THE INTERNATIONAL TRANSMISSION OF INTEREST RATE SHOCKS: THE FEDERAL RESERVE AND EMERGING MARKETS IN LATIN AMERICA AND ASIA

By

Sebastian Edwards

University of California, Los Angeles

and

National Bureau of Economic Research

Draft:

March 21, 2009

ABSTRACT

In this paper I use high frequency data to investigate the extent to which interest rate changes originated in the United States are transmitted to a group of emerging countries. More specifically, I am interested in understanding the effects of changes in the Federal Reserve Federal Fund's interest rates on differential between (short term) local currency interest rates. I also investigate how changes in the U.S. term structure affects short term rates in and international interest rates, properly adjusted by currency and country risk. Other shocks considered in the analysis include changes in the US dollar-Euro exchange rate, changes in the international price of oil, risk ratings, and the degree of capital mobility. The results indicate that there is a strong and fairly rapid transmission of changes in the Federal Funds rate into interest rates differentials in the Latin American countries in the sample. This effect is equally large in the Asian nations in the long run. The adjustment path is different across the two regions, however. Adjustment is very fast and cyclical in Latin America; it is gradual and slower in East Asia.

JEL Classification No: F30, F32

Key Words: Interest rates, Federal Reserve, Federal Funds Rates, EMBI, country risk, international transmission

This is a preliminary draft of a paper prepared for the UCSC-JIMF Conference *"The Emerging Global Financial Architecture: What's New and What's Old?"*, May, 2009. I thank Christine Richmond for excellent assistance.

I. Introduction

The Global Financial Crisis of 2008 has been traumatic and costly. Many long-held views about the global economic system are being questioned, and we are likely to see major changes in financial regulations, both at the global and individual countries' levels. The freewheeling of the 1990s and first eight years of the 2000s is over, and protectionism is already on the rise. Although it is too early to know precisely how the international financial system will evolve in response to the crisis, it would not be surprising if in the years to come we also see greater restrictions on cross-boarder capital movements. Believers in maintaining some degree of capital controls in the emerging countries -- including scholars such as Bhagwati (1998), Stiglitz (2002), Rodrik (2006) and Krugman (1995), among others -- have argued that these restrictions keep speculative capital out and protect countries from the excessive volatility of international financial markets. In that regard, it is possible that once the global financial system is normalized we will see a resurgence of controls on capital inflows in a number of emerging markets. These types of priced-based restrictions on capital mobility were made famous in Chile in the 1990s, and were adopted in the mid 2000s by countries as different as Colombia and Thailand.[1]

In order to understand the way in which possible reforms to the international financial architecture will affect different countries and outcomes, it is necessary to have a well founded idea on how the system actually operated in the period immediately preceding the Great Crash of 2008. An important question, in that regard, refers to the international transmission of interest rate changes. A particularly significant issue is to what extent and how rapidly (if at all) changes in the advanced countries policy interest rates -- changes in, say, the Federal Reserve's Federal Funds rate -- are transmitted into emerging countries. Equally important is how changes in the advanced countries term structure of interest rates affect financial conditions (including interest rates) in the emerging nations. In this paper I use high frequency (weekly) data for seven emerging countries -- three from East Asia and four from Latin America -- to investigate these issues. The analysis focuses on the differentials between domestic and (properly adjusted

[1] On controls on capital inflows, see Edwards (1999). On the relationship between financial and trade openness see Aizenman (2008). See Aizenman (2004) and Edwards (2007) for controversies on the opening financial markets.

by currency and country risk) international interest rates. More specifically, I use panel-data analysis to investigate how changes in interest rates by the Federal Reserve affected interest rate differentials in Brazil, Chile, Colombia, Mexico, Indonesia, Malaysia and the Philippines in the period spanning from the first week of January, 2000, to the last week of September of 2008.

Issues related to the transmission of interest rate shocks from advanced to emerging countries predate, of course, the Global Crash of 2008. In fact, a number of analysts have argued that interest rates hikes by the Federal Reserve contributed significantly to some of the most important currency crisis of the last quarter of a century, including the Mexican Tequila Crisis of 1994-1995 and the Argentine peso crisis of 2001-2002.[2]

Understanding the extent to which interest rate changes are transmitted across countries is also important for determining emerging countries' ability to conduct independent monetary policy. Central banks in the emerging markets – and in the advanced nations, for that matter – are interested in controlling the level of interest rates in their respective countries. That is, these central banks are interested in determining the by how much their countries' domestic interest rates diverge from world interest rates. For example, countries that are suffering a burst of inflation will like to have a positive (and presumably large) differential with respect to international interest rates. Likewise, countries that experience an increase in unemployment will want to reduce this interest rate differential and, in some cases, make it negative. An important question, then, and one addressed in this paper, is the extent to which interest rate differentials in emerging nations are affected by policy actions in the advanced nations.

The rest of the paper is organized as follows: Section II I present the conceptual framework used in the analysis and I provide a first look at the data. Section III contains the basic estimation results. In this Section I compare the results for the Latin American and East Asian nations. Section IV I expand the analysis, and I investigate how changes in the U.S. yield curve affects domestic credit market conditions in these seven countries, and I ask whether the vagaries of global currency markets -- and, in particular, changes in the U.S. dollar-Euro exchange rate -- affect domestic interest rates in emerging countries.

---

[2] On these crises see Edwards (2010).

I Section V I investigate whether the speed of adjustment to global interest shocks is affected by the extent of global liquidity or by the individual countries' degree of country risk. In this Section I also look in detail at the determinants of the dynamics of adjustment to interest rate differentials. Finally, in Section VI I offer some concluding remarks, including some thoughts on directions for future research.

II. Interest Rate Differentials and the International Transmission of Interest Rate Shocks

The central variable in this analysis is the differential between the (short term) domestic interest rate in an emerging country and the foreign (or international) interest rate properly adjusted by country risk and currency risk. More specifically, the variable "interest rate differential" is defined as follows:

$$(1) \qquad x_t = r_t - r_t^* - \delta_t - \rho_t \ ,$$

where r_t is the domestic currency nominal interest rate for securities of a certain maturity, r_t^* is the international, nominal interest rate on foreign currency denominated securities of the same maturity, δ_t is the expected rate of depreciation of the domestic currency, and ρ_t is a measure of country risk. Equation (1), of course, represents deviations of the (risk adjusted) uncovered interest parity condition. In steady state equilibrium, and with perfect capital mobility, this interest rate differential should be close to zero.[3] The speed at which convergence to long term equilibrium takes place will depend on specific countries' conditions, but under free capital mobility it should be rather fast. The following equation describes, in a general way, the possible dynamics of x_t:

$$(2) \qquad \Delta x_t = \theta(\tilde{x} - x_{t-1}) + \sum_{i=1}^{k} \gamma_i y_{it} + \lambda \Delta x_{t-1} + \varepsilon_t \, .$$

[3] This assumes that both securities (domestic and foreign) have the same degree of credit risk.

Where θ, γ_i, and λ are parameters, the y_{it} are zero-mean, finite-variance shocks, and ε_t is an error term with the usual characteristics. In steady state equilibrium:

$$(3) \qquad x = \tilde{x}.$$

Whether this is steady state different from zero is largely an empirical matter, and will depend on a number of issues, including the degree of capital mobility, and other type of market frictions and transaction costs. As noted, under full capital mobility, and no transaction costs of any type one would expect that $\tilde{x}$ would close to zero.

The main interest of this study is to investigate whether external interest rates shocks coming from the advanced nations -- from the U.S. Federal Reserve, in particular -- affect, interest rate differentials in a group of emerging nations. That is, the most important (but not the only) y_{it} in this paper refers to changes in the Federal Funds interest rates.

If λ is equal to zero in equation (2), the dynamic structure becomes the most simple possible one, and is characterized by a partial adjustment process. If, however, λ is different from zero, the adjustment process will be characterized by oscillations. In the empirical analysis that follows I investigate this issue empirically, and I allow the data to tell whether $\lambda = 0$. An important question, and one that I address in the Sections that follow, is whether the estimated coefficients depend on the extent of capital controls.

