



Financial Cycles, Contagion, and Liability Dollarization: Do Exchange Rate Regimes Matter?

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Crises and Exchange Rate Regimes

- As crises always do, the currency turmoil of the 1990s resuscitated old debates on the causes of crises.
- One of the most heated debates was centered on the role of the exchange rate regime.
- The crises of the 1990s were preceded by “**financial excesses**” and **liability dollarization**. Thus, the debate on the role of the exchange rate regime was centered on whether fixed or floating regimes trigger “excessive financial boom-bust cycles” or fuel too much borrowing in foreign currency.
- These crises were of a highly contagious nature, also raising the question of whether fixed or floating exchange rates contribute to the extent of **financial contagion**.



Financial Excesses and the Exchange Rate Regime: Theory

- **Dooley (1997) argues that fixed rates with an escape clause favor moral hazard behavior due to the presence of government guarantees.**
- **The exchange-rate guarantees promote over-borrowing because agents anticipate they will be bailed-out in the unlucky event of a devaluation.**
- **With fixed exchange rates, risk premium becomes zero and borrowing in foreign currencies becomes exaggerated.**
- **With credit increasing, the financial market booms and bubbles are formed.**
- **This and other models have influenced academics and public officials towards supporting fully flexible exchange rate regimes or fixed exchange rates in corsets (currency boards à la Hong Kong or even dollarization à la Ecuador).**
- **But are financial cycles linked to the exchange rate regime?**



Financial Cycles and Exchange Rate Regimes: Evidence

- **To examine these claims, I study the pattern of financial booms and crashes in twenty eight countries, both industrial and developing since 1973.**
- **I look at booms and busts in stock market prices measured in 1990 U.S. dollars in the following countries.**
 - **Seven Asian countries: Hong Kong, Indonesia, Korea, Malaysia, Philippines, Taiwan, and Thailand.**
 - **G-7 countries: Canada, France, Germany, Italy, Japan, United Kingdom, and United States.**
 - **Seven European countries: Denmark, Finland, Ireland, Norway, Portugal, Spain , and Sweden.**
 - **Seven Latin American countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.**
- **I examine whether the amplitude of the financial cycles depends on the exchange rate regime.**

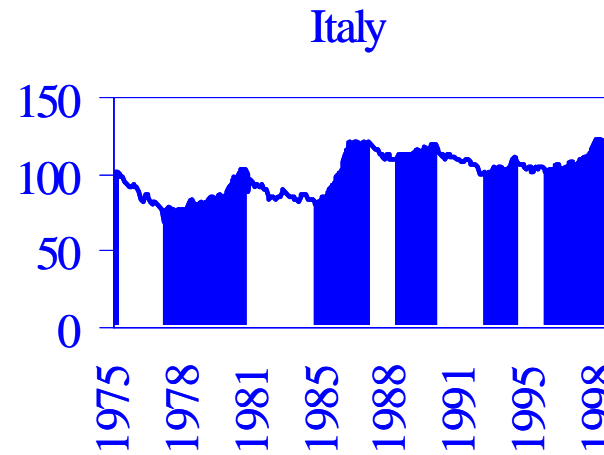
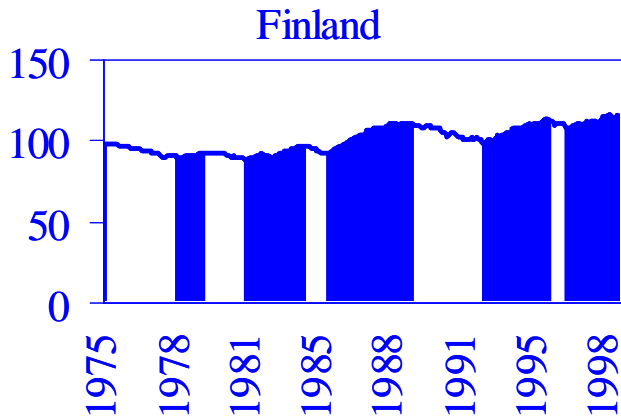
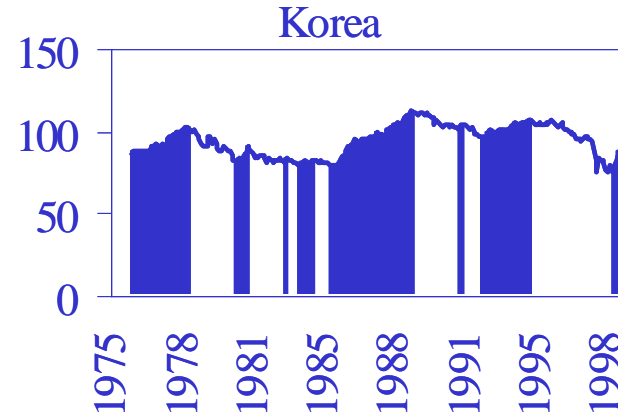
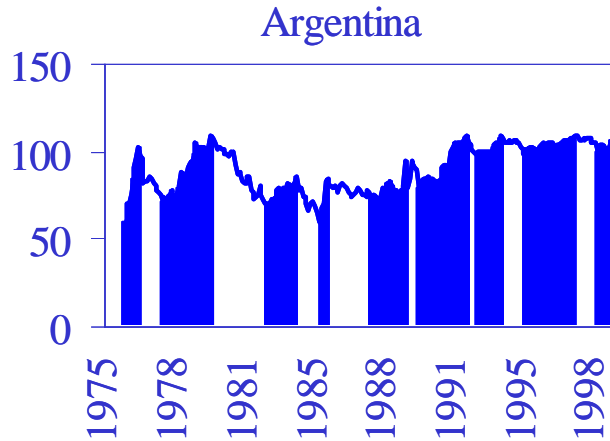


