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EXCHANGE RATE REGIMES AND EXTERNAL FINANCIAL STABILITY

ABSTRACT: *Financial stability within the framework of the global financial crisis has become a common topic for researchers and practitioners. In order to analyse the impact of exchange rate regimes on financial stability we use both the de jure and de facto exchange rate classifications. We apply the model to a 1999–2010 annual data sample for 135 countries and territories, grouped by the level of economic development. Our second focus is the investigation of the effects of the exchange rate regimes in three economic integration areas (member countries of the European Union 27, the Southern Common Market, and the Association of Southeast Asian Nations) on financial stability. Our results generally support the central banks' concerns that the flexibility of exchange rate regimes should be reduced in order to sustain financial stability; however, the findings are not robust when using alternative regime classifications.*

KEY WORDS: *exchange rate regimes; financial stability; economic integration; country development*

JEL CLASSIFICATION: E42, F30, F31

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1. INTRODUCTION

During and after the recent international financial crisis, financial stability became one of the main concerns of national financial regulatory authorities, next to monetary stability. Financial stability is a favourite subject in the financial literature; the issue is frequently associated with monetary stability and monetary policy, competition in the financial system, and financial innovation. Another relationship frequently discussed is between financial stability and the national regulatory and supervisory framework; sometimes, financial stability is linked directly to financial institutions or even to corporate financial structure. The research on exchange rate regimes itself is another common topic in high-level articles and journals. However, little direct attention has been paid to the consequences of the choice of exchange rate regime on financial stability, and our study was motivated by this literature gap. The objective is to determine if and how the choice of exchange rate regime flexibility influences the external sector's financial stability, measured by the accumulation of international reserves. We employed a large data panel of 135 countries and territories over the 1999–2010 period, which we divided into different subsamples to capture the impacts of the level of economic development and economic integration.

The rest of the paper is organized as follows: Section 2 covers the literature review; Section 3 explains the data and methodology; Section 4 discusses the empirical results; and Section 5 presents the summary and conclusions.

2. LITERATURE REVIEW

The problem of financial stability has attracted researchers due to its importance not only to national economies but also to the international financial system. As a result there are many directions for researchers to explore: how financial stability relates to monetary stability (and monetary policy), to fiscal stability (and fiscal policy), to the regulatory and supervisory framework, to the structure of the financial system (including the corporate financial structure), to competition, and to the performance of the financial system.

However, the correlation between the exchange rate regime and financial stability has been less investigated. Domaç and Martinez Peria (2003) claimed that, with the exception of Barry Eichengreen's work, the connection between exchange rate regime and financial stability remained largely unexplored at the empirical level.

McKinnon (1988) analysed the implications of monetary and exchange rate policies on financial (and monetary) stability at the international level. He proposed a pegged exchange rate for America, Japan, and Europe (more specifically, Germany). In 1998, Eichengreen approached the problem of financial stability from a perspective which was new and interesting at that time: the stability of the exchange rate. He emphasized that most of the literature on the choice of exchange rate regime paid little attention to its implications for financial stability. The situation is not much different now, after more than a decade. In his paper he focused on the implications of international monetary arrangements for the stability of the banking system. Researching the choice of appropriate exchange rate regime for the banking system's stability, Eichengreen claimed that in a pegged regime the central bank would sometimes need to choose between the stability of the exchange rate and financial stability. The latter is perceived as the stability of the banking system, or the absence of banking crises.

Eichengreen and Hausmann (1999) correlated the exchange rate regime (pegged or intermediate) with financial fragility (considered as the financial system's vulnerability in the face of financial crises). Aizenman and Hausmann (2000) showed that the choice of exchange rate regime was intertwined with the financial structure. Both studies focused on the banking crisis and analysed the role of exchange rate regime, financial liberalization, deposit insurance, and external factors (foreign interest rates and the economic growth of the Organisation for Economic Co-operation and Development countries).

Husain et al. (2005) observed that pegged regimes exposed developing countries to a higher risk of crisis, while richer and more financially developed countries seemed to benefit from increasingly flexible exchange rates. In the same regard, Bordo (2006) highlighted that the choice between fixed and floating exchange rate regime types had evolved considerably over the past hundred years: however, emerging countries with less financially mature economies were still afraid to float because they were especially vulnerable to financial crises. Xafa (2008, p.240) supported the idea that developing countries should adopt fixed exchange rate regimes, particularly in the case of dollarized, small, and open economies with undeveloped financial systems and without an independent and sophisticated central bank.

