CONTAGIOUS CURRENCY CRISES IN EMERGING ECONOMIES:

THE ROLE OF EXCHANGE RATE REGIMES

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Abstract

The purpose of this paper is to investigate the issue of exchange rate regimes increasing vulnerability of emerging economies to speculative attacks in a context of international contagion. We examine data on "*de facto*" regimes of 30 emerging countries during the 1990s emerging contagious crises and the recent Global crisis. The results show that intermediate regimes are the least crisis-prone, and that the likelihood of contagion may increase under "corner solutions."

***JEL* Classification** : F31 ; F33 ; F41 ; G01.

Keywords: Exchange rate regimes, currency crisis, speculative attacks, contagion, emerging economies.

ملخَّص

يَدرس هذا البحث إشكالية أنواع أنظمة الصرف التي من شأنها رفع قابلية تأثر الإقتصادات الناشئة بالأزمات الناجمة عن هجمات مضاربية في مناخ عدوى دولية. يَتـمُّ إجراء دراسة حول مدى ضعف أنظمة الصرف المتبعة فعليا من طرف 30 بلدا ناشئا خلال أزمات التسعينيات المعدية في الدول الناشئة والأزمة العالمية الأخيرة. تـُوضِح النتائج أن الأنظمة الوسيطة هي الأقل ضعفا، و أن "الأنظمة الرُّكـنِـيَّة" ترفع من احتمال التعرض لأزمة نقدية بفعل العدوى.

كلمات مفتاحية: أنظمة الصرف، أزمة نقدية، هجمات مضاربية، عدوى، إقتصادات ناشئة.

Résumé

Le présent papier se propose d'étudier la typologie des régimes de change accroissant la vulnérabilité des économies émergentes aux attaques spéculatives dans un contexte de contagion internationale. Nous examinons la fragilité des régimes de change "*de facto*" de 30 pays émergents durant plusieurs épisodes majeurs de crises contagieuses : Mexique (1994-95), Asie (1997), Russie (1998) et crise globale de (2008-09). Les résultats montrent une moindre fragilité des régimes intermédiaires, et que les "solutions en coins" augmentent la probabilité d'être affecté par une crise de change par contagion.

Mots-clés : Régimes de change, crise de change, attaques spéculatives, contagion, économies émergentes.

[*] I would like to thank Prof. Jeffrey Frankel (Harvard University) for sharing his data and encouragement.

1. INTRODUCTION

Emerging market economies (EMEs) started financial openness policies in the beginning of the 1990s with the objective of enhancing growth through: widening funding opportunities beyond domestic saving, improving the efficiency of resources allocation, lowering intermediation costs through direct finance, and facilitation of trade operations. However, financial integration was also accompanied by several waves of financial instability affecting markets and output. Indeed, the past two decades were marked by the occurrence of important financial crises affecting many EMEs: Mexico (1994-95), South-East Asia (1997-98), Russia (1998), Brazil (1999), Turkey (2001), and Argentina (2001-02).

Particularly, currency crises by speculative attacks have become more frequent during that period. A currency crisis occurs when speculative attacks on a currency result in an abrupt fluctuation of its exchange rate vis-à-vis other currencies. It could take the form of devaluation in the case of fixed exchange rate regime, or sharp depreciation in the case of more flexible regimes (intermediate or floating regimes) ; but also when the monetary authorities are forced to defend the exchange rate through intervention in foreign exchange market by selling reserves and/or increasing interest rates highly.

More recently, the Global financial crisis (GFC) originated by the collapse of Lehman Brothers on September 2008, which became the largest financial and economic crisis since the Great depression, has also impacted EMEs rather than U.S. and other developed countries. Thus, EMEs suffered short-term capital reversals and speculative pressures on their currencies. It is true that the impact on these countries was, generally, less severe than the 1990s crises, and that they were able to mitigate the output cost of the global crisis, partially thanks to precautionary policies (international reserve accumulation) adopted in the aftermath of the Asian crisis1, but one cannot ignore the fact that exchange rates suffered important pressures even in countries hoarding large reserves (Aizenman and Hutchison, 2012).

