

International Capital Flows and Destabilizing Fiscal and Monetary Policy*

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Abstract

Using the excessive macroeconomic volatility in Latin America and the possible contribution of destabilizing monetary and fiscal policies to this outcome as a motivation, this paper examine whether four Latin America countries practice pro-cyclical fiscal and monetary policies. In contrast with other literature on the subject this paper consider the possible simultaneous determination between policy and GDP growth. Additionally, this paper explores the direct impact international capital inflows have on these policies. The evidence suggests that most of the countries practices destabilizing fiscal and monetary policy and that capital inflows consistently influence policy in a pro-cyclical direction, as suggested by the literature.

Keywords: Pro-cyclical Policies; Capital Inflows; Business Cycles in Developing Countries
JEL Classifications: E59, E62, F39

* I would like to thank Steven Fazzari, James Morley, Ryan Compton, Tara Sinclair and the participants of the Applied Time Series Research Group at Washington University for comments and suggestions. I acknowledge the financial support of the Banco Central do Brasil and CNPq (Brazilian Council for Scientific and Technological Research). The views expressed in this work are those of the author and do not reflect those of the Banco Central or its member, or those of Washington University or CNPq. The usual disclaimer applies.

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I. Introduction

Do Latin American countries engage in destabilizing pro-cyclical fiscal and monetary policy? What does volatility in international capital flows have to do with this pattern of macroeconomic policy?

It is hard to imagine that some governments would like to make recessions worse for their citizens and for themselves. The literature on the subject is fairly recent, but indicates that governments in these countries act by maximizing their interest, especially regarding fiscal policy: when faced with some type of financial constraint or incomplete financial markets, developing countries' best option is to spend according to their revenue. Developing country governments would like to use fiscal policy to counteract temporary reductions in GDP, but they are unable to find the needed finance.

The literature, however, suggests that developing countries, especially Latin American (LA) countries, experience far more macroeconomic volatility than developed economies and those economic fluctuations in developing countries impose a significant welfare loss to these nations. The literature also suggests that destabilizing fiscal and monetary policies are one of the main causes of this macroeconomic volatility.

I identify two problems in the literature and attempt to address these issues in this paper. First, the empirical literature on pro-cyclical fiscal and monetary policy is mainly descriptive and the small number of estimations done to identify the problem use OLS regressions.¹ In addition, the pro-cyclical behavior implies that fiscal and monetary policies also affect economic growth, creating the problem of endogenous regressors. While the literature has identified pro-cyclical policy, I argue the possibility of endogenous regressors might create bias in existing conclusions.

I attempt to deal with the problem of endogenous regressors using generalized method of moments (GMM) with instrumental variables (IV) to investigate the contemporaneous correlation

and Vector Autoregression (VAR) estimation to deal with the dynamic relationship between policy and economic growth. Using these approaches, I avoid the problem of simultaneous determination of right and left hand side variables. My results indicate that most of the developing countries studied here engage in pro-cyclical fiscal and monetary policies, even when controlling for endogenous regressors, thus supporting the previous results emerging from the literature. I find, however, that in contrast with the previous literature, Chile implements counter-cyclical fiscal policy.

A second problem with past research on this topic concerns the main cause of the pro-cyclical policy. Even though the theoretical literature generally considers financial constraints as the basis for pro-cyclical fiscal policy, part of this literature indicates that volatility in international capital flows is the main reason for the destabilizing fiscal policy. Furthermore other parts of the literature suggest that the pro-cyclical fiscal policy is a result of misallocation of resources, where developing country governments fail to generate enough surpluses during good times to be used in bad times.

To investigate empirically the above question I estimate the direct impact capital flows have on fiscal and monetary policy decisions. Once policy behaves in a pro-cyclical way, the relation between capital flows and policy decisions may not be in unidirectional. Therefore, in order to avoid the problem of endogenous regressors, I again employ GMM and VAR estimation. The results indicate that the international capital flows have a direct impact on policy decision in a way which causes pro-cyclical policy, with few exceptions. However, I found weak evidence that Chile runs a counter-cyclical fiscal policy. This evidence suggests that both theoretical stories may coexist with some empirical support.

¹ The estimations are much more common regarding pro-cyclical fiscal policy. I found only Calderon and Schmidt-Hebbel (2003) use econometric instruments to study pro-cyclical monetary policy.

This paper proceeds as follows. Section II provides a literature review on pro-cyclical international capital flows and pro-cyclical fiscal and monetary policy. Section III discusses the logic of why fiscal and monetary policy may follow pro-cyclical behavior and also describes the econometric models used to implement the empirical analysis. Section IV presents the estimations, while section V concludes and discusses some policy implications.

II. Literature Review

Pro-Cyclical Capital Flows

The literature on pro-cyclical international capital flow to developing countries is fairly new and brings to the open macroeconomy the ideas and evidence presented by Gertler (1988), Bernanke and Gertler (1989), Kiyotaki and Moore (1997), Fazzari, Peterson and Hubbard (1988) and Bernanke et al. (1998) in the closed-economy context. Recent papers include Gourinchas (2001), Aghion et al. (1999a, 1999b), Calvo and Reinhart (1999), Caballero (2000, 2002), Fernandez-Arias and Panizza (2001), Ocampo (2002, 2003), Eichengreen (2003), Ffrench-Davis (2003), and Calderon and Schmidt-Hebbel (2003).

Diaz-Alejandro (1983, 1984) analyzes the Latin American external debt/economic crises of the early 80's and concludes that the financial constraint of the beginning of the decade impacted LA countries at different stages of development, structural organization and with different trade commodities.² What LA countries had in common at that time was strong reversal of capital flows, and the need to generate external currency surpluses to service their external debt. The economic downturn that LA economies faced was therefore a consequence of international financial constraints.

² Some of Latin American Countries have their economy based on oil exports and were positively affected by the oil price shocks of the 70's. See Griffith-Jones and Sunkel (1986) for a similar and deeper analysis on the 80's debt crises.

Gourinchas et al. (2001) investigate the role of lending booms in LA countries and infer that an increase in the international capital supply tends to lead to growth based on domestic credit booms and that it increases the probability of balance of payment crises and subsequent economic downturns. Aghion et al. (1999a, 1999b) provides a theoretical model that explains this phenomenon of growth with large external borrowing followed by a subsequent recession with no access to international liquidity. In this model external credit evolves in a cyclical way in developing countries, creating a necessary condition for an economic/financial cycle. In this cycle the growth period is a consequence of easy access to external liquidity, while a net capital outflow, a consequence of exchange rate appreciation and sequential reduction in profit opportunity, decreases investment in these economies.