From an empirical (and policy) point of view an important question is whether the long term equilibrium of interest rate differentials is a constant, as in equation (3), or whether it is affected by other economic variables. If $\tilde{x}$ is a constant (including zero), the effect of any shock on interest rate differentials will be transitory, even if the shock is permanent. Alternatively, it is possible that the long run equilibrium itself will be a function of a number of exogenous variables. One possibility, and one that is of interest for the discussion addressed in this paper, is that $\tilde{x}$ is a function of international interest rates, including the *level* of the Federal Funds interest rate. In this case, $\tilde{x}$ is replaced by $\tilde{x}_t$ in equation (2), and equation (3) becomes:

(4) $$\tilde{x}_t = \alpha + \beta FF_t + \sum_{j=1}^{m} \phi_i z_{it} + \omega_t .$$

Here, α , β , and ϕ_i are coefficients, FF_t is the *level* of the Federal Funds interest rates, or Federal Reserve's policy interest rate, the z_{it} are other possible *level* (as opposed to zero-mean shocks) determinants of $\tilde{x}_t$, and ω_t is an error term with the usual characteristics. One of the goals of the empirical analysis reported in this paper is to determine whether β and ϕ_i are significantly different from zero.

II.1 *Data*

Figure 1 presents weekly data on interest rate differentials for the seven countries in our sample for the period January 2000 through the last week of September 2008. The series were stopped at that point in order to avoid the period of major financial turmoil that followed the collapse of Lehman Brothers and the initial rejection of the TARP emergency program by the U.S. Congress. In constructing these series, the following definitions were used for the variables in equation (1): r_t is the nominal interest rate on 3-months CDs in the local banking sector; r_t^* is the 30 month US dollar Libor rate (in some regressions the 3 moths Treasury rate was used, without affecting the results). δ_t is the actual rate of depreciation of the domestic currency during the previous 90 days; when alternative measures of δ_t were used (including fitted values from an autoregressive equation) the results were similar to those reported here. Finally, ρ_t is given by the EMBI spread for each country sovereign bonds.[4] All data were obtained from Data Stream.

As may be seen from Figure 1, most countries have data for the complete period -- the main exception is Indonesia, which only has data for post-2004. In most countries the differential is, as expected, positive throughout most of the period. The only exception is Malaysia. This is a result of the combination of capital controls and a

[4] To the extent that the EMBI spread captures sovereign country risk premium, the actual computation of equation (1) excludes a residual credit risk premium. In that sense, then, we would expect that the computed interest rate differentials will, for most countries, be positive for most of the period. Moreover, we would expect their mean to be significantly positive.

deliberate policy in Malaysia for maintaining domestic interest rates low as a way of encouraging investment and growth. Another unique feature of Malaysia is that until mid-2005 its interest rate differential is significantly less volatile than that in the other countries in the sample. This is the result of the policy that, until the week of July 15, 2005, fixed the value of the U.S. dollar at 3.8 ringgit.

In terms of the empirical analysis, an important question refers to the timing of the observations. This is particularly relevant for timing the (possible) effects of the Fed's policy actions on domestic interest rates. The reason for being concerned about this issue is that when the FOMC of the Federal Reserve announces its interest rate decisions, Asian financial markets are already closed for that calendar day. That is, if there is any reaction to the Fed's action, it will be on the *next* calendar day. In this study, however, each data point corresponds to that week's Friday data. FOMC meetings are never on Fridays, however. They are usually on Tuesdays. Two days meetings usually span a Tuesday and a Wednesday. This means that using contemporaneous -- that is, same week -- data for analyzing the transmission issue does not pose a timing problem. It would be problematic, however, in studies that rely on daily data.[5]

II.2 Basic Statistics and Preliminary Tests

Table 1 contains basic statistics for interest rate differentials in our seven countries. As may be seen in all of them, except, Malaysia, the mean differential is positive. Not only that, in Brazil it is very high (7.35%), reflecting that country effort to control inflation during the latter years of president Fernando Henrique Cardoso's administration and the two administrations of president Luiz Inacio Lula da Silva.[6] Among the countries with positive mean differentials, only Chile and the Philippines have a mean below 100 basis points.

In Table 2 I present data on unit root tests for the seven countries' panel. As may be seen, the null hypothesis of a unit root is rejected both when a common unit root process is assumed, and for the case when individual unit root processes are assumed.

---

[5] For that actual dates of FOMC meetings since 1967, see the Fed's web site. The URL is: http://www.federalreserve.gov/monetarypolicy/fomc_historical.htm

[6] See Edwards (2010) for details.

III. Econometric Results

In this Section I report the basic results from the estimation of a series of equations on interest rate differentials. From equations (2) through (4), a general specification is:

$$x_t = \alpha\theta + (1-\theta)x_{t-1} + \sum_{i=1}^{k} \gamma_i y_{it} + \lambda \Delta x_{t-1} + \sum_{j=1}^{m} \phi_i z_{it} + \psi_t \,. \tag{5}$$

In what follows I report results obtained from estimating a number of variants of equation (5). I use panel weekly data for the period January 2000 through the last week of September 2008.

Before presenting the estimation results a brief discussion on the expected effects of changes in the Federal Funds rate on the interest rate differential is in order. It is clear from (1) that this is not a straightforward and depends on how Fed policy actions will affect the different components of the interest rate differential x_t. The simplest case occurs when the Fed only affects U.S. dollar denominated interest rates, r^*. In this case, $\frac{dx_t}{dff_t} = -\frac{dr^*_t}{dff_t}$. Here ff_t stands for the Federal Funds rate. To the extent that we are dealing with short term (3 months) interest rates, we expect that $\frac{dr^*_t}{dff_t} \approx 1$; that is, Fed policy actions have, approximately, a one-to-one effect on short term interest rates (See Figure 2). In this case, then, when there is neither a pass through from the Federal Funds rate to domestic interest rates, nor is there an impact on country or currency risk, we would expect $\frac{dx_t}{dff_t} \approx -1$. More generally, however, we would expect that changes in the Fed's policy rate will affect both the expected rate of depreciation of the emerging country's currency and its country risk premium. Carry trade considerations suggest that $\frac{d\delta_t}{dff_t} \geq 0$. On the other hand, research by Uribe and Yue (2003) indicate that country risk spreads increase somewhat as a result of hikes in U.S. policy rates; that is, $\frac{d\rho_t}{dff_t} \geq 0$.

This means that there are three channels through which hikes (reductions) in Federal Fund rate will exert a negative (positive) effect on interest rate differentials. This, however, is not the rest of the story, since it is possible that monetary policy actions by the Federal Reserve will affect domestic interest rates r_t in the country in question. If this effect is positive, it will tend to (partially) offset the negative forces operating through the three channels mentioned above. The final effect, then, will be the combination of these different forces, and its sign and magnitude will be an empirical issue. If domestic rates are not affected by the Fed's action we will expect that on impact $\frac{dx_t}{dff_t}$ will be negative, and greater or equal than one, in absolute value. If there is an effect of Fed action on r_t, however, we would expect $\frac{dx_t}{dff_t}$ to be negative but smaller than one. The empirical question addressed in the analysis that follows is the magnitude of the impact and final effects of changes in the Fed policy rate in these emerging markets' interest rate differential.

III.1 <u>*Pooled Data Analysis*</u>

Table 3 contains the base-runs for equation (5). Panels A and B are the simplest specifications, where the only shock is the *change* in the Federal Funds rate and the coefficients λ and ϕ_i are constrained to being equal to zero. While Panel A does not have country fixed effects, Panel B does. Panels C and D present the results from more complex specifications (both include country fixed effects): in Panel D I allow for a more general dynamic adjustment and for the possibility of both transitory and permanent effects of Fed policy actions on interest rate differentials; in Panel D I introduce changes in the spot WTI oil price as an additional possible global shock affecting interest rate differentials.