The issue of the causes of speculative attacks has been widely discussed in the literature. Numerous theoretical and empirical works have focused on the fragility of alternative exchange rate regimes (ERRs), *i.e.* which regimes make EMEs more crisis-prone? (Krugman, 1979 ; Obstfeld, 1994 ; Kaminsky and Reinhart, 1999 ; Williamson, 2000 ; Fischer, 2001 ; etc.). Nevertheless, this

[1] See for example: Bussière et al. (2014), Llaudes et al. (2012) and Berkmen et al. (2012).

literature focuses on ERRs typology as a factor explaining crises – among others – only for countries in isolation. In other words, the debate over different ERRs' fragility implicitly assumes domestic crises triggering factors (Masson, 1998).

However, financial and currency crises of the 1990s, and more particularly, the GFC of 2008-09, were characterized by a high potential of international propagation – well-known as "contagion" phenomenon. Indeed, a wide range of studies have examined the latter (Eichengreen et al. 1996 ; Masson, 1998,1999 ; Kaminsky and Reinhart, 2000 ; Forbes and Rigobon, 2002 ; etc.). However, the main focus of most of these works is about the detection of contagion and the channels through which financial turbulences spread. The role and typology of ERRs increasing vulnerability of an EME to contagious currency crisis have not been explicitly investigated, except a few studies at our knowledge.

In this paper we try to answer the following question: *which ERRs make EMEs more vulnerable to contagious currency crises?* It is built on the assumption that ERR is regarded as one of several channels increasing vulnerability to contagious crises. This assumption does not mean that the ERR is the unique channel of currency crises and/or contagion. Empirical literature has widely explored the issue of the determinants of contagion as mentioned above. Thus, it seems to be important to investigate first the rationales of the implication of ERRs in the logic of contagion.

The paper is organized as follows. In section 2, the role of ERR as a contagion determinant is identified through a review of contagion theories. Section 3 presents empirical strategy and results. Section 4 concludes.

2. LITERATURE REVIEW

The literature review below allows us to investigate the rationales of the implication of ERRs in contagion dynamics. In the following paragraphs, we will attempt to demonstrate the relevance of this assumption through theoretical and empirical literature. We began this section with works focusing on ERRs as endogenous variable when explaining contagion, and then we try to emphasize the role of ERRs in the corpus of contagion theories.

2.1. Endogenous ERRs and contagion

Caramazza et al. (2000) evaluate the factors of vulnerability to contagious currency crises during the 1990s for a sample of 61 developed and emerging countries (separately). They found that financial links –in particular with a common creditor– are the most significant factors explaining contagion, while ERRs and capital controls do not exert important effects. Furthermore, the adoption of a fixed ERR combined with greater capital mobility do not increase the likelihood to be affected by a contagious currency crisis, when the economy is characterized by sound fundamentals and a lower vulnerability to shocks related to trade and finance interdependencies.

Ffrench-Davis and Larrain (2002) examine macroeconomic performances (growth and growth volatility) and fragility of alternative ERRs adopted by three Latin-American countries facing the Asian crisis shock. These countries are: Argentina with currency board, Chile with band system, and Mexico with floating regime. They conclude that optimal regime varies across time and the conjuncture. Indeed, this study does not emphasize principally the vulnerability to contagious currency crises, but investigates the issue of optimal ERR choice according to macroeconomic performances in a context of contagion.

Edwards (2000,2001) explores the effectiveness of capital inflow controls coupled with band system in Chile as a precautionary policy during Mexican, Asian, and Brazilian contagious currency crises. He concludes that this country has been affected by the three waves of contagion. He explains that by the fact that, on one hand, financial restrictions were not so effective, and, on the other hand, that the intermediate regime adopted by Chile (the band system) does not bring sufficient credibility permitting to minimize external vulnerability to shocks.

Finally, Desroches (2004) examines the effects of propagation of two types of common shocks (real output and world interest rates) on 22 EMEs. According to her, ERR choice and financial account openness level play a crucial role in the dynamic of common shocks' transmission –contrary to results by Caramazza et al. (2000). However, regional interdependencies and trade openness are relatively less important.

2.2. ERRs role in contagion theories

2.2.1. Common shocks

Monetary regime in general (monetary and exchange rate policies), and ERR, more specifically, influence the manner an economy receives external shocks. In the case of common real shocks, countries are differently affected according to their structural specificities and their ERRs. The subsequent adjustment to external shocks depends on the exchange rate level of flexibility (in the case of flexible arrangements), the level of integration with the country from which the shock originates, and the flexibility of domestic prices / wages (in the case of a fixed ERR considered in the light of Optimum Currency Area theory). Thus, it seems to be clear that ERRs influence largely the response to common real shocks and, consequently, the magnitude of contagion.