Analyzing the phenomenon of sudden reversals in capital flows Calvo and Reinhart (1999), a significant paper in this literature, suggest that sudden reversion in capital flows is largely related to a fall in GDP in developing countries, especially in Latin America. Calvo and Reinhart describe this phenomenon as a sudden stop and argue that a reduction in GDP is the only way developing countries can feed capital outflows with the needed external currency. Sudden reversals in capital flows have to be met by sudden reduction in current account deficits. This reduction is likely to lead to severe decline in aggregate demand and consequently reduction in output and employment.³

In an attempt to explain why LA experiences so much volatility in output, Caballero (2000) identifies international financial links and undeveloped domestic financial markets as key causes. He further argues that international capital flows induce pro-cyclical fiscal policy which produces more volatility, while undeveloped domestic financial markets do not help smooth

³ Calvo and Reinhart (1999) suggest two channels through which sudden reversal become sudden stop: *Keynesian*, where prices and wage rigidities creates adjustment cost to the current account reversal, and *Fisherian*, where sudden capital reversal reduces availability of funds to investment and increases interest rate, leading to some bankruptcies.

private consumption and public expenditure during recessions. The role of an undeveloped domestic financial system is stressed by Caballero (2000), using a model of “dual liquidity.” During external crises access to international liquidity declines sharply and as a consequence domestic firms and government compete actively for limited domestic resources. This process may produce fire sales, a reduction in asset prices, an increase in interest rates and may result in a reduction of investment and increased bankruptcies.⁴ Analyzing the Chilean case, Caballero (2002b) suggests that once Chile’s domestic balances are under control, Chilean business cycles are driven mainly by external shocks:

“The financial nature of this excess-sensitivity has two central dimensions: a sharp contraction in Chile’s access to international financial markets when it needs it the most; and an inefficient reallocation of this scarce access across borrowers during external crises. I argue that Chile’s aggregate volatility can be reduced significantly by fostering the private sector’s development of financial institutions that are contingent on the main external shocks faced by Chile.”⁵

Ocampo (2002) discusses the relation between capital flows and growth in LA concluding that it behaves in a pro-cyclical way. This paper suggests that this pro-cyclicality is related to the credit constraints the private and public sector face in Latin American countries. An increase in capital inflow in this context would lead to an increase in government expenditure, private sector investment and consumption in ways related to lending booms described by Gourinchas et al. (2001). The counterpart of this credit boom is the increase in debt and probability of default as described by Reinhart et al. (2003). A decrease in capital inflow, or worse, a sudden stop as described by Calvo and Reinhart (1999) would mean a strong reduction in the availability of credit and therefore a reduction in public expenditure, private investment, and consumption. Ocampo (2003) follows in the same directions, but focuses on what should be done to prevent this phenomenon.⁶

⁴ This process is similar to debt-deflation in Fisher (1933) and to financial instability in Minsky (1982).

⁵ Caballero (2002b), page 1.

⁶ Ocampo advises regulation on capital mobility and improvement in domestic financial systems.

Eichengreen (2003) suggests that the pro-cyclical behavior of capital flows in LA reflects the fact that Latin American countries cannot borrow in their own currency in the international market. This paper also suggests that the current structure of the international capital market, composed of millions of participants, presents the necessary conditions for herd behavior that increases external vulnerability for those countries that depend on external finance. Similarly, Griffith-Jones (2003) suggests that the capital market analysis based on Value at Risk (VAR), institutional ratings and some of the policy introduced by the Basle Capital Accord, cause and reinforce the pro-cyclical behavior of international capital flows.

Ffrench-Davis (2003) concludes that the pro-cyclical behavior of international capital flows is well grounded in the literature:

“A growing body of the literature documents that a dominant feature of the “new generation” of business cycles in EEs [*Emerging Economies*] are the sharp fluctuation in private spending and balance sheets associated to boom-bust cycles in external finances.”⁷

Fernandez-Arias and Panizza (2001) and Calderon and Schmidt-Hebbel (2003) use econometric methods to implement empirical investigations on the influence of external factors on domestic developing economies. Fernandez-Arias and Panizza find that an increase of one point percent in private net flow over GDP raises investment by almost one per one (0.86%), while the impact on GDP growth is of 0.36%:

“in fact, regional output growth and private net flows, measured as a proportion of GDP, are positively correlated (0.34 percent). The notorious volatility of these net flows is associated with the high growth volatility of the region. Why is this so? A large net influx of capital from abroad allows economies to finance large current account deficit (without depleting limited reserves) and therefore to invest domestically beyond their national savings. The typical macroeconomic outcome is that larger net flows of capital are associated with larger current account deficit, greater investment, and lower savings ... When access to capital markets is closed, which happens with distressing frequency in Latin America, the collapse of real activity is dramatic.”⁸

Calderon and Schmidt-Hebbel (2003) argue that there is evidence that capital inflow affects growth positively, but that also there is evidence that growth gives feedback to capital inflows creating the possible bias of endogenous regressors. The paper solves this problem using panel GMM-IV that accounts not only for the endogenous regressors, but also for unobserved country-specific effects in the panel. This paper finds that surges in real international interest

⁷ Ffrench-Davis (2003), page 17.

⁸ Fernandez-Arias and Panizza (2001), page 4.

rates are associated with low growth in emerging markets, and that growth is fostered by large private capital inflows. Investigating the nature of the capital inflow, they find that only foreign direct investment (FDI) provides a positive and statistically significant contribution to growth in developing countries, dominating the relation between capital inflow and growth in these countries. The paper concludes that external factors (terms of trade, international interest rates and large private capital inflows) are a dominant cause of long term growth in emerging economies, with a median contribution of 80% in the 1981-2000 period.

In summary the literature on pro-cyclical capital flows to developing countries brings a conclusive interpretation that capital inflows influence and are influenced by the business cycle in developing countries. The underdevelopment of the domestic financial system in these countries creates the need for external finance.⁹ Once capital flows are considered very volatile, as inferred by Espinoza-Vega et al. (2000), business cycles in developing country will fluctuate severely, imposing a high welfare loss to the people of these countries, as calculated by Pallage and Robe (2000).¹⁰

Pro-Cyclical Fiscal Policy

The literature on pro-cyclical fiscal policy is mainly based on financial constraints, and although fairly new, it is an extensive literature. The literature is composed of theoretical papers like Aizenman et al. (1996), Talvi and Vegh (2000) and Riascos and Vegh (2003), and empirical papers that investigate the question using econometric OLS regressions, like Gavin et al. (1996),

⁹ Ferreira da Silva (2001) offers a good empirical study, with panel data GMM-IV estimation, showing that countries with more developed financial systems have smoother economic fluctuation. It explains that this find is supported by the balance sheet view, where countries with more developed banking systems will face reduced agency and verification costs, and as consequence, will be more able to smooth consumption and investment over the business cycles. As a consequence, countries with more developed financial systems should exhibit less volatile business cycles, as showing in the data.

¹⁰ Pallage and Robe (2000) calculate that economic volatility in developing countries is 15-30 times bigger than the one calculated for US economy and that the welfare loss resultant of this volatility in developing countries would be enough to trade a reduction of 1 point percent in economic growth for ever.

Gavin and Perotti (1997), IMF (2002) and Calderon and Schmidt-Hebel (2003). As well papers that analyze pro-cyclical fiscal policy in a descriptive way, include Carvalho (2001), Godfajn (2001), and Ocampo (2002, 2003).