Identifying Financial Cycles

- **I isolate cyclical turning points by using a technique similar to the NBER dating methodology for business cycles.**
- **The only constraint is that cycles have to be at least 24-month long.**
- **I tabulate the amplitude and duration of the booms and busts.**
- **Using this methodology, I identify 146 cycles (79 cycles in mature markets and 67 cycles in emerging markets), with an average duration of 44 months.**



Examples of Stock Market Cycles





Identifying Pegs and Floats

- To identify fixed and floating exchange rate regimes, I use a *de facto* classification à la Reinhart-Rogoff and not a *de jure* classification à la IMF.

$$I_t = \frac{\text{var}_{t,t-12}(\Delta e/e_t)}{\text{var}_{t,t-12}(\Delta R/R)} + \frac{\text{var}_{t,t-12}(\Delta e/e)}{\text{var}_{t,t-12}(\Delta BM/BM)}$$

- During the sample, only fifteen percent of the countries were truly floaters all the time.
- Another fifteen percent of the countries allowed their currencies to float about half of the time.



Do Pegs Trigger Financial Excesses?

- **Of the 146 cycles in our sample, 96 cycles occur during episodes of pegs and 50 occur during flexible exchange rate regimes.**
- **Cycles are more pronounced during episodes of pegs.**
- **The amplitude of the booms in Latin America is about 20 percent higher during pegs than during floats.**
- **The amplitude of the booms in the G-7 countries is about 40 percent higher during pegs than during floats.**
- **The results suggest that fixed rates may promote too much borrowing and financial vulnerabilities.**



Financial Contagion and the Exchange Rate Regime

- **The aftermath of the Mexican, Thai, and Russian crises was characterized by a sudden reversal of capital flows.**
- **This reversal affected the crisis country and also many countries in the region or even far apart from the crisis country.**
- **Channels of Contagion:**
 - **Trade**
 - **Common Creditor**
 - **Liquidity Channels, mutual funds, and cross-market hedging**
 - **Wake-Up Calls**
 - **Exchange Rate Regimes**