Another form of common shocks stressed in Corsetti et al. (1998) and Frankel and Roubini (2001) concerns the impact of major currencies exchange rate trends (U.S. dollar, yen for example) on pegging countries. Exchange rate management in the countries affected by external shock –*e.g.* appreciation of the "anchor" currency– substantially determines the nature of impact on trade competitiveness. A scenario of competitive / contagious devaluations takes place in such case.

2.2.2. Fundamentals' interdependencies

i) Trade channels of contagion

Trade links constitute an important transmission channel of financial and monetary turmoil (Eichengreen et al., 1996; Glick and Rose, 1999). According to both Keynesian and monetary approaches of balance of payments, exchange rate devaluation in a country is at the center of contagion mechanism: the currency crisis spillovers from country A to country B via trade links by influencing the current account balance in B or its level of foreign money demand. This will be reflected on international reserves of the later, and stimulates, therefore, speculative anticipations about a future depreciation or collapse of its currency. According to both approaches, the regime variable is greatly significant insofar as the explanations of contagion are somewhat formulated *à la* first generation of currency crises models. In other words, in a model where speculative attacks are influenced by reserve levels, the ERR plays a determinant role in the orientation of speculators' opinion.

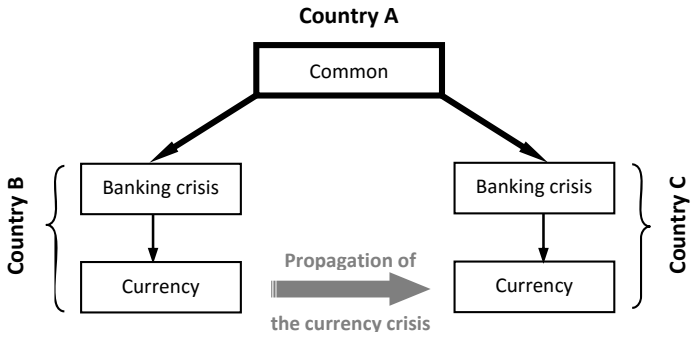
Also, the cooperative (or non-cooperative) nature and level of exchange rate policies pursued by countries belonging to regional economic area exert a significant effect on contagion magnitude following a crisis. The geographical proximity is often synonym of important trade links, hence the importance of trade channel as a vector of regional contagion. Thus, the level of regional monetary cooperation and, as a result, the ERR type explain the deepness and the scope of contagion episode, as mentioned by Colletaz et al. (1999).

ii) Financial channels of contagion

In this way, the role of ERRs is captured through the analysis of international dimension of "twin crises"[2]. Several propagation scenarios of exchange rate and banking sector difficulties – in which ERRs play a key role – could be imagined. Only three cases of several possibilities are presented below.

A first scenario, inspired from works by Van Rijckeghem and Weder (1999), Kaminsky and Reinhart (2000), and Sbracia and Zaghini (2003), explore the case when common creditor in country A provokes a liquidity shock in banking systems of countries B and C (as illustrated in Figure 1). The liquidity crisis in these two countries appears initially as banking failures (with or without bank runs). Consequently, the banking crisis in each country leads to a currency crisis. This (internal) systemic propagation could be explained in the way of Vélasco (1987): the ERR becomes important in this reasoning insofar as, following a banking crisis under a peg regime, monetary authorities bailout banks facing serious financial difficulties or bankruptcies, and therefore create excessive liquidity which leads to a currency crisis and the collapse of the peg. When applying this scenario to countries B and C affected by the initial liquidity shock, one can conclude that the ERR influence the dynamic of contagious currency crisis through credit channel of common creditor.

