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The Exchange Rate Regime, Government Quality and External Liability Dollarization

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ABSTRACT

This paper analyzes the debate over the effect of the exchange rate regime on hedging of dollar debt in emerging markets. This paper argues that the regime is far less important than the literature has previously claimed. The evidence presented in this paper strongly suggests that the exchange rate regime has only a limited effect on the extent to which domestic banks hedge external dollar borrowing. This result confirms the intuition that the exchange rate regime is not a key determinant of confidence in the domestic currency. The results in this paper also suggest that improvements in government quality, while necessary to restore confidence in the domestic currency, may have the unintended short run consequence of increasing exposure to foreign exchange risk as domestic banks become more willing to borrow in dollars from abroad.

JEL Classification: *Keywords: F33, G21.*

Keyword(s): *External dollar debt, exchange rate regimes.*

Introduction

The recent history of financial crises in emerging markets has spawned a debate over the choice of exchange rate regime for developing nations. Goldstein (1999), for example, has blamed fixed exchange rates for recent financial turmoil and recommends floating while others have suggested pegging or even official dollarization as the preferred choice (Calvo 1999; Hausmann, Gavin, Pages-Serra and Stein 1999). One particular concern that complicates this debate is the external dollar borrowing of domestic banks in many emerging markets.[1] Unhedged foreign-currency-denominated liabilities are a major source of vulnerability (Mishkin 1996) and contribute to a "fear of floating" among emerging markets (Calvo and Reinhart 2002). It is, therefore, possible that a country that is unable to reduce this risk might choose to peg or officially dollarize even though it would otherwise prefer to float. Clearly, this is a suboptimal outcome. Not surprisingly, economists have begun to analyze the causes of unhedged dollar liabilities, and a debate has emerged over the role played by the exchange rate regime.

The moral hazard view stresses that fixed exchange rates discourage hedging of dollar debt (Goldstein 1999; Burnside, Eichenbaum and Rebelo 2001; Mishkin 1999) because banks and firms believe that the peg protects them from exchange rate risk. There may also be a greater probability of a government bailout under a fixed regime if the

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government feels responsible for the devaluation. On the other hand, exchange rate volatility increases the cost of hedging and so floating regimes may increase the amount of unhedged dollar debt (Eichengreen and Hausman 1999).

It is difficult to resolve this debate empirically because it is impossible to measure accurately a bank's exposure to foreign exchange risk. First, detailed data on forward contracts are unavailable. Moreover, not all forward contracts eliminate foreign exchange risk. If a forward contract is made with other domestic banks, then the bank's aggregate net foreign exposure remains unchanged. It is unclear whether domestic redistribution of this risk is stabilizing (Eichengreen and Hausman 1999). In addition, as Eichengreen and Hausman (1999) point out, hedging opportunities with foreigners are limited as they are usually unwilling to sell dollars forward in exchange for domestic currency.

However, it is possible to shed light on the effect of the regime on hedging by analyzing the extent to which domestic banks match external dollar borrowing with foreign assets. I define external dollar mismatch of domestic banks as external dollar liabilities minus external dollar assets, divided by total bank liabilities.[2] Using a sample of 83 emerging markets for the years 1988-2000, I find that the exchange rate regime has a small effect on external dollar mismatch.

This result suggests that the exchange rate regime does not affect the degree to which domestic banks are willing to borrow (in net) from abroad in dollars, implying that the regime is not a key determinant of confidence in the domestic currency. This result suggests that the effect of the regime on hedging of external dollar debt has been exaggerated. Thus policymakers should not rely on the choice of exchange rate regime to reduce this source of currency risk. This result is also consistent with Honig (2002), which looks at the effect of the regime on the degree of *domestic* liability dollarization, finding that the regime does not play a role in promoting liability dollarization. Rather, more fundamentals factors, specifically government quality and credibility, ultimately determine confidence in the domestic currency and therefore the extent to which domestic lenders insist on denominating loans in dollars.