Aizenman et al. (1996) present a theoretical model of fiscal policy with borrowing constraints, where the pro-cyclical fiscal policy is mainly explained by the fact that countries are cut off from the international market in bad times:

“Our paper shows that for a developing country whose tax capacity is relatively small and its GDP is volatile, the optimal tax rate is state contingent...The switch to a partial default regime is associated with financial fragility, where small change in fundamentals [like a drop in the foreign interest rate, an increase in government expenditure, etc] may lead to a large accumulation o debt.”¹¹

Similarly, Riascos and Vegh (2003) present a theoretical model showing that pro-cyclical government consumption is consistent with a standard neoclassical model of fiscal policy in which policymakers optimally choose both the level of government consumption and taxes. Riascos and Vegh (2003) argue that when markets are complete, like in developed countries, the correlation between government consumption and output is zero, as it is in G-7.¹² However it becomes optimal to let government spending be pro-cyclical when markets are incomplete as in LA countries. Incomplete markets induce substantial volatility in both private and public consumption:

“The intuition behind these results is as follows. In the absent of state contingent claims, the economy is unable to borrow more in the worse state of natures (i.e., lowest output state of nature) as it would do under complete markets. This will force the economy to consume less in bad times (and more in good times) which introduces a positive correlation between private consumption and output. Put differently, the high correlation between private consumption and output illustrates the weak insurance role played by noncontigent debt, which is consistent with the results of Correia, Neves and Rebelo (1995). A similar intuition applies to public consumption: the government would prefer to smooth public consumption across states of nature but is not able to do so, which forces it to provide more public consumption in good times and less in bad times.”¹³

Talvi and Vegh (2000) prefer to emphasize the misconduct of developing country governments to explain pro-cyclical fiscal policy. The paper presents a theoretical model showing that pro-cyclical fiscal policy in developing countries is caused by the inability of governments to generate enough surpluses during good times to deal with bad times in a counter-cyclical way. The evidence that even some developed

¹¹ Aizenman et al. (1996), page 24.

¹² This result for G-7 countries is consistent with Barro’s smoothing government consumption theory.

countries that do not face external finance constraints practice pro-cyclical fiscal policy is used as a sign that external finance constraints are not the cause of this destabilizing policy. This paper focuses on the allocation mechanism problem, where government does not save during good times. In common with Riascos and Vegh (2003), this paper emphasizes that the G-7 have 0 correlation between fiscal policy and business cycles, while developing and even some developed countries exhibit positive correlation.

In the empirical literature, Gavin et al. (1996) find that LA economies are about two to three times more volatile than industrial countries. They suggest that this volatility is in part a consequence of the pro-cyclical fiscal policy in the region. These pro-cyclical responses are most pronounced during recessions, and according to the paper, seem to be related to the inability to access international capital markets in face of adverse shocks. Gavin et al. (1996) infer that access to international financial markets is precarious and that the perceived creditworthiness of Latin American governments is low and very volatile. Once capital flows are highly sensitive to international interest rates, fiscal policy in these countries becomes very volatile, presenting pro-cyclical, destabilizing behavior. The paper describes the relationship between pro-cyclical fiscal policy and international capital flows as bi-causal, creating a vicious circle. The paper however recognizes that central government deficits have not been much larger in LA than in OECD countries. In fact, during 1970-1994, the average ratio of central government deficit to GDP was almost exactly the same in both regions, while the former present an average primary surplus for the entire period.¹⁴ The problem is not the deficit, but its size relative to the financial system and fiscal revenue.

In very detailed work, Gavin and Perotti (1997) compare industrialized and LA countries, and finds empirical evidence that fiscal policy is pro-cyclical in LA countries, especially during bad times. They find that the answer for the pro-cyclical fiscal policy in LA is on the expenditure side, given that fiscal revenue behaves in the same way in LA and industrialized countries.¹⁵ Latin American fiscal expenditure, however, is strongly pro-cyclical during bad times. The paper investigates different explanations for the pro-cyclical fiscal policy in Latin America: Keynesian wrong causality – reduction in

¹³ Riascos and Vegh (2003), page 15.

¹⁴ See Table 1 in appendix 1.

¹⁵ Fiscal revenue increases with increase in GDP growth.

deficit causing downturns; voracity effect from a fiscal commons problem – no one will be willing to reduce their claim when fiscal revenue is going up; and borrowing constraints, where finance is severely curtailed during bad times. The authors conclude that borrowing constraints are the cause:

“The idea that borrowing constraints tend to be reinforced during ‘bad times’ provides an explanation why fiscal policy is particularly procyclical during such times; authorities might like to implement more countercyclical fiscal policies, but they are prevented from doing so by their inability to finance the implied fiscal deficit.”¹⁶

Investigating how financial markets affect real activity, IMF (2002) attempts to explain why LA experiences high macroeconomic volatility. This paper studies fiscal policy in Latin America and Asia, and concludes that policy is primarily pro-cyclical in LA, while Asian countries typically implement counter-cyclical policies.¹⁷ IMF (2002) suggests that the pro-cyclical fiscal policy in LA is due to structural feature of tax systems, political expenditure (the difficulty of restraining government expenditure during cyclical upswings), and volatility in capital flows. Monetary policy is constrained by the “unpleasant monetarist arithmetic” of fiscal policy in the long run. Financial liberalization, with lending booms, also plays a role in fiscal policy and macroeconomic volatility in LA.

Calderon and Schmidt-Hebbel (2003) investigate the existence of pro-cyclical fiscal policies in developing countries comparing the volatility in GDP with the volatility in the fiscal balance using deviations from the mean, and conclude that countries with mature institutions do not practice pro-cyclical policy.¹⁸

“...our results support the notion that countries with low to moderate risk spreads – reflecting better fundamentals and larger credibility – are capable of pursuing counter-cyclical policies. Only countries with high spreads exhibit pro-cyclical policies”¹⁹

Carvalho (2001) discusses the role of the IMF as crisis manager and concludes that it presents a very destabilizing force. This paper suggests that the recent currency crises were in fact liquidity crises, and

¹⁶ Gavin and Perotti (1997), page 31.

¹⁷ The paper implements an econometric study using OLS annual data on primary deficit, from 1970 to 2000. Its result are summarized in Table 2 in the appendix 1.

¹⁸ They used GLS with fixed-effect panel data for 11 emerging countries and annual data from 1996-2002.

the IMF instead of providing more liquidity to the crisis countries, forced them to adopt tight monetary and fiscal policy. The application of the IMF recommendation led to large output volatility in these economies. Ocampo (2002, 2003) makes a similar argument and suggests that the pro-cyclical volatility of capital inflow produces a pro-cyclical fiscal policy, while the IMF adjustment reinforces this pro-cyclical policy.

In a different perspective, Goldfajn (2001) does not think that volatility in capital flows is a problem, but agrees that when faced with a sudden stop, developing countries can only implement pro-cyclical fiscal and monetary policy.