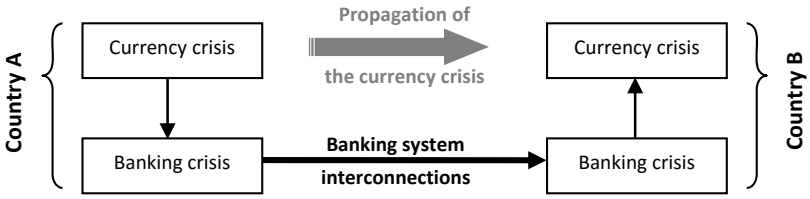
Figure 1: Common creditor and contagion



[2] Simultaneous occurrence of currency and banking crises

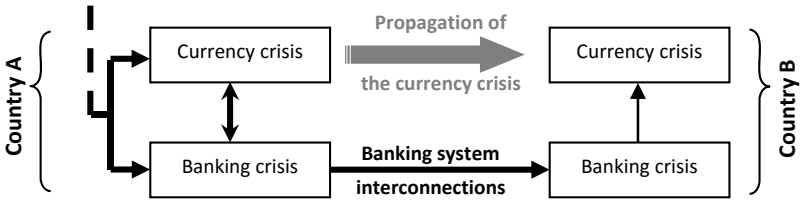
The second possibility (illustrated in Figure 2) focuses on banking interconnections in a scenario with two countries and where the causality (banking crisis-currency crisis) is bi-directional. A currency crisis in A causes banking difficulties via balance sheets deterioration, as explained in Obstfeld (1994), Mishkin (1996), and Miller (1996), among others. These models emphasize pegs' responsibility. The spread of tensions to country B, via interconnections between the two banking systems, ends by a currency crisis in the later following internal systemic propagation *à la* Vélasco (1987).

Figure 2: Banking and currency crises interconnections and contagion



A third scenario (illustrated in Figure 3) is based on models of twin crises with common causes (Calvo and Végh, 1999; Chang and Vélasco, 1999; and McKinnon and Pill, 1999). The spread of currency crises via banking interconnections shows, also, an important role of ERRs as a vector of transmission.

Figure 3: Twin crises with common causes and contagion



2.2.3. Multiple equilibria

Masson (1998,1999) explains financial contagion in multiple equilibria framework, and argues that investors use the information that a crisis triggered

in country B as a "sunspot"[3]. Consequently, they anticipate (in a self-fulfilling) process the occurrence of a crisis in country A. By doing so, their action pushes this latter from a "non-crisis equilibrium" to a "crisis equilibrium". This explanation is too valid in the case of contagious currency crises. Devaluation in country A is considered as "sunspot" by investors. This induces them to change their anticipations about exchange rate of the currency of B. Devaluation anticipation becomes self-fulfilling: speculative attacks lead concretely to this effect.

The role of ERRs, from the perspective of multiple equilibria models is found at least through two points. Firstly, considering devaluation of country A currency as "sunspot" by investors is highly influenced by an eventual similarity of ERRs in A and B. In such case, the occurrence of currency crisis in A is taken as a success sign of an eventual speculative attack against the currency of B which have a similar regime.

Secondly, ERR role is also important when we introduce what Masson calls "multiple equilibria area". In fact, the transition between non-crisis and crisis equilibria is not arbitrary. The country vulnerability – besides the "center" country – rises with the increase of external debt, the deterioration of trade balance, and the drop of foreign reserves. We can easily conclude the role (and influence) of ERR on these three factors of vulnerability. The regime type defines the composition and the growth pace of external debt, and peg collapse or parity devaluation directly affects the amount of debt in local currency. Regarding the position of trade balance and foreign reserves, adjustment properties of alternative ERRs give them particular significance.

2.2.4. Political contagion

Drazen (1999) studies the EMS crisis (1992-93) and concludes that political cost of devaluation or peg abandonment explains currency crises contagion. Decision to change drastically the exchange rate in one country reduces the

[3] Sunspot equilibrium is a stochastic equilibrium in which the outcome depends on an extrinsic random variable. Sunspot models refer to the idea of William Stanley Jevons (1835-1882) that the movements of the spots on the sun influence business cycles (because of their eventual influence on weather and thus agricultural output). In such models, it is assumed that agents believe in the impact of sunspots on economic activity – while nothing would happen if they do not pay attention. But as they act on the basis of this belief, they find that the causal relationship exists, and conclude that their belief is justified. The expected effect is true only because the agents cause it by their action (Guerrien [2000], p. 48).

political cost and increases feasibility of such measures in other countries. Drazen model is relevant in the context of contagious crises within monetary areas where adopted regimes are managed in a cooperative framework, or when they are, at least, typically comparable.