The results in Honig (2002) suggest that government quality might also have an effect on the extent to which domestic banks are willing to borrow from abroad in dollars. However, external dollar lending and borrowing is not the same thing as domestic dollar lending and borrowing. Specifically, because of the "Original Sin" (Eichengreen and Hausman, 1999) of emerging markets, foreign lenders are usually only willing to lend in dollars to domestic banks, implying that any foreign borrowing of domestic banks will be denominated in dollars. This differs from domestic liability dollarization, which varies depending on the behavior of banks and the portfolio decisions of domestic depositors.

This distinction implies that improvements in government quality might have different effects on external liability dollarization than domestic liability dollarization. If better governments instill greater confidence in the domestic currency, domestic banks may be more willing to borrow in dollars from abroad, *increasing* the banks' external mismatch, while domestic depositors may no longer feel the need to deposit dollars, reducing domestic liability dollarization. The results confirm this prediction. Improvements in government quality are found to increase external dollar mismatch. Thus, in the short

run at least, it is possible that improvements in government quality actually lead to greater vulnerability to large depreciations.

The rest of the paper is organized as follows. Section 2 presents the empirical methodology and a description of the data. Section 3 discusses the results of the estimation. Section 4 summarizes the findings and draws policy implications.

Empirical Methodology and Data

To estimate the effect of the exchange rate regime on external dollar mismatch, I perform the following regression covering the years 1988-2000:

$$ExternalMismatch_{it} = \beta_0 + \beta_1 ManagedFloat_{it} + \beta_2 Float_{it} + \underline{\gamma}' MacroControls_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

External mismatch is defined as foreign liabilities of domestic banks minus foreign assets, divided by total bank liabilities.[3] Summary statistics are presented in Table 1. Unfortunately, the data provided by the IMF does not actually provide the currency of denomination for these foreign assets and liabilities. However, since the sample consists exclusively of emerging markets, I assume, following Domaç and Peria (2000), that most of these foreign assets and liabilities are denominated in dollars. Therefore, the external dollar mismatch variable should be a good measure of the bank's external currency mismatch.

Table 1
Summary Statistics

	No. Obs.	*Median*	*Std. Dev.*
External Dollar Mismatch/Total Liabilities	961	-2.0	20.9
Peg or Limited Flexibility	1052	1.8	0.9
Managed Float	1052	1.8	0.9
Independent Float	1052	2.0	1.2
GovQual (0-6)	769	2.7	0.9
Inflation	1118	11.6	41.9
Depreciation	1038	6.3	40.7
Growth Real GDP	1036	3.0	7.5

Notes: All ratios expressed in percentage terms. Mean values of the exchange rate regime dummy variables are presented.

Before describing the regressors, it is important to analyze the structure of the empirical model. Equation (1) is a reduced form equation, obtained by the interaction of relative supply and demand for dollar and peso loans. In other words, we can think of a supply and demand equation for loanable funds where the dependent variable is the *proportion* of banks' total liabilities that is external dollar borrowing (to focus on *external* dollar borrowing, imagine that domestic banks can either borrow in dollars from abroad or in pesos from domestic depositors). The analysis of the supply equation, that is, of lender behavior, is straightforward. If foreign lenders always insist on lending in dollars, which is the case for most emerging markets, then even if confidence in the domestic currency improves, foreign lenders will still not lend in domestic currency. For example, suppose foreign lenders were willing to lend in pesos and that they decreased their peso

lending when the outlook for the peso worsened. In that case, the floating dummy would have a positive coefficient in the supply equation, assuming that floating is associated with less confidence in the peso. Since this is not the case and foreign lenders usually insist on lending in dollars, then even if floating is associated with less confidence in the peso, the coefficient of the floating dummy will still not have a positive coefficient in the supply equation.

One reason for this is that foreign banks are often required to match the currency denomination of liabilities with that of assets, thus forcing them to lend in dollars. In addition, Eichengreen, Hausman and Panizza (2002) argue that emerging markets are forced to borrow *externally* in one of the major currencies because the currencies of small countries offer little diversification benefits to foreign lenders relative to the additional transactions costs they imply, irrespective of country heterogeneity.

