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MONETARY POLICY INDEPENDENCE UNDER FLEXIBLE EXCHANGE RATES: AN ILLUSION?

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ABSTRACT

I analyze whether countries with flexible exchange rates are able to pursue an independent monetary policy, as suggested by traditional theory. I use data for three Latin American countries with flexible exchange rates, inflation targeting, and capital mobility – Chile, Colombia and Mexico – to investigate the extent to which Federal Reserve actions are translated into local central banks' policy rates. The results indicate that there is significant "policy contagion," and that these countries tend to "import" Fed policies. The degree of monetary policy independence is lower than what traditional models suggest.

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1. Introduction

Throughout his long and distinguished career, Ronald I. McKinnon embarked on many crusades. Perhaps his best known concern was related to the need to end "financial repression," "liberalize" the financial sector in developing countries, and allow market-determined interest rates to guide resource allocations and determine the level of domestic savings (McKinnon, 1973). But, of course, he had many other preoccupations. For instance, his early and very influential work on "optimal currency areas" provided guidance to many policy makers, including to the architects of the Euro (McKinnon, 1963). He was also a pioneer in studying the appropriate "sequencing of economic reforms" (McKinnon, 1979). Which markets to liberalize first and which ones later in a reform process? When are capital controls to be lifted? When is it adequate to liberalize labor markets? Should trade be opened up fully, before reducing inflation significantly? All of these questions became central during the 1990s, when country after country – including the nations in the former Soviet bloc – embarked in market-oriented reforms.[1]

But perhaps the policy issue that occupied most of his time after 1973 had to do with exchange rate regimes. Ron McKinnon was, decisively, a fixed exchange rates economist. He believed that the world would be a better place if currency values were fixed. In the 1980s, for instance, McKinnon argued for a new monetary system arranged around fixed parities between the U.S. dollar, the German mark, and the Japanese yen. In a1987 Op-Ed he referred to his proposal as a "gold standard without gold."[2] McKinnon's fixed exchange rate system was based on the combination of two ideas: First, he was skeptical about the role played by exchange rate adjustments in solving external imbalances. He argued that when one looked at the current account as the difference between savings and investment, it was unclear how useful a real depreciation was as a way of reestablishing equilibrium. Second, he believed that flexible exchange rates were excessively volatile and that this was harmful for the economy. McKinnon expounded his views on the subject in a variety of ways, including academic articles, books, and newspaper pieces. See, for example, McKinnon (1993).

In this paper I explore a specific aspect of the grand theme of exchange rate regimes, and I ask whether, as suggested by traditional theory, countries with flexible exchange rates have historically been able to pursue a truly independent monetary policy. I argue that to the extent that central banks take into account other central banks' policies there will be a "policy spillover," and monetary policy will not be fully independent.

According to traditional open economy macroeconomics models – say, in the tradition of Mundell-Fleming – one of the advantages of flexible exchange rates is, indeed, that the country in question can control its own monetary policy. Another way of putting this is that under flexible rates countries are not subject to the "trilemma" that states that it is not possible to have simultaneously fixed exchange rates, capital mobility, and an independent monetary policy. At

[1] For a discussion of the sequencing of reform that was influenced by McKinnon's thinking see Edwards (1990).
[2] McKinnon (1987).

the end of the road, however, the extent of monetary policy independence is an empirical matter. If, for whatever reason, a particular central bank feels that it needs to mimic (or follow) other countries policy actions, then there will be policy "contagion" and the actual – as opposed to theoretical – degree of monetary policy autonomy is greatly reduced.

In this paper I use data from three Latin American countries with flexible exchange rates – Chile, Colombia, and Mexico – to analyze the extent to which policy changes by the Federal Reserve are transmitted into domestic policy interest rates. I cover the period that goes from January 2000 through early June 2008. That is, I exclude the turmoil that followed the collapse of Lehman Brothers and the Fed policy based on zero interest rates and quantitative easing (QE).[3]

This analysis is particularly relevant at the time of this writing – early 2015 –, as the Federal Reserve is expected to begin hiking policy interest rates in mid- to late-2015. A key question at this juncture is this: What is the historical evidence regarding the impact of Fed interest rate hikes on Latin American policy interest rates and financial markets? Will these countries be able to maintain monetary independence when the Federal Reserve enters a tightening cycle?

It is interesting to note that in May 2014, a few months before passing, Ron McKinnon stated at a conference held at the Hoover Institution that "there's only one country that's truly independent and can set its monetary policy. That's the United States."[4]

The rest of the paper is organized as follows: In Section 2 I discuss the theoretical underpinnings of the analysis. In Section 3 I present the basic data for the three Latin American countries in the sample, as well as the data for the United States. Section 4 includes de regression results. I discuss estimates using both least squares and instrumental variables, and I use a variety of controls. In this Section I also deal with robustness and extensions. In Section 5 I investigate the possible role of capital mobility in the pass-through process. Finally, in Section 6 I offer some concluding comments and I deal with areas for future research. There is also a Data Appendix.

2. Policy independence or policy contagion?

A good starting point for this discussion is the uncovered interest arbitrage condition. Consider a small open economy with risk neutral investors. Assume further, and in order to simplify the exposition, that there are no controls on capital (both of these assumptions can be relaxed without any consequences for the analysis; see Section 5 of this paper).[5] Then, the following condition will hold in equilibrium:

[3] Aizenman et al (2014) analyzed how the announcement of Federal Reserve tapering in 2013 affected financial conditions in the emerging markets.

