Capital flows and boom-bust cycle in emerging Europe. Responses to the volatile financial global context

Jean-Pierre Allegret, Audrey Allegret-Sallenave

CHAPTER EIGHT

CAPITAL FLOWS and BOOM-BUST CYCLE IN EMERGING EUROPE. RESPONSES TO THE VOLATILE FINANCIAL GLOBAL CONTEXT

JEAN-PIERRE ALLEGRET
ECONOMIX, CNRS-UNIVERSITY PARIS OUEST NANTERRE LA DEFENSE
and AUDREY SALLENAVE
LEAD-UNIVERSITY of TOULON AND ECONOMIX, CNRS-UNIVERSITY PARIS OUEST NANTERRE LA DÉFENSE

1. Introduction

An extensive literature investigates macroeconomic fluctuations in emerging countries. Three lessons drawn from this literature are particularly important. First, macroeconomic variables tend to be more volatile in emerging economies relative to advanced countries (Schmitt-Grohé and Uribe, 2014). The globalization process has increased this volatility gap (Kose and Prasad, 2010). Second, amplitude of recessions is dramatically higher in emerging countries than in advanced economies. Indeed, the former suffer from larger cumulative output losses, particularly in the aftermath of recessions associated with financial crises (Cerra and Saxena, 2008; Balakrishnan *et al.*, 2011). Third, authorities in emerging countries encounter significant difficulties to respond to pro-cyclical capital inflows and, more broadly, to financial crises. Kaminsky *et al.* (2005) show that emerging economies tend to adopt pro-cyclical fiscal and monetary policies and thereby exacerbate the destabilizing effects of capital inflows. They explain these responses by stressing the role of political distortions, weak institutions, and capital market imperfections. Cavallo and Izquierdo (2009) and Izquierdo and Talvi (2009), by considering the experience of Latin American and Caribbean countries,

suggest that domestic liability dollarization exerts a strong influence on the monetary responses to external shocks.

Our contribution is related to the previous literature. Indeed, we investigate monetary policy responses to massive capital inflows and outflows in 9 emerging Europe countries over the period 2000-2013. Our sample consists of Bulgaria, Croatia, Estonia, Hungry, Latvia, Lithuania, Poland, Romania, and Serbia. These countries are either new member states of the European Union or European Union candidates. As a consequence, they enter domestic and external financial liberalization in order to respect the European Union accession process. Despite these common features, the fundamental point which we will pay special attention focuses on exchange rate regimes adopted in these countries. More specifically, Bulgaria, Croatia, Estonia, Latvia, and Lithuania adopted fixed exchange rate regimes (called peggers) while Hungary, Poland, Romania, and Serbia chose floating regimes (named floaters). The experience of these countries is particularly interesting insofar as they follow a specific pattern contrasting with other emerging countries. First, while the relative share of bank flows has decreased in the total of capital inflows to emerging markets, capital flows in emerging Europe have been mainly driven by bank flows. Second, the boom in capital inflows has fueled the build-up of macroeconomic imbalances leading some our studied countries to become highly vulnerable to capital flows reversals. Third, monetary authorities have encountered important constraints to manage this capital boom-bust episode. On the one hand, during the period of massive capital inflows, monetary policy has been ineffective to prevent macroeconomic overheating. On the other hand, in many of our studied countries central banks adopted pro-cyclical monetary policy in the aftermath of the sudden stop in capital flows.

The purpose of this chapter is to analyze the monetary policy constraints encountered in some emerging European economies to manage the boom-bust cycle over the period 2000-2013. We suggest a single interpretation by emphasizing the impact of the fixed exchange rate regimes and the degree of the currency mismatch. While the former matters both during the boom and the bust in capital flows, the latter is relevant during the crisis episode.

The rest of this chapter is structured as follows. Section 2 shows that the surge in capital flows over the period 2000-2008 has led to an overheating in the recipients countries. Section 3 analyzes the main macroeconomic impacts of the sudden stop in capital flows in the aftermath of the Lehman Brothers collapse in September 2008. Section 4

presents the main reasons explaining the low effectiveness of monetary policy to face the boom-bust cycle.

2. Surges in International Capital Flows and Macroeconomic Overheating

In a first step, an anatomy of international capital flows into emerging Europe is performed. We highlight the predominant role of cross-borders bank flows. In a second step, we show that these flows exert a critical influence on credit booms and overheating in many of our studied countries.

The anatomy of international capital flows

During the 1990s', several waves of speculative attacks have hit emerging countries. Despite the variety of crises, a striking empirical regularity has been the accumulation of financial imbalances in the period preceding financial crises. For instance, both empirical and theoretical studies have stressed that one of the main trigger of the Asian-5[1] crisis rested on sizeable financial vulnerabilities.

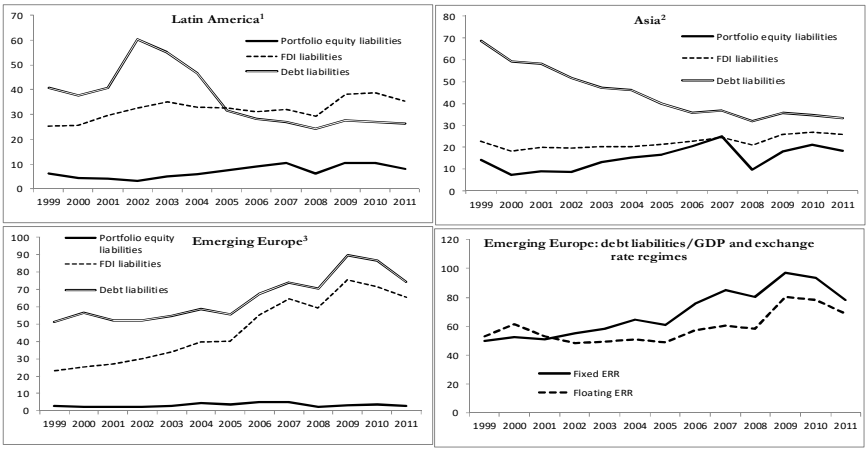
As emphasized by Radelet and Sachs (1998), a notable feature of the Asian crisis was the extent to which foreign investors, especially foreign commercial banks, increased their loans to the Asian-5 economies up to the onset of the crisis. BIS data shows that international bank lending to Asia increased from less than US$ 150 bn. at the end of 1990 to about US$ 390 bn. In mid 1997; in contrast, foreign bank lending to Latin America only increased from about US$ 180 bn. to about US$ 250 bn. over the same period. In addition, BIS data show that most of the loans by foreign banks were short term ones. At the time of the crisis, short term loans as a share of total obligations to the international banking community were 68% in Korea, 66% in Thailand, 59% in Indonesia, 56% in Malaysia, and 59% in the Philippines. As a consequence, these economies have been especially vulnerable to exogenous shock (such as an increase in the world interest rate) or a sudden loss of confidence leading to a massive reversal of capital flows. Interestingly, available information suggests that short term inflows suddenly reversed themselves during 1997. Data from the Institute of International Finance shows, in