The results are quite revealing: as may be seen, in all regressions the coefficient of the lagged interest rate differential is smaller than one, confirming the unit root results and indicating that there is convergence. The coefficients of the change in the Federal Funds' rate are always negative and smaller than one, and are significant at conventional levels in all estimates. This indicates that there changes in the Federal Funds' rate have some effect on domestic interest rates differentials. These, however, are less than one-to-one. The results in Panel's C and D indicate that the coefficients of the Federal Funds' rates in *levels* are significantly negative (and smaller that one in absolute values). This indicates that (permanent) changes in the Federal Funds' rate have permanent effects on interest rate differentials. As may also be seen from Panels C and D, the coefficients of the lagged change in the interest rate differential are significantly negative. This means that the dynamic process is more complex than a basic partial adjustment process of the top half of this Table. According to these results, shocks to the price of oil have no effects on interest rate differentials.

In Figure 3 I present a simulation for interest rate differentials' response to a 50 basis points hike in the Federal Funds rate. The questions addressed in this Figure is: what is the magnitude of the pass-through of changes in ff_t into interest rate differentials x_t. In this exercise I have used the parameter values from the panel estimation results reported in Panel D of Table 3. The initial conditions are characterized by an equilibrium interest differential of 2.068 %, and a Federal Fund's rate of 3.00 %. The only disturbance is a permanent increase in the Fed Funds' policy interest rate in period 15, from 3 percent to 3.5 percent.

Four aspects of the simulation results deserve attention: First, the impact effect of the hike of the Fed policy rate by 50 basis points is a *decline* in the interest rate differential of 30 basis points. That is, as expected, this effect is negative. However, even during the same week, the decline in the differential is less than one-to-one, indicating that there is a rapid reaction (increase) in the domestic interest rate; this, however, it is not large enough as to fully offset the increase in r^*_t (and in δ_t, and ρ_t) generated by the Fed's action. Second, the new long term equilibrium differential is 1.81%. That is, the increase in the Federal Funds rate results in a permanent decline in the equilibrium differential. This decline, however, is of 26 basis points, little over one half of the increase in the Fed's policy rate. That is, in the long run, the pass-through from a Fed Funds' interest rate hike to interest rate differentials is *negative* and equal, in absolute value, to approximately *one half* of the initial shock. Third, the adjustment to the new equilibrium interest rate differential is not smooth. Indeed, there is a downward overshooting of the differential, followed by partial recovery and a cyclical adjustment to the new equilibrium. And fourth, the adjustment is very fast: five weeks after the Fed's action, the interest rate differential has completed 91 % of its long term adjustment.

III.2 *How Different are Latin America and Asia?*

The results in Table 3 and in Figure 3 were obtained by pooling the seven countries in our sample. In Table 4 I present separate results for the four Latin American countries and the three East Asian nations considered in this paper. As may be seen, for most coefficients the results are very similar across the two regions. There is an important difference, however, in the coefficient of the change in the Federal Fund's policy rate. While it is negative and significant at conventional levels for the Latin American countries -- with a point estimate of -0.75 --, it is insignificantly different from zero for the East Asian countries (with a point estimate close to zero: 0.019). The rest of the coefficients of interest, however, are significant in both equations, and the point estimates are not significantly different across them.

These differences across the Latin American and Asia results have implications for the dynamics of interest rate differentials in response to a change in the Fed's policy rate. The results in Panel A of Table 4 indicate that the dynamic adjustment in Latin America will be very similar to the one depicted I Figure 3. There is an immediate decline in the interest rate differential, followed by a cyclical convergence to the new long run equilibrium. As in Figure 3, there is a downward overshooting -- see Figure 4.A for details. The estimates in Panel B of Table 4, on the other hand, indicate that in East Asia the adjustment toward a new equilibrium will be gradual and smooth; in contrast with the case of Latin America, there will be no downward overshooting, or cyclical adjustment.

Even if the dynamic adjustment path is quite different, the final impact on interest rate differentials turns out to be very similar in both regions. In the case of Latin America, a 50 basis pointes increase in the Fed's policy rate results in a decline in the long term equilibrium interest rate differential of 25 basis points. In East Asia, on the other hand, the same policy shock by the Fed results in a decline in the equilibrium interest rate differential of 26 basis points. In Figure 4 I present the two dynamic adjustments. Notice that the gradual decline of interest rate differentials in East Asia is the result of the magnitude of the estimated parameters. Under an alternative parameter constellation it is possible for the adjustment of the differential to be cyclical. However, the zero coefficient of the change in the Fed's Funds' rate implies that there will not be an initial jump in the differential, as the case in Latin America. In light of the differences in the dynamic adjustments, in what follows I report separate results for the two regions. As I argue in Section V below, the difference in the adjustment path may respond to differences in the extent of international capital mobility in the two regions during the period under study.

IV. The U.S. Term Structure, the USD, and Interest Rate Differentials

The results reported above have established that hikes (reductions) in the Fed's policy rate result in a decline (increase) in interest rate differentials in our group of Latin American and East Asian nations. In both region's the effect is about -0.5. An important question is whether changes in the U.S. yield curve have an effect in these countries' (short term) interest rate differential. I address this issue by including two variables to the analysis: the *change* in the yield of the U.S. Treasury 10 year bond and the *level* of that yield. In both estimations I excluded the change in the international price of oil since in Table 4 it was insignificant.

A second important question is whether changes in the value of the U.S. dollar in global financial markets affect interest rate differentials in the emerging nations. Ideally, one would want to include the Trade Weighted Index of the USD, as calculated by the Federal Reserve. These indexes, however, are not available at the high frequency level. Consequently, in the estimation I used the (percentage) weekly change in the USD-Euro exchange rate.

The results obtained are reported in Table 5: Panel A for Latin America and Panel B for East Asia. As before, country fixed effects were included. As may be seen, the estimates are qualitatively similar across the two regions. Four aspects of these results are worth discussing: First, the coefficients of the change in the U.S. long interest rate are significantly positive, indicating that a steeper yield curve -- that is an increase in the 10 year yield, with the Federal Funds' rate held constant -- results in an increase in the interest rate differential. Notice, however, that the point estimates are quite different across both regions (0.89 in Latin America and 0.41 in East Asia). Second, in both regressions the level of the 10 year bond yield is not significantly different from zero.

This indicates that, in contrast with the case of the Fed Funds' interest rates, the effect of the 10 years Treasury is purely temporary. Third, in both regressions the change in the dollar-Euro exchange rate has a significantly positive effect on interest rate differentials. When the *level* of (the log of) the exchange rate was included, its coefficient was insignificant, indicating that this global currency effect has only a temporary impact on interest rate differentials. And fourth, the previous results -- reported in Table 4 -- on the effects of changes in the Fed's policy interest rate remain unaltered by the inclusion of these additional regressors.

V. Capital Controls, Country Risk, and Interest Rate Differentials and the Speed of Adjustment,

The results discussed above assume that the speed of adjustment is the same across countries, and is not affected by global economic conditions or by the countries' own characteristics. In this section I investigate whether this is a reasonable assumption. More specifically, I investigate whether the speed of adjustment to international shocks depends on two variables: (a) the degree of international openness of these countries financial markets, as measured by an index computed since 1970 by the Fraser Institute in Vancouver, Canada; and (b) the overall perception of country risk as captured by the Standard and Poor's ratings on the emerging markets' sovereign debt. I investigate the potential role of each of these variables at a time, by interacting them with the two variables that generate the dynamic adjustment in equation (5)

Before proceeding, a word on these two variables: The Fraser Institute index on "International Capital Markets Controls" goes from 0 to 10, with higher values denoting an economy that is more open to international financial flows. This index is available yearly from Fraser from 2000 through 2006. I supplemented the last two years by providing my own index values for 2007 and the first 9 months of 2008. I constructed these additional data points by using information from national sources. Since this index is only available yearly, I assumed that the same value applies for every week during that particular week. See Figure 5 for a distribution and basic statistics on the "International Capital Markets Controls" index for 2000-2008. Interestingly, the means for the index are significantly different across both regions: 5.3 for the four Latin American countries and 4.1 for the three East Asian ones. That is, during the period under study the Latin American nations were, on average, more open to international capital movements.

The Standard and Poor's ratings were coded into an index that goes from 1 to 26, with lower numbers denoting a higher rating. The highest rating in the sample corresponds to A+, which gets a value of 1 in the index. Successively lower ratings -- A, A-, BBB+, and so on -- get higher values of the index in increments of one unit. The lowest rating in the sample is D (selective default), and has an index value of 22. See Figure 6 for the distribution of ratings during the period under study. The average ratings index for Latin America is 6.1, while that for East Asia is 7.9; the median is also lower in the Latin American countries, 7 vs. 8.