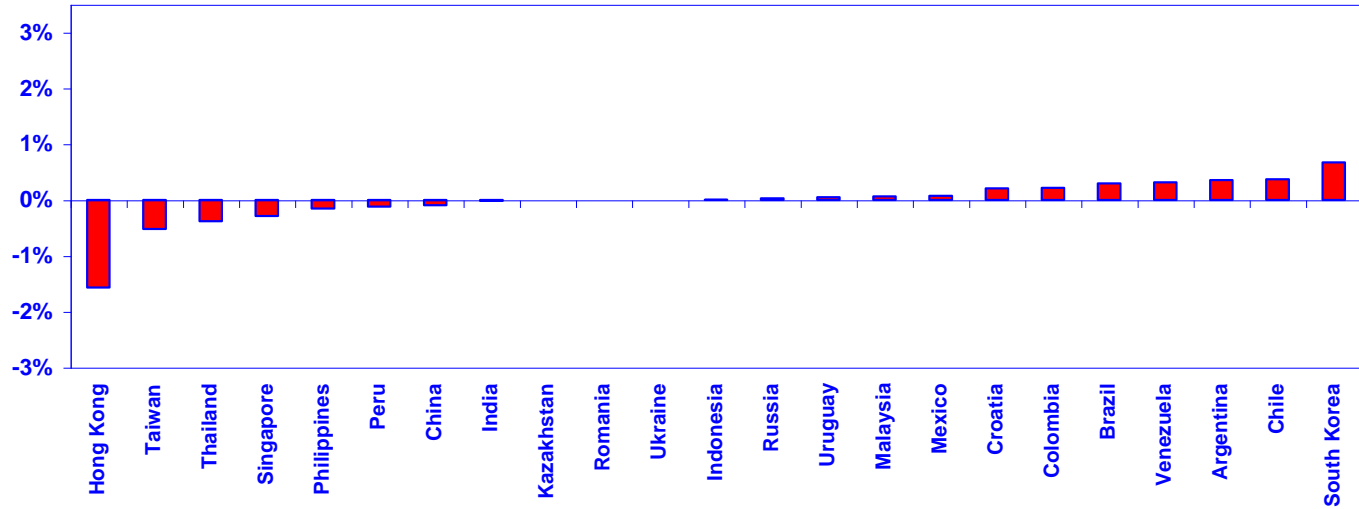
Capturing Contagion

- **Bond Market:** Primary gross issuance in international bond markets. These include Euro bonds, Yankee bonds, Samurai bonds, and global bonds. Emerging economies primary issuance was around 150 billion dollars in 2004.
- **Equity Mutual Funds:** 1,400 international emerging market equity funds, with an average position of about \$120 billion in 1996. It covers U.S. registered and offshore funds as well as funds registered in Luxembourg, United Kingdom, Ireland, Cayman Islands, Canada, and Switzerland.