3. EMPIRICAL EVIDENCES

3.1. Data definition and sources

For empirical investigation we consider three variables: emerging economies, exchange rate regimes and currency crises by contagion. EMEs are selected from the "*Emerging Markets Index"* provided by MSCI[4] which includes a list of countries where stock markets are open to foreign investment. We retain for the whole period under study a group of 30 countries, with some differences between the four episodes' composition. For example, Egypt and Morocco are not included in the first three episodes because they were not considered as EMs by our database provider. Conversely, four countries are excluded from the 2008 list: Sri Lanka and Venezuela are transferred to "Frontier Markets Index" (a lower market category), and Greece and Portugal are transferred to "Developed Markets Index" (a higher market category). Furthermore, we include Hong Kong and Singapore to our list of EMEs because of their geographical proximity, despite the fact that these two countries are categorized as "developed markets" by MSCI for the whole research period.

The ERRs adopted by countries in our sample during the period of study are obtained from the "*de facto*" classification of Reinhart and Rogoff (2004)[5]. This classification contains 15 different regimes. For the study purpose, these latter are divided into three major categories (fixed, intermediate and floating). The fine and coarse (grouped) regimes are listed in Annex 1.

We also use data provided by Van Rijckeghem and Weder (1999) for the 1990s crises and Frankel and Saravelos (2012) for the GFC (2008-09) to determine which countries were victims of contagious currency crises. Both papers calculate an "exchange market pressure index" (EMPI) – among other methods – to determine currency crisis dates for each country in the sample.

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[4] Morgan Stanley Capital International

[5] "*De facto"* classifications of ERRs are based on actual exchange rate policies, and are often different from what official authorities declare, *i.e.* "*de jure"* classifications.

EMPI is a weighted average of currency depreciation and reserve changes (plus interest rate changes for Van Rijckeghem and Weder). For contagion, a large definition is used: a country is hit by contagion when experiencing a currency crisis (measured using EMPI) after the crisis date in "ground zero" country. The "ground zero" country is the first country from which exchange rate (and financial) turbulences spread. Countries affected during each episode are listed in Annex 2

3.2. Methodology and results

In Table 1 the "crisis-regime" observations during the four episodes are illustrated. A "crisis-regime" observation notes for each country the adopted ERR during at least three months before the crisis date in the "ground zero" country. For example, Peru was victim of contagion when the Mexican crisis triggered and was under an intermediate regime. That is noted using underlined characters "Int". For Korea, which avoided currency crisis during the GFC and adopted a floating regime before that event, corresponding "crisis-regime" observation is noted in normal characters "Float".

To assess the fragility degree of alternative ERRs with regard to the triggering of currency crises by contagion we follow the methodology used by Rogoff et al. (2004) and calculate the crisis frequency (or probability) for each regime. Crisis frequency (noted: **Freq. Reg. i / Cris.**) for particular regime is the probability of currency crisis occurrence under this regime,

During the corresponding episode of contagion. It is obtained as the ratio of crises episodes under regime (i) divided by the number of regime-years, as illustrated by the formula below:

$$\text{Freq (Reg } i \text{ / Cris)} = \frac{\text{Nb. Obs. "Crisis-Regime } i \text{"}}{}$$

Results (in Table 2) show that EMEs with fixed regimes had the highest frequency of currency crises: among 7 "regime-year" observations for which fixed ERRs are noted, 6 observations correspond to crisis (0.86). In the second place, the likelihood of crises under floating regimes is (0.56): crises occurred 10 times from a total of 18 "regime-year" observations noted as floating. In last place, intermediate solutions tended to be the less fragile in terms of crisis frequency (0.34): only 28 observations correspond to crises among the 82 "regime-years" these regimes were adopted.

In Table 3, the sample is subdivided into three regions (Asia; Latin-America; and Europe, Middle-East, and Africa). Frequency results are presented by regime for each one of these regions. The overall trend seems to be respected. For all regions, currency crises tended to occur less frequently – in terms of frequency – in countries under intermediate ERRs than those under corner solutions (fixed and floating regimes), and, broadly, fixed regimes are the most fragile, except for EMEA region for which there was no countries under fixed regimes during the four episodes.