V.1 Capital Controls, and the Speed of Adjustment

In Table 6 I present data on panel regressions for the two regions, where I investigate whether the dynamics of the adjustment process depends on the degree of openness of the financial sector.[7] As has been customary throughout the paper in these estimates I have included country fixed effects. As may be seen from Panel A on Latin America, the interactive terms are not significant at conventional levels (although the t-statistic of the variable that interacts controls with the change in the lagged differential is 1.5). Generally speaking, these results suggest that the dynamics of adjustment in our four Latin American nations is not affected by the extent of capital controls.

The results for East Asia are different, however. As may be seen from Panel B, the coefficient that interacts lagged interest rate differentials with the capital controls index is significantly positive, with a point estimate of 0.048. The coefficient of the variable that interacts controls with the change in the lagged differential is not significant, however. This suggests that, within the Asian sample, in countries with a more open capital account the interest rate differential will exhibit a greater degree of persistence and will adjust more slowly. This is, to some extent, counterintuitive, as one would expect that capital mobility would speed international capital flows and the adjustment process. A possible explanation for these results has to do with the fact that the capital

[7] In Edwards (1998) I used monthly data for Argentina, Chile and Mexico to analyze the dynamic behavior of interest rate differentials and their relation to the extent of international capital mobility.

control indexes are constructed at annual interval and are, thus, unable to truly capture the dynamics of adjustment in a high frequency data exercise.

V.2 Country Risk and the Speed of Adjustment

In Table 7 I present results, for both regions, of panel equations where the two speed of adjustment variables are interacted with the country risk ratings index. As in previous estimates, I included country fixed effects. I first turn to the East Asian results (Panel B): as may be seen, the coefficients of the two interactive terms are insignificant, indicating that the adjustment pattern followed by interest rate differentials after an external shock does not depend on how risky these countries are perceived by the rating agencies. The results for Latin America are more interesting. As may be seen, the coefficient that interacts the ratings index and the lagged interest rates differentials term is significantly positive; the interaction of ratings and the lagged change in differentials is insignificant, however. This means that only the impact effect of shocks is affected by the ratings. What is particularly interesting is that countries with lower risk perception -- that is, countries with a lower index value -- will have a faster adjustment process than countries with higher risk rating. For example, a country with an A+ rating will have a coefficient of the lagged differential of 0.60; on the other hand, a country with a BBB- rating (an index value of 9), will have a coefficient of the lagged interest rate differential equal to 0.82. This is expected, as securities of higher ratings countries tend to be more liquid, and trading more fluid than in countries with lower ratings.

V.2 Country Risk, Capital Controls and the Long Term Interest Rate Differential

In the final exercise presented in this Section I investigate whether the coefficients of the Federal Reserve policy rate -- both in first differences and in levels -- are affected by capital controls or the country risk ratings. I do this by including interactive variables into the analysis.

The results in Table 8 show that for Latin America the variables that interact capital controls and the Federal Funds rates are not significant at conventional levels. Panel B, on East Asia, shows that the coefficient of the variable that interacts the *level* Federal Funds' policy rate and the capital control index is significantly positive, with a point estimate of 0.046. This means that in East Asian countries with a greater degree of capital mobility the effect of Fed policy changes on the long term differential will be smaller. For example, if the capital controls index is 6 -- a value higher than any observed in our East Asian countries during any time in the sample --, Federal Funds rates have only a temporary effect on the long term differential. The reason for this is that at this level of the controls' index the coefficient of the level of the Fed Funds rate becomes equal to zero.[8]

When I interacted the ratings index and the Fed policy rate the results were less interesting. In both regions these interacted coefficients were insignificantly different from zero, indicating that the extent to which changes in the Fed Funds' rate is transmitted does not depend on sovereign debt ratings. I don't report the detailed results due to space considerations.

VI. Concluding Remarks

In this paper I have analyzed the way in which changes in the Federal Reserve policy interest rate affect interest rate differentials between short term domestic interest rates and the international interest rate (properly adjusted by country risk and currency risk, in a group of seven emerging nations -- four from Latin America and seven from Asia.

The results presented in this paper show that there is a negative relationship between the Fed policy interest rate and interest rate differentials in these countries. The (negative) pass-through from Fed policy rates to interest rate differentials in less than complete however. I found that for both the Latin American and the Asian nations the log run pass-through coefficient is -0.5. The dynamic adjustment process in both countries is very different, however. While in Latin America there is an immediate (over)reaction to changes in Fed policy rates, in the Asian countries the adjustment is gradual and smooth. I also found that changes in the U.S. yield curve have a positive effect on interest rate differentials, as have changes in the USD-Euro exchange rate. On the other hand, there is no evidence that changes in the international price of oil affect interest rate differentials. The analysis of the adjustment process and of the potential role played by capital controls and risk ratings confirmed the findings that, during this period,

---

[8] Notice that for values of the capital controls index greater than 6, it will appear that the results from the previous section that establishes a negative long term relation between the Fed's policy rate and the long term differential, would be reverted, and would become positive. This, possibility, however, should not be taken seriously, since values of the index above 6 are significantly higher than any value observed during the period in these nations)the maximum value of the index for the Asian nations was 5).

interest rate differentials behaved differently in East Asian and in the Latin American countries.

These results suggest that domestic interest rates react in a positive fashion to changes in Fed policy rates; this reaction is rapid, but large enough as to fully offset the effect of the Fed action on U.S. short-term rates. The results presented here do not specify, however, the channel through which this (partial) reaction in domestic interest rates takes place. Analyzing these channels is an interesting line of inquiry for future research.

The estimates presented in this paper provide important information on the extent, nature and speed of transmission of interest rates from the U.S. central bank to a group of emerging nations. This type of information should be useful when considering reforms to the international financial architecture in the years to come.