[1] Indonesia, Malaysia, Philippines, South Korea, and Thailand.

particular, that net international inflows of capital to the Asian-5 countries fell dramatically to –US$12 bn. in 1997, from US$ 93 bn. in 1996. This fall in inflows is accounted by and large by the behavior of foreign banks, whose positions in the Asian-5 countries dropped by US$ 21.3 bn. in 1997 after increasing by US$ 55.5 bn. in 1996. Combining this information with BIS data, which shows that foreign banks increased their lending to the Asian-5 countries by US$ 13 bn. in the first half of 1997, Radelet and Sachs (1998) conclude that there must have been a capital outflow of about US$ 34 bn. in the second half of 1997, equivalent to a negative shock of 3.6 of GDP. In other words, international bankers are especially prone to panic behavior with destabilizing impacts on the recipient countries. The lesson from the Asian-5 crisis is clear: bank flows, notably short-term flows, are more volatile that other capital flows.

So, a debt was seen as a vulnerability factor, its relative share in stock of external liabilities decreased in Latin American and Asian emerging countries (Fig. 8-1).

Figure 8-1 Composition of external liabilities, stock, in % of GDP

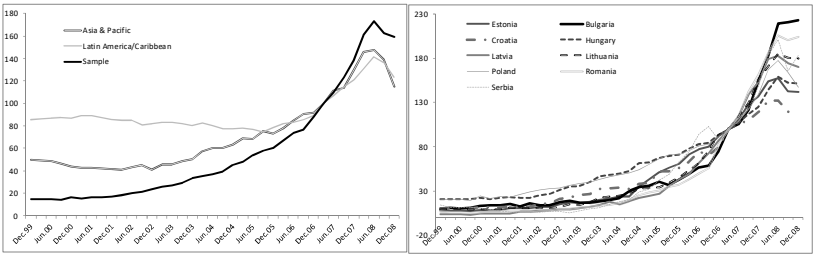


[1]Argentina, Brazil, Chile, Colombia, and Mexico.
[2]Indonesia, Malaysia, Philippines, South Korea, and Thailand.
[3]Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Serbia.

Source: Updated and extended the External Wealth of Nations Mark II database, Lane and Milesi-Ferretti, "The External Wealth of Nations Mark II", *Journal of International Economics*, November 2007.

The composition of external liabilities in our sample shows a divergent pattern. Indeed, Fig. 8-1 exhibits an increase in debt liabilities over the period 2000-2008. Interestingly, countries with fixed exchange rate regimes exhibit a higher share of debt liabilities suggesting a more significant sensitivity to sudden capital reversals. Fig. 8-2 provides additional information: among external debt liabilities, a significant portion took the form of cross-border bank loans.

Figure 8-2 External positions of reporting banks vis-à-vis all sectors, March 2007 = 100



Source: Authors' estimations. Data extracted from BIS, Locational banking statistics.

This high weigh of cross-border bank flows is explained by two related factors. On the one hand, both the transition process and the European Union accession process have led to a catching-up effect. In turn, higher growth perspectives attracted international capital flows as expected yields were high. On the other hand, privatization process of the banking sector has allowed the penetration of foreign banks (Table 8-1), and, more especially, banks from the European Union. IMF (2008) provides an overview of the concentrated exposures of emerging Europe to banks in European Union. For instance, in December 2007, the weight of Sweden in the external funding for the Baltics amounted to 85%. Austria held 40% of the claims in Croatia and Serbia, and more than 30% on Romania.

Table 8-1 Foreign bank assets among total bank assets, in %

	2004	2005	2006	2007	2008
Bulgaria	72	71	77	76	80
Croatia	88	92	90	90	90
Estonia	95	99	98	97	99
Hungary	65	63	61	64	67
Latvia	51	58	64	65	66
Lithuania	91	92	92	92	93
Poland	72	76	75	74	72
Romania	54	55	87	89	89
Serbia	n.a.	n.a.	n.a.	n.a.	n.a.

Source: World Bank, Global Financial Development.

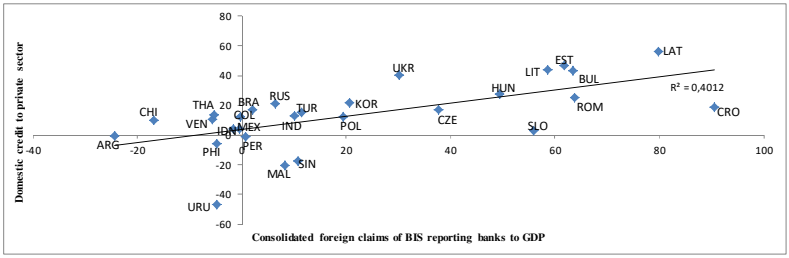
As a consequence, these economies are exposed to a common creditor effect from Western European banks (Balakrishnan *et al.*, 2011).

Credit boom and macroeconomic overheating

The boom in capital inflows played a critical role in the build-up of financial vulnerabilities, especially in countries with fixed exchange rate regimes. Fig. 8-3 exhibits a positive relationship between bank flows and domestic credit to the private sector.

This figure suggests also that fixed exchange rate regimes tend to lead to as stronger positive link between these two variables. An important implication is the increase in the currency mismatch in emerging Europe during the period preceding the global financial crisis.