[4] I thank John Taylor for making the transcript of Ron McKinnon's remarks available to me.

[5] See, also, Edwards (2012).

$$(1) \quad r_t - r_t^* = E_t\{\Delta e_{t+1}\},$$

Where r_t and r_t^* are domestic and foreign interest rates for securities of the same maturity and equivalent credit risk, and $E_t\{\Delta e_{t+1}\}$ is the expected rate of depreciation of the domestic currency. In a country with a credible fixed exchange rate, $E_t\{\Delta e_{t+1}\} = 0$, and $r_t = r_t^*$. That is, local interest rates (in domestic currency) will not deviate from foreign interest rates. Under these circumstances changes in world interest rates will be transmitted in a one-to-one fashion into the local economy. It is in this sense that with (credible) pegged exchange rates there cannot be an independent monetary policy; the local central bank cannot choose its own rate of interest. Under flexible rates, however, $E_t\{\Delta e_{t+1}\} \neq 0$, and local and international rates may deviate from world interest rates.

Consider a situation where there is a tightening of monetary policy in the foreign country that results in a higher r_t^*. As noted, under pegged exchange rates this would be translated in a one-to-one increase in r_t. Under flexible rates it is possible that r_t remains at its initial level, and that all of the adjustment takes place through an expected appreciation of the domestic currency, $E_t\{\Delta e_{t+1}\} < 0$. However, as Dornbusch (1976) showed in his celebrated "overshooting" paper, for this to happen it is necessary for the local currency to depreciate on impact by more than in the long run. Under flexible rates, then, the exchange rate will be the "shock absorber" and will tend to be highly volatile.

If central banks want to avoid "excessive" exchange rate volatility, they are likely to take into account other central banks' actions when determining their own policy rates. It is possible that the policy rule (i.e. the Taylor Rule) will include a term with other central banks' policy rate.[6] In a world with two countries, this situation is captured by the following two policy equations (where r_p is the policy rate in the domestic country, r_p^* is the policy rate in the foreign country, and the x and x^* are vectors with other determinants of policy rates, such as deviations from inflation from their target):

$$(2) \quad r_p = \alpha + \beta r_p^* + \gamma x$$

$$(3) \quad r_p^* = \alpha^* + \beta^* r_p + \gamma^* x^*.$$

[6] In Edwards (2006) I argue that many countries include the exchange rate as part of their policy (or Taylor) rule. Taylor (2007, 2013) has argued that many central banks include other central banks' policy rates in their rules. The analysis that follows owes much to Taylor's insights.

In equilibrium, the monetary policy rate in each country will depend on the other country's rate.[7] For the domestic country the equilibrium policy rate is (there is an equivalent expression for the foreign country):

$$(4) \quad r_p = \frac{\alpha + \beta\alpha^*}{1-\beta\beta^*} + \left(\frac{\gamma}{1-\beta\beta^*}\right) x + \left(\frac{\beta\gamma^*}{1-\beta\beta^*}\right) x^* \ .$$

Changes in the drivers of the foreign country's policy interest rate, such as α^* or x^*, will have an effect on the domestic policy rate. This interdependence is illustrated in Figure 1 that includes both reaction functions (2) and (3); PP is the policy function for the domestic country and P*P* for the foreign nation. The initial equilibrium is at point A. An increase in x^* (say the gap between actual and target inflation in the foreign country), will result in a shift to the right of P*P* and in higher equilibrium policy rates in both countries; the new equilibrium is depicted by point B.[8] Notice that in this case the final hike in the foreign policy rate gets amplified; it is larger than what was originally planned by the foreign central bank.

Figure 1 corresponds to a situation where both countries take into consideration the other nation's actions. But this needs not be the case. Indeed, if one country is large (say, the U.S.) and the other one is small (say, Chile), we would expect policy contagion to be a one way phenomenon. In this case, and if the foreign country is the large one, β^* in equation (2) will be zero, and the equilibrium condition will be as in Figure 2. A hike in the foreign country's policy rate will impact the domestic country rate, but there will be no feedback to the large nation and, thus, no amplifying effect. The magnitude of the "policy spillover" will depend on the slope of the PP curve. The steeper this curve, the larger is policy contagion; if, on the contrary, the PP curve is very flat, policy contagion will be minimal. At the end of the road, the extent to which specific countries are affected by policy contagion is an empirical matter.

3. A preliminary look at the data

Before proceeding, it is useful to discuss briefly the sample used in this paper. Chile, Colombia, and Mexico are the three Latin American countries with available weekly data for the variables of interest. In addition, they have three important characteristics in common: they followed inflation targeting during the period under study (2000-2008), they had a relatively high degree of capital mobility (more on this in Section 5 below), and had independent central banks. In that sense, they are a somewhat homogenous group. As noted, the analysis covers the period starting in January 2000 and ends in early June 2008, just before the Lehman Brothers crisis and the

[7] The stability conditions is $\beta\beta^* < 1$. That is, in Figure 1 the P*P* schedule has to be steeper than the PP schedule,
[8] The new equilibrium will be achieved through successive approximations, as in any model with reaction functions of this type, where the stability condition is met.

beginning of unconventional policy actions by the Federal Reserve, including the (virtually) zero interest rates policy and quantitative easing (QE).