Pro-Cyclical Monetary Policy

The literature on pro-cyclical monetary policy (low interest rates during booms periods and high interest rates when economic activity slows down) in developing countries is more recent and smaller than the literature on pro-cyclical fiscal policy. Calvo and Reinhart (2000) present a basic theoretical explanation of why developing countries enforce pro-cyclical monetary policy as a response to capital flow volatility. They argue that developing countries fear floating exchange rates because of their effects on inflation and therefore employ some kind of managed float, which makes monetary policy depend on capital movements. According to Gomez (2001), the old Mundell-Flemming framework suggests that it is incompatible to manage monetary policy and the exchange rate at the same time. Under the regime of fixed exchange rates, monetary policy is completely passive, varying in accord with the net flow of international capital. But under a floating exchange rate regime, monetary policy is active, permitting monetary authorities to decide domestic interest rates. However, more recently, developing countries, and especially Latin American countries, face a different problem: they adopt a floating exchange rate, but exchange rate volatility has a direct impact on prices, thus compromising price stability. For this reason developing countries avoid full flexibility in their exchange rate regimes, identified as “fear of floating” by Calvo and Reinhart (2000), producing pro-cyclical monetary policy.

¹⁹ Calderon and Schmidt-Hebbel (2003), page 989.

A similar theoretical result is a consequence of adopting inflation targeting regimes in many developing countries over the last decade, as described by Caballero (2002a). In this paper, the inflation-targeting framework does not allow for counter-cyclical monetary policy during external shocks.²⁰

The only econometric study in this literature is Calderon and Schmidt-Hebbel (2003), that investigates pro-cyclical monetary (and fiscal policies) by comparing volatility in GDP with volatility in the real interest rate. Calderon and Schmidt-Hebbel (2003) control for institutional maturity, measured by moderation in risk spread in the international market. They find that many developing countries do follow pro-cyclical policies, but countries with mature institutions (low risk-spread) escape this destabilizing behavior.

In a descriptive analysis of the facts surrounding LA monetary policies, Gomez (2001) suggests that LA countries practice pro-cyclical policy over the last decade for the following reasons: the rapid financial integration made monetary policy dependent on capital flows; the pro-cyclicality of capital flows reduced the ability of central banks to implement counter-cyclical policy; and the poor macroeconomic fundamentals and inflation in the recent past impose strong restrictions on LA central banks. This paper suggests that it is difficult to act in a crisis. In this case, policy makers have little option but to implement pro-cyclical monetary policy. Any attempt to reduce capital outflows may increase the problem. According to Gomez (2001), the only way to reduce the pro-cyclicality of foreign capital flows is to act during boom periods, reducing the level of nonfinancial firms' external liability:

“Nonfinancial private sector of a country may sometimes borrow amounts which seem individually prudent given certain macroeconomic assumptions – such as no devaluation of the currency – but which become collectively insupportable if such assumption turn out to be wrong.”²¹

²⁰ Caballero (2002a) suggests that developing countries should have a flexible inflation-targeting framework to deal with external crises. In this context, developing countries should allow for some short-run trade off between inflation and recession for more adequate insurance incentives by loosening monetary policy.

²¹ Gomez (2001), page 5.

Carvalho (2000) identifies external finance constraints as a source of pro-cyclical monetary policy, and thinks that IMF policy has reinforced this destabilizing policy decision.

This literature review identifies a more structured literature on the existence and cause of pro-cyclical fiscal policy, and less on monetary policy. In both cases, however, the empirical literature fails to deal with the problem of the feedback of the policy decision on the economic growth (simultaneous determination of the variables). Additionally, it is clear that the literature fails to investigate the direct impact of capital flows on policy decisions. The present paper intends to fill these gaps in the literature.

III. The Model

The Rationale behind Pro-cyclical Monetary and Fiscal Policy in Developing Countries

I present here the rationale for the existence of pro-cyclical fiscal and monetary policy in developing countries. By assumption, and based on the theoretical and empirical literature, capital flows are pro-cyclical in developing countries. What we need to understand is why capital flows impact policy in a pro-cyclical direction.

Let us start with the impact of capital flows on monetary policy. Suppose that a representative developing country faces internal and external financial constraints and has relatively high interest rates to deal with inflationary pressures. In this case, a reduction in the international interest rates, or a reduction in the perception of the country risk premium, will lead to large increase in capital inflow to this country.

According to the Mundell-Fleming model²² if this country adopts a fixed exchange rate capital inflow will move the LM curve to the right, with the consequent decrease in domestic interest rate to the point that makes it equal to the international interest rate plus the country risk premium. In the case of floating exchange rate, capital inflow will only generate exchange rate appreciation with no effect on the domestic interest rate in short run, but with consequent reduction of net exports.

²² Please see Caves et al. (1992) for a description about Mundell-Fleming model on fiscal and monetary policy with international capital mobility.

Another fact emphasizes the dependence of the domestic interest rate and monetary policy on capital movement in the case of fixed exchange rate. The international financial community, led by the IMF, suggests that countries under speculative attack can defend their currency by raising domestic interest rate. That means that a country that faces capital outflows and pressures to depreciate its currency could increase the interest rate to fight this move in exchange rates. According to Kraay (1999):

“By raising interest rates high enough, the conventional wisdom argues that the monetary authority can make it prohibitively costly for speculators to take short positions in the currency under attack. High interest rates are often also said to convey a positive signal regarding the commitment of the monetary authority to maintaining a fixed exchange rate.”²³

But even if the country adopts a pure floating exchange rate, it will not always be free of the pro-cyclical policy effects, as suggested by Caballero (2002a) about many developing countries that recently adopted the inflation-targeting monetary policy framework. This policy produces pro-cyclical monetary policy where an increase in capital inflow appreciates the exchange rate, eases pressures on domestic prices, and consequently leads to reduction in the domestic interest rate. To avoid this problem, Caballero suggests the adoption of a flexible inflation-targeting framework, where the target should adapt to change in international capital flow. This would permit developing countries to act counter-cyclically during periods that the country faces restricted access to the international capital market.

Calvo and Reinhart (2000) suggest that most emerging economies would prefer not to suffer the effects of high volatility of capital flows on the exchange rate, especially to protect the balance of trade and domestic prices. Because of this preference, countries tend to adopt an exchange rate policy that is something between fixed and flexible. The consequence is a monetary policy that is pro-cyclical with capital flow, in which large inflows leads to low domestic interest rates and low inflow or capital outflow leads to high interest rates.

The pro-cyclical monetary policy is then a consequence of the adoption of an inflation-targeting framework or of the fear of floating. Capital flows to developing countries are volatile and pro-cyclical as understood by the literature, and the monetary policy or exchange rate adopted by our representative developing country leads to a pro-cyclical policy.

²³ Kraay, A. (1999), page 1.

The reader may ask why we do not observe this pro-cyclical monetary policy in developed economies. A description of monetary policy in developed economies and its relation with capital flows is beyond the scope of this paper,²⁴ but I believe that once developed economies have a more mature domestic financial system, the domestic economy depends less of international finance to invest.²⁵ Therefore, we might find some of the impact of international capital flow on the domestic interest rate in the case of developed economies, but it will not make it pro-cyclical, because economic growth in these economies does not depend on and is not positively correlated with external capital flows.

