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Exchange Rate Regimes and Financial Dollarization: Does Flexibility Reduce Currency Mismatches in Bank Intermediation?

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April 2005

Abstract: The dollarization of bank deposits and credit is widespread in developing countries, resulting in varying degrees of currency mismatches in domestic financial intermediation. It is argued that flexible exchange rate regimes generally encourage banks to match dollar-denominated liabilities with a corresponding amount of dollar-denominated assets. Does this argument apply to the behavior of dollar deposits and credits in financially dollarized economies? A new database on deposit and credit dollarization in developing and transition countries is assembled and used to address this question. Empirical results suggest that, if anything, floating regimes are positively associated with deposit dollarization more strongly than they are associated with credit dollarization. As a consequence, currency mismatches in domestic financial intermediation seem to be greater under floating regimes.

Keywords: dollarization, exchange rate, regimes, currency mismatches, banks
JEL Classification Number: F33, G21

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1 Introduction

Partial dollarization, defined as the holding by residents of a significant share of their assets and liabilities in the form of foreign-currency-denominated instruments, is widespread in many developing and transition economies.[1] Financial intermediation in particular has become heavily dollarized in several countries. This process of financial dollarization has been reflected in varying patterns of dollarization of bank deposits and loans, which in turn have influenced the extent of currency mismatches in domestic financial intermediation.

In general, one of the debates about the causes of overall currency mismatches of banks and firms relates to the exchange rate regime. There are two views on the links between regimes and mismatches – in particular, on the question of whether greater flexibility encourages hedging. The majority view (e.g. Burnside, Eichenbaum and Rebelo 2001, Mishkin 1996, Obstfeld 1998, Goldstein 2002) would appear to be that fixed exchange rates encourage currency mismatches because banks and firms do not hedge their dollar liabilities, as they believe themselves to be immune to exchange rate fluctuations given the commitment from the authorities to defend the peg. Therefore, floating exchange rates would encourage banks and firms to match dollar liabilities with a corresponding quantity of dollar assets, as they seek to limit their exposure to exchange risk. On the other hand, a minority view (e.g. Eichengreen and Hausmann 1999, McKinnon 2001) argues that greater flexibility increases the cost of hedging and therefore may not lead to lower currency mismatches. This view

[1] Following the standard vocabulary, this paper uses the terms "dollar" when referring to any foreign currency and "peso" when referring to any domestic currency. In addition, the term "dollarization" in this paper does not refer to the adoption of a foreign currency as legal tender ("full dollarization").

emphasizes that the cost of insurance against exchange risk goes up with exchange rate volatility; consequently, floating regimes might raise the cost of insurance and result in less hedging, rather than more.

In the context of dollarized banking systems, this paper explores whether or not exchange rate flexibility is associated with *across-the-board* reductions of bank currency mismatches by focusing on a subcomponent of bank balance sheets: dollar deposits and loans. Indeed, there are reasons to believe that floating regimes may not encourage banks to match dollar deposits with dollar loans. Greater exchange rate flexibility may potentially enhance the attractiveness of dollar deposits as households seek to insure themselves against currency risk. Whether banks can and will respond to an increase in dollar deposits by further increasing dollar loans is an open question, as dollar credit might not increase and could even fall under flexibility. Substituting foreign-currency-denominated loans for domestic-currency-denominated loans trades one source of risk (default risk, reflecting the fact that sudden depreciations leave some firms unable to repay) for another (currency risk). Banks may have good reasons to regard it as undesirable to move too far to one or the other extreme of this tradeoff. Flexible exchange rates thus may encourage deposit dollarization more strongly than they encourage credit dollarization. Currency mismatches between deposits and loans could therefore be greater, not lower, under floating regimes. For all these reasons, the overall effect of greater exchange rate flexibility on credit and deposit dollarization, and thus on currency mismatches in domestic financial intermediation, is an empirical question.

In many developing economies, credits and deposits account for a significant portion of total bank assets and liabilities.[2] However, despite the relevance of the topic, there has been very little previous systematic, cross-

country empirical work on the links between the exchange rate, deposit and loan dollarization, and currency mismatches in financial intermediation. This paper contributes to the nascent cross-country, large-*n* empirical work on this issue.

To analyze the effects of exchange rate regimes on financial dollarization and currency mismatches between deposits and loans, I have assembled the first comprehensive database on dollarization. Its first component is data on dollar-denominated bank credit and deposits in a large number of developing economies for the past two decades. Its second component is information on bank regulations in the same sample of countries. Using these data, I study the impact of the exchange rate regime on credit dollarization, deposit dollarization, and deposit-credit currency mismatches, controlling for the institutional and regulatory framework.

The paper finds little support for the view that flexible exchange rate regimes reduce currency mismatches in domestic financial intermediation. If anything, the opposite would seem to be true. Although the results are somewhat sensitive to the exchange rate classification used, they suggest that deposit dollarization is apparently greater under floating regimes, whereas credit dollarization actually appears to be lower under flexibility. Since exchange rate flexibility is associated with deposit dollarization more strongly than it is associated with credit dollarization, floating exchange rates seem to result in greater deposit-credit mismatches. These general results hold across different variable definitions and robustness checks.

Before proceeding, it is important to restate that this paper does not attempt to show that flexibility increases overall currency mismatches in bank balance sheets; instead, it only deals with a specific – but relevant – subset of

[2] Loans and deposits account for roughly 40 to 50 percent of bank assets and liabilities in the sample of countries used in this study.

domestic assets and liabilities of banks.[3] While these results do not show that flexible exchange rates exacerbate banks' foreign currency risk, they suggest that banks could potentially face a greater need to hedge the increasing deposit-credit mismatches that are present under exchange rate flexibility.

The remainder of this paper is organized as follows. Section 2 outlines the methodology and introduces the dollarization database and other data used. Section 3 presents empirical evidence on the impact of exchange rate regimes on dollarization and on currency mismatches in financial intermediation. Section 4 concludes.

2 Methodology and Data

2.1 Methodology

To assess the links of floating regimes with credit and deposit dollarization, as well as with currency mismatches in financial intermediation, I estimate the following relationship:

(1) $$Dollarization_{it} = \beta_0 + \beta_1 Intermediate_{it} + \beta_2 Floating_{it} + \gamma' Controls_{it} + \varepsilon_{it}$$

Dollarization stands for a measure of either credit or deposit dollarization, or for the corresponding deposit-credit mismatch. *Intermediate* and *Floating* stand for two binary indicators for whether country *i* has an intermediate or a floating regime in place at time *t*, the reference group being fixed regimes. The term

[3] A complete assessment of the links between regimes and *overall* bank currency mismatches would require additional data on the currency denomination of other components of bank balance sheets and on off-balance-sheet hedging in insurance markets against currency risk. These data are unfortunately scarce. For example, data on banks' foreign assets and liabilities published by the IMF's *International Financial Statistics* deal with country of residence, not necessarily with currency denomination. Similarly,

Controls represents a vector of other explanatory variables affecting dollarization, to be detailed later. The coefficient of interest is β_2.

I begin the empirics with graphical event studies to analyze the behavior of dollarization and mismatches before and after the adoption of floating regimes. Thereafter, I concentrate in "tranquil" periods (i.e. periods when there were no regime changes) and compute the benchmark results via pooled OLS regressions to assess the cross-regime behavior of dollarization and mismatches. I also use instrumental variables to attempt to control for the potential endogeneity of the exchange rate regime. To check for the robustness of the results, I use alternative definitions of dollarization and exchange rate regimes and conduct various sensitivity tests throughout the paper.