In Table 4, the frequency of occurrence of crises under alternative ERRs is calculated separately for each episode of contagion. Again, the same trend is broadly respected, besides a few minor exceptions such as for the null frequency of currency crises under floating during the Mexican crisis and under fixity during the recent GFC. We can also note the extreme fragility of fixed ERRs during the first three waves of contagion (frequency = 1.00). This is due to the fact that the only two emerging countries which were under this category of regimes (Argentina and Hong Kong) have both been affected by all of the 1990s crises. On the eve of the 2008-09 GFC, only Hong Kong was maintaining a fixed arrangement; and was able to avoid a crisis[6].

4. CONCLUDING REMARKS

Results show that countries under corner solutions face a higher probability of currency difficulties following a currency/financial crisis in "ground zero" country. More specifically, fixed ERRs (or hard pegs) seem to be the most fragile. Floating regimes are also associated to higher vulnerability, but to a lesser extent. Otherwise, intermediate category of ERRs (soft pegs) appears to be less associated to currency crises during the four major episodes of contagion since the mid-1990s. Evidently, the adoption of an intermediate regime does not exclude completely the likelihood of crisis – found to be equal to 0.34 for the whole sample – but, when compared to corner solutions, the middle class could be considered as the most sound.

Our conclusion is in line with the purpose of intermediate solutions' defenders, such as Williamson (2000). The later notes that these regimes are not necessarily the most fragile (in a context of local-grown crises), and that, on the contrary, if well managed, they would lead to better macroeconomic

[6] The transmission of currency crises to both Argentina and Hong Kong during the 1990s did not end by a collapse of their currency boards, but was reflected by high increases in interest rates and significant loss of reserves.

performances, such as decreasing real overvaluation, and consequently reducing the vulnerability to currency crises.

Other defenders of intermediate solutions give theoretical framework which contributes to explain the relative soundness of this class of regimes. Frankel (2003) indicate that there is nothing that prevents countries to choose a solution which provides "half-stability" for exchange rate and "half-independence" for monetary policy. With a "moderate" flexible regime (intermediate regime), monetary authorities can face a part of fluctuation in demand on their currency by intervention on foreign exchange market and allow the other part to be reflected in the exchange rate.

Bénassy-Quéré and Coeuré (2002) demonstrate that intermediate ERRs remain reliable as long as financial and real external shocks are not too large and interest rate channel is not too strong (to avoid the deflationist effect of increasing rates used to defend currency against speculative attacks). For Allegret (2007), a wide fluctuation band coupled with inflation targeting policy provides an effective system for short-term control of exchange rate and inflation.

That said, we must consider the empirical results with caution for several reasons. At first, as mentioned above, countries with intermediate regimes were not completely insulated from contagion. Then, as explained in Section 2, ERRs play an important role in the transmission of financial and currency crises, but there are also other important determinants of contagion that we must not ignore, such as real and financial interdependencies – *cf*. theories of contagion channels. Furthermore, countries frequently use international reserves and/or interest rates to face speculative attacks and several times success to avoid great depreciations or regime collapses[7]. Indeed, we can easily see that the number of countries affected by a currency crisis during the recent GFC is less important than during the 1990s episodes, and that emerging Asia was the least affected during the GFC compared to other regions and former episodes.

This could be assigned to the great changes in external balance situation of many EMEs, and especially Asia, in the aftermath of Asian crisis. In fact, thanks to precautionary and/or export-led growth policies, and also to a

[7] However, we have used for empirical definition of currency crisis in this study a wide definition based on EMPI calculation which take into account both successful and unsuccessful speculative attacks.

favorable international conjuncture, EMEs (and natural resource exporters) were able to constitute important current account surpluses and to stockpile large international reserves. This situation has definitely improved their capacity to defend their currencies and, in a large scale, to smooth effects of external shocks on domestic demand and output.

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ANNEX 1: Reinhart and Rogoff *de facto* ERRs classification

Fixed	No separate legal tender Pre announced peg or currency board arrangement Pre announced horizontal band narrower than or equal to +/-2%
Intermediate	De facto peg Pre announced crawling peg Pre announced crawling band narrower than or equal to +/-2% De facto crawling peg De facto crawling band narrower than or equal to +/-2% Pre announced crawling band wider than or equal to +/-2% De facto crawling band narrower than or equal to +/-5% Moving band narrower than or equal to +/-2% (*i.e.*, allows for both appreciation and depreciation over time)
Floating	Managed floating Freely floating
	Freely falling* Dual market in which parallel market data is missing**

* Freely falling is not considered *per se* as an ERR, but is attributed to period where inflation exceed 40%. Usually, such situation is related to great monetary troubles or a currency collapse, and could be assimilated to freely floating regimes.