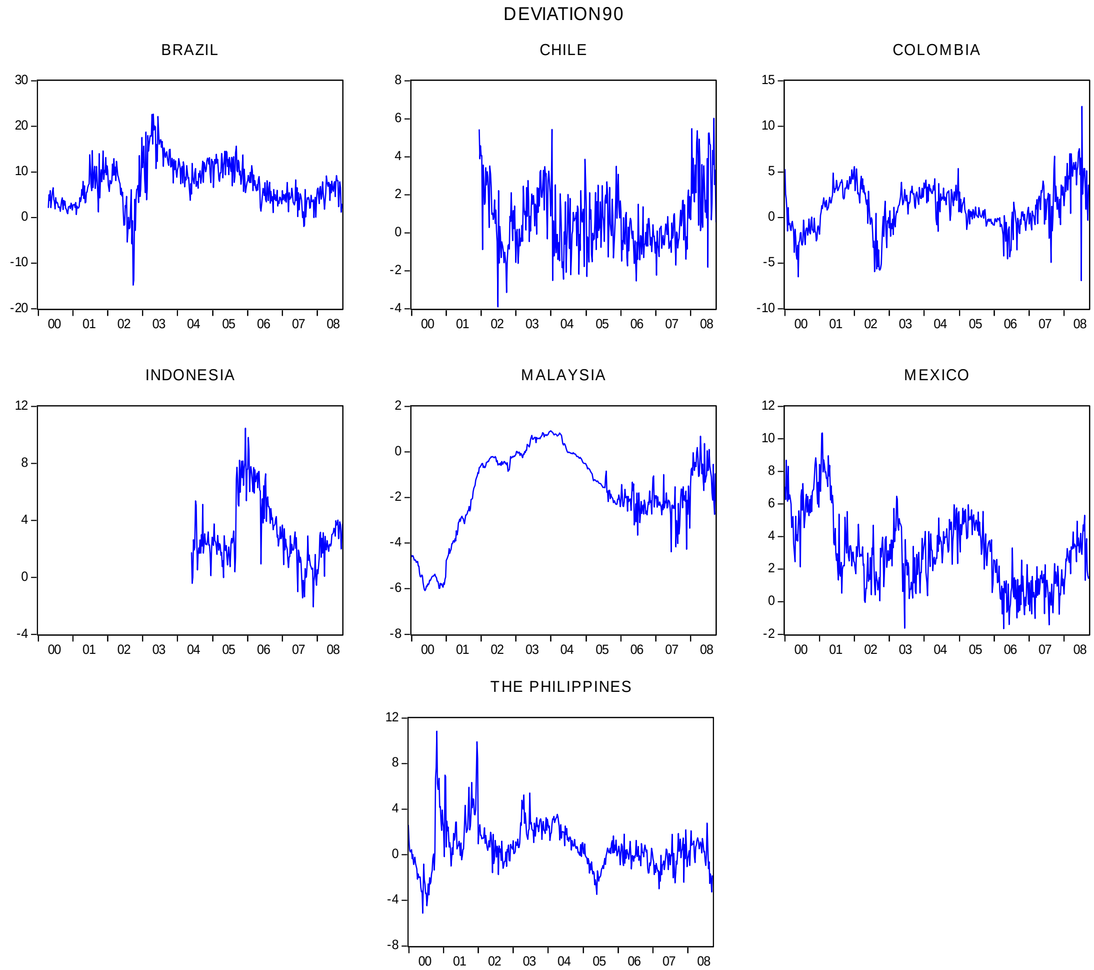


Figure 1: <u>Interest Rate Differentials in Selected Latin American and Asian Nations: Weekly Data, January, 2000- September, 2008</u>

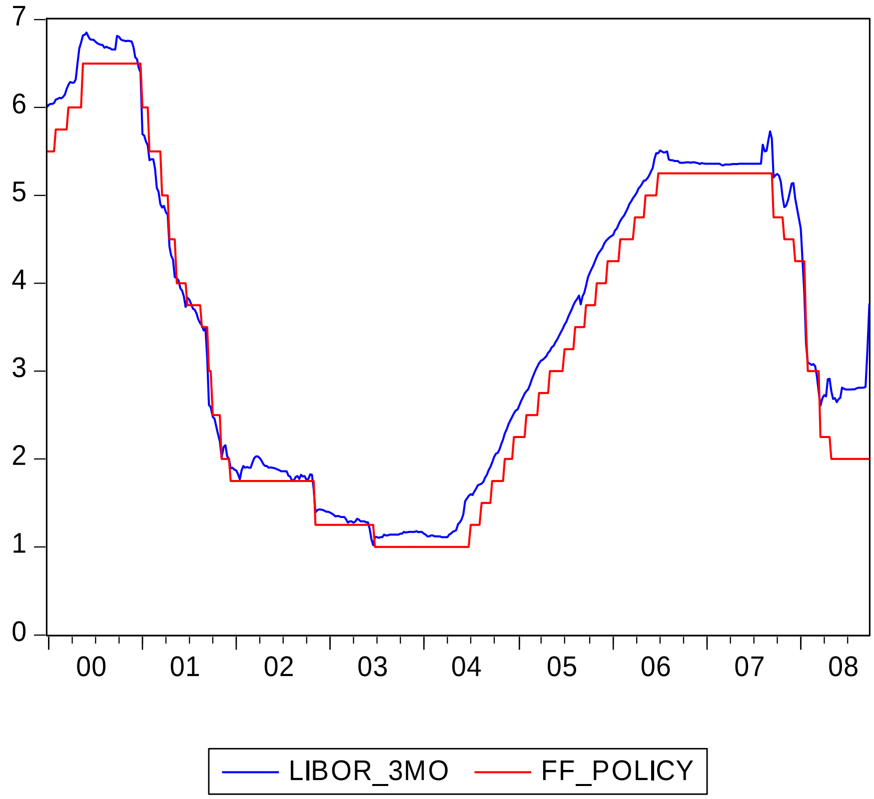
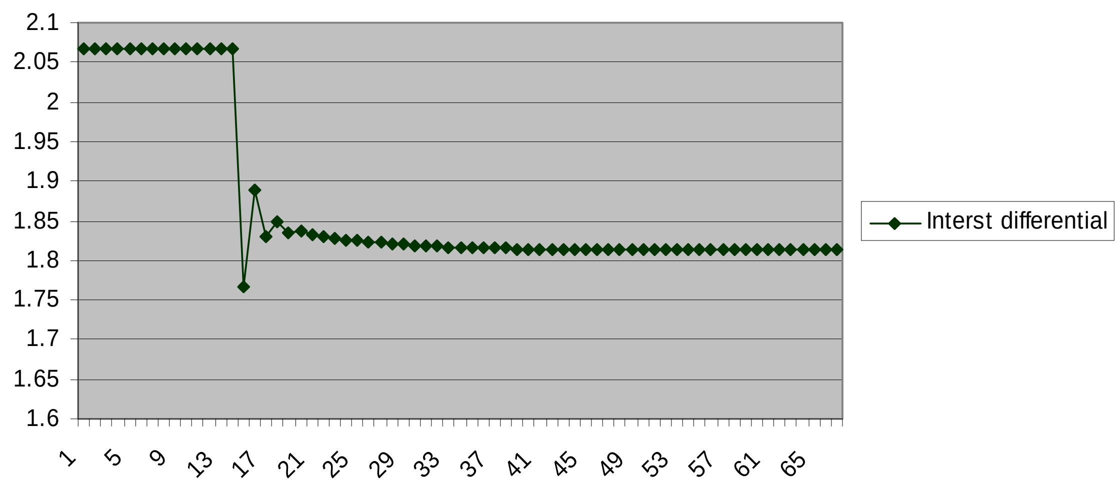


Figure 2: <u>Federal Funds Policy Rate and 3-Month U.S. Libor, Weekly Data, 2001-September 2008</u>

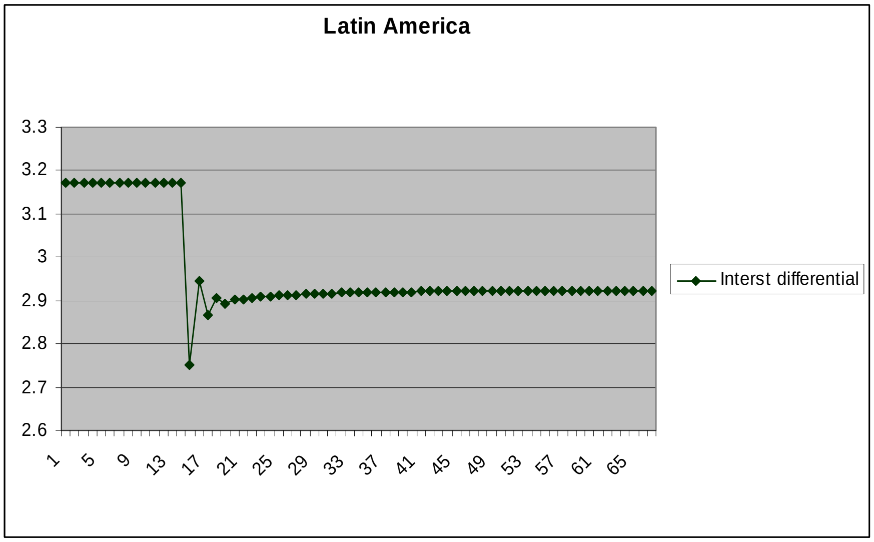
Figure 3: Interest Rate Differential Simulation: Fifty Basis Points Hike in the Federal Funds' Rate in Period Fifteen



Source: Computed using the equation reported in Panel D of Table 3.