2.2 Dollarization Data

The data set used in this paper consists of annual observations, mainly from the early 1990s up to 2000. Data on the aggregate volume of deposit money banks' foreign-currency-denominated ("dollar") deposits of residents are available for 92 countries. Data on the aggregate volume of deposit money banks' foreign-currency-denominated ("dollar") credit to the resident private sector are available for 40 countries, almost all of which also have dollar deposits data. The time span varies across countries, with some having data from as early as 1975 and some having data only from about 1995 onwards.[4] The main sources are data used by the IMF in constructing its *International Financial Statistics*, complemented by printed Central Bank bulletins from the monetary authorities

data on off-balance-sheet hedging provided by the Bank for International Settlements are only available for industrial countries and a handful of major emerging markets.

[4] Frequent changes in the format of primary sources are a major reason for the diverse time coverage.

of several countries. The data appendix presents more detailed information on country sample, definitions, availability, and sources. These data allow for the construction of deposit-credit currency mismatch measures for 37 countries.[5]

I define dollarization in two ways. The first definition emphasizes the *behavior* of credit and deposit dollarization. The second definition provides a sense of the *magnitude* of credit and deposit dollarization.[6] The dollarization ratios constructed are:

- Credit dollarization ratio. This is measured as: a) the ratio of dollar credit to the private sector over total credit to the private sector; or as b) the ratio of dollar credit to the private sector over total bank assets.
- Deposit dollarization ratio. This is measured as: a) the ratio of dollar deposits over total deposits; or as b) the ratio of dollar deposits over total bank liabilities.
- Deposit-credit mismatch ratio. This is measured as the difference between dollar deposits and dollar credit divided by total bank liabilities.

2.3 Regulatory Arrangements Data

The analysis requires controlling for institutional and regulatory arrangements. For instance, several dollarized economies temporarily restricted dollar deposits and/or credit heavily. Insofar as those restrictions were usually accompanied by pegged rates, one could mistakenly attribute a low level of dollarization to the

[5] There are a few instances in which values for dollar credit or deposits are equal to zero, principally when the data come from electronic sources. Unfortunately, it is not clear whether this means that the actual value was zero (e.g. values for dollar credit were zero because dollar credit was prohibited) or whether the data were missing. Therefore, I only work with strictly positive values of the relevant variables, and set any zero value to missing.

fixed regime. Similarly, regulations may freely allow dollar deposits but restrict dollar credit, or limit dollar deposits or credit to some sectors (e.g. residents that earn foreign exchange from abroad).

To control for the regulatory framework, I gathered qualitative information on the regulatory arrangements of dollarization from various issues of the IMF *Annual Report on Exchange Arrangements and Exchange Restrictions* and other IMF publications. The information collected allows for the construction of two binary indicators on whether a country allows residents' dollar deposits or dollar loans freely or with minor conditions, as opposed to severely restricting them, limiting them to certain residents (e.g. individuals or firms that earn foreign exchange), or prohibiting them.

2.4 Exchange Rate Regime Data

I employ two alternative exchange rate regime classifications throughout the paper. The first classification is based on the regime reported by monetary authorities to the IMF and published in the IMF *Annual Report on Exchange Arrangements and Exchange Restrictions*.[7] However, the regime that countries claim to operate may be different from the regime actually followed: many self-described floaters continuously try to minimize exchange rate volatility, and some pegged regimes frequently readjust their parity. To address these inconsistencies, I revised and corrected this classification to account for coding errors and reconciled this *de jure* information with a new *de facto* IMF

[6] As it is shown below, it turns out that the use of both definitions of dollarization yields very similar results.

[7] In general, this classification distinguishes regimes as fixed (single pegs or basket pegs), intermediate (limited flexibility, cooperative arrangements, crawling pegs or bands, or managed floats following a predetermined set of indicators), and floating (managed floats with no pre-announced path for the exchange rate or independent floats).

classification (available only from 1999 onwards) that distinguishes between managed floats and *de facto* pegs under managed floating.

As a second measure, I use the novel classification constructed by Reinhart and Rogoff (2002). These authors construct a "natural" exchange rate regime classification, which incorporate data on parallel and dual exchange rate markets and develop comprehensive chronologies of the history of exchange rate arrangements. With these data, Reinhart and Rogoff identify up to 15 categories of exchange rate regimes. To make their taxonomy comparable to the IMF classification, these categories are grouped into fixed, intermediate, and floating regimes. I henceforth refer the Reinhart-Rogoff classification as "RR regimes."[8]

Other explanatory variables, detailed below, come from standard sources, such as the *International Financial Statistics* of the IMF and the *World Development Indicators* of the World Bank.

[8] "Fixed regimes" include the following RR categories: pre-announced peg or currency board arrangement, and pre-announced horizontal band that is narrower than or equal to ±2 percent. "Intermediate regimes" include the following: de facto peg, pre-announced crawling peg, pre-announced crawling band that is narrower than or equal to ±2 percent, de factor crawling peg, de facto crawling band that is narrower than or equal to ±2 percent, pre-announced crawling band that is wider than or equal to ±2 percent, de facto crawling band that is narrower than or equal to ±5 percent, and moving band that is narrower than or equal to ±2 percent. Finally, "floating regimes" include the following: managed floating, freely floating, and freely falling. I also conduct sensitivity analysis in which the "freely falling" category is excluded from the definition of "floating regime." Note that the RR category "no separate legal tender" is not included in the analysis, because no country in it is officially dollarized.

3 Empirical Analysis

3.1 Event-Study Analysis

Figures 1 and 2 compare the average values of the dollarization series around the time of floating rate regime adoptions with the average values of the series for countries under fixed or intermediate regimes that did not adopt flexibility. The top part uses the series scaled by total credit/deposits, while the bottom part uses the series scaled by total assets/liabilities. The panels show the average pattern of deposit and credit dollarization and mismatches two years before and after floating regime adoptions (that is, changes from either fixed to floating or from intermediate to floating regimes).[9] Time is measured in the horizontal axis (from –2 to +2 years around regime changes). In each panel, the vertical line is the time of the regime change, and the horizontal line is the average value of the relevant dollarization series for the non-floating observations. The average values of the dollarization series during regime changes are surrounded by two-standard-error bands.[10]

[9] I do not consider the case of changes from flexible to non-flexible regimes, as those events were rare in my sample period, and because they are not relevant for the purpose of testing the impact of floating regimes adoptions on dollarization.

[10] As a result of the coverage and availability of the dollarization data and of the associated two-sided, two-year window around regime changes, these event studies consider up to 49 IMF floating regime adoptions and up to 38 RR regime changes. The exact number of regime changes used in each panel varies and is lower in the credit dollarization figures, due to data availability constraints. The IMF floating regime adoptions considered in Figure 1 are the following: Albania 1993, Angola 1999, Armenia 1993, Bolivia 1985, Cambodia 1992, Chile 1999, Colombia 1999, Congo Dem. Republic 1984, Czech Republic 1997, Egypt 2000, El Salvador 1985, El Salvador 1989, Georgia 1993, Guinea 1994, Indonesia 1997, Israel 1977, Kenya 1993, Korea 1997, Kyrgyz Republic 1993, Lao PDR 1989, Latvia 1992, Lithuania 1992, Malawi 1994, Maldives 1987, Mauritius 1994, Mongolia 1993, Mozambique 1992, Nigeria 1997, Papua New Guinea 1994, Paraguay 1989, Peru 1979, Peru 1983, Peru 1990, Poland 2000, Romania 1991, Russian Federation

Using the IMF classification, Figure 1 suggests that deposit dollarization increases after the adoption of a flexible regime. Credit dollarization also seems to go up, but not significantly. As a result, the deposit-credit mismatch rises significantly as well. This is the first evidence that floating regimes do not yield greater credit dollarization vis-à-vis deposit dollarization. Currency mismatches in financial intermediation seem to go up, in other words, during the first years after the adoption of floating regimes.

