclicality. The correlations are notably higher for the developing country groups—approximately two-to-three times as high as for the OECD countries--where there appears to be (at best) a weak link between the business and capital flow cycle.

TABLE 7. CORRELATIONS OF CAPITAL FLOW AND OUTPUT

Country Groups	Correlations	
	HP Filter	Band-Pass Filter
OECD	0.16	0.10
Middle-high	0.24*	0.20*
Middle-low	0.35*	0.26*
Low	0.38*	0.23*

Note: An * denotes statistical significance at the 5 percent level.
Sources: International Monetary Fund, *International Financial Statistics* and *World Economic Outlook*, and The World Bank, *World Development Indicators*.

3.2 Fiscal policy: The evidence

As to *Stylized fact # 2* (fiscal policy in OECD countries is, by and large, either countercyclical or acyclical while in developing countries fiscal policy is predominantly procyclical), the 11 fiscal indicators presented in Table 8 – which comprise six government expenditure indicators for two levels of government, central and general (or consolidated), and the inflation tax rate – provide the best indicators to look at in terms of discriminating among different cyclical policy stances (recall Table 3). Others indicators–such as fiscal balances or tax revenues–convey less information.

As anticipated by Figure 3, the striking aspect of Table 8 is that in the last column -- which shows the difference between the percent change in real government spending when GDP growth is above the median and when it is below the median, thus providing a measure of the *amplitude* of the policy cycle -- the entries for OECD countries are positive but quite small, while for the three income groups that comprise the developing non-OECD countries they are very large for almost any measure

TABLE 8. FISCAL INDICATORS: DESCRIPTIVE STATISTICS (PERCENT CHANGE)[1]

	Average when GDP Growth is:		
	Above the median (1)	Below the median (2)	Difference (1)-(2)
	OECD		
Central government:			
Expenditure (WEO)	3.4	3.1	0.3
Current expenditure minus interest payments	4.2	2.8	1.4
Expenditure on goods and services	3.0	2.0	1.0
Expenditure on wages and salaries	2.6	1.3	1.3
General or consolidated government:			
Expenditure (WEO)	3.6	3.2	0.4
Current expenditure minus interest payments	4.1	3.5	0.6
Inflation tax, $\pi/(1+\pi)$	4.5	5.4	-0.9
	Middle-High Income		
Central government:			
Expenditure (WEO)	8.1	0.0	8.1
Current expenditure minus interest payments	9.6	-0.1	9.7
General or consolidated government:			
Expenditure (WEO)	6.9	-0.1	7.0
Current expenditure minus interest payments	7.6	1.8	5.8
Inflation tax, $\pi/(1+\pi)$	10.9	13.1	-2.2
	Middle-low income		
Central government:			
Expenditure (WEO)	6.7	2.7	4.0
Current expenditure minus interest payments	9.3	3.1	6.2
Expenditure on goods and services	9.7	3.6	6.1
Expenditure on wages and salaries	8.9	4.2	4.7
General or consolidated government:			
Expenditure (WEO)	6.4	2.5	3.9
Current expenditure minus interest payments	8.5	-2.1	10.6
Inflation tax, $\pi/(1+\pi)$	8.7	10.1	-1.4
	Low Income		
Central government:			
Expenditure (WEO)	8.3	-0.2	8.5
Current expenditure minus interest payments	5.0	0.5	4.5
Expenditure on goods and services	5.1	0.6	4.5
Expenditure on wages and salaries	4.0	0.8	3.2
General or consolidated government:			
Expenditure (WEO)	7.3	-0.5	7.8
Current expenditure minus interest payments	5.7	-0.4	6.1
Inflation tax, $\pi/(1+\pi)$	9.4	12.4	-3.0

[1] All data is from International Monetary Fund, *Government Financial Statistics* unless otherwise noted.
Sources: International Monetary Fund, *Government Financial Statistics* and *World Economic Outlook*.

of government spending. Concretely, this suggests that for developing countries (in particular the two middle income groups) policy is not only procyclical—but markedly so.