In fact, the coefficient may even be negative if floating is associated with a lower probability of repayment of dollar loans or of poor macroeconomic performance in general, since foreign lenders decide that they do not want to lend at all. In that case, the share of banks' total liabilities that consists of external dollar debt will fall, all else equal. Therefore, if foreign lenders always lend in dollars, any variable that affects the tradeoff between peso lending and dollar lending should have a zero coefficient in the supply equation. Only variables that affect the decision to lend in general will affect the dependent variable. For example, any variable that reflects a weakening economic environment would have a negative coefficient as foreign lenders decide that they want to avoid that particular emerging market altogether.

The analysis of the demand equation for external dollar borrowing is somewhat different. Domestic banks have the choice of borrowing in dollars from foreigners (or domestic residents) or borrowing in pesos from domestic residents. Thus, any variable that potentially increases confidence in the domestic currency, such as the adoption of a fixed exchange rate, should lead to more dollar borrowing and less peso borrowing, ceteris Paribas. The reason is that borrowers have more confidence that they will be able to repay the dollar loan. In addition, there is also the possibility that borrowers prefer to contract in dollars under fixed regimes because the government will feel responsible for any devaluation and thus bail out the borrowers. Specifically, borrowers, while indifferent between borrowing local currency and borrowing dollars but hedging, would certainly prefer to borrow dollars if they felt there was no need to hedge because of a guaranteed bailout (Broda and Levy-Yeyati 2000; McKinnon and Pill 1999). Thus, theory suggests that borrowers prefer to borrow in dollars under fixed regimes, all else equal. Finally, any variable that reflects the overall demand for funds should have a zero coefficient in the demand equation because all that matters is the currency composition of borrowing. If, for example, domestic banks borrow less because of a weakening macro-economic environment, then their demand for both peso and dollar loans will fall.

Therefore, the demand and supply coefficients of the floating dummy should have the same sign so that the theoretical predictions are unambiguous: the floating dummy variable should have a negative coefficient if floating is associated with less confidence in

the domestic currency. As described later, the results confirm these predictions although the coefficient is quite small, suggesting that the regime has little impact on confidence in the domestic currency.

The exchange rate regime classifications are taken from the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* which is based on the reports of monetary authorities. In the base regression, the managed floating dummy indicates managed floats with or without pre-announced ranges or paths for the exchange rate. The floating regime dummy indicates independent floats. The excluded dummy variable indicates pegged or limited flexibility regimes. In an alternative specification, I include binary variables for limited flexibility, managed floating, and independently floating and exclude a hard peg indicator. I also include dummy variables to indicate intermediate regimes (limited flexibility or managed floats with pre-announced ranges or paths for the exchange rate) and floating regimes (independent floats or managed floats without a pre-announced path for the exchange rate). The qualitative results are not sensitive to these alternative classifications.

However, there is a potential problem with using the *de jure* classification of exchange rate regimes. A *de jure* pegged exchange rate captures the commitment of the monetary authorities to maintain a fixed exchange rate, but it does not control for policies that are inconsistent with the peg. Many emerging markets that claim to fix have had realignments within the last ten years. In addition, many that claim to float actually limit exchange rate variability considerably (Frankel 1999). To overcome this problem, Levy-Yeyati and Sturzenegger (2000) propose a new *de facto* classification of exchange rate regimes. They define exchange rate regimes according to the behavior of three classification variables: changes in the nominal exchange rate, the volatility of these changes, and the volatility of international reserves. Countries with high volatility of reserves and low volatility in the nominal exchange rate are identified as fixers. Conversely, countries with low volatility in international reserves and substantial volatility in the nominal exchange rate are categorized as floaters. There is also an intermediate regime classification based on these variables. I also employ the Reinhart and Rogoff (2003) dataset on "natural" exchange rate regime classifications. Their extensive database provides *de facto* classifications taking into account market-determined dual or parallel rates as well as additional information from historical accounts. I use their annual course classification although using end of year monthly data did not make a difference. In addition, I collapse their classification into three possible regimes to match the *de jure* classification used in this paper. This involves including free falling regimes with free floating. I also separate the two, creating an additional category. In both cases, I find that the regime has a small or insignificant effect.