Figure 8-3 Capital flows and credit expansion



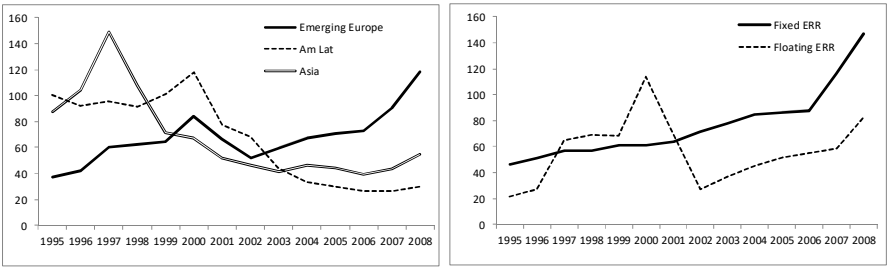
ARG, Argentina; BRA, Brazil; BGR, Bulgaria; CHL, Chile; COL, Colombia; HRV, Croatia; CZE, Czech Republic; EST, Estonia; HUN, Hungary; IND, India; IDN, Indonesia; KOR, South Korea; LVA, Latvia; LTU, Lithuania: MYS, Malaysia; MEX, Mexico; PER, Peru; PHL, Philippines; POL, Poland; ROM, Romania; RUS, Russia; SGP, Singapore; SVK, Slovakia; THA, Thailand; TUR, Turkey; UKR, Ukraine; URY, Uruguay; VEN, Venezuela.

Source: authors' estimates. Data extracted from World Bank, *Global Financial Development Database*.

Over the same period, currency mismatch decreased in Latin American and Asian emerging economies (Fig. 8-4).[2]

[2] We use as a proxy of currency mismatch the ratio foreign liabilities to money following the methodology of Levy-Yeyati et al. (2010).

Figure 8-4 Ratio of Foreign Liabilities to Money in several emerging countries*, in %

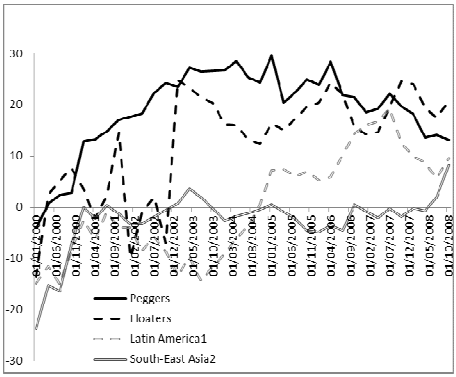


*Foreign liabilities to money ratio: Foreign liabilities / (Reserve money + Demand deposits).

Source: Authors' estimates. Data extracted from IMF, *International Financial Statistics*.

Two main indicators allow us to assess to what extent the domestic credit boom –fueled by foreign capital flows- was excessive. First, growth differential between credit and GDP has been sizeable in emerging Europe relative to South-East Asia and, to a lesser extent, Latin America (Fig. 8-5).

Figure 8-5 Growth differentials between credit and GDP, percentage points

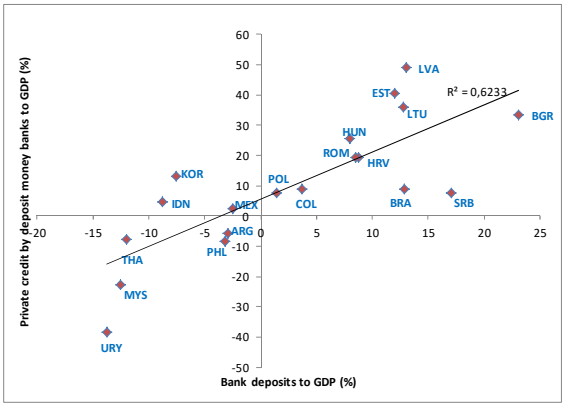


[1]Argentina, Brazil, Chile, Mexico, and Colombia, simple average.
[2] Indonesia, Malaysia, Philippines, South Korea, and Thailand, simple average.

Sources: authors' estimations. Data extracted from World Bank, *World Development Indicators*, and IMF, *International Financial Statistics*.

The growth differential is particularly striking in fixed exchange rate regimes. Second, as exhibited in Fig. 8-6, emerging Europe has experienced a higher discrepancy between changes in deposit and credit to GDP.

Figure 8-6 Changes in deposit and credit to GDP, 2002-2007, in percentage points



Source: Authors' estimates, data extracted from World Bank, *Global Financial Development Database.*

Magud and Vesperoni (2014) investigate how economies with different degrees of exchange rate flexibility behave during capital inflows reversals. They find that, on the one hand, a higher degree of exchange rate flexibility is accompanied by a lower domestic credit growth, and, on the other hand, countries with flexible exchange rates are less vulnerable to episodes of capital inflows reversals.

Table 8-2 portrays the evolution of output gap from 2004 – corresponding to the fourth European Union enlargement- to 2008.[3]

[3] The output gap is defined as the cyclical component of the Hodrick-Prescott filter, defined as the difference between the GDP and its long run counterpart named trend.