Indeed, based on the country-by-country computations for this exercise (Table 8, of course, only shows the averages for the group), there is ample evidence to support the conclusion that developing countries are predominantly procyclical. For example, as a check on the incidence of procyclicality, we counted the number of countries in each of the four groups that met our definition of fiscal procyclicality (a case where real spending either falls during recessions or grows by less than during expansions--the definition used in column 3). For real central government expenditure, for example, 94 percent of all the countries in the low-income group met our criteria of procyclicality. For middle-low income countries, the share meeting this criterion was 91 percent, while for the middle-high income group every single country registered as procyclical. In contrast, when it comes to OECD countries, only 50 percent met the procyclicality criteria—which is another way of stating that half of them registered as countercyclical.

Turning to the inflation tax rate, $\pi/(1+\pi)$, it registers as procyclical in all of the four groups. It increases the most for the low income group (3 percentage points, last column) and least for the OECD (0.9) percentage point.[21] Not surprisingly, the tax rate is the highest during recessions (13.1 percent) for the middle-high income countries (which includes chronic high inflation countries like Argentina, Brazil, and Uruguay) and lowest for the OECD at 5.4 percent.

Table 9 presents the pairwise correlations for the expenditure measures shown in Table 8 as well as the inflation tax rate (memorandum item).[22] For the correlations between the cyclical components of GDP and government expenditure, the most salient feature of the results is that among the developing countries, all but one of the 36 correlations are positive, irrespective of the expenditure series used or the type of filter. By contrast, all 12 correlations for the OECD are negative (though low). This is not to say that the relationship between the fiscal expenditure and business cycle is

[21] Figures on the inflation tax are multiplied by one hundred.

[22] We focus on a fewer number of variables for the sake of brevity. The other four expenditure measures not shown in Table 10 yield similar results.

uniformly an extremely tight one (several entries show low correlations that are not significantly differently from zero—consistent with an acyclical pattern as defined in Table 2). However, when one examines these results, it becomes evident that for the middle-high income and the low income countries (at least according to this exercise), fiscal policy is squarely procyclical.

We next examine international capital flows and fiscal policy (Table 9). Our premise is that the capital flow cycle may affect macroeconomic policies in developing countries, particularly in the highly volatile economies that comprise the middle-high income countries. To this end, we report the correlations (using both filters) of the cyclical components of the fiscal variables and net capital flows. The evidence confirms some of our priors but rejects others. As expected, the middle-high income countries provide the most conclusive evidence that the fiscal spending cycle is positively linked to the capital flow cycle (*Stylized fact #4*.) We do not pretend to draw inference on causality from pairwise correlations, but it is not unreasonable to expect that a plausible causal relationship may run from capital flows (market access or no access) to fiscal spending—an issue that clearly warrants further study. For this group of countries the inflation tax appears to be negatively correlated with the capital flow cycle. As before, an untested speculation is that inflation provides a form of alternative financing when international capital market conditions deteriorate.

For middle-low income countries, there is little here to suggest any link between fiscal policy and the capital flow cycle. More surprising, however, are the results for the low income countries (most of which have little access to international capital markets), which show a similar pattern to the one observed for the middle-high income group. It may be fruitful to explore to what extent this result may owe to cycles in commodity prices and government expenditure.[23]

[23] In that regard, see Cuddington (1989).

TABLE 9. FISCAL INDICATORS, GDP, AND CAPITAL FLOWS: ARE CYCLES CORRELATED?