Bergvall (2005) studied the Swedish case for the period 1974-1994 and concluded that the choice of exchange rate regime influenced macroeconomic stability. Choi and Baek (2007) found that the exchange rate regime mattered for countries' international reserve holdings. Moreover, they showed that the reserve level was

nonlinearly and significantly correlated with the exchange rate system, being smaller under polar-opposite than under intermediate regimes.

Ghosh et al. (2010) concentrated on the question of whether the choice of exchange rate regime would help countries achieve their own domestic macroeconomic goals: they claimed that the optimal regime would depend on the macroeconomic challenges facing a country.

Karimi and Voia's (2011) findings showed that high volatility values of unemployment rates, inflation rates, unemployment rates, real effective exchange rates, trade openness, economy size, and contagion factors increased the hazards of a crisis.

Obstfeld et al. (2011) proposed the use of international reserves as a measure of financial stability, since the reserves would express a country's ability to resist external shocks. They discovered that, with some exceptions, the financial stability specifications that were used could predict the official reserve holdings with reasonable accuracy.

Magud et al. (2012) studied policy options to cope with large capital inflows in emerging markets. Their findings suggested that exchange rate flexibility might be used to counteract the negative effects of capital inflows on lending booms that might generate financial instability. The less flexible regimes must be accompanied by carefully designed macro-prudential policies. This last statement is consistent with the recommendations of Bush et al. (2011) that financial regulation and macro-prudential policy frameworks should be improved at the international level.

Han and Wei (2014) found that capital controls are a necessary component for building resilience into international monetary policy shocks, especially for a flexible exchange rate regime. Morales-Zumaquero and Sosvilla-Rivero (2015) analysed the impact of financial crises and nominal exchange rate regime changes on growth dynamics. They showed that exchange rate regimes have a certain influence on the growth rate for lower-middle-income and low-income countries in the short-run, without a major impact on long-run growth rates. Hallren (2015), analysing the Asian financial crisis, discovered that the country's exchange rate regime choice at that time did not had a significant effect on the size of the shock to real income levels; however, it lowered income growth and slightly increased the inflation rate.

Starting from the choice of the exchange rate regime, by assessing if and to what extent exchange rate regime flexibility has an influence on financial stability, the present study tries to fill a gap in this body of literature.

3. METHODOLOGY AND DATA

Our intent was to determine whether choice of exchange rate regime has any influence on a country's financial stability, using a 1999–2010[1] annual data sample for 135 countries and territories. The academic literature reveals the controversial nature of financial stability measurement. Theorists and practitioners have focused on a number of quantitative measures, surveyed in a comprehensive paper by Gadanecz and Jayaram (2009). The variables expressed different aspects of financial stability, referring to the real economy or the corporate, household, external, and financial sectors. From the perspective of the external sector, financial stability can be proxied by the level of international reserve holdings. Composite indices were also built but were usually used for a specific country.

In our research we did not address financial stability in a comprehensive way. We supported the view of Obstfeld et al. (2011) that reserve accumulation is a key tool for managing domestic financial stability and exchange rate stability in a financially integrated world. Foreign reserves express a country's ability to resist external shocks, an aspect that supports this variable's use as a proxy measure for financial stability.

Our research started from the financial stability model of Obstfeld et al. (2011) but concentrated on a different perspective, the choice of exchange rate regime. Our main interest was the consequence of the choice of exchange rate regime on financial stability; that is, on international reserve holdings, while controlling for the other determinants of reserves identified in the paper mentioned above: money supply, financial openness, and trade openness. We scaled the reserve holdings variable to the gross domestic product (GDP) in order to obtain a stationary variable. We expressed the money supply as the ratio of monetary aggregate (M2) to GDP in log form; financial openness by the Chinn and Ito (2008) index (in contrast to the original model), which we scaled from 0 to 1; and trade openness as the ratio of imports and exports to GDP (%). The main specification used a

1 One of the reasons for choosing the 1999–2010 sample period was the homogeneity of the exchange rate regime classifications since the International Monetary Fund's introduction of a new classification system in 1999.

high-income country dummy, similar to the model of Obstfeld et al. (2011). The descriptive statistics of the data (including the Phillips-Perron panel unit root tests, with 10 lags) are available in the Appendix.

Financial openness is a measure of international capital mobility, money supply ratio is a measure of financial development, and the exchange rate regime captures the exchange rate policy. All three variables proxy the 'impossible trinity' components. Trade openness has been identified as a robust regressor for the reserve holdings.