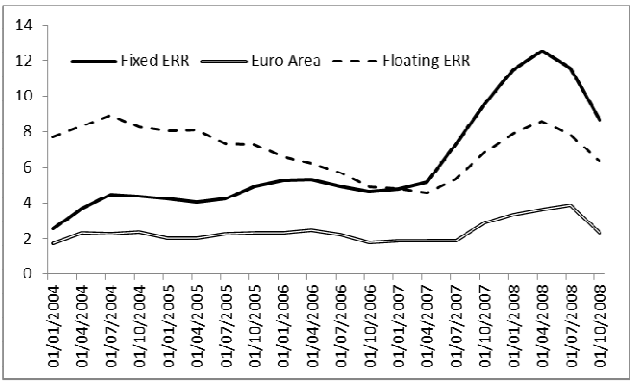
Table 8-2 Output gap from 2004 to 2008

	2004Q1	2004Q2	2004Q3	2004Q4	2005Q1	2005Q2	2005Q3	2005Q4	2006Q1	2006Q2	2006Q3	2006Q4	2007Q1	2007Q2	2007Q3	2007Q4	2008Q1	2008Q2	2008Q3	2008Q4
Fixed Exchange Rate Regimes																				
Bulgaria	-1,0	-0,8	-0,7	-1,0	-0,3	-0,8	-1,0	-0,6	-0,4	-0,2	0,3	0,9	1,8	2,4	1,4	3,1	6,7	5,7	5,4	4,8
Croatia	-0,3	-0,8	-1,4	-1,7	-2,7	-0,6	-0,6	-0,8	-0,4	-0,2	1,0	0,5	3,9	3,6	3,5	2,0	6,7	6,3	4,6	2,1
Latvia	-1,0	-3,5	-4,0	-3,4	-4,4	-2,9	0,1	2,5	0,7	2,6	5,1	8,5	11,0	13,3	14,1	12,6	15,6	13,1	7,8	2,9
Estonia	-1,8	-2,7	-2,4	-2,6	-2,0	-0,6	0,4	1,1	3,2	3,9	5,2	6,6	10,0	10,0	9,9	10,5	7,1	8,2	7,4	-1,1
Lituania	-0,2	-1,0	-1,9	-1,1	-1,4	-1,3	-0,3	0,5	0,5	0,9	1,1	2,8	4,9	7,1	8,4	10,0	10,5	11,3	8,9	7,0
Avarage	**-0,8**	**-1,8**	**-2,1**	**-2,0**	**-2,2**	**-1,2**	**-0,3**	**0,5**	**0,7**	**1,4**	**2,6**	**3,9**	**6,3**	**7,3**	**7,5**	**7,6**	**9,4**	**8,9**	**6,8**	**3,1**
Floating Exchange Rate Regimes																				
Hungary	-0,3	0,1	0,1	-0,2	-0,6	1,2	1,0	1,2	1,6	2,5	2,7	3,1	1,7	1,3	1,5	2,2	3,7	3,9	3,4	0,2
Poland	0,1	0,4	-1,1	-0,7	-0,9	-1,6	-1,3	-1,2	-0,9	-0,8	0,0	0,1	0,7	0,9	0,8	1,9	2,6	2,3	1,8	0,2
Romania	-1,2	-0,5	0,9	0,3	-1,4	-1,6	-1,9	-1,5	-0,2	0,3	0,4	0,9	1,4	1,9	1,7	3,8	7,0	8,7	8,3	4,9
Serbia	0,6	-1,1	0,1	2,7	-2,0	-0,2	1,0	1,7	-1,4	-1,1	-0,3	-0,1	1,3	1,9	0,5	1,4	5,3	3,6	2,3	1,3
Average	**-0,2**	**-0,3**	**0,0**	**0,5**	**-1,2**	**-0,5**	**-0,3**	**0,1**	**-0,2**	**0,2**	**0,7**	**1,0**	**1,3**	**1,5**	**1,1**	**2,3**	**4,6**	**4,6**	**4,0**	**1,7**

Source: Authors' estimation.

An interesting feature of this table is the dramatic increase in the output gap differentials between peggers and floaters. Specifically, while the former experienced a growing positive output gap before the global financial crisis, the output gap remains relatively stable in the latter. The rise in output gap suggests the presence of an unsustainable economic boom. Inflation differential heightens our previous remark. On the one hand, as portrayed in Fig. 8-7 from 2004 to 2007, floaters closed their inflation differentials relative to peggers. On the other hand, at the peak of the boom, inflation was higher in the last group of countries. In other words, in the case of emerging Europe, we do not verify the results from the open macroeconomics textbooks according to which fixed exchange rates reduce inflation to the extent that they improve the credibility of domestic authorities.

Figure 8-7 Inflation rates in fixed and floating exchange rate regimes



Source: IMF, *International Financial Statistics*.

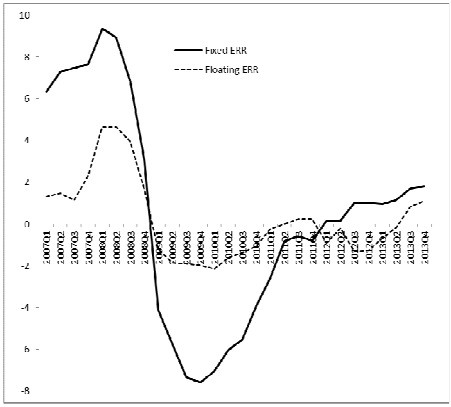
3. Sudden Stop in International Capital Flows and Economic Recession

Investigating the factors driving the size of the economic contraction in 2009, Berkmen *et al.* (2012) find, for a sample of 43 emerging countries, that two main determinants matter: on the one hand, the level of leverage in the financial system and, on the other hand, the credit boom to the private sector. High leveraged domestic financial system and sizeable credit boom lead to larger output loss. In addition, vulnerabilities to shocks increase when the credit boom is mainly funded from abroad (CGFS, 2009). The destabilizing influence of the cross-border bank flows-

domestic credit nexus may be due to the procyclicality of the former (Brunnermeier *et al.*, 2012).

Some countries in our sample exhibit these driving factors. As a consequence, Fig. 8-8 portrays the dramatic change in the output gap in the aftermath of the Lehman Brothers collapse in September 2008. Peggers have experienced the strongest reversal confirming the importance of financial vulnerabilities. Mitra (2011) shows that countries suffered from largest swing in GDP growth are those with the highest concentration of capital flows invested into real estates, as in Baltics.

Figure 8-8 Output gap from 2007 to 2013 in fixed and floating exchange rate regimes



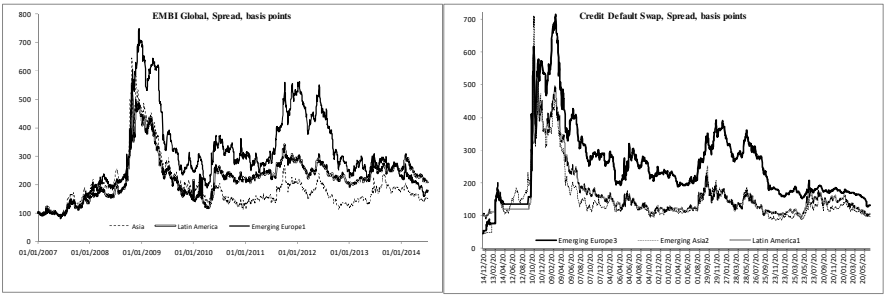
Source: Authors' estimates.

Blanchard *et al.* (2010) analyze the respective influence of trade and financial channels in the transmission of shocks. Given the scope of the financial vulnerabilities in emerging Europe, we focus in this chapter on financial channels. Two shocks are particularly important: the global financial crisis in 2008-2009, and the European sovereign debt crisis since 2010.