Figure 4:
The Effect of a Fed Hike in the Federal Funds rate by 50 basis points on Interest rate Differentials in Latin America and East Asia

Panel A: Latin America



Panel B: East Asia

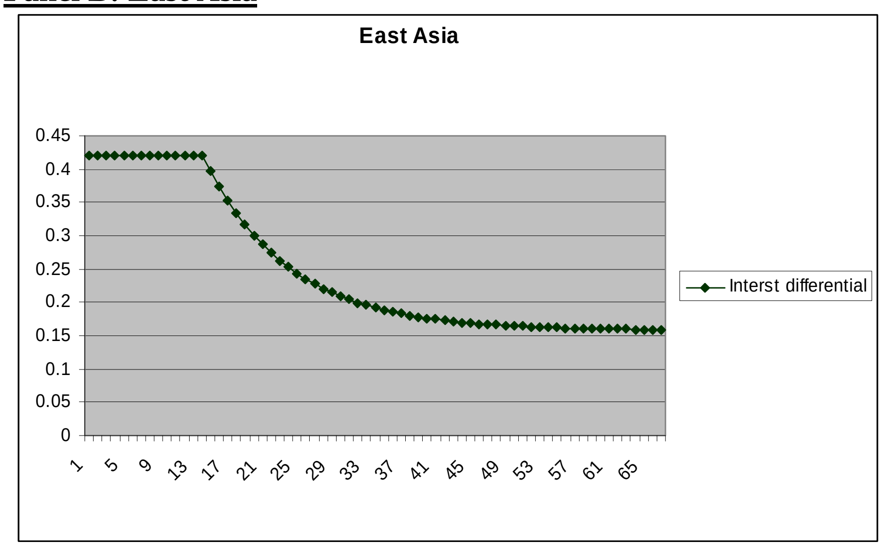


Figure 5: Distribution of Capital Controls Index (Constructed from Expanded Fraser Institute Data): All Countries in Sample

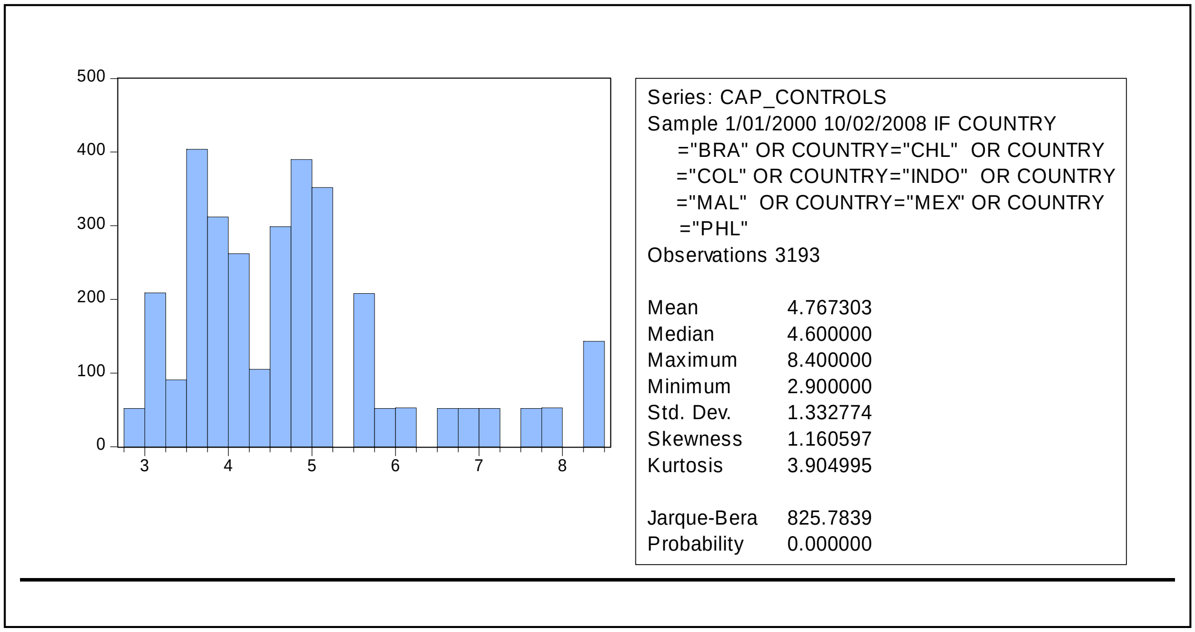


Figure 6: Distribution of Ratings Index (Constructed from S&P Ratings): All Countries in Sample

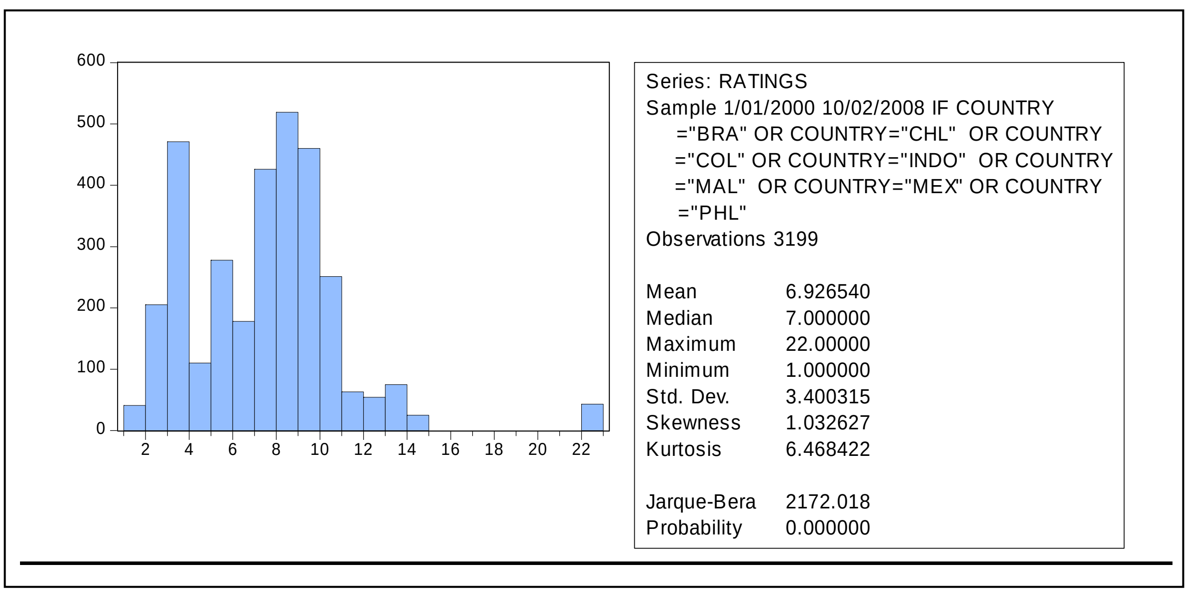


Table 1: Interest Rate Differentials in Selected Latin American and East Asian Countries: Descriptive Statistics, Weekly Data 01/2000-09/2008

	Brazil	Chile	Colombia	Mexico	Indonesia	Malaysia	Philippines
Mean	7.353	0.718	1.056	3.121	3.072	-1.710	0.703
Median	7.145	0.505	1.087	2.950	2.562	-1.427	0.526
Maximum	22.664	6.033	12.179	10.355	10.471	0.927	10.827
Minimum	-14.825	-3.902	-6.926	-1.655	-2.077	-6.087	-5.122
Std. Dev.	4.868	1.708	2.523	2.239	2.322	1.853	2.043
Skewness	0.013	0.572	-0.089	0.475	0.765	-0.746	0.946
Kurtosis	4.511	3.207	3.850	2.954	3.201	2.745	5.823
Jarque-Bera	41.950	19.984	14.349	17.250	22.537	43.628	219.904
Probability	0.000	0.000	0.001	0.000	0.000	0.000	0.000
Sum	3242.890	255.038	482.406	1426.239	697.289	-781.482	321.200
Sum Sq. Dev.	10428.410	1033.265	2903.122	2285.167	1218.692	1565.392	1903.470
Observations	441.000	355.000	457.000	457.000	227.000	457.000	457.000

Table 2: Unit Root Tests, Weekly data, 2000-2008

Panel unit root test: Summary
Series: DEVIATION90

Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 2 to 4
Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.04322	0.0000	7	2838
Breitung t-stat	-2.58312	0.0049	7	2831
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.50538	0.0000	7	2838
ADF - Fisher Chi-square	55.1835	0.0000	7	2838
PP - Fisher Chi-square	412.799	0.0000	7	2848

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

TABLE 3:
Interest Rate Differential Equations: Panel Estimation, Weekly Data, 2000-2008

Periods included: 457
Cross-sections included: 7
Total panel (unbalanced) observations: 2848