	General government expenditure	Consolidated government expenditure minus interest payments	Central government: Expenditure	Central government: Expenditure Minus interest payments	Central government: Goods and services	Central government: Wages and salaries
			HP Filter			
			Average Correlation with GDP			
OECD	-0.10	-0.04	-0.16	-0.03	-0.04	-0.14
Middle-high	0.43*	0.10	0.38*	0.10	0.08	0.01
Middle-low	0.20*	0.12	0.22*	0.13	0.07	0.03
Low	0.38*	0.17	0.38*	0.24*	0.54*	0.59*
			Average Correlation with total capital flows (net)			
OECD	0.07	0.04	0.02	0.06	0.05	0.04
Middle-high	0.25*	0.20*	0.25*	0.22*	0.28*	0.27*
Middle-low	0.18	0.13	0.16	0.11	0.13	0.12
Low	0.24*	-0.16	0.20*	0.05*	0.20*	0.37*
			Band-Pass Filter			
			Average Correlation with GDP			
OECD	-0.06	-0.11	-0.08	-0.15	-0.10	-0.20*
Middle-high	0.44*	0.23*	0.53*	0.19*	0.23*	0.13
Middle-low	0.23*	0.23*	0.29*	0.29*	0.26*	0.23*
Low	0.34*	0.32*	0.46*	0.42*	0.53*	0.59*
			Average Correlation with total capital flows (net)			
OECD	0.11	-0.01	0.06	0.08	0.06	0.02
Middle-high	0.16	0.09	0.19*	0.12	0.28*	0.25*
Middle-low	0.16	0.11	0.14	0.08	0.05	0.10
Low	0.22*	0.13	0.19*	0.25*	0.26*	0.39*

Memorandum item: Inflation Tax , $\pi/(1+\pi)$

	Average Correlation with GDP		Average Correlation with total capital flows (net)	
	HP Filter	Band-Pass Filter	HP Filter	Band-Pass Filter
OECD	0.15	0.14	0.04	0.02
Middle-high	-0.15	-0.13	-0.31*	-0.25*
Middle-low	-0.09	-0.10	-0.14	-0.10
Low	-0.20*	-0.16	-0.09	-0.07

Notes: The detrending method used requires a substantive number of continuous observations, hence the country coverage is smaller. An * denotes statistical significance at the 5 percent level.

3.3. Monetary policy and cycles

To document *Stylized fact # 3* (i.e., monetary policy is countercyclical in most OECD countries while it is mostly procyclical in developing ones), we perform the same kind of exercises as for the fiscal indicators but, in addition, we also estimate variants of the Taylor rule, as described in Section II.

Table 10 presents the same exercise performed in Table 8 for government spending for the five interest rate series used in this study. As discussed in Section II, a short-term policy instrument, such as the interbank rate (or in some countries the T-bill or discount rate), is the best indicator of the stance of monetary policy. Here, the difference between the OECD countries and the other groups is striking. For the OECD, interest rates decline in recessions and increase in expansions (for example, the interbank interest rate falls on average 0.7 percent or 70 basis points during recessions)—this is the complete opposite of what we observe in non-OECD countries, where most or all of the nominal interest rates decline in expansions and increase in recessions (for instance, interbank rates in middle high income countries rise by 2.3 percent or 230 basis points in recessions). Thus the pattern for the non-OECD group is broadly indicative of strong procyclicality. [24]

Table 11 presents the correlations of the cyclical components for the variables of interest. For nominal interest rates, the evidence is only conclusive for the OECD (countercyclical) and for the middle-high income (procyclical). It should be noticed that these two groups of countries have relatively longer time series on market-determined interest rates.

Turning to the correlations between capital flows and interest rates in Table 11, there is little there to indicate a connection, except for the OECD countries in which high interest rates are associated with higher net inflows of capital and the middle-high income countries in which high interest rates are associated with capital outflows (or lower inflows). The latter provides evidence of the when-it–rains-it-pours syndrome.

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[24] Results for real interest rates are reported in the working paper version of this paper.