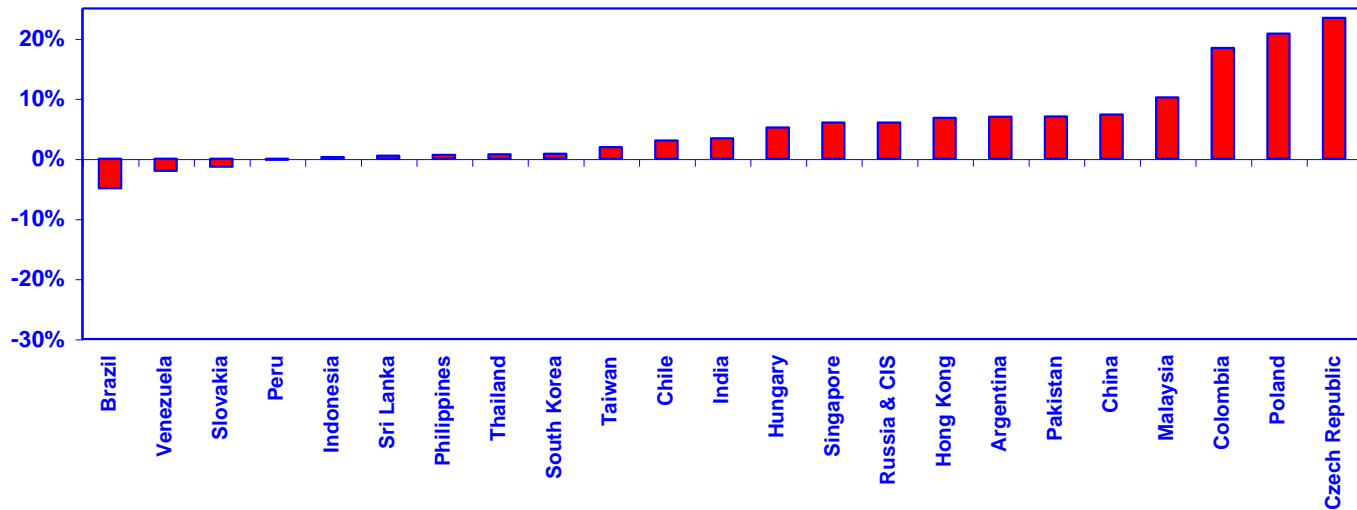


The Mexican Crisis: Global Spillovers

International Bond Markets



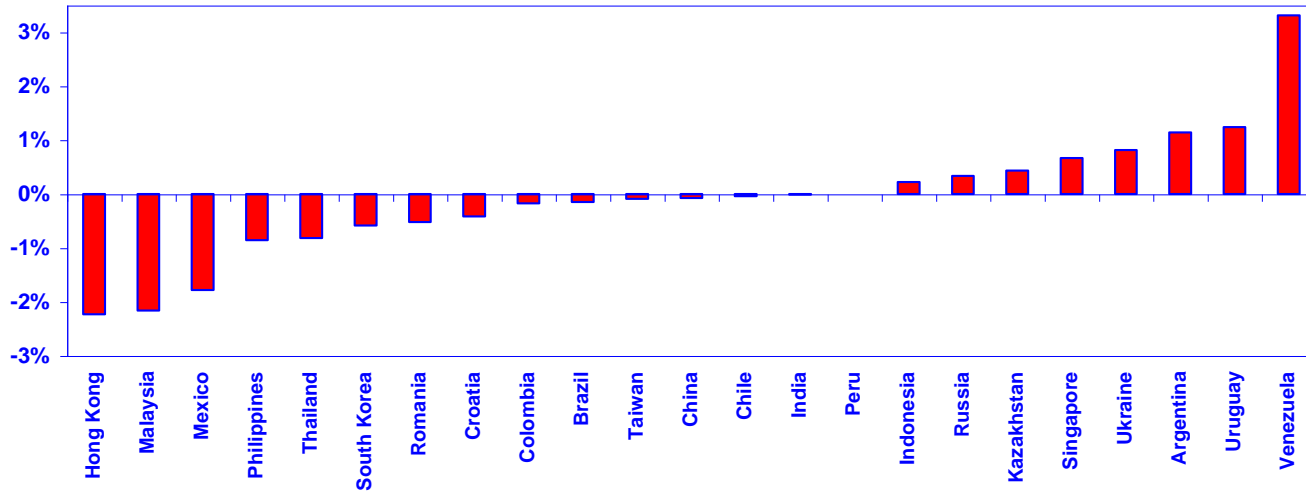
Equity Mutual Funds