In Figure 3 I present data on these three countries central banks' policy rates and on the Federal Reserves' Federal Funds Rate. During the period under study – between January 2000 and June 2008 – there were 40 changes in the Federal Funds' rate. Twenty corresponded to rate increases, and twenty to rate cuts. Simple inspection of this Figure suggests that there was some relation between the Fed Funds and policy interest rates in the Latin American sample. This is particularly so during the earlier period. The relation, however, is far from perfect.

Standard tests indicate that it isn't possible to reject the null hypothesis that the policy interest rates have unit roots. For this reasons in the analysis that follows I rely on an error correction specification. This is standard in the literature on interest rate dynamics.[9] In addition, and not surprisingly, it is not possible to reject the hypothesis that the Fed Fund's rate "Granger causes" the Latin American policy rates; on the other hand, the null that these rates "cause" Fed policy actions may be rejected at conventional levels. The details of these tests are not reported here due to space considerations; they are available on request.

4. A "contagion" empirical model of monetary policy

In this section I report the results from the estimation of a number of equations for monetary policy rates for Chile, Colombia and Mexico. I assume that each central bank has a policy function of the form of equation (2), and that central banks don't adjust their policy rates instantaneously to new information. More specifically, I estimate the following error correction model that allows central banks to make adjustments at a gradual pace:

$$(5) \quad \Delta r_t^p = \alpha + \beta FF_t + \gamma \Delta r_{t-1}^p + \delta r_{t-1}^p + \sum \theta_j \, x_{jt} + \varepsilon_t.$$

r_t^p is the policy rate in each of the three countries in period t, FF_t is the Federal Funds interest rate, the x_{jt} are other variables that affect the central bank policy actions, including, in particular, inflationary pressures, global perceptions of country risk, expectations of global inflation, and the expected depreciation of the currency. If there is policy contagion the estimated β would be significantly positive. The extent of long term policy spillover is given by $-\left(\frac{\beta}{\delta}\right)$. If, for

[9] See, for example, Frankel, Schmukler, and Serven (2004), Shambaugh(2004) and Edwards (2012) for analyses of the transmission of interest rate shocks. Those studies are different from the current paper in a number of respects, including the fact that they concentrate on market rates and don't explore the issue of "policy contagion." Other differences are the periodicity of the data (this paper uses weekly data) and the fact that in the current work individual countries are analyzed. Rey (2013) deals with policy interdependence, as does Edwards for the case of one country only (Chile).

example, $-\left(\frac{\beta}{\delta}\right) = 1$, then, there will be full importation of Fed policies into domestic policy rates. In this case, monetary autonomy would be greatly reduced. Parameter γ allows for the adjustment to a new equilibrium policy rate to be cyclical; this, however, is unlikely. In equation (4) the timing of the variables is contemporaneous. However, in the estimation, and as explained below, alternative lag structures were considered.

4.1 Basic results

In the estimation of equation (5) I included the following covariates x_{jt}: (a) Year over year inflation rate, lagged six weeks. Its coefficient is expected to be positive, as central banks tight policy when domestic inflation increases. (b) Expected depreciation, measured as the annualized difference between the three month forward exchange rate relative to the USD and the spot exchange rate. This variable is included with a one period lag and, if central banks are concerned about the value of the currency, its coefficient is expected to be positive. (c) A measure of expected global inflationary pressures, defined as the breakeven spread between the five year Treasuries and five year TIPS. This is entered with one period lag and its coefficient is expected to be positive.[10] In addition, in some regressions I entered an indicator of country risk premium, defined as the lagged EMBI spread for Latin America. Its expected sign is not determined a priori, and will depend on how central banks react to changes on perceived regional risk.

The results reported in Table 1 are quite satisfactory. This is especially the case considering that interest rate equations are often difficult to estimate. As may be seen, most coefficients are significant at conventional levels, and have the expected signs. The R-squared is quite low, as is usually the case for interest rate regressions in first differences. The most salient findings in Table 1 may be summarized as follows:

- In every regression the coefficient of the Federal Funds rate (FF-Policy) is significantly positive, indicating that during the period under study there was a pass-through of U.S. policy rates into central banks' policy interest rates in the three Latin American countries in this sample. These coefficients are positive and significant, even when expected devaluation, country risk and global financial covariates are included in the regressions.

- The extent of long term policy contagion, measured by $-\left(\frac{\beta}{\delta}\right)$, is rather large. The point estimates for the long run effect range from 0.32 for Mexico to 0.74 for Colombia; for Chile it is 0.45 in equation (1.1) and 0.74 in equation (1.4) in Table 1. However, in none of the three cases the pass-through is one-to-one. The null hypothesis that $-\left(\frac{\beta}{\delta}\right) = 1$ is rejected at conventional levels.

[10] However, it is possible to argue that once the Fed Funds rate is included, the coefficient of the spread between Treasuries and TIPS should be zero, since the Fed Funds rate already incorporates market expectations of inflation of the US.