One final issue related to the exchange rate regime data is possible regime "contamination". In particular, if countries that peg implement policies that are inconsistent with maintaining the peg, the domestic banks may expect a large depreciation and therefore become less likely to borrow in dollars from abroad. In such a case, we would misleadingly attribute the post-collapse decrease in the external dollar mismatch variable to the floating regime. Following Ghosh, Gulde, Ostry and Wolf (1997), who

look at the effect of the exchange rate regime on inflation, I exclude the first year following a regime change. As a robustness check, I exclude the second year as well. The qualitative results were not sensitive to this change.

The empirical model also includes variables that control for the effect of macro variables on external dollar borrowing. Perhaps the most direct cause of the need to denominate loans in dollars are periods of high inflation and large depreciations. As I have discussed, if foreign lenders always insist on lending in dollars, then peso inflation will not affect their choice of currency. However, it will affect the decision of domestic banks to borrow in dollars. For example, periods of low inflation or even disinflation might make domestic banks more willing to borrow in dollars whereas high inflation or depreciation would have the opposite effect. Consequently, I include inflation and exchange rate depreciation as regressors. Including the latter also controls for valuation effects in the measures of external dollar mismatch.

Due to potential multicollinearity between inflation and depreciation, I exclude the former in certain specifications. I also include a time trend in the base specification to account for the general movement towards external dollar borrowing which may coincide with a movement towards more flexible regimes. I include the ratio of trade to GDP and a dummy indicating that foreign currency deposits are allowed in case some foreign lenders decide to deposit dollars in domestic banks. Finally, I include the growth of real GDP as foreign lenders are more willing to lend to banks in emerging markets if economic prospects improve.

I perform a number of robustness tests, including region specific dummies, year dummies and a binary variable that indicates whether a forward market was reported to exist to reflect the possibility that increased hedging opportunities might reduce the need to hold dollar assets. To capture hysteresis in the effects of past inflation on the decision of borrowers to borrow in dollars today, I construct a rolling variable that indicates the number of years that annual inflation exceeded 100% in the previous ten years. I also examine the possibility that the exchange rate regime affects inflation. Ghosh, Gulde, Ostry and Wolf (1997) find that countries with pegged exchange rates experience significantly lower and less variable inflation rates. Therefore, including inflation as a regressor eliminates a potential omitted variable problem. However, if the link between the exchange rate regime and inflation is causal, then including inflation in the model would underestimate the effect that the regime has on external dollar mismatch. Therefore, I estimate the model leaving out inflation. However, I find that there is no significant additional effect of the exchange rate regime. I also exclude the ratio of trade to GDP because the inclusion of this variable might underestimate the effect of the exchange rate regime, assuming there is a causal relationship from the regime to the degree of trade.

There is also the issue of potential endogeneity. It is possible that there is feedback from the level external dollar mismatch to the exchange rate regime for a number of reasons. First, a substantial degree of external dollar borrowing contributes to a fear of floating because of the devastating effects of large depreciations, perhaps leading to the adoption of a fixed exchange rate (Calvo and Reinhart 2002). To address this potential

problem, I estimate an alternative model that includes both one year and two year lagged values of the exchange rate regime variables.[4] I also perform instrumental variables estimation. There is a large literature from which to draw instruments on the determinants of the exchange rate regime. Following Edwards (1996), I use inflation, real GDP growth rates, per capita real GDP, ratio of central bank foreign exchange reserves to M1, and the growth in domestic credit. The growth rate of GDP measures either the incentive to engage in expansionary exchange rate policy or, conversely, the need for the countries to "tie their own hands". Per capita income captures the fact that more advanced countries have a lower tolerance for inflation and therefore might choose to peg. On the other hand, high income countries might be better at innovating technologies for reducing the costs of inflation, so their inflation aversion might be lower (Campillo and Miron 1996). The ratio of central bank foreign exchange reserves to M1 reflects the ability of the central bank to maintain a pegged exchange rate. Countries with a higher rate of growth of domestic liquidity will have a lower ability to sustain the peg. Following Poirson (2001), I include the ratio of trade to GDP as a measure of the country's openness and therefore the likelihood of adopting a fixed exchange rate. Of course this variable is a regressor so it automatically becomes an instrument. Finally, since smaller countries are more likely to adopt fixed exchange rates, I use real GDP and land area to account for country size.