Figure 2, which uses the RR classification, implies a weaker pattern. Deposit dollarization appears to go up after a regime change, but not significantly. Similarly, the ratio of dollar credit to total credit goes down, but this movement is indistinguishable from that of the no-regime-change group. However, the ratio of dollar credit to total assets does go down after the adoption of a floating regime, as if flexibility encourages banks to use asset classes other than dollar credit.

3.2 Descriptive Statistics

The previous event-study analysis focused on the periods around floating regime adoptions. In order to focus on "tranquil" periods (i.e. periods in which no regime changes took place), I henceforth use a two-sided, one-year exclusion

1992, Rwanda 1994, Sao Tome and Principe 1994, Slovak Republic 1992, Slovak Republic 1998, Slovenia 1992, Sudan 1992, Tanzania 1993, Thailand 1997, Uganda 1992, Ukraine 1992, Ukraine 1999, Yemen 1996, and Zimbabwe 1994. Similarly, the RR floating regime adoptions considered in Figure 2 are the following: Armenia 1992, Bolivia 1974, Chile 1974, Chile 1982, Chile 2000, Colombia 2000, Czech Republic 1997, El Salvador 1983, Estonia 1991, Georgia 1999, Guinea 2000, Indonesia 1998, Israel 1974, Korea 1998, Lao PDR 1997, Latvia 1991, Lithuania 1991, Malawi 1998, Malaysia 1998, Mexico 1995, Moldova 1998, Myanmar 1993, Myanmar 1997, Paraguay 1989, Peru 1976, Philippines 1984, Philippines 1998, Poland 1991, Poland 2000, Romania 1990, Russian Federation 1992, Russian Federation 1999, Slovak Republic 1999, Slovenia 1991, South Africa 1995, Syrian Arab Republic 1982, Thailand 1997, and Ukraine 1991.

window around regime changes that led to the adoption of a floating regime. This exclusion window helps avoid potential regime "contamination" which may occur before and, particularly, after the collapse of a fixed regime.[11]

Tables 1 and 2 report a basic version of equation (1), in the form of the pooled OLS regression:[12]

(2) $$Dollarization_{it} = \beta_0 + \beta_1 Intermediate_{it} + \beta_2 Floating_{it} + \varepsilon_{it}$$

Here, β_0 is the mean of the relevant dollarization ratio under fixed regimes (the reference group), while $\beta_0 + \beta_1$ and $\beta_0 + \beta_2$ are the means under intermediate and flexible regimes, respectively.

Using the IMF classification in Table 1, both credit and deposit dollarization are significantly higher in floating regimes, in the economic and statistical senses. When scaling by total credit and deposits, credit dollarization is 14 percent higher under floating regimes than under fixed exchange rates, while deposit dollarization is 26 percent higher. When scaling by total assets and liabilities, the numbers are 6 percent and 11 percent, respectively. As a result, deposit-credit mismatches are also higher: while such mismatches are not statistically different from zero under fixed regimes, they are 6 percent of total bank liabilities under floating regimes.

Table 2, which uses the RR classification, suggests that credit dollarization is lower under floating regimes than under fixed regimes by about 11 to 13 percent, depending on the scaling used. In addition, the ratio of dollar deposits to total deposits is higher under floating by 13 percent; relative to total liabilities, dollar deposits are higher by 8 percent. More importantly, there is further

[11] If residents expect the collapse of a peg and a large devaluation, they may reduce their holding of peso assets in advance. More importantly, the collapse of the peg may generate of burst of dollarization (particularly deposit dollarization), which can be mistakenly regarded as being caused by the subsequent flexible regime.

[12] All regressions in this paper compute heteroskedasticity-robust standard errors.

evidence that deposit-credit mismatches are higher under floating regimes – by almost 14 percent of total liabilities.

3.3 Benchmark Results

I now proceed to estimate the following equation:

$$(3) \quad Dollarization_{it} = \beta_0 + \beta_1 Intermediate_{it} + \beta_2 Floating_{it} + \gamma_1' MacroControls_{it} + \gamma_2' HistoricalControls_{it} + \gamma_3' RegulatoryControls_{it} + \varepsilon_{it}$$

The macroeconomic controls come from the existing literature on partial dollarization and include the following:

- *Interest rate differential*. One of the potential determinants of dollarization is lending and deposit interest rate differentials. Data on domestic- and foreign-currency lending and deposit rates are not available for the majority of countries in the sample. I use the difference of the country's money market rate with respect to the rate in the United States as a proxy.
- *Trade/GDP*. Trade openness may encourage dollarization, as relatively large trade sectors may require dollar accounts for their transactions. On the other hand, foreign exchange earnings of exporters may reduce the need for dollar credit from resident banks. The ratio of trade (exports plus imports) to GDP is used to control for openness.
- *Depreciation*. Large and sudden downward movements of the exchange rate have exacerbated nominal instability and dollarization. This variable also serves to control for potential valuation effects. [13]

[13] Valuation effects may be present regardless of the currency used to express the values of the variables. In particular, any dollarization ratio will increase after depreciation by construction. If all volumes are expressed in their peso value, the ratio's numerator will increase, but only one part of its denominator (the dollar component) will. On the other hand, if all volumes are expressed in their dollar values, its numerator will stay constant,

- *Time trend*. As the movement towards floating regimes has accelerated in the past ten years, so has dollarization. A time trend helps distinguish the impact of floating regimes on dollarization from a common trend.

Financial dollarization appears to be persistent. To control for persistence effects, I use the following:

- *Maximum historical rate of inflation*. High inflation at one point in the past may have led to the acceleration of dollarization. Even if low inflation is achieved later, hysteresis effects may persist. Including the highest past rate of inflation controls for these effects.[14]

Finally, the set of regulatory variables affecting dollarization includes the two binary indicators mentioned previously:

- *Foreign currency loans allowed*. This indicator controls for whether dollar credit can be freely issued.
- *Foreign currency deposits allowed.* Similarly, this indicator controls for whether dollar deposits can be freely issued.

Table 3 reports results scaling the dollarization series by total credit and deposits, and Table 4 reports results scaling the dollarization series by total assets and liabilities. Table 5 reports estimations for the deposit-credit currency mismatch variable. Each of Tables 3 and 4 reports four columns, which contain two pairs of specifications. Each pair consists of one regression for credit

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but its denominator will go down (as the dollar value of the denominator's peso component decreases).

[14] I define the maximum historical rate of inflation as the "running" maximum: if in a given year a new maximum is reached, it replaces the previous one, until a higher rate of inflation is achieved in a subsequent year. Note that this definition may result in a time-invariant maximum inflation for many countries, as the highest level of inflation usually took place in the 1980s in many cases, while dollarization data are usually available from the early 1990s onwards.

dollarization and an analogous regression for deposit dollarization. Table 5 uses the same two specifications in the mismatch regressions.[15]

Tables 3 reports some evidence that, compared to fixed regimes, credit dollarization is lower under floating regimes – 6 percent lower under IMF floats, and 15 percent lower under RR floats. On the other hand, the ratio of dollar deposits to total deposits is about 6 percent higher under IMF floats, but not significantly different under RR floats. Table 4 suggests similar but slightly weaker patterns: compared to fixed regimes, the ratio of dollar deposits to total liabilities is 5 percent higher under IMF floats, whereas that of dollar credits to total assets is 9 percent lower.[16]

Table 5 shows that floating regimes are consistently associated with greater, not lower, mismatches. This effect is economically large and statistically significant in three out of four regressions. As a share of total bank liabilities, currency mismatches are about 5 per cent higher under IMF floats, and 8 percent higher under RR floats.