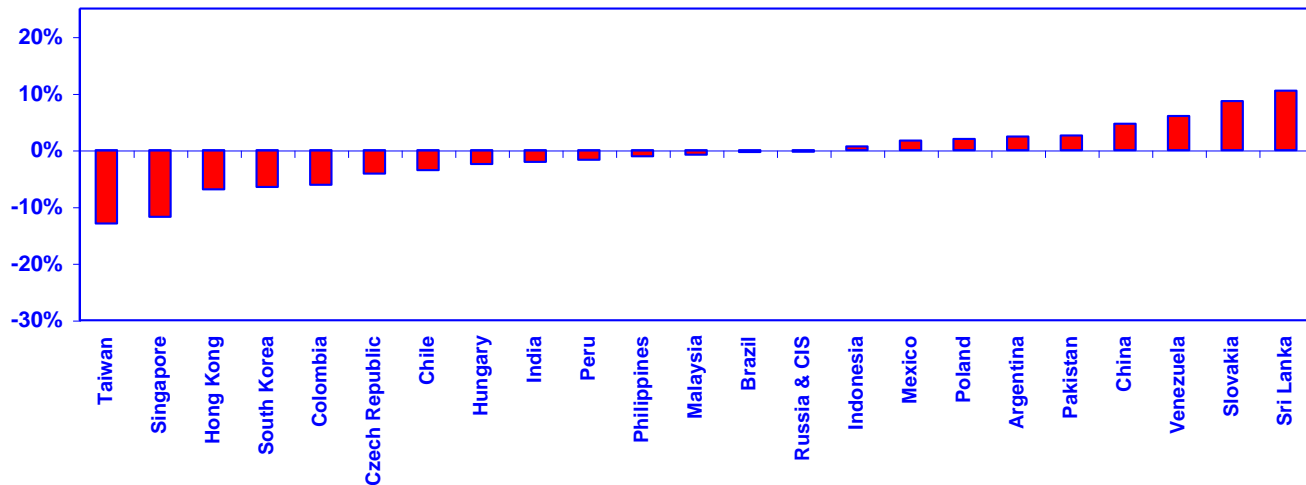


The Thai Crisis: Global Spillovers

International Bond Markets



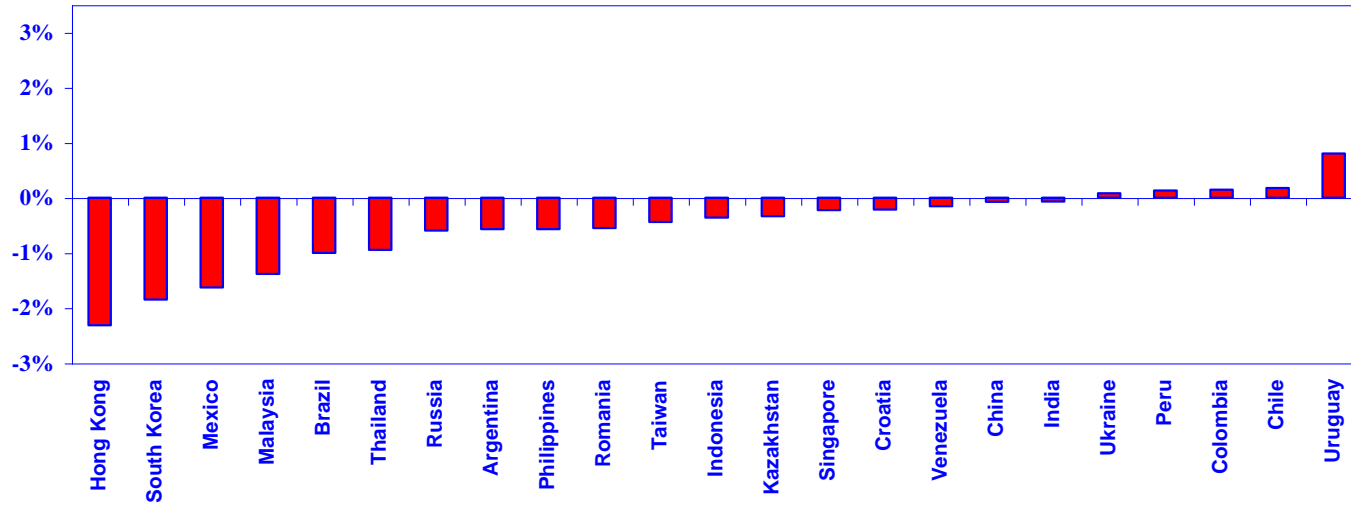
Equity Mutual Funds