- Consider a 50 basis point increase in the Federal Funds rate. According to the estimates in the three first columns in Table 1, after 12 weeks the transmission into Chile is, on average, equal to 7 basis points; in Colombia it is 16 basis points, and in Mexico 8 basis points, on average. After 6 months, the pass-through into Chile is 13 basis points, on average;, 27 bps to Colombia; and 12 basis points to Mexico. After one year, the transmission is almost completed: in Chile policy rates will be almost 25 basis points higher, in Colombia 38 bps higher and in Mexico 16 basis points on average.[11]

- The coefficients of the controls have, in almost every case, the expected signs, and are significant at conventional levels. These results indicate that as expected, with other things given, inflationary pressures – both domestic and global – result in higher policy rates. The same is true for expected devaluation in Chile and Mexico. A higher country risk premia impacts policy rates in Chile and Colombia (although with different signs).

A possible limitation of the results in Table 1 is that they don't include a measure of domestic activity in the country in question; this is because there are no higher frequency estimates for real activity. Customary Taylor Rules, however, do consider the possibility that central banks react to evolution of the real economy. In order to consider this possibility in a number of regressions I added the change of the country's main commodity export as a proxy for real activity.[12] The results are reported in Table 2, where a different commodity index is used for each country.[13] The variable is defined as the accumulated change in the commodity price over 6 months, lagged one period. The more salient aspects of these estimates may be summarized as follows: The results regarding "policy contagion" reported in Table 1 are maintained, as are the results on the other regressors. In addition, the coefficient of the accumulated change in export prices is positive, as expected, in all regressions and significant in the estimates for Colombia and Mexico. This suggests that global market for exports strengthens, and prices increase (and through this indicate a stronger local economy), the central bank will tend to reduce liquidity.

4.2 Extensions, robustness, instrumental variables, and capital market rates

In the regressions reported in Tables 1 and 2 the Fed Funds rate was entered with a one period (week) lag. However, if the contemporaneous Fed Funds rate is used the results are virtually

[11] Most (but not all) central banks conduct policy by adjusting their policy rates by multiples of 25 bps. The estimates discussed here refer to *averages*. Thus, they need not be multiples of 25 bps.

[12] There are no weekly data on real activity. However, there is significant evidence that the evolution of prices of the major commodity export is a good leading indicator of economic performance.

[13] For Chile it is the weekly price of the JP Morgan copper; for Colombia a combination of coffee and oil; and for Mexico I use the JP Morgan oil index (WTI).

identical.[14] Also, results were basically unaltered if the estimation period was altered somewhat, and if the *effective* Federal Funds rate was used instead of the *target* rate.

An interesting question is whether other policies related to global economic conditions enter these three countries policy rules. I address this issue by considering two additional covariates: the yield on the U.S. ten year Treasury note, and the (log of the) Euro-USD exchange rate. Adding the ten year Treasury yield allows me to investigate if central banks react to changes in the global yield curve. The results obtained suggest that this is not the case. However, in two of the regressions (for Colombia and Mexico) the coefficient of the (one period lagged) Euro-USD exchange rate is significantly possible. The inclusion of this variable, however, doesn't affect the main findings regarding "policy contagion" presented in Tables 1 and 2.[15]

Another important question is whether the extent of "policy contagion" changes depending on whether the FOMC increases or cuts the Fed Funds rate. I investigated this issue by separating positive and negative changes. The results don't support the idea of asymmetrical responses.

Given the structure of lags and the nature of the covariates included in the analysis, it is unlikely that the results are affected by endogeneity issues. For countries such as Chile, Colombia and Mexico, the Fed Funds rate, the yield on TIPS, and global commodity prices are clearly exogenous to their monetary policy decisions. One could argue, however, that in a specification where some covariates are entered contemporaneously, the expected depreciation variable may be endogenous. In order to be on the safe side I estimated instrumental variables versions of the equations in Table 1 and 2. The results are presented in Table 3, and confirm that during the period under consideration the three countries were subject to considerable "policy contagion."[16] Table 3 also includes a pooled data estimate; in this case country fixed effects were included.

I also investigated the extent to which Fed policies were translated into (short run) market rates. The results obtained – also available on request – show that there is a significant and fairly rapid pass-through from Federal Reserve policies into 3-month CD rates in the three countries in the sample. This is the case even after controlling for expected depreciation, country risk, and global financial conditions such as the USD-Euro exchange rate and commodity prices.

5. Capital mobility and "policy contagion"

Equation (1) assumes that there are no capital controls, and that capital can move freely across countries. If, however, there is a tax on the repatriation of capital, then equation (1) becomes:[17]

[14] The data refer to the end of the week (Friday). Since the FOMC never meets on a Friday, Fed actions will precede in time the recording of the local interest rate

[15] Results available on request.

[16] The following instruments were used: log of lagged commodity prices (copper, coffee, metals, energy, WTI oil), lagged USD-Euro rate, 6 periods lagged effective devaluation, and lagged expected depreciation.

[17] See, for example, Edwards (2012).

(1') $r_t - r_t^*(1-t) + t = E_t\{\Delta e_{t+1}\}$,

Where t is the rate of the tax. As noted in the introduction, the three Latin American countries in this study had significant degree of capital mobility during the period under study. The extent of mobility, however, varied across the three countries, with Chile being the most open one, followed by Mexico and then by Colombia. In addition, during the (almost) ten years covered by this analysis there were some adjustments to the extent of mobility in all three countries. This was especially the case of Chile, a country that in early 2001, and during the negotiation of the Free Trade Agreement with the United States, opened it capital account further.

In Figure 4 I present the evolution of a comprehensive index of capital mobility. I took the basis of this indicator is taken from the Fraser Institute, and I then I used country-specific data to refine it and find the moments when there were policy changes in the three countries – see the data appendix for details. A higher number denotes a higher degree of capital mobility.