To assess the importance of these two crises for emerging markets, and more particularly for emerging Europe, Fig. 8-9 portrays two indicators related to the perceived sovereign risks by investors. The first one is the EMBI Global spreads (Fig. 8-9, left side) that measures yield spreads (over safe or risk free assets that bear minimal credit risk) on emerging market countries' debt instruments. The spread is the extra return required to compensate the investor for the additional risks faced when investing in emerging economies rather than in a safe asset (such as a US government bond). Spreads increase with the deterioration –effective or expected- of

fundamentals and in periods of international financial strains. The second indicator concern the Credit Default Swap spreads on sovereign bonds. This is a credit derivative contract that allows an agent (called the buyer) to purchase to a counterparty (called the seller) an insurance against the event of default or other credit events The CDS spread is the premium paid by protection buyer to the seller. An increase in the probability of default leads to spread rise as the demand for protection is higher. As a result, CDS spreads tend to increase in episodes of financial stress.

Figure 8-9 Indicators of sovereign risk in emerging countries



[1]EMBIG: Croatia, Hungary, Latvia, Lithuania, Poland, Romania, and Serbia.
[1]CDS: Brazil, Colombia, Mexico, Peru, and Uruguay.
[2]CDS: Indonesia, Malaysia, Philippines, South Korea, and Thailand.
[3]CDS: Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Serbia.

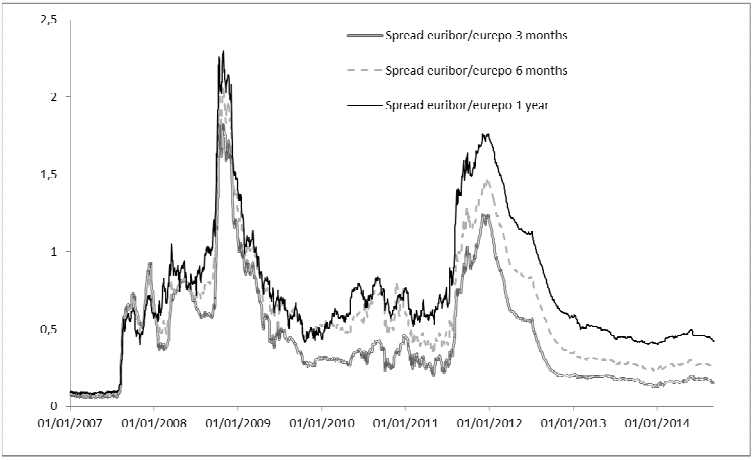
Source: JP Morgan, data extracted from Macrobond and Thomson Reuters, data extracted from Datastream.

The two indicators show that the Lehman Brothers collapse in September 2008 has been a common shock for emerging countries. Indeed, whatever the emerging region, we see a dramatic increase in spreads. But Fig. 8-9 gives us an additional interesting information: the European sovereign debt crisis constitutes a specific shock to emerging Europe as sizeable tensions is observed in this region in the aftermath of the contagion to Italy, Portugal, and Spain.

The size of the economic contraction: the impact of the deleveraging process

In the immediate aftermath of the Lehman collapse, interbank funding markets disrupted. Fig. 8-10 estimates the spreads between the unsecured money market segment (EURIBOR) and the secured money market segment (EUREPO). As expected, during the periods of intense financial stress, the spreads increase as banks lose confidence in their counterparties in the interbank market.

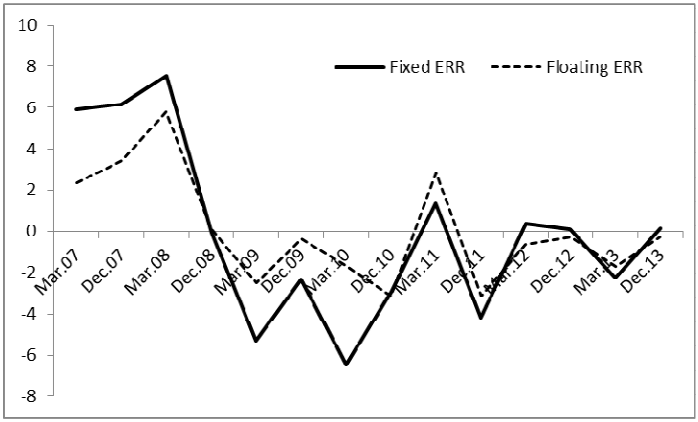
Figure 8-10 Tensions on interbank funding markets



Source: Macrobond.

The major consequence of this disruption has been the bank deleveraging process at a global level (Fig. 8-11). The negative shock is particularly large in countries with fixed exchange rate regimes.

Figure 8-11 Changes in external positions of reporting banks vis-à-vis all sectors, in terms of 2013 GDP in fixed and floating exchange rate regimes

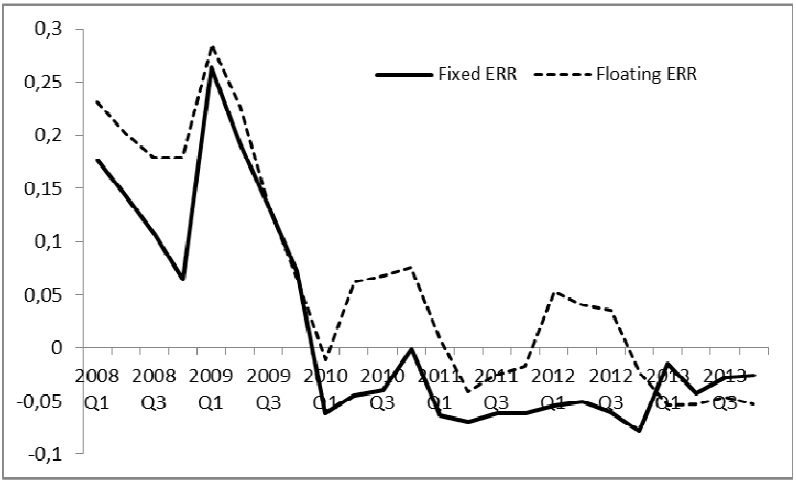


Source: Authors' estimates. Data extracted from Bank for International Settlements.

As peggers were especially dependent on cross-border bank flows to finance the domestic credit boom, the corollary to this global deleveraging process has been a domestic deleveraging one as exhibited by the credit crunch after 2008-Q3 (Fig. 8-12).[4]

[4] The size of the deleveraging process in Central and Eastern Europe has been mitigated by the Vienna Initiative. The main goal of this initiative was to maintain exposures and to support their subsidiaries. Using data in 1 294 banks in Central and Eastern Europe during the global financial crisis, De Haas *et al.* (2012) find that foreign banks involved in the Vienna Initiative have been more stable lenders than other foreign banks.