A similar pro-cyclical pattern is captured by the domestic fiscal policy in developing countries as a consequence of the volatility of international capital flows. To illustrate this argument, it is easy to assume that the government of our representative developing country has an unfulfilled demand for social and structural investments in areas of concern such as primary education and safe water.

Easier access to international liquidity creates an increase in economic growth, as demonstrated in the literature, and a consequent increase in tax revenue. It is difficult not to increase government expenditure to fulfill part of the social demands. This increase in government expenditure is described by Gavin and Perotti (1997) as a voracity effect from a fiscal commons problem, and considered by Talvi and Vegh (2000) to be the main cause of pro-cyclical behavior of fiscal policy in developing countries.

The reduction in international interest rates and pro-cyclical domestic monetary policy reduces the cost of servicing the public debt of our representative economy, leaving larger amounts of fiscal revenue to be used for public expenditure. As a consequence, fiscal expenditure tends to increase significantly during times of high international liquidity.

Using the same rationale it is easy to see that an increase in the international interest rates or in the country risk premium perception and the consequent increase in domestic interest rates will lead to a

²⁴ I applied the same empirical investigations for two developing countries: USA and United Kingdom. The results are presented later in the paper.

²⁵ For example, Aghion et al. (1999a, 1999b) present a model where countries with more developed financial system do not need external finance to make domestic investments, and will be free of the pro-cyclical behavior of external capital flows. Ferreira da Silva (2001) finds that those countries with more mature financial system have lower macroeconomic volatility.

reduction in fiscal expenditure. The resulting increase in cost of the public debt forces the government to increase the primary surplus in order to avoid problems with the perception of debt sustainability.

The literature emphasizes that pro-cyclical fiscal policy is more evident during bad times, consistent with the sudden stop described by Calvo and Reinhart (1999), where capital flows go abruptly from a large inflow to a complete stop or even to a large outflow.²⁶ In this case, the sudden reversion in capital flows increases cost of debt rollover and international finance constraints. At the same time, the economy will have to prove to the international financial market that it will honor its liabilities accumulated during the good times. A huge fiscal movement toward primary surplus has to be made not only because of absence of the needed finance, but also to satisfy the international financial system's confidence problem. This phenomenon is described in Goldfajn (2001), Ocampo (2002), and Carvalho (2000). Ocampo (2003) emphasizes that this pro-cyclical effort will be more intense in the case of developing countries that have a large amount of short term debt.²⁷

The Econometric Models

This paper addresses two questions. The first is whether developing countries practice pro-cyclical fiscal and monetary policies. The fiscal policy part of this question has been answered positively by the literature in more than one study. But as I mentioned earlier, this literature fails to deal with the problem of endogenous estimators, where the policy itself gives feedback to economic growth. In the case of monetary policy, I identified only one paper that uses econometric tools to investigate the existence of pro-cyclical monetary policy. This study has the same problem of endogenous regressors observed in the studies done on fiscal policy.

²⁶ This means a complete closure of the international capital market to the country in question.

²⁷ In the case of international debt, Ffrench-Davis (2003) and Griffith-Jones (2003) consider that debt flows after Asian crises have been mainly short term. In terms of domestic public debt, Brazil is a good example of short term, where sometimes $\frac{3}{4}$ of its public debt were based on overnight operations.

I address this problem using two econometric tools: generalized methods of moments – instrumental variable – GMM-IV,²⁸ where I can analyze the contemporaneous relationship between policy and economic growth and Vector Autoregression – (VAR) estimation, a standard approach to deal with dynamics in macroeconomic time series.

In the first case, I use a GMM-IV version of the equation estimated by Gavin and Perotti (1997) and IMF (2002), using a lag of the GDP growth as instrument for the endogenous regressor, as suggested by Campbell and Mankiw (1989):

$$\text{Policy}_t = \alpha_0 + \alpha_1 \Delta \text{GDP}_t + \alpha_2 \text{Policy}_{t-1} + \alpha_3 X_t + \varepsilon_t \quad (1)$$

where X_t represent controls. In the study of fiscal policy, policy is measured by the primary surplus, defined as budget surplus minus nominal interest paid as percentage of GDP,²⁹ while in the study of monetary policy, policy is measured by the real money market interest rates or short-term treasury rates, deflated by consumer price inflation.³⁰ Central banks can easily access and influence the money market interest rates and as a consequence these rates better reflect the intention of the monetary authority. I do not use other financial market rates, like lending and deposit, as proxy when money market or short term treasure bonds are not available for a sufficient period, because analyses done for some of the countries show that lending and deposit rates do not necessarily follow monetary policy decisions.

²⁸ GMM deals better with possible heteroskedasticity than the two-stages least square - TSLS, and as I could check in alternative estimations done with TSLS, produce more efficient estimators.

²⁹ The IMF (2002) and Calderon and Schmidt-Hebel (2003) uses primary surplus, while Gavin and Perotti (1997) uses primary deficit and a measure of government expenditure. I also estimated fiscal policy with the growth of government consumption. The results are roughly consistent with those estimations done with primary surplus.

³⁰ Governments do not decide real interest rates; the decision variable is nominal interest rates. However real rates will be a better measure, and I follow Calderon and Schmidt-Hebel on this choice, with the caveat that this selection contains an identification problem that is: central bank may increase the interest rates in a pro-cyclical way, but inflation might end up being larger than expected and ex-post real rates could fall rather than rising as the policy intended. I use CPI because Central Banks around the world have used CPI to target inflation, and so the deflation for CPI would better translate monetary policy decision. I also estimate the equations using real interest rates calculated over a broad measure of inflation. In this case the results are similar, but less robust.

I estimate equation (1) with and without controls (X_t). I control for change in oil prices to deal with productivity shocks, and for the change in inflation, as done in Gavin and Perotti (1997).³¹

To support the hypothesis that governments in developing countries are using destabilizing pro-cyclical fiscal policy, I would expect the following sign: negative from GDP growth to primary surplus that means a reduction in growth would lead to an increase in government primary surplus. To check the hypothesis that those governments are using pro-cyclical monetary policy I would expect a negative sign from GDP growth to the real interest rates, that is to say, a reduction in growth would lead to an increase in real interest rates.³²

I also estimate equation (1) with special attention to the state of the economy, as did Gavin and Perotti (1997), to investigate whether there is an asymmetry in policy decisions depending on the state of the economy. I have defined the state of the economy based on whether or not GDP growth is above or below a linear time trend.³³ The resulting equation follows:

$$\text{Policy}_t = \alpha_0 + \alpha_1 \Delta \text{GDP}_t * \text{Dgood} + \alpha_1 \Delta \text{GDP}_t * \text{Dbad} + \alpha_2 \text{Policy}_{t-1} + \alpha_3 X_t + \varepsilon_t \quad (2)$$

The second method used is the Vector Autoregression as follows:

$$\begin{aligned} \text{Policy}_t &= C_1 + \sum_{p=1}^{\rho} a_{1p} \Delta \text{GDP}_{t-p} + \sum_{p=1}^{\rho} a_{2p} \text{Policy}_{t-p} + \beta_1 X_t + \varepsilon_{1t} \\ \Delta \text{GDP}_t &= C_2 + \sum_{p=1}^{\rho} b_{1p} \Delta \text{GDP}_{t-p} + \sum_{p=1}^{\rho} b_{2p} \text{Policy}_{t-p} + \beta_2 X_t + \varepsilon_{2t} \end{aligned} \quad (3)$$

where policy and controls variables are the same as the ones used in the GMM estimations. I expect signs in the first equation of the VAR estimations to be similar to those explained for the GMM estimations, while the second equation gives us an idea of the economic and statistical significance that the feedback policy would have on economic growth in the next period.