An important question, then, is whether the degree of capital mobility affects the extent of pass-through from Fed Funds rates into market interest rates in emerging countries. In order to address this issue I estimated a number of equations of the type of (4) with two additional regressors: an index of capital mobility, and a variable that interacts that index with the Fed Funds rate. The rather limited variation in the mobility index within each country means that in this case it is difficult to estimate country specific regressions. For this reason, in this particular case I relied on a dynamic panel. All regressions include fixed effects terms.

The results in Table 4 may be summarized as follows: (1) they confirm the findings reported in previous Tables: there is a pass-through from Fed Funds rates into domestic policy rates in the three Latin American countries in this study. And (2), for this group of countries there is no strong evidence suggesting that the extent of the pass-through depends on capital mobility. These results, however, should be interpreted with caution and should be the subject of further research. This is for a number of reasons: first, the index of capital mobility is an aggregate summary that includes different modalities of capital controls. To understand better the role of mobility on interest rate pass-through it is necessary to construct more detailed and granular indexes. Second, and as noted, all three countries in the sample had a fairly open capital account. In order to investigate this issue fully, a broader sample that includes countries with greater restrictions would be required.

6. Concluding remarks

At the time of this writing, – early 2015 – it is expected that the Federal Reserve will raise interest rates before the end of the year. It will be the first Federal Funds hike since 2006. An important question is how is the tightening of monetary policy going to affect the emerging markets. In this paper I attempt to provide a (partial) answer to this question by investigating the

extent to which Fed policy actions have been passed into monetary policy interest rates in three Latin American nations with flexible exchange rates – Chile, Colombia and Mexico. I use weekly data for the period January 2000 through early June 2008. More specifically, I investigate whether during this period tere was "policy contagion," and the three central banks in the sample "imported" U.S. monetary policy.

The basic estimates suggest that Federal Reserve interest rate changes are imported, on average, by 74% in Colombia, more than 50% in Chile and 33% in Mexico. That is, if the Federal Reserve were to hike rates by a cumulative total of 325 basis points – bringing the Fed Funds rate to 3.5% – we could expect that (with other things given) Colombia would hike policy rates by 250 basis points, Chile by 162 basis points, and Mexico by more than n100 basis points. There is no evidence that the results depend on the extent of capital mobility (it should be noticed, however, that the three countries had a fairly high degree of capital mobility during the period under study).

The finding of (very) high pass-through from advanced countries monetary policy to local monetary policy in countries with flexible rates is important for the debate on optimal exchange rate regimes. Indeed, according to traditional models one of the key advantages of flexibility is that the country in question can run its own monetary policy. The results in this paper question that principle, by indicating the high degree of "policy contagion."

A possible explanation for the results reported in this paper is related to "fear to float."[18] According to models in the Mundell-Fleming tradition, if there is less than perfect capital mobility, a hike in the global interest rate – generated by, say, Federal Reserve action – will result in an incipient external deficit and in a depreciation of the domestic currency. Indeed, it is this currency adjustment what reestablishes equilibrium with a domestic interest rate that is very similar to the original one. If, however, there is "fear to float," the local authorities will be tempted to contract their own monetary stance (i.e. hike their own policy rates) as a way of avoiding the weakening of the currency. Further investigation along these lines should shed additional light onto the question of the "true" degree of monetary independence in small countries with flexible exchange rates. A particularly important point that follows from this analysis is that, to the extent that the advanced country central bank (i.e. the Fed) pursues a destabilizing policy, this will be imported by the smaller nations.[19]

[18] Calvo and Reinhart (2000) is the classical reference on this subject.
[19] For a discussion along these lines see, for example, Taylor (2013), See, also, Edwards (2012) and Rey (2013).

Data Sources

Interest rates: Domestic CD rates for Chile, Colombia, Mexico and the U.S. correspond to 90-day CDs, and were obtained from *Datastream*. Data on U.S. Treasuries and Federal Funds rate were also obtained from *Datastream*. All the figures correspond to the Friday of that particular week.

Exchange rates: For the Latin American countries they correspond to units of domestic currency per USD. Expected devaluation is constructed as the 90 day forward discount also relative to the USD. The Euro-USD rate is defined as Euros per USD. The source is *Datastream*.

Commodity Price Indexes: Obtained from the JP Morgan data set.

Country risk: Defined as the EMBI premium above Treasuries, measured in percentage points. The data were obtained from *Datastream*.

Latin American central banks' policy rates: Obtained from the respective central banks bulletins and web pages.