Figure 8-12 Changes in the ratio domestic credit to the private sector / GDP , year on year change



Source: Authors' estimates. Data extracted from IMF, *International Financial Statistics*.

Fig. 8-8 and 8-12 suggest that economies experiencing more reliance on cross-border flows performed the worst during the crisis. Such finding is in line with Alvarez and De Gregorio (2014) that shows positive relation between the degree of financial openness and growth performance during the global financial crisis.

The collapse of Lehman Brothers in September 2008 highlights the importance of financial channels for emerging Europe. The European sovereign debt crisis provides the opportunity to assess financial transmission from the Euro area to emerging Europe.

The impact of the European sovereign debt crisis

Allegret and Sallenave (2015) investigate the impact of the European debt crisis by estimating rolling correlations between credit default swap (CDS) spreads in emerging Europe and European Union. They get two main findings. First, during the period July 2011-September 2012 –where the Greek crisis has spillover to other peripheral European countries- the rolling correlation between CDS sovereign debt for our sample and the

weighted CDS sovereign debt for IIPS dramatically increased.[5] During this period that corresponds to the peak in the European crisis, IIPS CDS Granger causes CDS in Emerging Europe.[6] Second, rolling correlations between sovereign CDS of our studied countries and CDS of banking sector from the European Union increased for all economies but Serbia from May 2010 to November 2010. Sovereign CDS of Baltics were Granger caused by the banking sector CDS.

4. The Ineffectiveness of monetary policy during the boom-bust cycle

This section assesses to what extent monetary policy conducted in emerging Europe has been weakly ineffective to face the boom-bust cycle in capital flows. We highlight three main motives.

International capital boom and macroeconomic imbalances: the role of the exchange rate regime

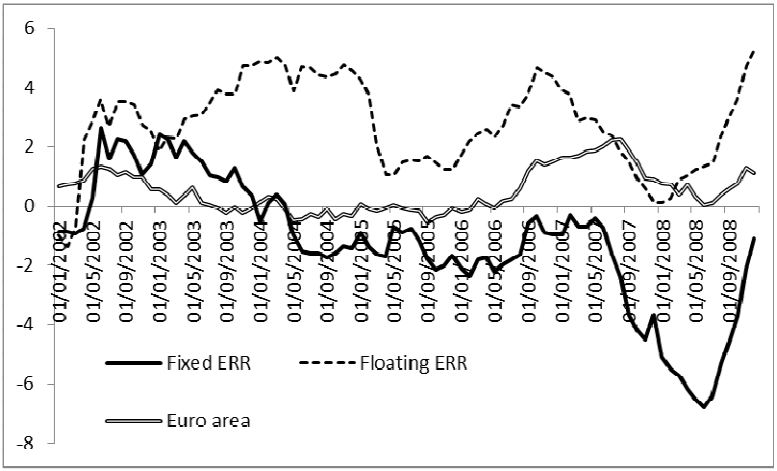
As stressed above, peggers are characterized by persistence of positive output gap during the capital flows boom episode. Such persistence results from monetary policy constraints due to the exchange rate regime.

Fig. 8-13 shows the short-term interest rates in real terms for our sample. Countries with fixed exchange rates had real short term interest rates than floaters. In accordance with the impossible trinity, fixed exchange regimes constraint the ability of the central bank to raise its policy rates insofar as raising domestic rates may attract more capital flows and, in turn, induce a pressure on the exchange rate. Specifically, many Emerging Europe countries have to ensure open financial account in order to respect rules defined in Copenhagen (the so-called "Copenhagen criteria") to be eligible to join the European Union. In a similar way, IMF (2008) finds that peggers set policy rates consistently below rates resulting from a Taylor rule.

[5] IIPS for Italy, Ireland, Portugal, and Spain. We use the share of the public debt of these countries in the total public debt of Euro area as weight.

[6] A variable *X* Granger-causes *Y* if *Y* can be better predicted using the histories of both *X* and *Y* than it can by using the history of *Y* alone.

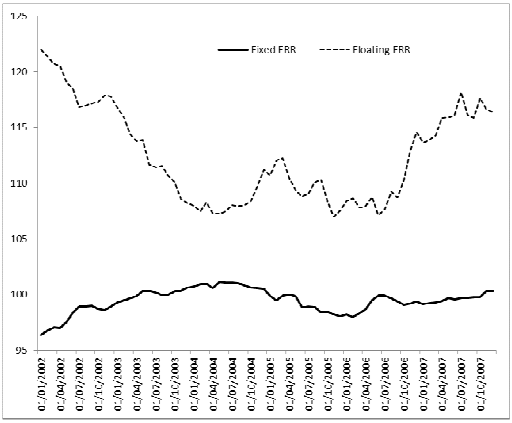
Figure 8-13 Short-term real interest rates in fixed and floating exchange rate regimes



Source: Authors' estimates. Data extracted from IMF, *International Financial Statistics*.

However, domestic authorities can try to curb capital inflows by allowing nominal appreciation of the currency. Indeed, nominal appreciation decreases the attractiveness of the country for international investors. On the one hand, nominal appreciation exerts a similar influence of the real economy than a restrictive monetary policy. Thus, future inflation and growth expectations tend to decrease. On the other hand, the immediate appreciation reduces future appreciations and, then, prospective returns. The behavior of nominal effective exchange rates, portrayed in Fig. 8-14, highlights the authorities' reluctance to let currency appreciates, then losing a degree of freedom in the conduct of the monetary policy.

Figure 8-14 Nominal effective exchange rates in fixed and floating exchange rate regimes, 100 = 2010



Source: Data extracted from Bank for International Settlements.

In addition, Allegret and Sallenave (2015) find that short-term interest rates for the sample countries are significantly influenced by those of the Euro area. They report a higher influence for peggers economies.

The cost of exchange rate adjustments under fixed exchange rate regime

Since the seminal paper by Friedman (1953), it is widely accepted that the flexible exchange rate can play as a shock absorber insofar as larger movements in relative prices –allowed by floating regimes- bring to smoother adjustment of output to real shocks under floating regimes.[7] This view has been challenged by Calvo and Reinhart (2001 and 2002) who find that depreciation leads to contractionary output in emerging markets insofar as exchange rate crises in these countries go hand in hand with a sudden stop of capital inflows. As the result, they suffer from reserve losses and severe current account reversals explained by a dramatic fall in aggregate demand.