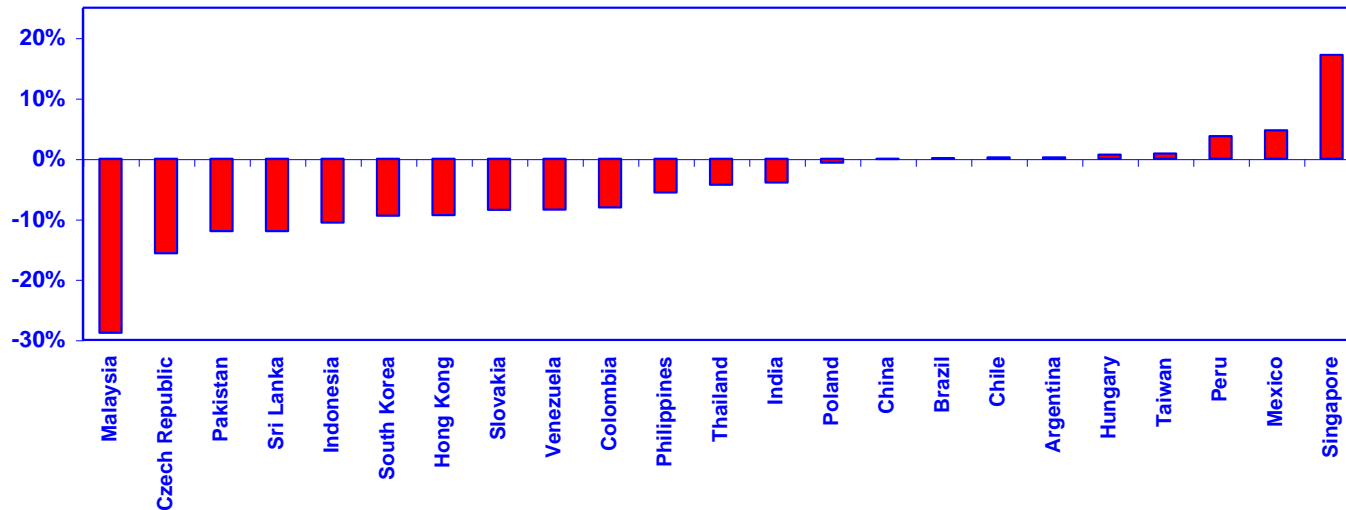


The Russian Crisis: Global Spillovers

International Bond Markets

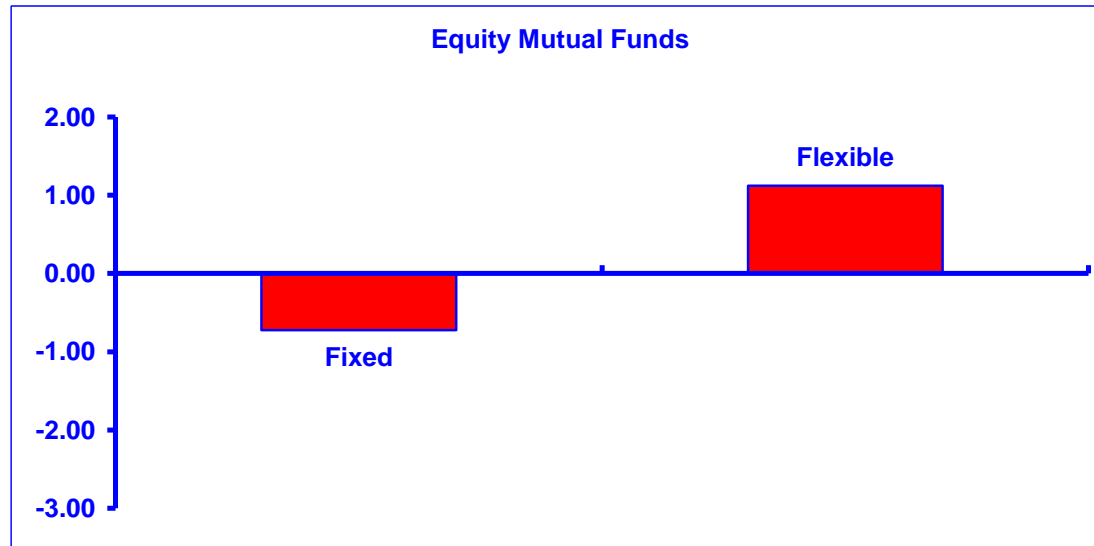
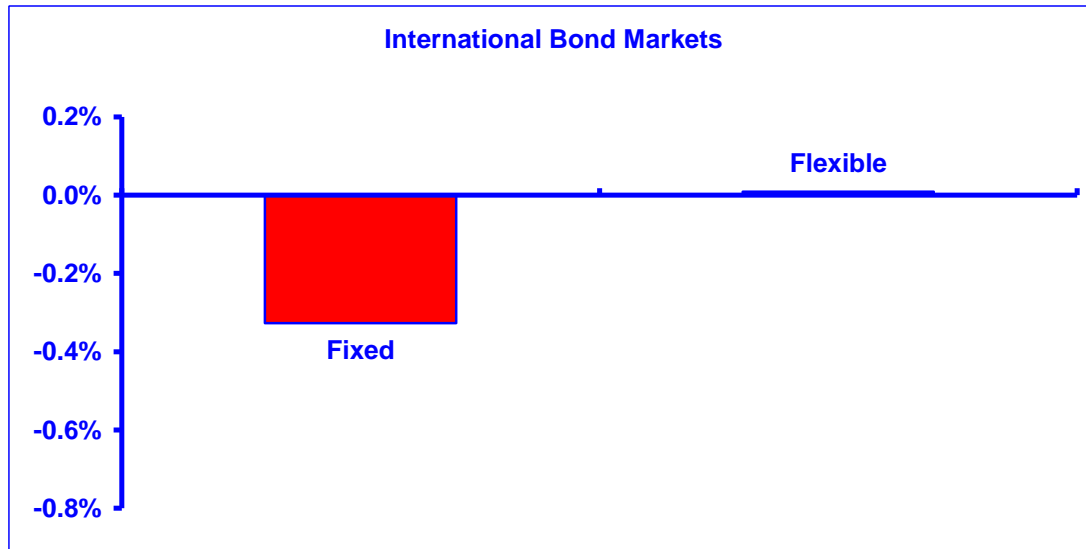