³¹ Results are robust with and without controls, but I only comment results with controls.

³² Results are presented next section

³³ I also used the same dummy definition used by Gavin and Perotti (1997) and found similar results.

To check whether policy depends on the state of the economy, I estimated equation (3) like equation (2).

The second question addressed by this paper is whether capital flows have a direct impact on policy decisions. To deal with this question I consider that policy is affected by movements in capital flows, but also can give feedback to capital flows. The concern with endogenous regressors is the same as in the investigation of pro-cyclical policy. Therefore, I use the same methods. I use GMM-IV estimators for contemporaneous correlation and VAR to investigate dynamic relationship between policy and capital inflow:

$$\text{Policy}_t = \alpha_0 + \alpha_1 \text{Capital Flows}_t + \alpha_2 \text{Policy}_{t-1} + \alpha_3 X_t + \varepsilon_t, \quad (4)$$

with capital flows_{t-1} as instrument variable for capital flows_t, and changes in inflation and oil prices as controls, and:

$$\begin{aligned} \text{Policy}_t &= C_1 + \sum_{p=1}^{\rho} a_{1p} \text{Capital Flow}_{t-p} + \sum_{p=1}^{\rho} a_{2p} \text{Policy}_{t-p} + \beta_1 X_t + \varepsilon_{1t} \\ \text{Capital Flow}_t &= C_2 + \sum_{p=1}^{\rho} b_{1p} \text{Capital Flow}_{t-p} + \sum_{p=1}^{\rho} b_{2p} \text{Policy}_{t-p} + \beta_2 X_t + \varepsilon_{2t} \end{aligned} \quad (5)$$

with the same controls X_t as in the GMM-IV.

The expected signs here are similar to those expected in the pro-cyclical policy tests.³⁴ A negative parameter on capital inflows would tell us that capital inflows have a “pro-cyclical” impact on fiscal policy.³⁵ In the case of monetary policy, negative parameters would indicate that an increase in capital inflow reduces real interest rates in the country, characterizing a pro-cyclical impact. The same signs are expected in the first equation of the VAR approach. To

³⁴ Once capital flows are pro-cyclical, an increase in capital flows is positively correlated with GDP growth.

³⁵ This means an increase in capital inflows lead to a loose policy.

address whether capital flows impact policy differently according with the state of the economy, I apply to equations (4) and (5) the same transformation I did in equations (2).

IV. Empirical Evidence

In this section I present the result of the estimations done to investigate both questions: whether fiscal and monetary policy are pro-cyclical in developing countries when controlling for endogenous regressors, and whether capital flows have a direct impact on this pro-cyclical behavior.

Econometric Considerations

Given that I am dealing with time series, stationarity of the series is checked using Augmented Dickey-Fuller (ADF) test with a maximum of four lags (annual data). I use the 10% level of significance to reject the unit root, and avoid the use of variables that present a unit root.³⁶ I also use the 10% level of significance in order to reject the null hypothesis that a parameter equals zero (no relationship) in all estimations. T-statistics are described beside the parameter estimates.

For the VAR estimations I use the Schwarz information criterion to choose the lag length. This criterion tends to indicate the lowest-lag Vector Autoregression, which is preferable when dealing with a short data period, such as in this paper. I also use the White heteroskedasticity-consistent covariance matrix, making the hypothesis of heteroskedasticity as the general case.³⁷

The Data

Following the literature I use annual data to search for pro-cyclical policy in four Latin-American countries – Argentina, Brazil, Chile, and Mexico, once the access to quarterly data to developing countries is not always possible. To contrast the main results with developed country

³⁶ According to Campbell and Mankiw (1989) one should use only lags of stationary endogenous variables. Also look at Stock and Watson (1988) for problems of regressions with non-stationary variables in the left hand side.

results, I implemented the same estimations for United States of America and for United Kingdom.

To construct the annual data set I collected information from the *Global Development Finance* CD-ROM, 2003, the *World Development Indicator* CD-ROM, 2002, both from the World Bank. I also collected data from the *International Financial Statistics*, various issues, and the *Government Financial Statistics Yearbook*, various issues, both from the International Monetary Fund. Some additional data was collected from the countries' respective Central Banks or Ministry of Finance. The data span is from 1970 to 2000.

I calculate the primary surplus by subtracting nominal interest paid from the overall budget of the central government for Argentina, Chile and Mexico. For Brazil I use general government that includes state enterprises and local governments. I use primary surplus in levels and in differences when it is stationary and only in differences when I could not reject the unit root (Argentina and Mexico).

An aggregate measure of net capital inflow was created by adding net transfer on debt (all flows minus interest payments), net flow on foreign direct investment and on portfolio, and subtracting profit remittances.³⁸ A measure of private net transfer from the World Bank (excludes official loans and short term debt) was also used to check for robustness. Both measures indicate similar results, but sometimes different standard errors. I present in the appendix the estimations done with the aggregate measure, because it better reflects a broad sense of international liquidity.

³⁷ See Stock and Watson (2003).

³⁸ These data are not available for USA and UK in the *Global Development Finance*. I used the sum of current account deficit with changes in international reserves as aggregate measure of net capital inflow.

I normalize this data on exports.³⁹ I estimate regressions with and without normalization, reporting the former.

ARGENTINA

a) Fiscal

I do not find any statistically significant indication that GDP growth affects government primary surplus in Argentina in either the GMM or VAR estimations.⁴⁰ However when regressions estimate different effect for different states of the economy, I find evidence that Argentina has pro-cyclical fiscal policy during recessions.⁴¹

The relation among fiscal measures and capital flows indicates that international capital influences the primary surplus in a pro-cyclical direction. Both GMM and VAR estimations suggest that an increase in capital inflow helps predict a loosening in the fiscal policy. The data also suggests that capital flows impact fiscal policy independent of the state of the economy.

b) Monetary Policy

Both GMM and VAR estimations indicate that Argentina follows a pro-cyclical monetary policy. The negative sign on GDP growth points toward an increase in the real interest rates when there is a reduction in GDP growth and vice-versa. The VAR also indicates that the causality of the pro-cyclical relation is only from growth to interest rates.