Case studies on Central Eastern and South-Eastern European countries during the global financial crisis of 2008-2009 suggest that monetary

[7] On the empirical side, see, among others, Edwards and Levy-Yeyati (2003), and Broda (2004).

policy in peggers has been more constrained to respond to the crisis than floaters (Gardó and Martin, 2010**;** Corozza *et al*., 2011).

Cross-country analyses tend to confirm the initial conclusions by Friedman (1953) displays a more mixed view on the advantages of floating exchange rates to respond to the financial crisis. IMF (2010) finds that emerging countries with fixed exchange rate regimes experienced weaker decrease in their interest rates relative to floaters. Berkmen *et al.* (2012) show that countries with more flexible exchange rates exhibits smaller output declines. Adler and Tovar (2012) consider the "pure effect" of external financial shocks[8] on output performance[9]. Their main result suggests that flexible exchange rate regimes smooth international financial shocks. Tsangarides (2012) get more nuanced conclusions than previous studies. On the one hand, during the crisis, countries with floating exchange rate regime experience no better performances than pegged regimes. As a result, floating regimes do not seem provide an effective shock absorber mechanism. On the other hand, during the recovery period, peggers recover slower than floaters.

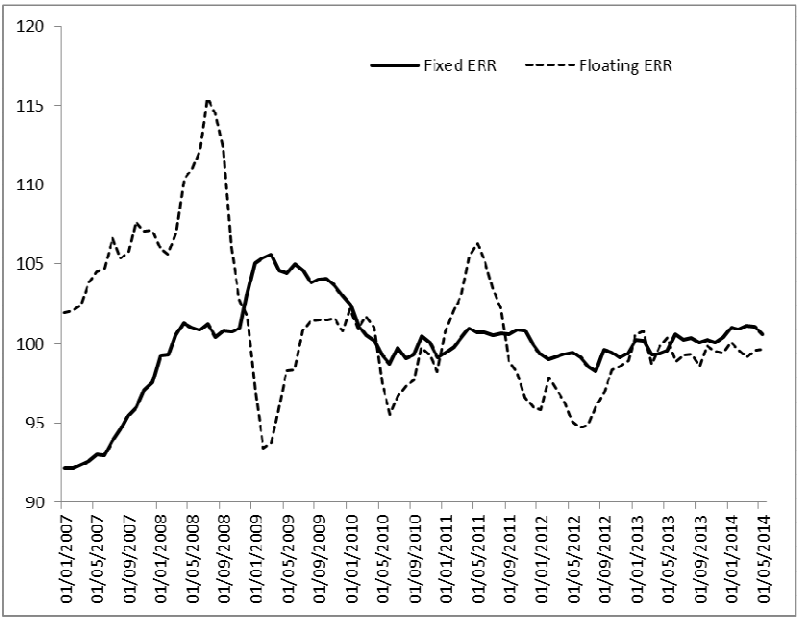
Josifidis *et al.* (2013) analyze adjustment mechanisms during the global financial crisis in some new European Union members according to the exchange rate regimes (Czech Republic, Hungary, and Poland as flexible regimes group, and Estonia Latvia, and Lithuania for fixed regimes group). In order to assess differences in adjustment mechanisms to external shocks, vector autoregression (VAR) or vector error correction models (VECM) are estimated over the period from January 2004 to December 2010 and the crisis sub-period (January 2008-December 2010). Following Blanchard *et al.* (2010), we estimate the effects of two international shocks: a trade shock proxied through an indicator of economic activity in the Group of seven countries, and a financial shock proxied through three indicators: (i) the VIX index; (ii) the EMBI+ indicator; and (iii) a banking shock by considering the external positions of reporting banks vis-à-vis all sectors in emerging Europe.

Josifidis *et al.* (2013) show that the weakest real exchange rate adjustment during the crisis is observed in countries with fixed exchange rate regimes. In addition, when real exchange rate adjustment occurs –with lags for peggers (Fig.8-15), underlying mechanisms differ in the two exchange rate regimes.

[8] The international financial shock is represented by deviations of the VIX from its trend. The effects of the shock on output are estimated after controlling for trade shocks (such as deterioration in terms of trade and a drop in external demand).

[9] Output performance captures the depth and duration of each crisis episode.

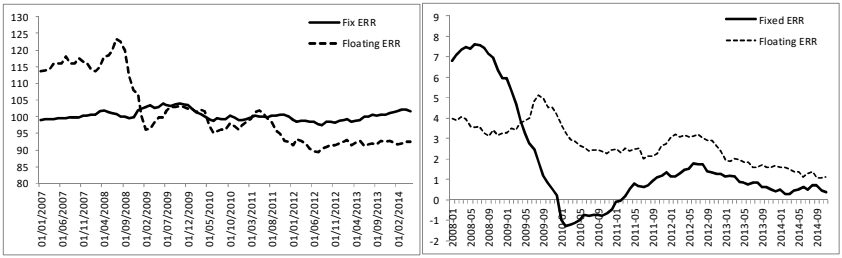
Figure 8-15 Real effective exchange rates in fixed and floating exchange rate regimes, 2010 = 100



Source: Data extracted from Bank for International Settlements.

Floaters countries adjust the real exchange rate mainly through nominal exchange rate movements (Fig. 8-16, left side) while peggers make the adjustment *via* changes in domestic prices (Fig. 8-16, right side).

Figure 8-16 Nominal effective exchange rates and core inflation



Source: Authors' estimates. Data extracted from Bank for International Settlements and European Central Bank.

Table 8-3 shows for the whole period the percentage ratio of real effective exchange rate variations explained by the nominal effective exchange rate shock during 12 months.[10] The nominal exchange rate shocks tend to have a higher influence on real exchange rate volatility in floaters countries (Poland (98%-90%), Hungary (93%-81%), and Czech Republic (84%-78%)).