Finally, following Honig (2002), I also estimate a regression including a variable that proxies for government quality:

$$ExternalMismatch_{it}=\beta_0 + \beta_1 ManagedFloat_{it} + \beta_2 Float_{it} + \underline{\delta}' GovernmentQuality_{it} + \underline{\gamma}' MacroControls_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

As previously discussed, even if foreign lenders only lend in dollars, the decision of domestic banks to borrow abroad in dollars certainly depends on the outlook for the domestic currency. Confidence in the domestic currency may not stem from the particular exchange rate regime but rather from the belief that the government will not follow policies that promote long run currency stability. It has been demonstrated repeatedly that a fixed exchange rate does not ensure this stability and that the choice of exchange rate regime is not an easy fix.

There are a number of channels through which government quality affects confidence in the domestic currency. First, myopic politicians eager to expand short-run output might enact inflationary policy that has the long run effect of reducing confidence in the domestic currency. Second, there is a direct link between significant fiscal excess and high inflation (Easterly and Schmidt-Hebbel 1991). Since it is reasonable to assume that well run governments are able to control fiscal imbalances, it therefore follows that they restrain inflation and thus promote confidence in the peso. In addition, if there is external debt denominated in domestic currency, the government or monetary authorities might have an incentive, if pressured by domestic firms, to reduce the value of this debt through expansionary monetary policy. Presumably, able governments that are committed to long run currency stability will be far less tempted to manipulate the currency for this purpose.

Finally, poor regulation and supervision of the financial system can result in large losses in bank balance sheets that make it costly for the monetary authorities to raise interest rates to control inflation (Calvo and Mishkin 2003). It is important to note that because is inflation is a regressor, any effect that government quality has on external dollar mismatch is above and beyond the indirect effect it has on external mismatch through inflation.

I construct a composite government quality variable, *GovQual*, based on several variables from the *International Country Risk Guide* meant to proxy for government quality. *Bureaucracy Quality* (range 0-4) measures institutional strength and quality of the bureaucracy as well as autonomy from political pressure. Higher scores also indicate that the bureaucracy has the ability to operate without drastic changes in policy when governments change. It is plausible that a skilled bureaucracy that is resistant to political winds can promote faith in the domestic currency by maintaining a stable policy, thus increasing the probably that domestic banks are willing to borrow in dollars from abroad. It is also likely that a strong bureaucracy that is immune from the pressures of politicians will have a longer time horizon and will therefore work to prevent policy with short run benefits but long run costs. *Corruption* (range 0-6) within the political system measures the extent to which government officials are able to assume positions of power through patronage rather than ability and to which they can be influenced by illegal payments. This variable should also be correlated with government quality and therefore might be able to capture the effects of good, consistent policy on confidence in the domestic currency. *Law and order* (range 0-6) assesses the strength and impartiality of the legal system and popular observance of the law. Higher scores also indicate well functioning political institutions implying that this variable should be correlated with measures of sound policy such as budgetary discipline.

In addition to looking at government quality, I examine the effect of central bank independence and political stability on external dollar mismatch. There is a large literature on the effect of these variables on inflation, yet the effect on external dollar mismatch has not been explored to date. Following Haan and Kooi (2000) and Sturm and Haan (2001), *Turnover* is defined as the turnover rate of central bank governors. A higher turnover rate is associated with less central bank independence. *Stability* represents the number of government transfers and is defined as the percent of veto players who drop from the government in any given year (Beck, Clarke, Groff, Keefer, and Walsh 1999)[5].It is quite possible that government leaders, who know their time in office is limited, will enact inflationary policies with only short-run benefits.

I perform numerous robustness checks for the effect of government quality on external dollar borrowing. In addition, I also control for GDP per capita to proxy for government quality. I include the government deficit as a percent of GDP to measure potentially inflationary fiscal policy. In no case was the effect of government variables reduced, and in some cases the effect became stronger. I also lag the government quality variable to capture the slow recognition of the public to changes in government quality. This change did not affect the qualitative results. Including the variable that indicates high inflation in the past does not affect the government quality coefficients.