TABLE 10. CHANGES IN NOMINAL INTEREST RATES IN GOOD AND BAD STATES OF NATURE

	Average or Median when GDP Growth is: [1]		Difference
	Above the median (1)	Below the median (2)	(1)-(2)
	OECD		
Interbank rate	0.3	-0.7	1.0
Treasury bill rate	0.2	-0.5	0.7
Discount rate	0.5	-0.5	1.0
Lending rate	0.0	-0.4	0.4
Deposit rate	0.1	-0.3	0.4
	Middle-High Income		
Interbank rate[2]	-2.2	2.3	-4.5
Treasury bill rate	-2.6	-1.5	-1.1
Discount rate	-1.5	2.7	-4.2
Lending rate	-4.0	2.1	-6.1
Deposit rate[2]	0.7	1.0	-0.3
	Middle-Low Income		
Interbank rate	-0.8	-0.1	-0.7
Treasury bill rate	-0.7	1.1	-0.4
Discount rate	0.5	0.5	0.0
Lending rate	-1.0	0.4	-1.4
Deposit rate	-0.5	-0.5	0.0
	Low Income		
Interbank rate	-1.3	1.5	-2.8
Treasury bill rate	-1.0	0.5	-1.5
Discount rate[2]	-0.8	0.2	-1.0
Lending rate	-4.7	0.2	-4.9
Deposit rate[2]	-1.6	0.2	-1.8

[1] Interest rates are reported as the annual first difference (in percent).

[2] The median is reported in lieu of the average, as the average is distorted by one or more very high inflation (or hyperinflation) episodes.

TABLE 11. NOMINAL INTEREST RATES, CAPITAL FLOWS AND GDP: ARE CYCLES CORRELATED?

Country Groups	Interest rates				
	Interbank	T-bill	Discount	Lending	Deposit
			HP Filter		
			Average Correlation with GDP		
OECD	0.27*	0.40*	0.37*	0.23*	0.21*
Middle-high	-0.24*	-0.09	-0.02	-0.24*	-0.21*
Middle-low	0.02	-0.01	0.03	0.07	0.01
Low	-0.12	-0.02	0.03	-0.02	-0.10
			Average Correlation with total capital flows (net)		
OECD	0.14	0.25*	0.20*	0.19*	0.11
Middle-high	-0.11	-0.24*	0.11	-0.13	-0.09
Middle-low	0.04	0.03	0.07	0.05	-0.00
Low	0.01	0.06	0.03	-0.11	0.05
			Band-Pass Filter		
			Average Correlation with GDP		
OECD	0.12	0.14	0.19*	0.16	0.13
Middle-high	-0.23*	-0.14	0.08	-0.18*	-0.11
Middle-low	0.18	0.00	0.00	0.00	-0.07
Low	-0.09	-0.04	0.02	-0.11	0.03
			Average Correlation with total capital flows (net)		
OECD	0.11	0.28*	0.19*	0.16	0.13
Middle-high	-0.29*	-0.17	0.08	-0.18*	-0.11
Middle-low	-0.05	-0.03	0.00	0.00	-0.07
Low	0.16	0.07	0.02	-0.11	0.03

Notes: An * denotes statistical significance at the 5 percent level.

Given the notorious difficulties (present even for advanced countries such as the United States) in empirically characterizing the stance of monetary policy, we performed a complementary exercise as a robustness check for OECD and non-OECD countries. Specifically, we estimated two variants of a Taylor rule as described in Section II.

Table 12 reports the results for the two groups and three rates of interest (interbank, T-bill, and discount.)[25] Recalling that countercyclical policy requires a positive and significant β_2, the main results can be summarized as follow. There is evidence of countercyclical policy for two of the three interest rate for the OECD countries. For the non-OECD countries, β_2 is not significantly different from zero for any of the three specifications, suggesting acyclical policy.

[25] To conserve on space, we only report results for the specification with no lagged dependent variable. The same results obtain for the lagged dependent variable specification (available upon request).