The performance of current depreciation is relatively poor; however, maximum inflation has a significant explanatory power, underlining the importance of past events in shaping current dollarization: countries that

[15] Deposit dollarization regressions cover a larger number of countries and, as a result, include more observations than credit dollarization regressions. Fixing the number of observations to a common sample for deposits and credits (in unreported robustness checks) does not change the results, as the regressions for the currency mismatch variable (which is constructed using deposit and credit data) confirm.

[16] Compared to Tables 1 and 2, a few of the regime coefficients in Tables 3 and 4 (particularly those in the credit dollarization regressions) change sign , due mainly to differences in the sample size (due to missing values for some of the controls) and the relatively low number of observations for credit dollarization.

suffered high inflation in the past are more prone to have large dollarization of both credit and deposits in the present.[17]

The time trend shows that both deposit and credit dollarization have increased over time; on the other hand, it would appear that deposit-credit mismatches have declined. Furthermore, the regulatory indicators have a very large explanatory power, confirming the importance of the institutional framework in the dollarization process. The performance of interest rate differentials is poor. Finally, the results for trade openness suggest a negative link with dollarization; perhaps residents in relatively closed economies need to rely more on bank-supplied foreign exchange.

In sum, the evidence suggests that floating exchange rate regimes lead to less credit dollarization vis-à-vis deposit dollarization. As a consequence, currency mismatches in financial intermediation tend to be greater under floating regimes.

3.4 Robustness Tests

To assess the robustness of these findings, I conducted extensive sensitivity analysis, which I do not report to save space. The permutation to the benchmark specifications included the following:

- Using the floating regimes as the control (omitted) group, instead of the fixed regimes.[18]

[17] Using current inflation (instead of current depreciation) or maximum historical depreciation (instead of maximum historical inflation) in unreported regressions yields analogous results.

[18] When the floating regime is the omitted category, the coefficient of both the fixed and the intermediate regime indicators in the "currency mismatch" regressions are negative and significant, further suggesting that floating regimes are associated with greater deposit-credit currency mismatches.

- Using the exchange rate regime data constructed by Levy-Yeyati and Sturzenegger (2004) as an alternative classification. [19]
- Including a binary indicator for the presence of an explicit deposit insurance scheme that covers foreign-currency deposits.[20]
- Including a binary indicator for the existence of a forward exchange market.[21]
- Using a two-year exclusion window instead of the one-year window around regime changes, as well as not including any exclusion window at all.
- Dropping outliers and excluding countries with implausibly low or high mismatch (e.g. countries where credit dollarization was very low while deposit dollarization was very large).

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[19] The classification by Levy-Yeyati and Sturzenegger is based on cluster analysis and takes into account actual exchange rate volatility, the volatility of exchange rate changes, and the volatility of reserves. While this classification represents a commendable effort, it has some limitations. First, it does not use interest rate data in their analysis, even though interest rates can be extensively used to fix and defend the exchange rate. Second, Levy-Yeyati and Sturzenegger classify countries as fixers if they exhibit low exchange rate variability but high reserve volatility, but do not account for the presence of capital controls, which may minimize the need of using reserves to manage the peg. More critically for the purpose of this paper, this classification is only available for significantly fewer observations in my sample.

[20] The presence of deposit insurance may reduce depositors' incentives to withdraw their funds in periods of banking turmoil. Insofar as deposit insurance is part of the existing financial safety net, it may also affect banks' incentives and the pattern of loan dollarization. Regressions including a binary indicator (constructed from Demirgüç-Kunt and Detragiache 2002) for the presence of deposit insurance do not change the results.

[21] The existence of an insurance market against exchange risk may influence banks' behavior regarding mismatches and open currency positions. Although data on the volume of hedging activities by banks in insurance markets are not available, I was able to construct the forward market indicator based on information from the country pages of the IMF *Annual Reports* for the past two decades. The indicator equals one if a forward market was reported to exist, and zero if such market was reported to be underdeveloped, heavily regulated, or nonexistent. The results, however, are insensitive to its inclusion.

- Adding regional dummies for the transition economies, South America, and Asia.
- Using the lagged values of the right-hand-side variables instead of their current values.
- Using year dummies as time effects instead of the time trend.

  In general, none of these sensitivity tests significantly changed the main results.

3.5 Endogeneity

The analysis has so far assumed that the exchange rate regime is exogenous with respect to dollarization. But the exchange rate regime is a policy decision, based in part on the financial characteristics of the economy. This raises the possibility of endogeneity.

There are reasons to believe that endogeneity is not driving the results. Under high dollarization of bank liabilities (e.g. deposit dollarization) or high currency mismatches, the monetary authorities may be concerned about the potentially destabilizing impact of depreciation shocks. As a consequence, they may be inclined to implement and maintain a fixed exchange rate.[22] In this context, endogeneity could create a bias in favor of floating regimes and *lower* deposit dollarization and mismatches. But the results above suggest that the opposite appears to be the case.[23]

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[22] Poirson (2001) reports that countries with higher deposit dollarization are more likely to adopt a fixed exchange rate regime.

[23] On the other hand, greater dollarization and mismatches may still force countries to float (for example, a currency crisis may be partly fueled by mismatches); however, the exclusion windows used throughout this analysis address this problem. At the same time, in a scenario of asset substitution like financial dollarization, the greater sensitivity of the exchange rate to portfolio reallocations by residents (which is the domestic

To address the possibility of endogeneity, I estimate instrumental variable regressions. The standard theory on optimal currency areas suggests that if real shocks are prevalent, a country may choose exchange rate flexibility. On the other hand, small economies have an incentive to peg their exchange rate. These two variables are exogenous to dollarization. Therefore, I use terms-of-trade shocks and land area as instruments. As a third instrument, I use the value of the exchange rate regime (for intermediate and floating) in 1974 or, if 1974 regime data are not available, the earliest available year. Given that dollarization in most countries did not begin until after the early 1980s, the 1974 value of the regime should be regarded as plausibly exogenous (or at least predetermined) to the dollarization process, and potentially correlated to the current exchange rate regime.[24]

Table 6 suggests that endogeneity does not seem to drive the main results. Deposit dollarization is significantly higher under flexible exchange rate regimes, as column 2 (using the IMF regimes) and column 5 (using the RR regimes) indicate. This is evidence that the potential bias worked against the OLS results reported in previous tables. On the other hand, the estimated impact of the floating regimes on credit dollarization is insignificant regardless of the exchange rate classification used. This finding suggests that the OLS result of a negative link between credit dollarization and the floating regime could potentially be driven by the fact that policymakers might be concerned about the default risk attached to dollar loans and thus prefer to avoid exchange rate fluctuations.

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equivalent to greater capital mobility) may create an additional incentive to adopt a more flexible exchange rate.

[24] Unreported first-stage regression results consistently suggest a reasonable fit: the regressions of the intermediate and floating regimes (the endogenous variables) on the instruments and the controls yield R-squares in the range of 0.18 and 0.57, while F-tests reject the null hypothesis of no joint significance of the instruments in the same regressions.