The coefficient of *GovQual* should be positive. The reason is that if foreign lenders only lend in dollars, then an improvement in government quality which increases confidence in the domestic currency does not affect the lending decision of foreign lenders in terms of which currency to denominate the loan in. If, as Eichengreen, Hausman and Panizza (2002) assert, emerging markets are forced to borrow *externally* in one of the major currencies because the currencies of small countries offer little diversification benefits to foreign lenders relative to the additional transactions costs they imply, irrespective of country heterogeneity, then improvements in government credibility and reductions in inflation will not reduce the proportion of *external* borrowing that is foreign currency denominated.

However, if government quality affects the probability of repayment of the loan or is associated with macroeconomic performance, then we would expect a positive coefficient in the lending supply equation. Moreover, if improvements in government quality increase confidence in the domestic currency, then domestic banks will be more willing to borrow in dollars from abroad, implying a positive coefficient as well. Therefore, the demand and supply coefficients should have the same sign so that the theoretical predictions are unambiguous. As described later, the results confirm these predictions.

Table 2
Effect of the Exchange Rate Regime on External Dollar Mismatch
Dependent variable: External Dollar Mismatch/Total Liabilities

	OLS	*RE*	*FE*	*IV*
Managed Float	2.36	-3.43	-5.03	-11.18
	(1.35)*	(1.54)**	(1.69)***	(11.33)
Independent Float	-2.35	-5.30	-6.43	-5.11
	(1.53)	(1.44)***	(1.58)***	(8.11)
Growth Real GDP	0.05	-0.03	-0.03	-0.01
	(0.12)	(0.07)	(0.07)	(0.09)
Trade/GDP	-0.02	-0.02	0.00	-0.03
	(0.02)	(0.02)	(0.03)	(0.03)
FC Deposits Allowed	-3.20	-3.17	-3.89	-3.13
	(1.22)***	(1.82)*	(2.19)*	(2.07)
Inflation	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Depreciation	-0.01	-0.01	-0.01	-0.01
	(0.00)***	(0.00)***	(0.00)***	(0.00)***
Time	-0.03	0.31	0.33	0.40
	(0.20)	(0.11)***	(0.11)***	(0.20)**
Constant	-0.63	-1.34	-0.74	1.01
	(2.41)	(2.63)	(2.56)	(5.71)
Observations	617	617	617	592
R2	0.06		0.03	
Countries	83	83	83	81
Hausman p-value		0.73		

Robust standard errors in parentheses.
All ratios and growth rates expressed in percentage terms.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Empirical Results

Table 2 presents the results for the estimation of equation (1), which excludes the government quality variable. The coefficients of the managed float and independently floating dummy variables are small and negative, further providing evidence that faith in the domestic currency does not stem from the exchange rate regime. The negative coefficient confirms that intuition discussed earlier that if foreign lenders always insist on lending in dollars and if floating is associated with greater exchange rate risk, then the coefficient of the floating dummy should be negative since domestic banks may be more reluctant to borrow in dollars. However, the size of the coefficient suggests that this effect is small, implying that pegged regimes only marginally increase confidence in the domestic currency. In fact, the floating dummy is insignificant under OLS.

Because of potential feedback from external dollar mismatch to the exchange rate regime, I perform instrumental variables estimation. The results are provided in the 4th column of Table 2. Using instrumental variables, both regime dummy variables are insignificant in explaining external dollar mismatch although the coefficients are still negative and larger in absolute value. However, the R^2 in the prediction equation is too low to put much weight on these results. In unreported regressions, I lag the exchange rate regime by both one and two years to deal with potential endogeneity. The results are not sensitive to this change.