TABLE 12. TAYLOR RULES: FIXED EFFECTS PANEL REGRESSIONS

Regression $i_t = \alpha + \beta_1(\pi_t - \underline{\pi}) + \beta_2 y^c_t + u_t$
i_t = Short term interest rate. Definitions of the rates are given below.
$\pi_t - \underline{\pi}$ = Inflation rate minus sample mean.
y^c_t = Cyclical component of real GDP (HP filter).
Estimated using fixed effects

Dependent variable (number of observations)	β_1	β_2	R^2
	OECD		
Interbank rate (663)	0.56*	0.18	0.26
T-bill rate (503)	0.60*	0.12*	0.39
Discount rate (758)	0.49*	0.15*	0.25
	Non-OECD		
Interbank rate (719)	4.38*	-0.008	0.36
T-bill rate (628)	0.31*	-0.78	0.10
Discount rate(2050)	3.65*	0.41	0.16

Notes: Asterisks denote significance at the 5 percent level.

3.4 Exchange rate arrangements, capital market integration, and crises

In the remainder of this section, we divide the sample along three different dimensions in order to assess whether our results are affected by the exchange rate regime in place, the degree of capital mobility in the world economy, and the presence of crises. First, to examine whether the increased capital account integration of the more recent past has affected the cyclical patterns of the variables of interest, we split our sample into two subperiods (1960-1979 and 1980-2003) and performed all the exercises described earlier in this section. Second, we split the sample into currency crises periods and tranquil periods. This enables us to ascertain whether our results on procyclicality are driven to some extent by the more extreme crises episodes. Lastly, we broke up the sample according to a rough measure of the de facto degree of exchange rate flexibility. The results of each of these partitions of the data will be discussed in turn. (Further details are available in the working paper version of this paper.)

a. 1960-1979 versus 1980-2003

The three main results that emerge from dividing the sample into 1960-1979 and 1980-2003 are the following. First, correlations between the cyclical components of GDP and capital flows for

the 1980-2003 period are significantly higher than those reported in Table 7 for the OECD and middle-high-income countries. These correlations remain essentially unchanged for the lower income groups. Second, while the results are not air-tight across indicators, fiscal policies appear to be less countercyclical for the OECD countries during the more recent period. For non-OECD economies, the picture is mixed and not suggestive of systematic differences. Third, using any of our approaches based on the behavior of interest rates, monetary policy comes out as more countercyclical in the more recent period for the OECD countries. In contrast, monetary policy appears as more procyclical for the two middle-income groups. There does not appear to be any discernible difference across periods for the low income group.

b. Crises versus tranquil periods

As in Reinhart and Rogoff (2003), two definitions of currency crashes are used: (i) a "severe" currency crash, which refers to a 25 percent or higher monthly depreciation that is at least 10 percent higher than the previous month's depreciation and (ii) a "milder" version that refers to a 12.5 percent monthly depreciation that is at least 10 percent above the preceding month's depreciation. Those years (as well as the two years following the crisis) are treated separately from tranquil periods. While procyclicality at the time of a crisis should hardly come as a surprise, our interest was to investigate the cyclical patterns during tranquil periods. Two clear results follow. First, no significant differences emerge regarding the links among the business, capital flow, fiscal expenditures, and interest rates cycles. Second, when it comes to the inflation tax, the evidence suggests that the inflation tax is more procyclical during crisis periods than in tranquil times for the non OECD countries relative to the results shown in Tables 8 and 9.

c. Fixed versus flexible exchange rates

Our final partition was an attempt to assess whether the cyclical patterns in capital flows and macroeconomic policies differs across exchange rate regimes (broadly defined). To do so, we split the sample into three groups (a coarser version of the five-way *de facto* classification in Reinhart and Rogoff, 2004). The fixed exchange rate group comprises the exchange rate regimes labeled "1 and 2" in the five-way classification just mentioned. The flexible exchange rate group comprises categories 3

and 4. Those labeled freely falling by the Reinhart and Rogoff classification (category 5) were excluded from the analysis altogether.