Table 1: Monetary Policy Rates in Chile, Colombia and Mexico, 2000-2008, (Least Squares)

Eq Name:	(1.1) CHILE	(1.2) COLOMBIA	(1.3) MEXICO	(1.4) CHILE	(1.5) COLOMBIA	(1.6) MEXICO
FF_POLICY(-1)	0.014 [1.983]**	0.035 [3.572]***	0.017 [1.807]*	0.026 [2.679]***	0.030 [2.939]***	0.020 [1.631]*
C	-0.113 [-1.306]	-0.375 [-3.001]***	-0.282 [-1.536]	-0.342 [-2.220]**	-0.222 [-1.536]	-0.339 [-1.469]
POL_RATE(-1)	-0.031 [-3.007]***	-0.047 [-3.941]***	-0.053 [-4.191]***	-0.035 [-3.302]***	-0.050 [-4.188]***	-0.054 [-4.198]***
TIPS_EXP_INF(-1)	0.059 [1.844]*	0.115 [3.156]***	0.169 [2.943]***	0.124 [2.569]**	0.070 [1.644]*	0.187 [2.592]***
EXP_DEV_AN(-1)	0.008 [1.698]*	-0.002 [-0.468]	0.026 [2.984]***	0.005 [1.174]	-0.001 [-0.175]	0.026 [2.879]**
D(POL_RATE(-1))	0.004 [0.078]	-0.043 [-0.843]	-0.018 [-0.351]	-0.002 [-0.047]	-0.050 [-0.994]	-0.019 [-0.357]
INF_YOY_L	0.018 [1.647]*	0.059 [4.368]***	0.027 [1.735]*	0.018 [1.674]*	0.065 [4.712]***	0.026 [1.343]
EMBI_LATAM(-1)	--	--	--	0.012 [1.974]**	-0.010 [-2.079]**	0.004 [0.409]
Observations:	389	387	351	389	387	351
R-squared:	0.035	0.086	0.068	0.043	0.096	0.069
F-statistic:	2.324	5.924	4.197	2.463	5.740	3.613
Durbin-Watson	1.996	1.994	2.006	1.994	1.993	2.011

*, **, and *** refer to significance at 10%, 5% and 1%, respectively.

Table 2: Monetary Policy Rates in Chile, Colombia and Mexico, 2000-2008: The role of commodity prices, (Least Squares)

Eq Name:	(2.1) CHILE	(2.2) COLOMBIA	(2.3) MEXICO
FF_POLICY(-1)	0.026 [2.675]***	0.029 [2.933]***	0.025 [2.048]**
C	-0.342 [-2.219]**	-0.209 [-1.456]	-0.213 [-0.933]
POL_RATE(-1)	-0.035 [-3.300]***	-0.050 [-4.186]***	-0.055 [-4.246]***
TIPS_EXP_INF_USA(-1)	0.124 [2.568]**	0.066 [1.662]*	0.157 [2.154]**
EMBI_LATAM(-1)	0.012 [1.992]**	-0.010 [-2.090]**	0.004 [0.449]
EXP_DEV_AN(-1)	0.006 [1.180]	-0.001 [-0.135]	0.031 [3.595]**
D(POL_RATE(-1))	-0.002 [-0.038]	-0.033 [-0.649]	-0.008 [-0.159]
INF_YOY_L	0.018 [1.752]*	0.064 [4.657]***	0.005 [1.271]
DLOG(COMM_CHILE(-1),8)	0.003 [0.609]	--	--
DLOG(COMM_COLOM(-1),8)	--	0.007 [2.773]***	--
DLOG(COMM_MEXICO)	--	--	0.081 [1.955]**
Observations:	389	387	351
R-squared:	0.044	0.114	0.071
F-statistic:	2.198	6.072	3.270
Durbin-Watson	1.997	1.979	2.005

*, **, and *** refer to significance at 10%, 5% and 1%, respectively.

Table 3: Monetary Policy Rates in Chile, Colombia and Mexico, 2000-2008, (Instrumental Variables)

Eq Name:	(3.1) CHILE	(3.2) COLOMBIA	(3.3) MEXICO	(3.4) POOLED
FF_POLICY	0.025	0.021	0.034	0.015
	[2.532]**	[1.705]*	[2.182]**	[3.093]***
C	-0.353	-0.197	-0.301	-0.202
	[-2.249]**	[-1.315]	[-1.185]	[-2.187]**
POL_RATE(-1)	-0.028	-0.040	-0.066	-0.022
	[-2.401]**	[-2.467]**	[-3.277]***	[-3.989]***
TIPS_EXP _USA(-1)	0.113	0.062	0.201	0.081
	[2.345]**	[1.432]	[2.812]***	[2.768]***
EMBI_LATAM	0.015	-0.010	0.006	0.002
	[2.006]**	[-2.066]**	[0.679]	[0.580]
EXP_DEV_AN	-0.009	-0.004	0.042	0.007
	[-0.702]	[-0.505]	[1.785]*	[1.969]**
D(POL_RATE(-1))	-0.006	-0.051	-0.026	-0.007
	[-0.119]	[-1.012]	[-0.481]	[-0.228]
INF_YOY(-4)	0.020	0.058	0.001	0.015
	[1.679]*	[4.095]***	[0.018]	[3.071]***
Observations:	378	384	351	1119
R-squared:	0.040	0.091	0.063	0.020
F-statistic:	2.165	5.333	2.719	3.950
Durbin-Watson	1.992	1.997	2.005	2.013

*, **, and *** refer to significance at 10%, 5% and 1%, respectively.
Pooled equations include country fixed effects.