We estimated the equation below:

$$Reserves = \beta_{peg} Peg + \beta_{\text{int}\,erm} Interm + X\beta_X + \beta_H Advanced \quad (1)$$

where *Reserves* express the ratio of international reserve holdings to GDP in log form and *Peg* and *Interm* are dummies for the pegged and intermediate exchange rate regimes respectively; thus the β_{peg} and β_{interm} coefficients express the influence of the respective regimes on financial stability, while the floating regime is considered the reference level; *X* is a vector of independent variables that control for other factors that influence the international reserve level (money supply, financial openness, trade openness, and inflation differential); and *Advanced* is a high-income country dummy.

We employed the data series from the World Bank data website (M2 aggregate, GDP, imports, exports, inflation rate, and country development dummies), the International Monetary Fund (IMF) Annual Report of Exchange Arrangements and Exchange Restrictions (de jure exchange rate regime dummies), and the Chinn and Ito website[2] (financial openness index). We obtained the de facto exchange rate regime dummies courtesy of Professor Carmen Reinhart.

We tested the model for robustness with two exchange rate regime classifications—the IMF de jure classification and the Ilzetzki-Reinhart-Rogoff (RR) de facto arrangement (Ilzetzki et al. 2010). This approach was designed to distinguish between countries' officially declared exchange rate regimes and the exchange rate policy that was actually implemented by monetary authorities. As Harms and Kretschmann (2009, p.140) noted, "such a distinction is important since, on the one hand, many countries tolerated – and still tolerate – the existence of parallel foreign exchange markets, and in these countries the stability of the

2 http://web.pdx.edu/~ito/Chinn-Ito_website.htm

official exchange rate often conveys a wrong impression about the volatility of the [relevant] (parallel) exchange rate." These classifications reflect different aspects of the exchange rate policy and may even capture to a certain degree the endogeneity of policies, shocks, and markets' reactions (Magud et al. 2012).

We grouped the exchange rate arrangement dummies into three broad regime types— pegged, intermediate, and floating. The results are shown in Table 1.

Table 1. Exchange rate regime classifications

Classification employed in the current research		
Pegged	Intermediate	Floating
IMF classification (de jure)		
(1) no separate legal tender (2) currency board arrangement (3) other conventional fixed peg	(4) horizontal band (5) crawling peg (6) crawling band (7) managed floating without pre-announced path for exchange rates	(8) independently floating
Ilzetzki, Reinhart, and Rogoff fine classification (de facto)		
(1) No separate legal tender (2) Pre-announced peg or currency board arrangement (3) Pre-announced horizontal band that is narrower than or equal to +/-2% (4) De facto peg	(5) Pre-announced crawling peg (6) Pre-announced crawling band that is narrower than or equal to +/-2% (7) De facto crawling peg (8) De facto crawling band that is narrower than or equal to +/-2% (9) Pre-announced crawling band that is wider than or equal to +/-2% (10) De facto crawling band that is narrower than or equal to +/-5% (11) Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and depreciation over time) (12) Managed floating	(13) Freely floating (14) Freely falling

Note "Dual market in which parallel market data is missing" is ignored.
Source: IMF (various issues) and Ilzetzki et al. (2010).

One of our key interests in this paper is whether a country's development has any influence on the exchange rate policy effect on financial stability. Thus, we estimated equation (2)—without the "high-income countries" dummy—on four samples: low-, low-medium-, upper-medium-, and high-income countries, as defined and reported by the World Bank:

$$Reserves = \beta_{peg} Peg + \beta_{\text{int}\,erm} Interm + X\beta_X \quad (2)$$

Another goal of this paper was to highlight the exchange rate regime effect on financial stability within the framework of economic integration in different parts of the world. Thus we built three subsamples, called "economic areas" for convenience: the member countries of the European Union 27 (EU27), the Southern Common Market (MERCOSUR), and the Association of Southeast Asian Nations (ASEAN). All three samples refer to different forms of economic integration, defined in the literature as economic and monetary union, common market, and free trade area, respectively. Table 2 lists the member countries of the three economic areas.

Table 2. Members of the economic areas

Economic area	**Member countries**
European Union 27	Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom
MERCOSUR	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela
ASEAN	Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam

Note: The Republic of Croatia, the 28th EU member from July 1st 2013, was not included in the respective sample

We built the "economic area" samples irrespective of the official membership of the countries during the entire period under study (1999–2010). The main reason for this was that the current members went through a period of convergence and integration long before formal acceptance into the organizations.