Therefore, controlling for this potential source of endogeneity apparently weakens – but does not reverse – the OLS results for credit dollarization.

More importantly, the mismatch ratio is still greater under floating regimes after controlling for endogeneity: whereas the point estimate of the IMF floating regime indicator is statistically insignificant due to larger standard errors, that of the RR floating regime -- 26 percent – is significant.[25] In conclusion, this simple IV framework suggests that the OLS results reported earlier do not appear to be driven by the endogeneity of the exchange rate regime, as the IV regressions yield less efficient but qualitatively similar coefficients.

4 Concluding Remarks

This paper studied the links of exchange rate regimes with financial dollarization and currency mismatches in financial intermediation – in particular, it analyzed whether flexible exchange rate regimes are associated with lower deposit-credit currency mismatches in financially dollarized countries. To that end, it assembled and used a comprehensive database on the dollarization of bank deposits and credits in a large number of developing and transition economies, along with accompanying bank regulatory arrangements.

The results do not support the presumption that flexibility is associated with a reduction of currency mismatches between deposits and loans in the banking systems of financially dollarized countries. Most (if not all) of the evidence goes against such presumption. Floating exchange rate regimes appear to be associated with greater deposit dollarization more strongly than they appear to be associated with greater credit dollarization. Therefore, currency

[25] Additional unreported IV regressions that excluded the controls (analogous to those reported in Tables 1 and 2) yielded similar results.

mismatches in financial intermediation are more severe under exchange rate flexibility. These results are robust to the inclusion of a variety of controls, different definitions of dollarization and mismatches, the presence of outliers, and different specifications. Moreover, they do not appear to be driven by the potential presence of endogeneity.

Why do these stylized facts obtain? As suggested in the Introduction, dollar loan default risk, and the trade-off between default risk and currency risk, may play an important role in shaping these results. However, deeper empirical scrutiny on the role of default risk requires gathering data on the share of non-performing dollar loans in a large number of countries and analyzing the links between exchange rate flexibility and dollar loan default rates. This is beyond the scope of this paper and is left for future research.

It is again important to keep in mind that deposit-credit mismatches do not account for all the foreign currency exposure of banks. A bank facing a deposit-credit mismatch may hedge by purchasing dollar-denominated securities. It may also conduct off-balance sheet transactions and buy insurance in forward markets. Regrettably, the necessary data to analyze these issues more closely are non-existent for a large number of countries. In that sense, the results in this paper do not necessarily show that banks hedge less under floating regimes; instead, these results imply that banks *might need to hedge more* (elsewhere in their balance sheets or in insurance markets) if they wish to cover the increasing deposit-credit mismatches that are present under exchange rate flexibility.

At the same time, there can be an "optimal" degree of mismatch in financial intermediation. It is not clear whether a perfectly matched banking system exhibits lower overall risk than a slightly mismatched one, given the trade-off between currency risk and default risk. And the slightly mismatched banking system may compensate its greater deposit-credit mismatch by holding more

dollar securities.[26] Both theoretical and empirical research on that direction is needed.

If the results reported in this paper are right, they constitute the first systematic evidence that flexible exchange rate regimes might not necessarily lead to across-the-board reductions in bank currency mismatches. Of course, further systematic research is needed to assess the causal impact of flexibility on overall currency mismatches in banks' - and firms' - balance sheets, as well as on hedged and unhedged exposures in insurance markets. Until that research is done, however, the burden of proof appears to be on the side of advocates of floating exchange rates as unambiguous remedy against currency mismatches in the banking sector of dollarized countries.

[26] Whether it is socially optimal that banks hold a greater proportion of their dollar assets in the form of securities in international markets, rather than in the form of credit to finance productive domestic investment, represents an additional welfare issue to consider.

Data Appendix

A.1 Data Definitions and Sources

Abbreviations: AREAER: IMF *Annual Report on Exchange Arrangements and Exchange Restrictions* country pages (various issues). CB: Central Bank bulletins (various countries/issues). IFS: IMF *International Financial Statistics*. MBS: IMF Money and Banking Statistics data. WDI: World Bank *World Development Indicators*.

Dollarization Data

Raw Data

- Total credit to the resident private sector issued by resident banks. Source: line 22d of IFS.
- Foreign-currency-denominated ("dollar") credit to the resident private sector issued by resident banks. Sources: MBS and CB.
- Total assets of resident banks. Sources: MBS and CB.
- Total deposits of residents held in resident banks. Source: lines 24 plus line 25 of IFS.
- Foreign-currency-denominated ("dollar") deposits of residents held in resident banks. Sources: MBS, CB, and lines 25.a and 25b of IFS.
- Total liabilities of resident banks. Sources: MBS and CB.

Definition of Dependent Variables

- Credit dollarization (percent). First definition: ratio of dollar credit to total credit. Second definition: ratio of dollar credit to total assets.
- Deposit dollarization (percent). First definition: ratio of dollar deposits to total deposits. Second definition: ratio of dollar deposits to total liabilities.
- Currency mismatches (percent): Ratio of gap between dollar deposits and dollar credit to total liabilities [i.e. (dollar deposits – dollar credit) * 100 / (total liabilities)].

Exchange Rate Regime Data

First classification: IMF regimes. Source: AREAER. (Revised and corrected using information provided by Virgilio Sandoval and Holger Wolf, via personal correspondence.)

- Fixed regimes: binary for fixed exchange rate regimes against a particular currency, a basket of currencies, or SDR.
- Intermediate regimes: binary for limited flexibility or managed floats with a pre-announced path for the exchange rate.

- Floating regimes: binary for managed floats with no pre-announced path for the exchange rate or independent floats.

Second classification: Reinhart and Rogoff (2002), grouped in three categories.

- Fixed regimes: binary for pre-announced peg or currency board arrangement, and pre-announced horizontal band that is narrower than or equal to ±2%.
- Intermediate regimes: binary for de facto peg, pre-announced crawling peg, pre-announced crawling band that is narrower than or equal to ±2%, de factor crawling peg, de facto crawling band that is narrower than or equal to ±2%, pre-announced crawling band that is wider than or equal to ±2%, de facto crawling band that is narrower than or equal to ±5%, and moving band that is narrower than or equal to ±2%.
- Floating regimes: binary for managed floating, freely floating, and freely falling.

Alternative classification (for sensitivity analysis): Levy-Yeyati and Sturzenegger (2004). See their paper for definitions of fixed, intermediate, and floating regimes. Fixed regimes in this paper include their "high-credibility pegs" group.

Regulatory Controls

- Foreign currency loans allowed: binary for whether or not dollar loans are freely or almost freely allowed. Source: AREAER, other IMF publications.
- Foreign currency deposits allowed: binary for whether or not dollar deposits are freely or almost freely allowed. Source: AREAER, other IMF publications.

Other Controls

- Interest rate differentials (percentage points): difference of line 60b of IFS with that of the United States. If line 60b is unavailable, line 60c is used. If line 60c is unavailable, line 60 is used. Source: IFS.
- Trade (percent): ratio of exports plus imports to GDP. Source: WDI.
- Inflation (percent): percentage change of CPI, as reported by source. If series is unavailable, percentage change of GDP deflator, as reported by source. Source: WDI.
- Depreciation (percent): first difference of the log of the nominal exchange rate * 100. Source: WDI.
- Maximum historical inflation: running maximum value of inflation rate (as defined in the text).