When examining policy in different states of the economy, I do not identify any statistically significant relation in the GMM estimations, while the VAR estimations tells me that Argentina follows a pro-cyclical policy during good times.

³⁹ Part of the literature uses GDP to normalize. I also normalized with GDP and found similar results. However, I prefer not to use GDP, because capital flows are considered pro-cyclical. So an increase in inflow increases GDP. I prefer a measure that is not directly affected by the movement in capital.

⁴⁰ It is possible that the privatizations implemented during the 90's in Argentina are influencing the estimations with primary surplus. The financial gains from privatization are not considered fiscal revenue in the calculus of fiscal deficit. Once Argentina had a broad privatization process, it is possible that the income generated from this process isolated the fiscal policy of behaving in a pro-cyclical way and of depending on external funds (even though part of the privatization funds came from foreign direct investment and will be counted in the capital inflow measure).

The investigation on the direct effect of capital inflow on monetary policy in Argentina presents the expected negative sign (higher capital inflow lowers interest rate) in both GMM and VAR estimations. The estimations with different states of the economy suggest that capital inflow always impact monetary policy in a pro-cyclical direction.

BRAZIL

a) Fiscal Policy

The estimations of equation (1) using the primary surplus in levels do not show statistically significant evidence of pro-cyclical policy, even though signs are in the expected direction.⁴² However, when I analyze the same data in first differences (that means the effect GDP growth would have on the change of fiscal policy), I find strong and consistent evidence that the primary deficit moves in a pro-cyclical way.

The VAR estimates show that a decrease of the GDP growth rate helps forecast an increase on primary surplus levels. I find same results using first difference of primary surplus, supporting the pro-cyclical behavior suggested by the GMM estimations.

For different states of the economy, the GMM estimations suggest that fiscal policy is always pro-cyclical, while the VAR show statistically significant support for pro-cyclical policy only during good times.

I find no consistent conclusion when analyzing the direct effect that net capital inflows have on fiscal policy in Brazil. These findings are consistent with the estimations for different states of the economy.

⁴¹ See Appendix 3.A.

⁴² I used a measure of general government for primary surplus in the case of Brazil, joint data from the IMF and from Central Bank of Brazil.

b) Monetary Policy

The GMM estimates indicate that Brazil practices pro-cyclical monetary policy, in which the real interest rates increases when the country faces a reduction on growth. The VAR estimations support the GMM findings, with statistically significant negative parameters, suggesting that a fall in the GDP helps forecast an increase in the real interest rates.

The estimations for different states shows that monetary policy is indistinctly pro-cyclical regardless of whether the country is in a good or in a bad state.

The estimations of equations (5) and (6) show evidence that capital flows directly affect real interest rates in Brazil. Both the GMM and the VAR estimations indicate that an increase in capital inflows leads to a decrease in real interest rates and vice-versa. The data show that this impact is statistically significant in good and bad states.

CHILE

a) Fiscal

I do not find any statistically significant relation for fiscal policy in Chile using GMM estimations. The VAR estimations, however, show a counter-cyclical policy using primary surplus in levels, with the caveat that the VAR estimations show a bi-causal relationship.

This counter-cyclical policy is supported by the investigation of the relation of fiscal policy and economic growth in different states of the economy, in which I find that fiscal policy is counter-cyclical during periods of growth.

It is possible that the fund for the stabilization of copper's price may explain the ability of Chile's government to implement counter-cyclical fiscal policy here identified. This fund was created in 1985 to save resources when the price of copper is above a threshold and to use the resource when the price is below the threshold. Even though the relative importance of revenue with copper has declined in the Chilean public budget throughout the 1990s, it accounted for

almost 30% of all fiscal revenue late 1980s. The capital controls implemented by Chile during this period might also have influenced these findings.

It is interesting to note, however, that even though there is no evidence that Chile follows pro-cyclical fiscal policy the data indicates that net capital flows have direct impact on policy. An increase in capital inflows helps predict a loosening fiscal policy. This evidence was captured by both approaches, and appears statistically significant in good and bad times. This says that fiscal policy in Chile reacts to capital inflows in the direction the recent literature suggest, but this behavior is not sufficient to make policy pro-cyclical.

Chile is an interesting case study. This is the first case where I find a different answer about fiscal policy from the previous literature. In contrast to IMF (2002) based on OLS estimations, that finds pro-cyclical policy, I find some evidence of counter-cyclical policy. Additionally, the case of Chile indicates that the different theoretical explanations of pro-cyclical fiscal policy presented in the literature review may be not inconsistent. Capital inflows may directly impact policy in pro-cyclical direction as in Chile, but if the developing country's government finds a way to save resources in good times (as did Chile with the fund for stabilization of the copper price), it may be able to act counter-cyclically during bad times.

b) Monetary Policy

The sample size of the series used for real interest rates in Chile is very small, from 1992 to 2001. Additionally, the regressions are unstable and not robust. For these reasons, I do not analyze the behavior of monetary policy in Chile.

MEXICO

a) Fiscal

The GMM and the VAR estimations for the primary surplus⁴³ indicate that Mexico practices pro-cyclical fiscal policy. The estimations to investigate asymmetries in policy during good and bad states show signs that Mexico follows pro-cyclical policy in both states, but I only find statistically significant indication of pro-cyclical policy during low-growth periods.

Investigating the direct impact of capital inflow on fiscal policy I find that both GMM and VAR estimations demonstrate economic and statistical support for the fact that capital flows affect the primary surplus in a pro-cyclical direction. The estimations to study policy for different states of the economy show statistically significant pro-cyclical impact of capital flows when economic growth is below average.

b) Monetary

I find no evidence of pro-cyclical monetary policy in Mexico. Both the GMM and the VAR estimations have counter-cyclical signs, although not statistically significant. The estimations regarding policy in different states have counter-cyclical sign in periods of high growth and pro-cyclical signs in periods of low growth but, again, they are not statistically significant.

The effect of the impact of capital inflows have on real interest rates is not statistically significant, although the parameters are consistently negative for all estimations (pro-cyclical). Examining policy in different states, I find that capital inflow impacts monetary policy in a pro-cyclical direction during bad times.

Mexico may be a case where the authorities act to increase interest rates during bad times to fight capital outflows, but it is possible that the increase in inflation ends up being bigger than

⁴³ I used the first difference of primary surplus over GDP in the estimations for testing to investigate the pro-cyclical fiscal policy in Mexico, once I could not reject unit root in this fiscal measure, and this regressions gives me the direction the fiscal policy takes.

the increase in the nominal interest rates, resulting in a ex-post decrease in the real interest rates. In fact, looking at the nominal interest rates, I realize that Mexico increases it during bad times (especially during 1982 and 1995 crises).

DEVELOPED COUNTRIES

I present the result of the same estimations for two developed countries - USA and United Kingdom - to be used as benchmark to help better understand the information found for the developing countries investigated here. To make these estimations more comparable, I used the same period and data source.

USA

a) Fiscal

The GMM estimations do not show statistically significant relation between fiscal policy and economic growth, while the VAR estimations shows evidence of counter-cyclical policy. The estimations with different states show statistically significant evidence that USA implement counter-cyclical fiscal policy during good times.