We estimated equation (2) on these subsamples and expected that a certain degree of economic integration might reduce the need for international reserve holdings. The trade and financial flows inside an economic area might be carried out in a common currency, in each country's currency, on a barter basis, or in a single currency as in the Euro area's case.

One of our concerns was the potential endogeneity of the model due to reverse causality. The level of foreign reserves might determine the change in exchange rate regime. For example, in 1992, when the reserves in Italy dropped to a dangerous level, the authorities decided to switch from a fixed to a flexible exchange rate by abandoning membership of the European Monetary System (Fratianni and Artis 1996). However, these switches do not (more precisely, should not) occur too often, since they pose a significant credibility problem for monetary authorities, which can generate high, long-term costs. During the recent international financial crisis, foreign reserves in Latvia declined sharply due to a large current account deficit, but the country resisted an exchange rate regime switch, with the help of the EU and the IMF (Bank of Latvia, 2009, p.39, 115). For the Latvian authorities it was important to preserve the credibility of their long-term policies, even though they had to adopt painful decisions. In the light of these two opposite examples the reverse causality issue is not totally clear, but it remains a potential issue that should be mitigated.

Consequently, we did not employ the standard Ordinary Least Squares (OLS) method but used the Generalized Method of Moments (GMM), with fixed-country effects in all specifications. Whenever there is a problem with endogenous regressors, either an Independent Variable (IV) or GMM estimator is appropriate, but GMM is more efficient. The instruments were the lagged values of the exchange rate regime dummies (the regime of the previous year in a specific country) and the contemporaneous values of all other dependent variables.

4. EMPIRICAL RESULTS

The results reported in Table 3 show (for the entire sample) that both pegged and intermediate exchange rate regimes have positive effects on the creation of countries' foreign reserves, superior to that of floating regimes.

A first observation is that, generally, the regimes that allow a higher exchange rate stability seem to lead to better external financial stability (Table 3, specification 1). Money supply and trade openness have statistically significant positive effects at

around 0.3–0.5. Capital mobility does not favour an increase in foreign reserves; it affects financial stability because an increase in financial integration leads to a decrease in the level of international reserves.

Table 3. Estimates of entire sample and country-development-level samples (de jure IMF classification)

	(1) All	(2) Low	(3) LowMed	(4) UpMed	(5) High
Peg	**0.320*****	**0.0784**	**-0.415**	**-0.0430**	**0.127**
	(0.0846)	**(0.323)**	**(0.309)**	**(0.274)**	**(0.127)**
Intermediate	**0.291*****	**0.177**	**-0.0610**	**0.0678**	**0.0387**
	(0.0718)	**(0.132)**	**(0.186)**	**(0.224)**	**(0.241)**
M2 (%GDP)	0.457***	0.788***	0.867***	0.355***	-0.414**
	(0.0663)	(0.131)	(0.172)	(0.135)	(0.191)
Trade Openness (log)	0.347***	0.113	0.619***	0.538***	0.215
	(0.101)	(0.171)	(0.192)	(0.201)	(0.339)
Financial Openness	-0.190*	0.487	0.264	0.130	-1.527***
	(0.110)	(0.414)	(0.241)	(0.205)	(0.274)
Inflation Differential	-0.0412	-1.088**	0.433	0.451	8.785***
	(0.241)	(0.446)	(0.345)	(0.587)	(2.051)
High-income dummy	0.119				
	(0.0973)				
Constant	-3.029***	-4.454***	-7.174***	-2.735*	6.309***
	(0.660)	(1.144)	(1.649)	(1.503)	(2.219)
Observations	1329	305	369	301	354

Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01
All = entire sample
Low = low-income countries; LowMed = lower-medium-income countries; UpMed = upper-medium-income countries; High = high-income countries (World Bank classification)

The empirical results of the first specification deliver quite a general outcome, as the sample is heterogeneous in terms of countries' economic development. This finding suggests the need to deepen our research by splitting the sample according to the country's degree of development. Specifications 2 to 5 in Table 3 show the estimation results as per countries' income level as classified by the World Bank: low-, lower-medium-, upper-medium-, and high-income.

Following the evidence, the choice of the exchange rate regime is no longer so convincing from the perspective of its consequence for financial stability. In all

cases, the coefficients of the exchange rate regime dummies become statistically insignificant. These results suggest that countries' development level is irrelevant when studying the effect of choice of exchange rate regime on the level of international reserves.