- Maximum historical depreciation: running maximum value of depreciation rate (as defined in the text).
- Forward market indicator: binary for whether a forward market was reported to exist, as opposed to being reported to be underdeveloped, heavily regulated, or nonexistent. Source: AREAER.
- Deposit insurance: binary for whether there is an explicit deposit insurance scheme that covers foreign currency accounts. Source: Demirgüç-Kunt and Detragiache (2002).

Instruments

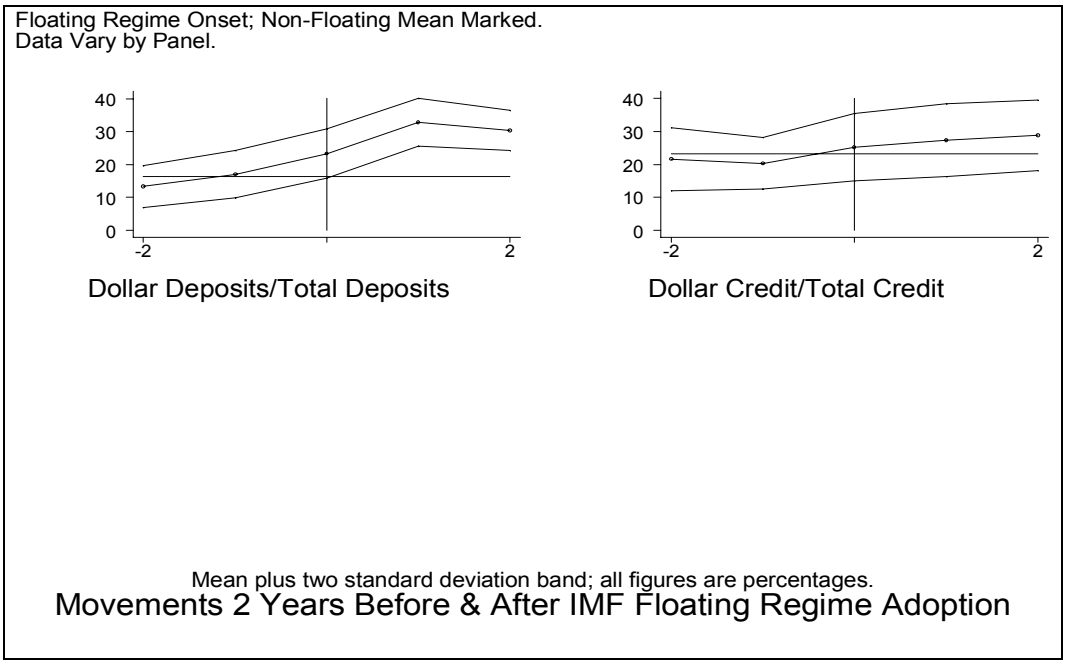
- Terms-of-trade shocks (percent): first difference of the log of terms-of-trade index in goods and services * 100. Source: WDI.
- Land area in squared kilometers. Source: WDI.
- Initial exchange rate regime: IMF regime in 1974 or earliest year available. Source: AREAER.

A.2 Country Coverage and Dollarization Data Availability

Country	Deposits	Credit	Country	Deposits	Credit	Country	Deposits	Credit
Albania	1994-99	1994-99	Haiti	1997-99	1997-99	Qatar	1993-99	--
Angola	1995-99	--	Hong Kong, China	1990-99	--	Romania	1990-99	--
Antigua and Barbuda	1979-99	--	Hungary	1989-99	1989-99	Russian Federation	1993-99	1993-99
Argentina	1994-99	1994-99	Indonesia	1992-99	1992-99	Rwanda	1994-99	--
Armenia	1994-99	1994-99	Israel	1981-99	1975-99	Sao Tome & Principe	1995-99	1996-99
Bahamas, The	1975-99	1977-99	Jordan	1993-99	--	Saudi Arabia	1975-99	1992-99
Bahrain	1984-99	--	Kenya	1995-99	--	Sierra Leone	1996-99	--
Bangladesh	1987-99	--	Korea, Rep.	--	1975-99	Slovak Republic	1993-99	--
Barbados	1975-99	--	Kuwait	1981-99		Slovenia	1991-99	--
Belarus	1998-99	1996-99	Kyrgyz Republic	1995-99	1995-96	South Africa	--	1992-99
Belize	1976-99	--	Lao PDR	1987-99	1987-99	St. Kitts and Nevis	1979-99	--
Bhutan	1993-99	--	Latvia	1993-99	--	St. Lucia	1979-99	--
Bolivia	1975-99	1996-99	Lithuania	1993-99	1993-99	St. Vincent & Grenadines	1979-99	--
Bulgaria	1995-99	--	Malawi	1996-99	--	Sudan	1992-99	--
Cambodia	1993-99	1993-99	Malaysia	1996-99	1996-99	Suriname	1975-76	--
Cape Verde	1995-99	--	Maldives	1981-99	1985-99	Syrian Arab Republic	1975-99	--
Chile	1976-99	1976-99	Malta	1975-84	--	Tanzania	1993-99	--
Colombia	1990-99	1990-99	Mauritius	1992-99	--	Thailand	1982-99	--
Comoros	1998-99	--	Mexico	1997-99	1997-99	Tonga	1994-99	--
Congo, Dem. Rep.	1975-95	--	Moldova	1998-99	1998-99	Trinidad and Tobago	1996-99	--
Costa Rica	1997-99	1997-99	Mongolia	1993-99	1994-99	Turkey	1986-99	--
Cyprus	1991-99	--	Mozambique	1991-99	--	Turkmenistan	1998-99	1998-99
Czech Republic	1993-99	1997-99	Myanmar	1991-99	--	Uganda	1993-99	--
Dominica	1988-99	--	Netherlands Antilles	1975-99	--	Ukraine	1992-99	1998-99
Egypt, Arab Rep.	1980-99	1980-99	Nicaragua	1996-99	1996-99	United Arab Emirates	1981-99	--
El Salvador	1982-99	--	Nigeria	1994-99	--	Uruguay	1998-99	1998-99
Estonia	1991-99	1992-99	Oman	1975-99	--	Vanuatu	1981-99	--
Ethiopia	1998-99	--	Papua New Guinea	1976-81, 87-99	1979-99	Venezuela	1996-99	1996-99
Georgia	1995-99	1995-99	Paraguay	1988-99	1988-99	Vietnam	1992-99	1992-99
Grenada	1979-99	--	Peru	1975-99	1975-99	Yemen, Rep.	1990-99	--
Guatemala	1997-99	1997-99	Philippines	1982-99	--	Zambia	1998-99	--
Guinea	1989-99	--	Poland	1991-99	1996-99	Zimbabwe	1993-99	--