Both GMM and VAR estimations show signs that capital flows impact fiscal policy in a counter-cyclical direction, but this is not statistically significant. Looking at the asymmetric impact, I find that capital flows affect policy in a counter-cyclical direction during good times and in a pro-cyclical direction in bad times.

b) Monetary

I find no statistically significant relation between monetary policy and economic growth in USA.⁴⁴ Both the GMM and the VAR estimations have counter-cyclical signs, but they are not statistically significance. The estimations regarding policy in different states have counter-

⁴⁴ It is possible that the Paul Volker period (low growth and high interest rate) is compensating for those where USA followed counter-cyclical policy. One additional problem in theses estimations is that the data do not includes the period pos-2000, where the common sense recognize the adoption of counter-cyclical monetary policy.

cyclical sign in periods of high growth and pro-cyclical signs in periods of low growth but none of these is statistically significance.

The estimations of the effect of the impact of capital inflows have on real interest rates do not present statistically significant results, although the parameter signs indicate counter-cyclical direction. With different states I could identify evidence that capital flows impact monetary policy in counter-cyclical direction in good state with the VAR estimations.

UNITED KINGDOM

United Kingdom is a good developed country benchmark, even better than the USA that is a very larger country.

a) Fiscal

Both GMM and VAR estimations show evidence of counter-cyclical policy in UK. When separated for good and bad states of the economy, the evidence is only statistically significant in the good state.

Investigating the direct impact of capital inflow on fiscal policy I find support for pro-cyclical influence in the VAR estimations. Estimations for different states of the economy show that this pro-cyclical influence is statistically significant during bad times.

b) Monetary

I find that the UK follows counter-cyclical monetary policy. This evidence is supported by both estimations. The GMM estimations for different states of the economy show evidence of counter-cyclical monetary policy during good times, but the VAR estimations suggest that it is valid for both states. I find no statistically significant evidence of the relation between capital flows and monetary policy in UK, although the signs suggest pro-cyclical direction. I find same results looking for policy in different states but the sign suggests a counter-cyclical impact during good times and a pro-cyclical influence in bad times.

V. Conclusions and Policy Implications

This paper addresses two questions. First is there empirical evidence that developing countries that face financial constraints experience pro-cyclical fiscal and monetary policy? Second, do capital flows directly impact policy decisions in these countries?

Using a sample of four LA countries to study these questions, I find the answer to be partially yes for both questions. LA countries do practice pro-cyclical fiscal and monetary policy, with exception of Chile for fiscal policy and Mexico for monetary policy. For the second question I find that capital flows have pro-cyclical impact on policy decisions in these countries. This answer is consistent with the intuition given in most of the theoretical literature.

I find evidence that Argentina, Brazil and Mexico follows pro-cyclical fiscal policy, while I come across with evidence that Chile follows counter-cyclical policy. Regarding monetary policy I obtain evidence that Argentina and Brazil follows pro-cyclical monetary policy. I have no information about Chile, and I am not able to make a clear conclusion about monetary policy in Mexico.

The summary tables 3.01 and 3.02 show that the majority of the signs indicate pro-cyclical policy in the Latin American countries. The only statistically significant results are pro-cyclical, with the exception of fiscal policy in Chile.

Comparing results to the developed country benchmark, I observe that the USA and the United Kingdom follow counter-cyclical fiscal policy and that the second engages in counter-cyclical monetary policy. My data do not permit me to reach a clear conclusion regarding USA monetary policy.

Table 3.01: Policy Directions and International Capital Influence

	Argentina	Brazil	Chile	Mexico	USA	UK
Fiscal Policy						
Direction						
GMM	P	P*	C	P*	C	C*
VAR	P	P*	C*	P*	C*	C*
Capital Influence						
GMM	P*	P	P*	P*	C	P
VAR	P*	C	P*	P*	C	P*
Monetary Policy						
Direction						
GMM	P*	P*	na	C	C	C*
VAR	P*	P*	na	C	C	C*
Capital Influence						
GMM	P*	P*	na	P	C	P
VAR	P*	P*	na	P	C	P

P is for pro-cyclical policy or pro-cyclical influence of international capital movement.

C is for counter-cyclical policy or counter-cyclical influence of international capital movement.

* is for statistical significance (at least 10%).

Please see Appendix 3.2 for detailed estimation results in Table 3.1.

Table 3.02: Policy Directions and Capital Influence Under Different State of the Economy

	Argentina	Brazil	Chile	Mexico	USA	UK
Fiscal Policy						
Direction						
GMM - Good	C	P*	C	P	C*	C*
GMM - Bad	P	P*	C	P	P	P
VAR- Good	C	P*	C*	P	C*	C*
VAR - Bad	P*	P	C	P*	C	C
Capital Influence						
GMM - Good	P*	P	P*	P	C*	C
GMM - Bad	P*	C	P	P*	P*	P*
VAR- Good	P*	P	P	P	C*	P
VAR - Bad	P	C	P*	P*	P*	P*
Monetary Policy						
Direction						
GMM - Good	C	P*	na	C	C	C*
GMM - Bad	P	P	na	P	P	P
VAR- Good	P*	P*	na	C	C	C*
VAR - Bad	P	P*	na	P	P	C*
Capital Influence						
GMM - Good	P*	P*	na	C	C	C
GMM - Bad	P*	P*	na	P	P	P
VAR- Good	P*	P*	na	C	C*	C
VAR - Bad	P*	P	na	P*	P	P

P is for pro-cyclical policy or pro-cyclical influence of international capital movement.

C is for counter-cyclical policy or counter-cyclical influence of international capital movement.

* is for statistical significance (at least 10%).

Please see Appendix 3.3 for detailed estimation results in Table 3.2.

Regarding capital flows, the estimation results show that capital inflows have direct effect on fiscal policy (loosening the policy when there is a larger capital inflow) for three of four countries. I also find some evidence that monetary policy is directly influenced by capital inflows for all developing countries studied.

These findings suggest that developing countries adopt pro-cyclical monetary and fiscal policy in contrast with what happen with developed nations, as suggested by the literature. This study also suggests that capital flows have strong influence on the policy direction.

One immediate conclusion is that the fact that I find Chile follows counter-cyclical policy may be an empirical evidence of the efficiency of some kind of fiscal saving mechanism during good times, helping implement a counter-cyclical policy. Regarding the impact of capital flows, a possible conclusion of these findings is that some prudential regulation in capital mobility may help reduce the destabilizing effect of fiscal and monetary policy and so reduce macroeconomic volatility in these countries over the short run. A large portion of the literature advocates this solution, as one can see in Espinosa-Vega et al. (2000), Carvalho (2000), Caballero (2002a), and Ocampo (2003).

Over the long run, the solution requires measures that help develop the domestic financial system, reducing the existence of credit constraints, as explored by Ferreira da Silva (2001) and Caballero (2002a).

Further research should be done to incorporate more developing countries and compare regional policy responses to movement in capital flows.

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