Most of the results that emerge from this exercise are quite intuitive. First, there are no discernible differences in the correlations between capital flow and real GDP cycles across the two groups. Second, there is some suggestive evidence (although the results are too mixed to make a strong case) that fiscal policy is more countercyclical for more flexible arrangements—especially for the OECD and middle-high-income countries. Third, for non-OECD countries the inflation tax is more procyclical in flexible regimes. Lastly, and most noticeably, monetary policy is more countercyclical for the flex OECD group; that is, the correlations between the cyclical components of real GDP and nominal interest rates are significantly higher than those reported in Table 11. However, the same cannot be said for non-OECD where the evidence points in the opposite direction—monetary policy being more procyclical for flexible arrangements.

VII. CONCLUDING REMARKS

We have studied the cyclical properties of capital flows and fiscal and monetary policies for 105 countries. Much more analysis needs to be undertaken to refine our understanding of the links between the business cycle, capital flows, and macroeconomic policies, particularly across such a heterogeneous group of countries and circumstances—especially in light of endemic data limitations. With these considerations in mind, our main findings can be summarized as follows:

First, capital flows are procyclical for the developing economies and, most notably, for the volatile middle-high income countries. Sovereign credit ratings are also procyclical for middle income countries. We have not investigated causal patterns among the two, but this would appear to be a fruitful area for future research.

Second, using the most unambiguous measures of fiscal policy that we are aware of, we find strong evidence of procyclical fiscal policies in all the groups of developing countries—once more, middle-high income countries stand out in this regard as the most procyclical, which helps explain the

high incidence of financial crisis and the volatility and amplitude of their business cycles. As regards the OECD, the evidence is more ambivalent as to whether policies are countercyclical or acyclical.

Third, for the middle-high-income countries and (surprisingly) for the low income-countries, the feast and famine cycle of fiscal spending is positively linked to the capital flow cycle, with spending rising markedly when capital is plentiful. There appears to be little or no link between fiscal expenditure and capital flows in the case of the OECD or middle-low income economies.

Fourth, as a first pass to studying the cyclical properties of monetary policy in developing countries, we find evidence of policy procyclicality in developing countries, particularly for the middle-high income economies. There is also evidence for countercyclical monetary policy for the OECD countries.

Lastly, taking together the preceding stylized facts it would appear that for the middle-high income countries—the emerging markets that investors either love or hate—the business, capital, fiscal, and monetary policy cycles all reinforce one another. For these countries when it rains, it does indeed pour.

Finally, it is worth emphasizing that our empirical objective has consisted in computing "reduced-form" correlations in the data (in the spirit of the real business cycle literature) and *not* in identifying policy rules or structural parameters. What types of models and/or mechanisms could reproduce the correlations found in the data should be the subject of further research. In sum, we hope that the empirical regularities that we have identified will invite theoreticians to reconsider existing models that may be at odds with the facts and empiricists to revisit the data with more refined techniques.

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APPENDIX I. DATA AND SAMPLE

The variables

While quarterly national accounts data are available for advanced economies and a handful of developing countries, for the latter most of the higher frequency observations cover only a recent period, making it difficult or impossible in many cases to establish recurring cyclical patterns. Thus, our analysis relies on annual data. Broadly, the data cover 1960-2003—but the starting date of each series varies by country and by indicator. The variables are grouped into three batches: external, fiscal, and monetary. Particulars on the indicators that make up each these groups are discussed in the remainder of this section. The external indicators include total net capital flows and the current account balance, both in billions of US dollars and expressed as a percent of GDP. The Institutional Investor Ratings Index completes this set.[26] Where possible, we focus on variables that give us an unambiguous reading of cyclical patterns implying that for the fiscal variables we use various measures of central and general (or consolidated) government expenditure in real terms (deflated using the GDP deflator) and the inflation tax rate.[27] For the two levels of government, these measures are comprised of total expenditure, total expenditure less interest payments, purchases of goods and services, and expenditure on wages and salaries. The inflation tax rate, defined as $\pi/(1+\pi)$, completes our fiscal data. The monetary policy variables include various measures of nominal and real interest rates and monetary aggregates. Nominal interest rates, which are the least ambiguous include (listed from the most policy relevant to the least): the interbank rate, Treasury bill rate (T-bill), discount rate, and lending and deposit rates. Some of our exercises also use measures of ex-post real rates using these five series. The aggregates are defined as the annual percent change in real money balances and it is measured using the monetary base (M0), narrow money (M1), and broad money (M2).