In the case of the RR classification, built on the de facto exchange rate policy of the authorities, the results are not robust (Table 4). There is no statistically significant effect of choice of exchange rate regime on external financial stability when the entire sample is considered.

Table 4. Estimates for entire sample and country-development-level samples (de facto RR classification)

	(1) All	(2) Low	(3) LowMed	(4) UpMed	(5) High
Peg	**-0.159**	**-0.477**	**-0.525**	**0.126**	
	(0.254)	**(0.357)**	**(0.411)**	**(0.535)**	
Intermediate	**0.135**	**-0.994*****	**-0.293**	**0.245**	**1.865*****
	(0.239)	**(0.323)**	**(0.401)**	**(0.479)**	**(0.236)**
M2 (%GDP)	0.477***	0.832***	1.017***	0.370**	-0.422***
	(0.0651)	(0.133)	(0.129)	(0.145)	(0.141)
Trade Openness (log)	0.342***	0.339*	0.518***	0.578***	0.474
	(0.104)	(0.176)	(0.165)	(0.215)	(0.313)
Financial Openness	-0.276**	2.024***	0.0397	0.118	-0.864***
	(0.108)	(0.614)	(0.174)	(0.187)	(0.238)
Inflation Differential	-0.260	-1.854***	-0.228	0.589	7.720***
	(0.289)	(0.512)	(0.390)	(0.549)	(1.848)
High-income dummy	0.0868				
	(0.0938)				
Constant	-2.898***	-5.485***	-7.673***	-3.200**	3.967**
	(0.635)	(1.083)	(1.182)	(1.559)	(1.574)
Observations	1288	286	353	295	354

Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01
All = entire sample
Low = low-income countries; LowMed = lower-medium-income countries; UpMed = upper-medium-income countries; High = high-income countries (World Bank classification).

However, while there seems to be no difference between polar-opposite regimes (pegged versus floating), some coefficients of the intermediate regime dummy are statistically significant. The estimations show evidence that in the

case of underdeveloped and advanced countries (the extreme categories) the intermediate regime has a significant effect on the level of international reserves, that is, external financial stability.

In the case of underdeveloped countries the coefficient is negative and is very close to unity. This finding may mean that the monetary authorities in these countries make discretionary interventions to avoid currency depreciation, which consumes high amounts of foreign reserves. By being underdeveloped, these countries are very sensitive to large fluctuations of the national currency rate against major reserve currencies, compelling the authorities to support the national currency rate with more interventions than in other cases.

On the other hand, in the case of advanced countries, the intermediate regime coefficient is positive and statistically significant. Generally, the governance of these countries is considered more reliable: the monetary authorities are more credible. In this context, demand for the advanced countries' currencies will push their appreciation. The authorities will be forced to intervene in order to avoid excessive appreciation of the domestic currency, which may lead to a loss of competitiveness for national products and services.

The results do not seem to be robust across regime classifications, both for the entire sample and for the country-income-level samples. A possible explanation is that the two exchange rate regime classifications are built on totally different principles. While reserve accumulation or reduction is strictly related to the monetary authorities' commitment to support the official (de jure) exchange rate regime, the parallel market exchange rate level (de facto regime) does not influence the authorities' behaviour (including the use of reserves as a policy instrument).

The second focus of our research was the exchange rate regime's effect on financial stability within the framework of economic integration in different parts of the world. We employed the financial stability model in three economic areas from different continents; the results are reported in Table 5.

Table 5. Estimates for economic area samples (de jure IMF classification)

	(1) EU27	(2) MERCOSUR	(3) ASEAN
Peg	**0.264****	**-0.113**	**0.127**
	(0.130)	**(0.306)**	**(0.172)**
Intermediate	**0.793****	**-0.144**	**0.0764**
	(0.388)	**(0.162)**	**(0.130)**
M2 (%GDP)	-0.282	0.0675	0.833***
	(0.202)	(0.232)	(0.114)
Trade Openness (log)	0.667*	2.145***	0.136
	(0.354)	(0.383)	(0.225)
Financial Openness	-0.437**	0.0403	-0.856***
	(0.201)	(0.241)	(0.215)
Inflation Differential	-1.751	1.438***	0.329
	(1.144)	(0.481)	(0.596)
Constant	1.653	-6.107***	-4.279***
	(2.036)	(2.295)	(1.127)
Observations	282	100	88

Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01

From the evidence it can be seen that in the EU's case the coefficients are positive and statistically significant for the pegged and intermediate regimes, suggesting that a higher stability of the exchange rate favours financial stability. Moreover, the effect of the intermediate regime is quite close to unity (the coefficient is 0.793). In the case of ASEAN and MERCOSUR member countries there is no evidence of choice of exchange rate regime significantly influencing external financial stability. The difference may reside in the varying levels of integration of these organizations—the EU is more integrated than MERCOSUR and ASEAN. Thus, in the EU, the choice of exchange rate regime seems to play a vital role in financial stability, while the opposite is the case in MERCOSUR, where it is not the regime but probably other country characteristics that are important.

Table 6 shows the estimates of the classification of the de facto exchange rate regimes.

Table 6. Estimates for economic area samples (de facto RR classification)

	(1) EU27	(2) MERCOSUR	(3) ASEAN
Peg	**0.593**	**-1.286**	**0.161**
	(1.340)	**(1.946)**	**(0.149)**
Intermediate	**1.972**	**-0.842**	
	(1.291)	**(1.421)**	
M2 (%GDP)	-0.510***	0.390	0.803***
	(0.168)	(0.528)	(0.160)
Trade Openness (log)	0.142	2.067***	-0.0641
	(0.373)	(0.400)	(0.293)
Financial Openness	-0.226	-0.306	-1.108***
	(0.209)	(0.460)	(0.265)
Inflation Differential	0.288	0.826	1.101
	(1.997)	(0.906)	(0.833)
Constant	5.166***	-7.338**	-2.833
	(2.004)	(3.535)	(1.952)
Observations	282	100	73

Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01

In this case we found no evidence that choice of exchange rate regime has any influence on international reserves. The results are robust for MERCOSUR and ASEAN but not for the EU. The explanation of the contradictory results may be the same as previously: parallel markets do not influence the monetary authorities' behaviour regarding the management of international reserves.

5. CONCLUSIONS

Using annual data for 135 countries and territories from 1999 to 2010, we investigated the consequences of exchange rate policy on financial stability from two perspectives. First, we narrowed our analysis to three samples at the country development level and then we focused on three economic integration areas (EU27, ASEAN, and MERCOSUR). For the robustness check, we used two exchange rate regime classifications (the IMF de jure classification and the RR de facto arrangement), since they reflect different aspects of exchange rate policy: monetary authorities' official declarations versus real behaviour.

We found some weak evidence that the choice of exchange rate regime may influence the relative level of foreign reserves. The influence occurs in some cases for the intermediate regimes, which means that the polar-opposite arrangements (pegged or floating) are unsuitable for financial stability. It seems that some exchange rate control from the authorities, on the one hand, and some flexibility, on the other hand, may support foreign reserve accumulation.

However, the results are not robust when using alternative regime classifications, mainly because they are built on totally different principles. While the variation in reserves is commonly related to the monetary authorities' commitment to support the (de jure) official exchange rate regime, the parallel market exchange-rate level (de facto regime) does not influence authorities' behaviour. Thus, the contradictions may only be apparent, and this conclusion supports the findings of Magud et al. (2012).

Our results support the recent findings of Magud et al. (2012, p.19), who suggested using exchange rate flexibility to counteract the negative effects of capital inflows on lending booms that might generate financial instability. Our findings do not contradict their policy recommendation that "relatively inflexible exchange rate regimes may need to be 'counteracted' by carefully designed macro-prudential policies."

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APPENDIX: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max	PP unit root test[1]
Reserves (log)	2149	2.561494	0.908537	-2.983801	5.11426	-12.5582 **
M2 (%GDP)	2138	8.403252	0.757075	5.997321	11.06117	-1.6586 *
Trade Openness	1701	4.411817	0.551779	2.922884	6.18589	
Financial Openness	2148	0.522182	0.372007	0	1	-19.9210**
Inflation Differential	2055	.0482623	.1807558	-.1455735	5.477586	-42.9457**
Peg (de jure)	2268	0.456349	0.498200	0	1	-6.0038**
Interm (de jure)	2268	0.331569	0.470881	0	1	-8.7238 **
Peg (de facto)	2143	0.466168	0.498970	0	1	-0.8596
Interm (de facto)	2143	0.474568	0.499469	0	1	0.0151*

Note 1: inverse logit distribution
Note 2: * significant at 5%, ** significant at 1%

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