Table 4: Monetary Policy Rates in Chile, Colombia and Mexico, 2000-2008: The role of capital mobility, (Dynamic panels)

Eq Name:	(4.1) Panel	(4.2) Panel	(4.3) Panel
FF_POLICY(-1)	0.014	0.031	0.019
	[3.038]**	[2.599]**	[2.403]*
C	-0.191	-0.281	-0.190
	[-1.934]*	[-2.442]**	[-2.044]*
POL_RATE(-1)	-0.020	-0.022	-0.021
	[-4.540]**	[-4.737]**	[-4.685]**
TIPS_EXP_INF_USA(-1)	0.077	0.086	0.079
	[2.604]**	[2.862]**	[2.670]**
EMBI_LATAM(-1)	0.002	0.002	0.002
	[0.504]	[0.434]	[0.557]
EXP_DEV_AN(-1)	0.006	0.007	0.006
	[2.232]*	[2.447]*	[2.281]*
D(POL_RATE(-1))	-0.004	-0.005	-0.003
	[-0.134]	[-0.152]	[-0.114]
INF_YOY_L	0.015	0.018	0.014
	[2.830]**	[3.173]**	[2.875]**
CAP_MOBILITY	0.000	0.013	--
	[0.061]	[1.341]	
CAP_MOB*FF_POL(-1)	--	-0.003	-0.001
		[-1.526]	[-0.729]
Observations:	1127	1127	1127
R-squared:	0.025	0.027	0.026
F-statistic:	3.639	3.497	3.706
Durbin-Watson	1.997	2.030	2.001

*, **, and *** refer to significance at 10%, 5% and 1%, respectively.
All equations include country fixed effects.

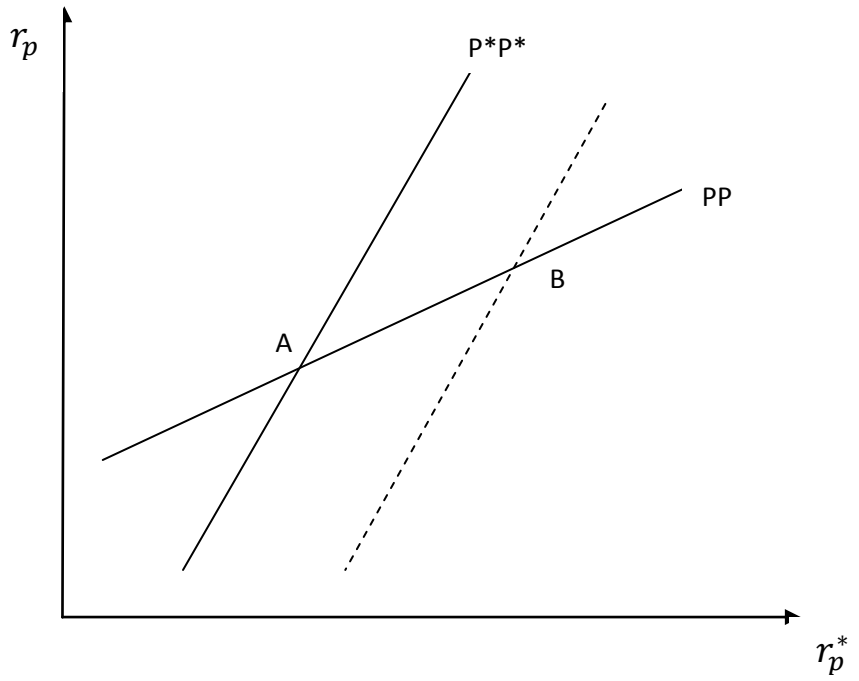

Figure 1: Policy rates equilibrium under "policy contagion" and large countries

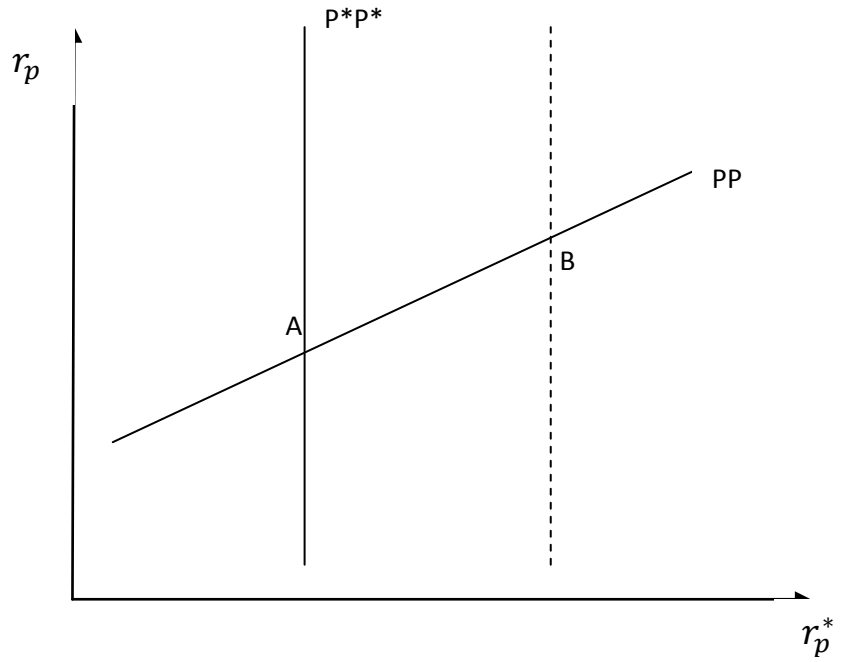

Figure 2: Policy rates equilibrium under "policy contagion" with one large and one small country