** As the authors use data on dual/multiple and parallel markets to classify ERRs, they put cases for which data is missing in a distinct category.

Source: Reinhart and Rogoff (2004)

ANNEX 2: Contagious episodes and affected EMEs

Mexican crisis (1994-95)	Asian crisis (1997-98)	Russian crisis (1998)	GFC (2008-09)
Argentina	Argentina	Argentina	Brazil
Brazil	Brazil	Brazil	Hungary
Hong Kong	Czech R.	Czech Rep.	Mexico
Hungary	Hong Kong	Colombia	Pakistan
Indonesia	Hungary	Hong Kong	Poland
Mexico (C)	Indonesia	Indonesia	Russia
Peru	Korea	Korea	Turkey
Philippines	Malaysia	Mexico	
Thailand	Mexico	Pakistan	
Venezuela	Pakistan	Poland	
	Philippines	**Russia (C)**	
	Poland	South Africa	
	Singapore	Thailand	
	South Africa	Turkey	
	Thailand (C)	Venezuela	

Source: Van Rijckeghem and Weder (1999) for the 1990s crises, and Frankel and Saravelos (2012) for the GFC.

Table 1: "Crisis-Regime" and "Non-crisis-regime" observations during the four episodes of contagion*

		Mexican crisis	Asian Crisis	Russian crisis	GFC
Asia	China	Int	Int	Int	Int
	Hong Kong	Fix	Fix	Fix	Fix
	India	Int	Int	Int	Int
	Indonesia	Int	Int	Float	Int
	Korea	Int	Int	Float	Float
	Malaysia	Int	Int	Float	Int
	Pakistan	Int	Int	Int	Int
	Philippines	Int	Int	Float	Int
	Singapore	Int	Int	Int	Int
	Sri Lanka	Int	Int	Int	-
	Thailand	Int	0	Float	Int
Latin America	Argentina	Fix	Fix	Fix	Int
	Brazil	Int	Int	Int	Float
	Chile	Int	Int	Int	Int
	Colombia	Int	Int	Int	Int
	Mexico	0	Float	Float	Float
	Peru	Int	Int	Int	Int
	Venezuela	Int	Int	Int	-
Europe – Middle East - Africa	Czech Rep.	Int	Int	Int	Int
	Egypt	-	-	-	Int
	Greece	Int	Int	Int	-
	Hungary	Int	Int	Int	Int
	Israel	Int	Int	Int	Int
	Jordan	Int	Int	Int	Int
	Morocco	-	-	-	Int
	Poland	Int	Int	Int	Float
	Portugal	Int	Int	Int	-
	Russia	Float	Int	0	Int
	South Africa	Float	Float	Float	Float
	Turkey	Float	Float	Int	Int

* Fix: fixed ; Int: intermediate ; Float: floating ; 0: "ground zero" country.

Source: Author's compilation.

Table 2: Frequency of crises per regime

ERRs	Crisis-years	Regime-years	Crisis frequency
Fixed	6	7	0.86
Intermediate	28	82	0.34
Floating	10	18	0.56

***Source**:* Author's calculation

Table 3: Frequency of crises per regime and by region

Regions	ERRs	Crisis-years	Regime-years	Crisis frequency
Asia	Fixed	3	4	0,75
	Intermediate	11	32	0,34
	Floating	3	6	0,50
Latin America	Fixed	3	3	1,00
	Intermediate	7	19	0,37
	Floating	4	4	1,00
EMEA	Fixed	0	0	-
	Intermediate	10	31	0,32
	Floating	3	8	0,38

***Source**:* Author's calculation

Table 4: Frequency of crises per regime and by episode of contagion

Episodes	ERRs	Crisis-years	Regime-years	Crisis frequency
Mexican crisis	Fixed	2	2	1,00
	Intermediate	7	22	0,32
	Floating	0	3	0,00
Asian crisis	Fixed	2	2	1,00
	Intermediate	10	22	0,45
	Floating	2	3	0,67
Russian crisis	Fixed	2	2	1,00
	Intermediate	7	18	0,39
	Floating	5	7	0,71
GFC	Fixed	0	1	0,00
	Intermediate	4	20	0,20
	Floating	3	5	0,60

***Source**:* Author's calculation