Figure and Tables

Figure 1: Effect of IMF Floating Regime Adoption



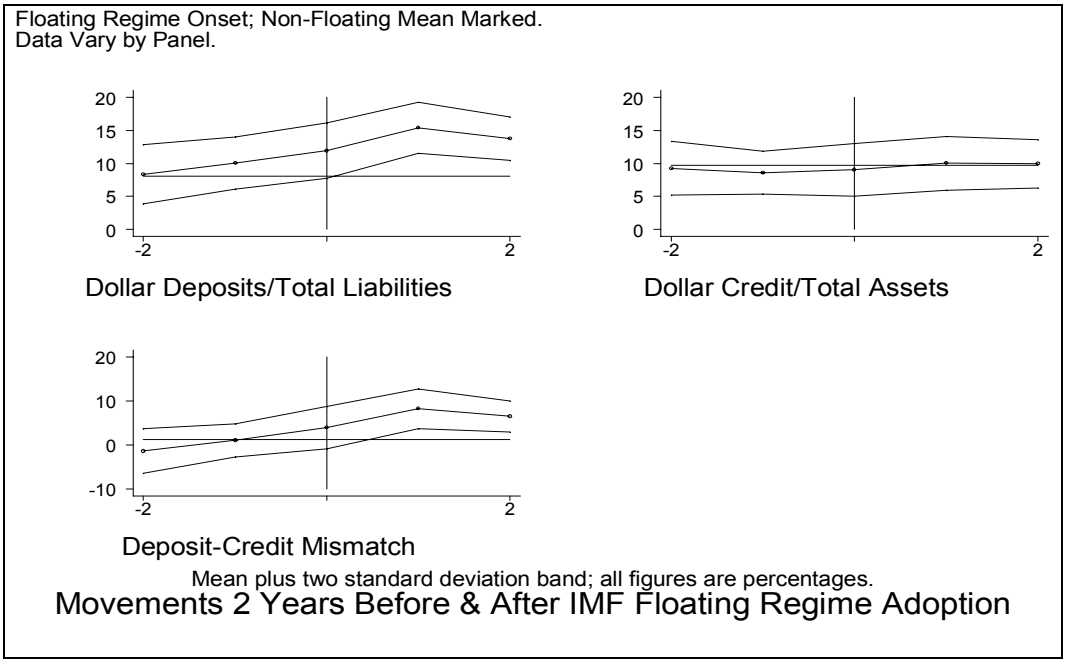
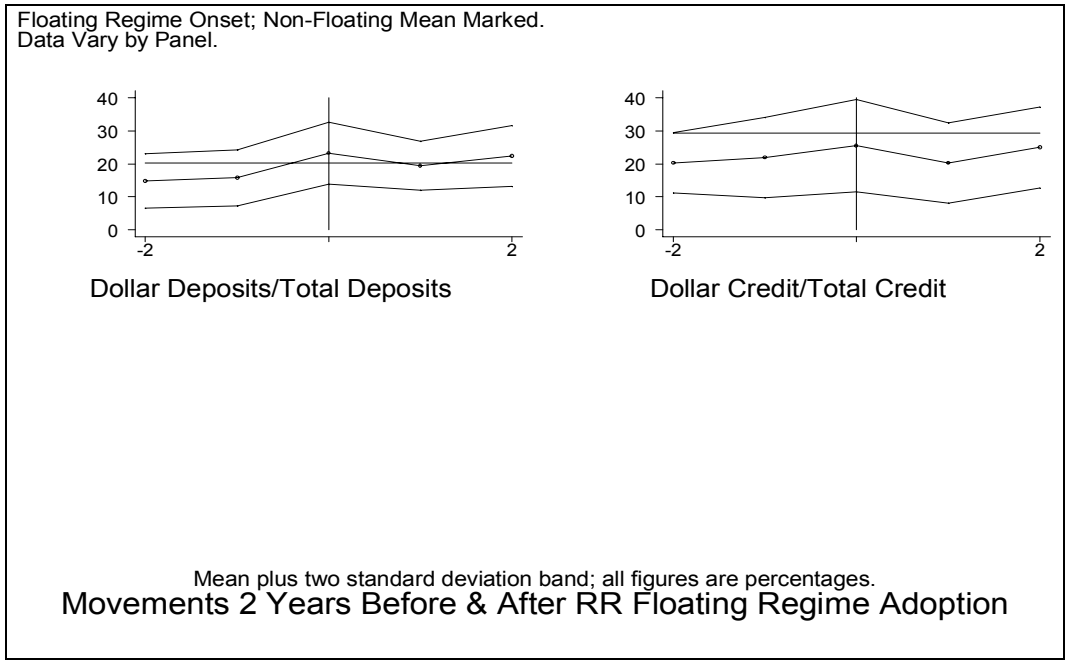
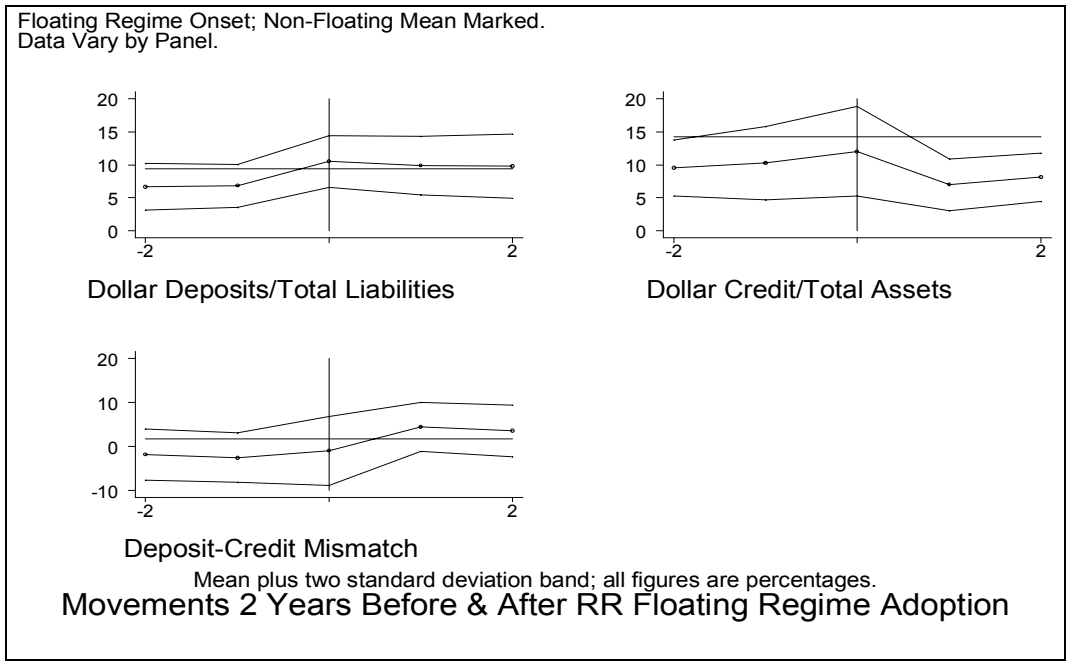


Figure 2: Effect of Reinhart-Rogoff Floating Regime Adoption





Note: In all tables below, a two-sided, one-year exclusion window around floating regime adoptions is used.

Table 1
Comparison of Means Across IMF Exchange Rate Regimes

	(1) Dollar Credit / Total Credit	(2) Dollar Deposit / Total Deposits	(3) Dollar Credit / Total Assets	(4) Dollar Deposit / Total Liabilities	(5) Deposit- Credit Mismatch
Intermediate Regime	-0.02	12.09***	2.46*	6.59***	2.23
	(2.69)	(1.73)	(1.40)	(1.12)	(1.36)
Floating Regime	14.08***	25.62***	6.35***	11.35***	6.04***
	(3.48)	(1.75)	(1.70)	(0.90)	(1.40)
Constant	22.83***	12.40***	7.95***	6.27***	-0.09
	(1.97)	(0.83)	(0.99)	(0.47)	(0.96)
Observations	294	834	288	762	258
Adjusted R^2	0.07	0.24	0.04	0.18	0.06

Pooled OLS regressions. Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 2
Comparison of Means Across Reinhart-Rogoff Exchange Rate Regimes