Equity Mutual Funds





Contagion: The Role of the Exchange Rate Regime





Exchange Rate Regimes and Liability Dollarization Theory

- **By providing an implicit exchange rate guarantee, fixed exchange rate regimes bias corporate borrowing towards foreign currency.**
- **According to Burnside, Eichenbaum, and Rebelo(2001) and Scheneider and Tornell (2004), under fixed exchange rate regimes, firms do not fully internalize their exchange rate risk and will be more likely to engage in balance sheet mismatches that under a floating regime.**
- **Even without moral hazard considerations, the exchange rate regime might also affect the currency composition of debt by modifying the relative return volatilities of domestic and foreign currency assets. Ize and Levy Yeyati (2003) show that, in a minimum variance portfolio equilibrium, financial dollarization is explained by the relative volatilities of inflation and real exchange rates. Since pegs tend to reduce real exchange rate volatility, they also increase dollarization.**
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Exchange Rate Regimes and Liability Dollarization

- **Iannariello (2005) examines the possible two-way causality between the exchange rate regime and dollarization.**
- **When the economy is dollarized, a volatile exchange rate exacerbates currency mismatches between bank assets and liabilities, debilitating the financial system. To avoid the detrimental effects of exchange rate volatility, dollarized economies should opt for a fixed exchange rate regime.**
- **However, a fixed exchange rate regime might in itself be the cause of vulnerabilities if market participants do not fully internalize the exchange risk. When investors make their decisions based on the peg, they may end up with too much liability-dollarization.**



Liability Dollarization and the Exchange Rate Regime

- Panel VAR
- Countries: Argentina, Bolivia, Chile, Colombia, Czech Republic, Ecuador, Egypt, Estonia, Hungary, Indonesia, Korea, Malaysia, Mexico, Nigeria, Peru, Philippines, Poland South Africa, Thailand, Turkey, Ukraine, and Venezuela.
- Annual Data, 1990-2001.
- Dollarization: Dollar deposits and foreign borrowing of domestic banks as a share of GDP.
- Index of Exchange-Rate Flexibility:

$$I_t = \frac{\sum_{k=1}^{12} \left[\frac{|e_{t-k} - e_{t-k-1}|}{e_{t-k-1}} \right]}{\sum_{k=1}^{12} \left[\frac{|R_{t-k} - R_{t-k-1}|}{MB_{t-k}} \right]}$$



The Estimation

$$Y_t = \sum_{s=1}^L B_s Y_{t-s} + \mu_t$$

$$Y_t = \begin{array}{|l} \text{Exchange - Rate Regime Index} \\ \text{Inflation} \\ \text{Dollarization} \\ \text{Interest Rate Differential} \end{array}$$



Do Exchange Rate Regimes Affect Dollarization?