Before turning to the effect of government quality on external dollar mismatch, I briefly discuss the other coefficients and some of the interesting results from the robustness tests which are not presented. The coefficients of inflation and depreciation are either insignificant or extremely small. This is true regardless of whether inflation and depreciation are included together as regressors or separately. A likely explanation is that foreigners insist on lending in dollars, regardless of the inflation performance of emerging market countries because of the Original Sin of emerging markets. In unreported regressions, the binary variable indicating the presence of a developed forward market is significantly positive with a coefficient of 4%. A likely explanation is that domestic banks feel more comfortable borrowing in dollars from abroad if they have access to a domestic forward foreign exchange market that allows them to hedge some of this risk The inclusion of this variable did not significantly affect the coefficients of the exchange rate regime variables.

Table 3 reports results for the effect of government quality on external dollar mismatch. Higher values of *GovQual* represent better government quality. The standard deviation of this variable is close to one, so a one unit increase also represents an increase in one standard deviation. The coefficient of *GovQual* is positive and significant under all estimation procedures. Overall, the results suggest that a country that is two standard deviations above the mean in terms of government quality will have a value of external mismatch that is approximately eight percentage points higher than a country that is two standard deviations below the mean. In unreported regressions, the turnover of central bank governors is uncorrelated with the dependent variable, but increases in government stability over the 1980's are associated with very small but significant increases in external dollar mismatch. Of course there is the question of how well indicators of bureaucratic quality, corruption and law and order actually measure government quality. For example,

a simple rating of bureaucratic quality on a scale of 0-4 will most likely not capture subtle differences across governments. However, this inability to perfectly capture government quality suggests that the coefficient of *GovQual* actually underestimates the effect of government quality on external dollar mismatch.

The results of Table 3 suggest that improved government quality tends to have a very small but positive effect on external dollar mismatch. If we assume that foreigners only lend in dollars, then, as discussed earlier, improved government quality will tend to *increase* external mismatch because domestic banks are more willing to borrow dollars as a result of increased faith in the domestic currency. The results confirm this intuition. These results imply that in the short run, improvements in government quality can actually lead to *greater* currency risk through increases in net external dollar borrowing, although this effect is quite small. However, in the long run, if improving government quality leads to the development of domestic capital markets (Burger and Warnock, 2003), then less foreign dollar borrowing is required, reducing external mismatch. In addition, it is possible that if government quality improves beyond a certain threshold, foreigners may become willing to lend in domestic currency, reducing external mismatch as well. Brazil, for example, recently began issuing local currency bonds in international capital markets.

Table 3
Effect of Government Quality on External Dollar Mismatch
Dependent variable: External Dollar Mismatch/Total Liabilities

	OLS	*RE*	*FE*	*IV*
Managed Float	1.91	-3.37	-5.87	-2.98
	(1.31)	(1.66)**	(1.86)***	(10.09)
Independent Float	-2.38	-4.68	-6.93	7.97
	(1.49)	(1.59)***	(1.79)***	(9.27)
GovQual	3.07	2.15	1.85	2.92
	(0.73)***	(0.75)***	(0.80)**	(1.15)**
Growth Real GDP	-0.34	-0.13	-0.11	-0.16
	(0.15)**	(0.10)	(0.10)	(0.12)
Trade/GDP	-0.03	0.03	0.08	0.01
	(0.02)	(0.03)	(0.03)***	(0.03)
FC Deposits Allowed	-2.47	-6.52	-10.17	-6.71
	(1.11)**	(2.22)***	(3.15)***	(2.74)**
Inflation	-0.05	-0.04	-0.03	-0.04
	(0.02)**	(0.01)***	(0.01)***	(0.02)***
Depreciation	-0.02	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Time	-0.57	-0.10	-0.05	-0.22
	(0.21)***	(0.15)	(0.15)	(0.28)
Constant	-0.18	-2.64	-0.52	-6.66
	(2.47)	(3.32)	(3.69)	(6.02)
Observations	427	427	427	407
R2	0.19		0.39	
Countries	65	65	65	63
Hausman p-value		0.01		

Robust standard errors in parentheses.
All ratios and growth rates expressed in percentage terms.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Conclusion

The empirical results in this paper suggest that the exchange rate regime is not an important determinant of external dollar mismatch, having a marginal impact at best. The implication is that too much emphasis has been placed on the role that the exchange rate can play in either reducing or exacerbating emerging market vulnerability. These results imply that until faith in the domestic currency can be restored and domestic banks are no longer forced to borrow in dollars, countries with both floating and fixed regimes that maintain the domestic currency will be subject to currency risk.