	(1) Dollar Credit / Total Credit	(2) Dollar Deposit / Total Deposits	(3) Dollar Credit / Total Assets	(4) Dollar Deposit / Total Liabilities	(5) Deposit-Credit Mismatch
Intermediate Regime	-14.53***	9.94***	-6.47**	6.20***	10.06***
	(5.38)	(2.08)	(2.56)	(0.94)	(2.31)
Floating Regime	-13.74**	13.26***	-11.37***	7.93***	13.81***
	(5.50)	(2.32)	(2.38)	(1.20)	(2.44)
Constant	41.92***	12.48***	19.98***	5.07***	-7.79***
	(4.98)	(1.54)	(2.20)	(0.54)	(2.13)
Observations	211	533	207	478	180
Adjusted R^2	0.03	0.05	0.05	0.09	0.12

Pooled OLS regressions. Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3
Credit and Deposit Dollarization (I)

	(1) Dollar Credit / Total Credit IMF Regimes	(2) Dollar Deposits / Total Deposits IMF Regimes	(3) Dollar Credit / Total Credit RR Regimes	(4) Dollar Deposits / Total Deposits RR Regimes
Intermediate Regimes	-10.16***	2.40	-11.71***	3.26*
	(2.84)	(2.41)	(3.13)	(1.74)
Floating Regimes	-5.98*	6.46***	-14.94***	3.58
	(3.54)	(2.37)	(4.47)	(3.46)
Trade/GDP	0.04	0.02	0.02	0.02
	(0.05)	(0.03)	(0.05)	(0.03)
Depreciation	0.11	0.00	0.16*	0.02
	(0.09)	(0.06)	(0.09)	(0.06)
Inflation Maximum	0.01***	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)
Interest Differentials	0.00	0.05***	0.00	0.05**
	(0.03)	(0.02)	(0.02)	(0.02)
FC Loans Allowed	10.33**		7.41	
	(4.09)		(5.27)	
FC Deposits Allowed		17.84***		18.60***
		(1.46)		(1.39)
Time Trend	0.88***	0.16	0.80***	0.28**
	(0.18)	(0.11)	(0.21)	(0.12)
Constant	-1.57	-2.45	8.50	-5.69
	(4.96)	(3.55)	(6.15)	(4.60)
Observations	140	372	140	372
Adjusted R^2	0.59	0.54	0.59	0.54

Pooled OLS regressions. Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4
Credit and Deposit Dollarization (II)

	(1) Dollar Credit / Total Assets IMF Regimes	(2) Dollar Deposits / Total Liabilities IMF Regimes	(3) Dollar Credit / Total Assets RR Regimes	(4) Dollar Deposits / Total Liabilities RR Regimes
Intermediate Regimes	-1.35	1.75	-4.54***	2.32***
	(1.14)	(1.26)	(1.21)	(0.71)
Floating Regimes	-1.43	4.57***	-8.50***	1.53
	(1.63)	(1.23)	(1.81)	(1.67)
Trade/GDP	0.04*	-0.01	0.02	-0.01
	(0.02)	(0.01)	(0.02)	(0.01)
Depreciation	-0.01	0.04	0.03	0.07
	(0.04)	(0.05)	(0.04)	(0.06)
Inflation Maximum	0.01***	0.003***	0.005***	0.004***
	(0.00)	(0.00)	(0.00)	(0.00)
Interest Differentials	0.00	0.01	0.00	0.01
	(0.01)	(0.02)	(0.01)	(0.02)
FC Loans Allowed	6.59***		4.54**	
	(1.70)		(2.13)	
FC Deposits Allowed		7.93***		8.45***
		(0.69)		(0.66)
Time Trend	0.35***	0.05	0.38***	0.13**
	(0.09)	(0.05)	(0.08)	(0.06)
Constant	-5.16**	1.28	0.70	-0.84
	(2.31)	(1.39)	(2.65)	(1.69)
Observations	140	360	140	360
Adjusted R^2	0.73	0.60	0.75	0.59

Pooled OLS regressions. Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5
Currency Mismatches in Financial Intermediation

	(1) Deposit-Credit Mismatch IMF Regimes	(3) Deposit-Credit Mismatch IMF Regimes	(2) Deposit-Credit Mismatch RR Regimes	(4) Deposit-Credit Mismatch RR Regimes
Intermediate Regimes	-0.84	2.50	6.30***	6.54***
	(2.08)	(1.90)	(2.33)	(2.08)
Floating Regimes	5.31***	4.36**	8.00**	4.44
	(1.94)	(1.77)	(3.29)	(3.12)
Trade/GDP	-0.02	-0.05*	-0.00	-0.05*
	(0.03)	(0.03)	(0.03)	(0.03)
Depreciation	0.02	0.02	0.00	0.03
	(0.09)	(0.08)	(0.09)	(0.07)
Inflation Maximum	-0.002***	-0.001***	-0.002***	-0.002***
	(0.00)	(0.00)	(0.00)	(0.00)
Interest Differentials	-0.01	0.00	-0.00	0.01
	(0.02)	(0.02)	(0.02)	(0.02)
FC Loans Allowed		-8.07***		-9.92***
		(1.84)		(2.05)
FC Deposits Allowed		16.34***		17.26***
		(1.69)		(1.45)
Time Trend	-0.54***	-0.66***	-0.41***	-0.47***
	(0.17)	(0.14)	(0.15)	(0.10)
Constant	14.37***	11.01***	5.63	4.12
	(3.91)	(3.67)	(4.35)	(3.93)
Observations	114	114	114	114
Adjusted R^2	0.24	0.45	0.20	0.47

Pooled OLS regressions. Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6
Instrumental Variable Regressions

	(1) Dollar Cr / Total Cr IMF Regime	(2) Dollar Dep / Total Dep IMF Regime	(3) Dep-Cr Mismatch IMF Regime	(4) Dollar Cr / Total Cr RR Regime	(5) Dollar Dep / Total Dep RR Regime	(6) Dep-Cr Mismatch RR Regime
Intermediate Regimes	-19.58 (12.25)	-1.34 (6.31)	14.06** (6.39)	5.46 (21.97)	58.73*** (17.07)	22.72*** (7.49)
Floating Regimes	6.52 (22.80)	31.49** (13.17)	2.66 (7.14)	10.41 (36.15)	125.87** (52.66)	25.75** (11.07)
Trade/GDP	0.05 (0.06)	0.07 (0.05)	-0.05* (0.03)	0.10 (0.11)	0.47*** (0.15)	-0.00 (0.04)
Depreciation	-0.01 (0.17)	-0.11 (0.08)	0.04 (0.09)	0.00 (0.22)	-0.65* (0.37)	-0.04 (0.11)
Inflation Maximum	0.01*** (0.00)	0.005*** (0.00)	-0.001* (0.00)	0.01*** (0.00)	0.01*** (0.00)	-0.001** (0.00)
Interest Differentials	0.03 (0.05)	0.06** (0.03)	0.00 (0.02)	0.04 (0.04)	0.07 (0.06)	0.01 (0.03)
FC Loans Allowed	14.44*** (4.90)		-14.28*** (3.71)	11.82 (9.36)		-6.39 (4.49)
FC Deposits Allowed		12.40*** (3.11)	23.65*** (4.05)		1.43 (6.74)	15.36*** (2.17)
Time Trend	0.69 (0.67)	-0.23 (0.33)	-0.94*** (0.30)	0.55 (0.38)	0.21 (0.31)	-0.38*** (0.13)
Constant	0.39 (6.18)	-1.28 (4.11)	10.25** (4.73)	-11.88 (27.31)	-74.82*** (22.62)	-17.62 (11.03)
Observations	134	324	108	134	324	108
R^2	0.48	0.29	0.19	0.55		0.18

Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Instruments in IV regressions: terms-of-trade changes, land area, intermediate and floating regime for earliest year available (usually 1974).

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