PANEL A

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.228150	0.038562	5.916500	0.0000
DEVIATION90(-1)	0.880604	0.008834	99.67784	0.0000
FF_DELTA	-0.551057	0.311275	-1.770321	0.0768

R-squared	0.777479	Mean dependent var	1.978308
Adjusted R-squared	0.777322	S.D. dependent var	3.879468
S.E. of regression	1.830672	Akaike info criterion	4.048296
Log likelihood	-5761.773	Hannan-Quinn criter.	4.050558
F-statistic	4970.151	Durbin-Watson stat	2.754154
Prob(F-statistic)	0.000000		

PANEL B

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.466806	0.041042	11.37372	0.0000
DEVIATION90(-1)	0.760334	0.012123	62.71984	0.0000
FF_DELTA	-0.539470	0.301585	-1.788781	0.0738

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.791854	Mean dependent var	1.978308
Adjusted R-squared	0.791268	S.D. dependent var	3.879468
S.E. of regression	1.772421	Akaike info criterion	3.985725
Log likelihood	-5666.673	Hannan-Quinn criter.	3.992511
F-statistic	1350.060	Durbin-Watson stat	2.593532
Prob(F-statistic)	0.000000		

(<u>Table 3</u>: Continuation)

PANEL C

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.612587	0.079529	7.702726	0.0000
DEVIATION90(-1)	0.830984	0.012681	65.52752	0.0000
FF_DELTA	-0.425148	0.277063	-1.534479	0.1250
FF_POLICY	-0.086793	0.018388	-4.720175	0.0000
D(DEVIATION90(-1))	-0.376201	0.017350	-21.68342	0.0000
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.824626	Mean dependent var		1.977433
Adjusted R-squared	0.824007	S.D. dependent var		3.880682
S.E. of regression	1.628005	Akaike info criterion		3.816446
Log likelihood	-5417.895	Hannan-Quinn criter.		3.824748
F-statistic	1332.575	Durbin-Watson stat		2.199452
Prob(F-statistic)	0.000000			

PANEL D

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.607781	0.079620	7.633543	0.0000
DEVIATION90(-1)	0.831226	0.012682	65.54412	0.0000
D(LOG(WTI_SPOT(-1)))	0.747554	0.614068	1.217381	0.2236
FF_DELTA	-0.429208	0.277060	-1.549155	0.1215
FF_POLICY	-0.086241	0.018392	-4.689130	0.0000
D(DEVIATION90(-1))	-0.375367	0.017362	-21.62030	0.0000
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.824718	Mean dependent var		1.977433
Adjusted R-squared	0.824037	S.D. dependent var		3.880682
S.E. of regression	1.627866	Akaike info criterion		3.816626
Log likelihood	-5417.151	Hannan-Quinn criter.		3.825683
F-statistic	1211.772	Durbin-Watson stat		2.198439
Prob(F-statistic)	0.000000			

Table 4: Interest Rate Differentials panel Estimates: Latin America and Asia

PANEL A: Latin America

Periods included: 457
Cross-sections included: 4
Total panel (unbalanced) observations: 1706

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.840510	0.126669	6.635482	0.0000
DEVIATION90(-1)	0.820231	0.016977	48.31329	0.0000
D(LOG(WTI_SPOT(-1)))	0.603747	0.943141	0.640145	0.5222
FF_DELTA	-0.751970	0.432102	-1.740262	0.0820
FF_POLICY	-0.090081	0.027702	-3.251794	0.0012
D(DEVIATION90(-1))	-0.388360	0.022300	-17.41493	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.775613	Mean dependent var	3.159482
Adjusted R-squared	0.774555	S.D. dependent var	4.091055
S.E. of regression	1.942476	Akaike info criterion	4.171065
Sum squared resid	6403.140	Schwarz criterion	4.199774
Log likelihood	-3548.919	Hannan-Quinn criter.	4.181691
F-statistic	733.2277	Durbin-Watson stat	2.216392
Prob(F-statistic)	0.000000		

PANEL B: Asia

Periods included: 457
Cross-sections included: 3
Total panel (unbalanced) observations: 1139

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.252551	0.071458	3.534266	0.0004
DEVIATION90(-1)	0.873527	0.016697	52.31596	0.0000
D(LOG(WTI_SPOT(-1)))	1.002319	0.581996	1.722209	0.0853
FF_DELTA	0.019190	0.256733	0.074745	0.9404
FF_POLICY	-0.066453	0.018607	-3.571467	0.0004
D(DEVIATION90(-1))	-0.266997	0.028550	-9.351915	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.872072	Mean dependent var	0.206954
Adjusted R-squared	0.871281	S.D. dependent var	2.707090
S.E. of regression	0.971236	Akaike info criterion	2.786504
Log likelihood	-1578.914	Hannan-Quinn criter.	2.799867
F-statistic	1101.420	Durbin-Watson stat	2.101063
Prob(F-statistic)	0.000000		

Table 5: Interest Rate Differentials and the U.S. Term Structure

PANEL A: Latin America

Periods included: 457
Cross-sections included: 4;
Total panel (unbalanced) observations: 1706

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.996250	0.390827	2.549079	0.0109
DEVIATION90(-1)	0.822336	0.016967	48.46591	0.0000
FF_DELTA	-0.734277	0.432610	-1.697318	0.0898
FF_POLICY	-0.072727	0.035459	-2.050986	0.0404
D(DEVIATION90(-1))	-0.392691	0.022234	-17.66173	0.0000
D(LOG(EUR_USD(-1)))*100	0.107010	0.035401	3.022813	0.0025
D(UST_10YR)	0.886694	0.384200	2.307896	0.0211
UST_10YR	-0.048658	0.097382	-0.499655	0.6174

Cross-section fixed (dummy variables)

R-squared	0.777433	Mean dependent var	3.159482
Adjusted R-squared	0.776120	S.D. dependent var	4.091055
S.E. of regression	1.935721	Akaike info criterion	4.165264
Log likelihood	-3541.970	Hannan-Quinn criter.	4.178251
F-statistic	592.0694	Durbin-Watson stat	2.221881
Prob(F-statistic)	0.000000		

PANEL B: Asia

Periods included: 457
Cross-sections included: 3
Total panel (unbalanced) observations: 1139

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.364707	0.235569	1.548196	0.1219
DEVIATION90(-1)	0.871237	0.016560	52.61219	0.0000
FF_DELTA	0.040423	0.256167	0.157800	0.8746
FF_POLICY	-0.056529	0.023716	-2.383566	0.0173
D(DEVIATION90(-1))	-0.263936	0.028326	-9.317923	0.0000
D(LOG(EUR_USD(-1)))*100	0.101706	0.021633	4.701468	0.0000
D(UST_10YR)	0.407755	0.239359	1.703533	0.0887
UST_10YR	-0.032285	0.060029	-0.537818	0.5908

Cross-section fixed (dummy variables)

R-squared	0.874531	Mean dependent var	0.206954
Adjusted R-squared	0.873531	S.D. dependent var	2.707090
S.E. of regression	0.962709	Akaike info criterion	2.770610
Log likelihood	-1567.862	Hannan-Quinn criter.	2.787314
F-statistic	874.3604	Durbin-Watson stat	2.109703
Prob(F-statistic)	0.000000		

Table 6: Capital Controls and the Speed of Adjustment

PANEL A: Latin America

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.808868	0.127132	6.362431	0.0000
DEVIATION90(-1)	0.825855	0.070596	11.69840	0.0000
FF_DELTA	-0.736539	0.431481	-1.707002	0.0880
FF_POLICY	-0.083232	0.027727	-3.001858	0.0027
D(DEVIATION90(-1))	-0.528271	0.094680	-5.579552	0.0000
D(LOG(EUR_USD(-1)))*100	0.108712	0.035383	3.072403	0.0022
D(UST_10YR)	0.885433	0.381540	2.320681	0.0204
DEVIATION90(-1)*CAP_CONTROLS	-0.000669	0.012642	-0.052949	0.9578
D(DEVIATION90(-1))*CAP_CONTROLS	0.025552	0.017254	1.480960	0.1388

Cross-section fixed (dummy variables)