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[26] The Institutional Investor (IIR) ratings, which are compiled twice a year, are based on information provided by economists and sovereign risk analysts at leading global banks and securities firms. The ratings grade each country on a scale going from zero to 100, with a rating of 100 given to countries which are perceived as having the lowest chance of defaulting on its government debt obligations.

[27] *World Economic Outlook* uses the concept of Central and General government expenditure, while *Government Financial Statistics* uses Central Government Budgetary Accounts and Consolidated Government Accounts.

Variable	Source
1. External	
Total capital flows (net)	International Monetary Fund*, World Economic Outlook*.WEO
Institutional Investor Index (level)	Institutional Investor
2. Fiscal	
Central government:	
Expenditure	WEO
Current expenditure, Current expenditure minus interest payments, Expenditure on goods and services, Expenditure on wages and salaries	International Monetary Fund, *Government Financial Statistics* (GFS)
General or consolidated government:	
Expenditure	WEO
Current expenditure, Current expenditure minus interest payments, Expenditure on goods and services, Expenditure on wages and salaries	GFS
Inflation tax, $\pi/(1+\pi)$	International Monetary Fund, *International Financial Statistics* (IFS)
3. Monetary	
Domestic credit, M0, M1, M2, Interbank rate, Treasury bill rate, Discount rate, Lending rate, Deposit rate	International Monetary Fund, *International Financial Statistics* (IFS)
4. Other	
Real GDP	WEO
GDP deflator	WEO
Consumer Price Index	IFS

The sample

Our sample covers a total of 105 countries, which we group into four categories according to income per capita, along the lines followed by The World Bank.[28]

The 41 low income countries	**The 25 middle-low income countries**	**The 17 middle-high income countries**	**22 OECD[29]**
Angola	Algeria	Argentina	Australia
Bangladesh	Bolivia	Botswana	Austria
Benin	Cape Verde	Brazil	Belgium
Burma (now Myanmar)	China	Chile	Canada
Cambodia	Colombia	Costa Rica	Denmark
Cameroon	Dominican Republic	Gabon	Finland
Central African Republic	Ecuador	Lebanon	France
Chad	Egypt	Malaysia	Germany
Comoros	El Salvador	Mauritius	Greece
Congo (Republic of)	Guatemala	Mexico	Japan
Côte D'Ivoire	Honduras	Oman	Korea, Rep. of
The Gambia	Iran	Panama	Ireland
Ghana	Iraq	Saudi Arabia	Italy
Haiti	Jamaica	Seychelles	Netherlands
India	Jordan	Trinidad and Tobago	New Zealand
Indonesia	Morocco	Uruguay	Norway
Kenya	Paraguay	Venezuela	Portugal
Laos	Peru		Spain
Liberia	Philippines		Sweden
Madagascar	South Africa		Switzerland
Mali	Sri Lanka		United Kingdom
Mauritania	Syria		United States
Mongolia	Thailand		
Mozambique	Tunisia		
Nepal	Turkey		
Nicaragua			
Niger			
Nigeria			
Pakistan			
Rwanda			
Senegal			
Sierra Leone			
Somalia			
Sudan			
Tanzania			
Togo			
Uganda			
Vietnam			
Yemen			
Zambia			
Zimbabwe			

[28] See World Bank *Global Development Finance* Statistical Appendix, Table A.53 Classification of Countries by Region and Income Level.

[29] Iceland and Luxembourg are not included in our sample.