The results in this paper also suggest that improvements in government quality, while necessary to restore confidence in the domestic currency, may have the unintended short run consequence of increasing exposure to foreign exchange risk as domestic banks become more willing to borrow in dollars externally. The hope, however, is that eventually foreign lenders will become willing to lend in domestic currency. At the very least, improving government quality should reduce domestic liability dollarization and spur the growth of domestic capital markets.

Notes

1. Following the standard vocabulary, this paper employs the terms "dollar" when referring to any hard foreign currency and "peso" when referring to any domestic currency.
2. Domaç and Peria (2000) use a similar variable in looking at the effect of unhedged external dollar liabilities of domestic banks on the probability of a banking crisis.
3. External currency mismatch does not capture the full extent of currency mismatch of domestic banks, which also accept dollar deposits of domestic residents and make dollar loans to domestic firms. For an analysis of domestic liability dollarization, see Honig (2002).
4. I also lagged the other regressors in separate regressions to examine any additional feedback. This did not affect the results.
5. Veto players are the president, the largest government party, and the largest party in the Senate; for parliamentary systems, veto players are defined as the Prime Minister and the biggest three coalition members. If there is no legislature, an unelected legislature, only 1 candidate, or 1 party to choose from during elections this index is based only on changes in the chief executive. Stability is calculated by dividing the number of exits between year t and t+1 by the total number of veto players in year t (multiplied by 100). It is therefore on a 0-100 scale, with zero representing no exits and one hundred representing the exit and replacement of all veto players.

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Appendix A

Below I list the variables and sources used. The data is annual and it covers the period 1988–2000.

Table A1

Variable	*Description and Source*
External Mismatch	
Foreign Assets	Foreign assets of domestic deposit money banks. Source: IFS.
Foreign Liabilities	Foreign liabilities of domestic deposit money banks. Source: IFS.
Total Liabilities	Total deposits + money market instruments + bonds + foreign liabilities + central government deposits + credit from monetary authorities + capital accounts. Source: IFS.
Exchange Rate Regime Variables	
de facto regime	Source: Reinhart and Rogoff (2003); Levy-Yeyati and Sturzenegger (2000)
de jure regime	Source: IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*.
Government Quality Variables	
Bureaucracy Quality	Bureaucratic Quality, scale of 0-4. Source: International Country Risk Guide, published by The PRS group.
Corruption	Corruption in Government, scale of 0-6. Source: International Country Risk Guide, published by The PRS group.
Law and Order	Measures law and order tradition, scale of 0-6. Source: International Country Risk Guide, published by The PRS group.
Turnover of central bank governors	Source: Sturm and Haan (2001)
Political Stability	Source: Beck, Clarke, Groff, Keefer, and Walsh (1999)
Control Variables	
Trade (% of GDP)	Exports plus Imports divided by GDP. Source: IFS and WDI.
Growth in Real GDP %	Annual percentage change of real gross domestic product. Source: WDI.
Inflation %	Annual percentage change in Consumer price index. Source: IFS and WDI.
Foreign currency deposits allowed	IMF's Annual Report on Exchange Arrangements and ExchangeRestrictions.
Presence of Forward Market	Dummy variable for whether a forward market was reported to exist, as opposed to being reported to be underdeveloped, heavily regulated, or nonexistent. Source: IMF's Annual Report on Exchange Arrangements and Exchange Restrictions.
Government Deficit (% of GDP)	Source: IFS and WDI.
Instruments	
Central bank foreign exchange reserves (% of M1)	Central bank foreign exchange reserves as percent of M1. Source: IFS.
Growth in Domestic Credit %	Annual percentage change in domestic credit. Source: IFS.
Real GDP per capita	Source: IFS and WDI.
Land Area	Source: WDI.
Real GDP	GDP in 2000 dollars. Source: IFS and WDI.