R-squared	0.777605	Mean dependent var	3.156131
Adjusted R-squared	0.776160	S.D. dependent var	4.092204
S.E. of regression	1.936095	Akaike info criterion	4.166240
Log likelihood	-3537.637	Hannan-Quinn criter.	4.180423
F-statistic	537.8271	Durbin-Watson stat	2.222640
Prob(F-statistic)	0.000000		

PANEL B: Asia

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.302267	0.074435	4.060817	0.0001
DEVIATION90(-1)	0.661422	0.087357	7.571501	0.0000
FF_DELTA	0.050513	0.254287	0.198645	0.8426
FF_POLICY	-0.083661	0.019929	-4.197961	0.0000
D(DEVIATION90(-1))	-0.300160	0.168464	-1.781747	0.0751
D(LOG(EUR_USD(-1)))*100	0.104199	0.021576	4.829505	0.0000
D(UST_10YR)	0.394437	0.237494	1.660830	0.0970
DEVIATION90(-1)*CAP_CONTROLS	0.047952	0.019718	2.431944	0.0152
D(DEVIATION90(-1))*CAP_CONTROLS	0.008433	0.039004	0.216207	0.8289

Cross-section fixed (dummy variables)

R-squared	0.874883	Mean dependent var	0.209025
Adjusted R-squared	0.873772	S.D. dependent var	2.704923
S.E. of regression	0.961022	Akaike info criterion	2.767989
Log likelihood	-1562.602	Hannan-Quinn criter.	2.786392
F-statistic	787.3557	Durbin-Watson stat	2.099721
Prob(F-statistic)	0.000000		

Table 7: Speed of Adjustment and Risk Ratings

PANEL A: Latin America

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.890763	0.127143	7.006014	0.0000
DEVIATION90(-1)	0.571757	0.059661	9.583395	0.0000
FF_DELTA	-0.909227	0.429708	-2.115917	0.0345
FF_POLICY	-0.083220	0.027510	-3.025125	0.0025
D(DEVIATION90(-1))	-0.299610	0.071069	-4.215759	0.0000
D(LOG(EUR_USD(-1)))*100	0.098211	0.035251	2.786053	0.0054
D(UST_10YR)	0.836485	0.379342	2.205095	0.0276
DEVIATION90(-1)*RATINGS	0.028805	0.006593	4.369332	0.0000
D(DEVIATION90(-1))*RATINGS	-0.010196	0.008662	-1.177032	0.2393

Cross-section fixed (dummy variables)

R-squared	0.779914	Mean dependent var	3.159482
Adjusted R-squared	0.778485	S.D. dependent var	4.091055
S.E. of regression	1.925472	Akaike info criterion	4.155228
Log likelihood	-3532.410	Hannan-Quinn criter.	4.169396
F-statistic	545.7261	Durbin-Watson stat	2.212674
Prob(F-statistic)	0.000000		

PANEL B: Asia

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.238152	0.071113	3.348918	0.0008
DEVIATION90(-1)	0.920440	0.059102	15.57387	0.0000
FF_DELTA	0.043378	0.255225	0.169961	0.8651
FF_POLICY	-0.056190	0.020828	-2.697848	0.0071
D(DEVIATION90(-1))	-0.209952	0.117791	-1.782403	0.0750
D(LOG(EUR_USD(-1)))*100	0.102691	0.021623	4.749051	0.0000
D(UST_10YR)	0.396937	0.237477	1.671477	0.0949
DEVIATION90(-1)*RATINGS	-0.006419	0.007378	-0.870077	0.3844
D(DEVIATION90(-1))*RATINGS	-0.006566	0.014316	-0.458639	0.6466

Cross-section fixed (dummy variables)

R-squared	0.874640	Mean dependent var	0.206954
Adjusted R-squared	0.873528	S.D. dependent var	2.707090
S.E. of regression	0.962719	Akaike info criterion	2.771499
Sum squared resid	1045.461	Schwarz criterion	2.820153
Log likelihood	-1567.369	Hannan-Quinn criter.	2.789874
F-statistic	787.0063	Durbin-Watson stat	2.108421
Prob(F-statistic)	0.000000		

Table 8: Capital Controls and Interest Rate Differentials

PANEL A: Latin America

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.826804	0.127484	6.485551	0.0000
DEVIATION90(-1)	0.818585	0.017171	47.67315	0.0000
FF_DELTA	-2.639335	1.561842	-1.689886	0.0912
FF_POLICY	-0.206254	0.083639	-2.465994	0.0138
D(DEVIATION90(-1))	-0.390030	0.022254	-17.52638	0.0000
D(LOG(EUR_USD(-1)))*100	0.108142	0.035384	3.056260	0.0023
D(UST_10YR)	0.853625	0.381200	2.239307	0.0253
FF_DELTA*CAP_CONTROLS	0.368575	0.295729	1.246328	0.2128
FF_POLICY*CAP_CONTROLS	0.023109	0.014820	1.559237	0.1191

Cross-section fixed (dummy variables)

R-squared	0.777799	Mean dependent var	3.156131
Adjusted R-squared	0.776354	S.D. dependent var	4.092204
S.E. of regression	1.935253	Akaike info criterion	4.165371
Log likelihood	-3536.896	Hannan-Quinn criter.	4.179554
F-statistic	538.4286	Durbin-Watson stat	2.222472
Prob(F-statistic)	0.000000		

PANEL B: Asia

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.323963	0.075261	4.304517	0.0000
DEVIATION90(-1)	0.850396	0.017828	47.70004	0.0000
FF_DELTA	-1.379409	1.721790	-0.801148	0.4232
FF_POLICY	-0.282046	0.074935	-3.763876	0.0002
D(DEVIATION90(-1))	-0.253765	0.028428	-8.926440	0.0000
D(LOG(EUR_USD(-1)))*100	0.103528	0.021536	4.807089	0.0000
D(UST_10YR)	0.383746	0.236728	1.621043	0.1053
FF_DELTA*CAP_CONTROLS	0.336450	0.404326	0.832126	0.4055
FF_POLICY*CAP_CONTROLS	0.045810	0.015362	2.982091	0.0029

Cross-section fixed (dummy variables)

R-squared	0.875214	Mean dependent var	0.209025
Adjusted R-squared	0.874106	S.D. dependent var	2.704923
S.E. of regression	0.959749	Akaike info criterion	2.765338
Log likelihood	-1561.095	Hannan-Quinn criter.	2.783740
F-statistic	789.7449	Durbin-Watson stat	2.097718
Prob(F-statistic)	0.000000		

References

Aizenman, J. 2004. "Financial Opening and Development: Evidence and Policy Controversies," *American Economic Review*, May 2004, pp 65-70.

Aizenman, J. 2008. "On the Hidden Links between Financial and Trade Opening," *Journal of International Money and Finance*, April 2008, pp. 372-386

Bhagwati, J. N., 1998. The Capital Myth: The Difference between Trade in Widgets and Dollars. *Foreign Affairs* May/June.

Edwards, S. 1998. "Interest rate Volatility, Contagion and Convergence: An Empirical Investigation of the Cases of Argentina, Chile and Mexico," *Journal of Applied Economics*, 1, 1: 55-86

Edwards, S. 1999. "How Effective are Capital Controls," *Journal of Economic Perspectives*, 13, 4: 65-84.

Edwards, S. 2007. "Capital Controls, Capital Flow Contractions, and Macroeconomic Vulnerability," *Journal of International Money and Finance*, April 2008,

Edwards, S. 2010. *Populism and Markets: Latin America's Bumpy Road to Modernity*, University of Chicago Press

Krugman, Paul. 1995 "Dutch tulips and the emerging markets: Another bubble bursts" *Foreign Affairs*, 75(4): 28-44.

Rodrik, D., 2006. "Goodbye Washington Consensus, Hello Washington Confusion? A Review of the World Bank's 'Economic Growth in the 1990s: Learning from a Decade of Reform'". Journal of Economic Literature 44 (4), pp. 973-987.

Stiglitz, J. E., 2002. Globalization and its Discontents. W. W. Norton, New York

Uribe, M. and V. Yue, 2003. “Country Spreads and Emerging Markets,” National Bureau of Economic Research Working Paper, 10018.