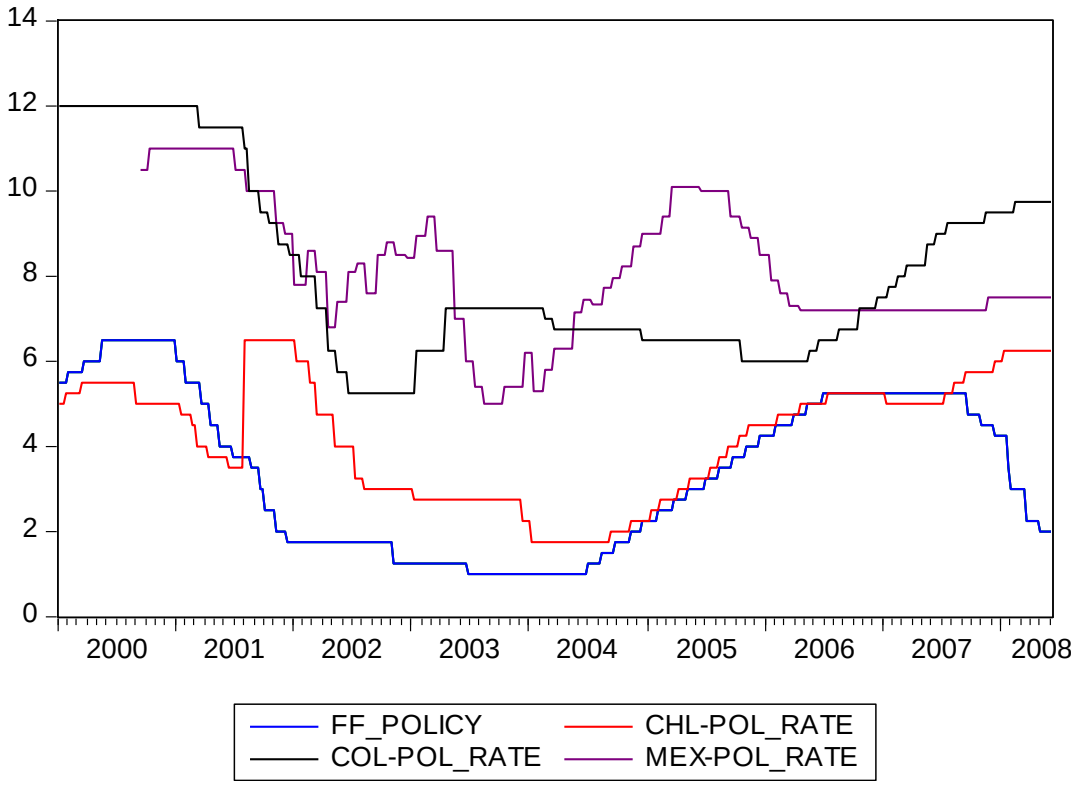

Figure 3: Monetary policy rates in the United States, Chile, Colombia and Mexico: 2000-2008

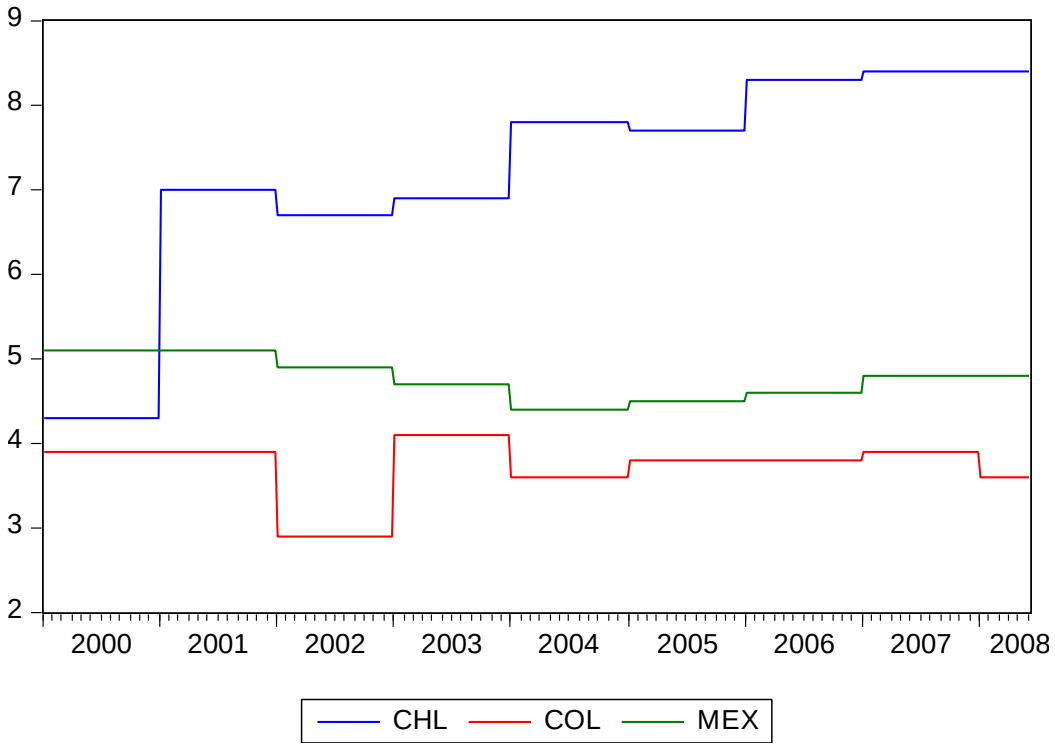

Figure 4: Capital Mobility Index for Chile, Colombia, and Mexico, 2000-2008

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