Variance Decomposition for Dollarization
(In Percent)

Horizon (years)	Exchange Rate Regime	Inflation	Interest Rate Differential	Dollarization
1	3	5	0	92
2	4	7	0	89
3	14	6	0	80
4	30	4	0	66
5	46	2	0	52
6	59	2	0	39
7	68	2	0	30
8	75	2	0	23
9	79	2	0	19
10	82	2	0	16

Source: Iannariello, 2005, GWU.

- Impulse Responses:** A one-percentage point increase in the Index of Flexibility (equivalent to a move from a move from a peg to a crawling peg regime) leads to a persistent decrease in financial dollarization close to 4 percent of GDP.



On the Currency of Denomination of Firms' Liabilities

- **Burnside, Eichenbaum, and Rebelo (2001) conclude that peg exchange regimes trigger corporate borrowing in foreign currencies as firms do not fully internalize the exchange risk during pegs and will be more likely to engage in balance sheet mismatches that under a floating regime.**
- **In contrast, Eichengreen and Hausman (1999) claim that emerging markets have a natural tendency for liability dollarization and is not linked to the exchange rate regime. Currency mismatches exist not because banks and firms lack the prudence to hedge their exposures. Rather, it is the incompleteness of the markets that is at the root of liability dollarization. According to this view, floating rates may even trigger more liability dollarization as volatile exchange rates make hedging even more expensive.**



The Currency Composition of Corporate Debt and the Exchange Rate Regime Mexico 1992-2003

- Total of 318 firms during the sample 1992-2003.
- Mexico had a fixed exchange rate regime prior to the 1994 crisis. Since then, the peso has been allowed to float more freely.

Debt Denominated in Foreign Currency/Exports
(in Percent)

Firms	1992	1994	1996	2000
All Firms	246	389	192	156
Small	131	300	132	116
Medium	223	442	209	158
Large	385	377	209	199

Source: Martinez and Werner, Journal of Development Economics, 2002.



Evidence from Latin America

- **Kamil (2006) extends Martinez and Werner study to seven Latin American countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay.**
- **Two thousand firms.**
- **Sample: 1992-2005.**
- **The database includes the following information on firms:**
 - **Total Assets and Liabilities**
 - **Foreign currency assets and liabilities**
 - **Short-term foreign currency liabilities**
 - **Total sales and total sales in foreign markets (exports)**



Do Exchange Rate Regimes Matter?

$$\frac{\text{Foreign Currency Debt}}{\text{Total Debt}} = \alpha_0 + \alpha_1 \text{ERR} + \alpha_2 \frac{\text{Exports}}{\text{Total Sales}} + \alpha_3 \left[\frac{\text{Exports}}{\text{Total Sales}} \times \text{ERR} \right] + X\beta + \varepsilon$$

- Where ERR is 1 if Flexible Exchange Rates, 0 otherwise.
- α_2 captures the degree of natural currency risk hedging, shows the matching of the currency composition of liabilities to the currency composition of income streams.
- α_1 captures the effect of the exchange rate regime without consideration to the currency-composition of income flows. While α_3 is the effect of the interaction of the exchange rate regime and export intensity on liability dollarization.
- Liability dollarization in the less export-oriented firm declines about 6 percentage points (when compared to a more export-oriented firm) when the domestic currency is floating.



Reflections

- **The recent turmoil in currency markets has re-ignited the old debate of fixed versus flexible exchange rate regimes.**
- **While the debate is old, it has acquired a new twist. It does not focus anymore on asymmetric real shocks to determine whether a group of countries belongs to an optimum currency area.**
- **The discussion is now centered on the effects of liability dollarization and the moral-hazard problem triggered by the exchange-rate government-guarantees implicit in “soft” pegs.**
- **Recent evidence suggests that pegs may in fact trigger more liability dollarization and overall financial fragility.**
- **Still, the empirical evidence is limited to a small number of countries or experiences. Further empirical work is still needed.**
- **Still to do better measures of currency mismatch. What about derivative positions?**