Table 8-3 Variance Decomposition of the Real Exchange Rate: Ratio of NEER Shocks to REER Variations 2004M1-2010M12, in percent

Months	Czech Rep.	Estonia	Hungary	Latvia	Lithuania	Poland
1	84.32	35.59	92.95	0.56	51.92	97.65
3	79.20	35.67	83.26	5.06	61.25	92.74
6	77.85	35.63	80.94	13.55	60.80	90.59
9	77.90	35.62	80.92	20.08	60.79	90.40
12	77.91	35.62	80.92	24.68	60.79	90.38

Source: Josifidis *et al.* (2013).

At the opposite, domestic price shocks exert a stronger influence on real effective exchange rate variance in peggers (Table 8-4). Thus, the share of the real exchange rate variance explained by prices shocks accounts for 39%-23% in Latvia, 32%-25% in Lithuania, and 28%-27% in Estonia.

Table 8-4 Variance Decomposition of the Real Exchange Rate: The ratio of price shocks to REER variations 2004M1-2010M12

Months	Czech Rep.	Estonia	Hungary	Latvia	Lithuania	Poland
1	9.44	27.63	5.10	39.22	32.32	1.02
3	11.38	26.61	14.08	27.28	25.30	3.78
6	12.26	26.69	15.51	23.58	25.32	5.22
9	12.23	26.70	15.51	23.17	25.32	5.35
12	12.23	26.70	15.51	22.99	25.32	5.37

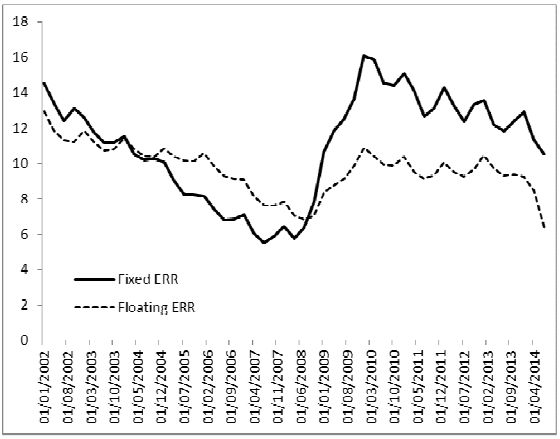
Source: Josifidis *et al.* (2013).

Real exchange rate adjustment is very costly in terms of output loss (see Fig. 8-8) and unemployment (Fig. 8-17) under fixed exchange rate

[10] Crisis period does not change the results.

regimes when prices and wages are sticky. Indeed, competitiveness improvement rests on internal devaluation due to deflationary pressures.

Figure 8-17 Unemployment rates in fixed and floating exchange rate regimes



Source: Authors' estimates. Data extracted from IMF, *International Financial Statistics*.

To what extent the currency mismatch constraints the responses of the monetary policy to face the crisis?

In line with the fear of floating literature, many studies suggest that a high domestic liability dollarization may lead to a fear of floating behavior by domestic authorities. Specifically, for a sample of 7 Latin American countries, Cavallo and Izquierdo (2009) have shown that the higher the domestic liability dollarization, the higher is the output loss following exchange rate depreciation. For their part, Izquierdo and Talvi (2009) explain the stark contrast concerning the monetary policy responses in Latin American countries in the aftermath of the Russian crisis of 1998 and the 2008-2009 global financial crisis by stressing the reduction in the degree of domestic liability dollarization in these countries. While in the former Latin American countries suffered from a fear of floating behavior –limiting the size of the depreciation and dramatically increased interest rates- in the latter crisis episode they let their currency to depreciate and decreased interest rates.

Two related papers use Taylor-type monetary policy rule in a panel data setting to assess the influence of currency mismatch on the adoption of counter-cyclical monetary policy. Hausmann and Panizza (2010) compare monetary policy responses to the Asian-Russian crises and the global financial crisis for a panel of 28 emerging markets. They find that the decrease in the currency mismatch allows the conduct of counter-cyclical monetary policy. Vegh and Vuletin (2012) include in the Taylor rule a fear of floating variables measured as the correlation between the cyclical component of the short-term interest rate and the rate of depreciation of the exchange rate. Over the period 1960-2009, they identify a negative correlation between the degree of fear of floating and the adoption of countercyclical monetary policy. In other words, monetary policy is procyclical for high levels of fear of floating and more countercyclical as fear of floating diminishes. In addition, Vegh and Vuletin (2012) show that the fear of floating coefficient is particularly important for developing countries.

Josifidis *et al.* (2014) analyze the influence of the currency mismatch during crises episodes for a sample of 10 emerging European countries: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Russia, and Turkey. Specifically, the authors study monetary policy responses to common alternative financial shocks: EMBI shock, VIX shock[11], and two volatility shocks in equities markets (the MSCI of G7 group and the MSCI of Emerging Markets. To assess to what extent these indicators are relevant to identify crises episodes, Bloom (2009) approach is used. Thus, crises episodes are identified as deviations of each indicator from its HP trend. Applying such methodology, all financial indicators used in this study are relevant insofar as they are able to identify the following financial crises episodes: (i) Mexican crisis 1994-1995; (ii) Asian and Russian crises 1997-1998 and Brazilian crisis 1999 (crises cluster around 1997-1999); (iii) ICT bubble and 09 / 11 bombing attack 2000-2001; (iv) Subprime crisis. Josifidis *et al.* (2014) distinguish two sub-periods: 1995:Q1-2001:Q4 in which crises are mainly driven by emerging countries and 2002:Q1-2010:Q4 in which crises originate from advanced economies.

The responses of macroeconomic variables to external financial shocks are identified with Structural Bayesian vector autoregressive (SBVAR) models. The model includes the real GDP as the response of the overall activity to the external shocks and he financial account excluding FDI as a ratio to GDP as the external side of the domestic economy. Capital inflows are especially sensitive to international financial shocks. Three monetary

[11] The VIX measures market expectations of near term volatility conveyed by stock index option prices (S&P 500 index). VIX is often referred to as the "investor fear gauge".

policy variables are considered: the domestic short-term interest rates, the real effective exchange rates, and the foreign exchange reserves. To assess the influence of currency mismatch, two sub-groups of countries are distinguished according to the median value of the currency mismatch – estimated with the FLM ratio and the Ranciere *et al.* (2010) approach:

- the high currency mismatch group that includes Bulgaria, Estonia, Lithuania, Latvia, Croatia, and Hungary;
- the low currency mismatch group encompassing Czech Republic, Poland, Russia, and Turkey.

Josifidis et al. (2014) get two main findings. First, emerging European markets with high currency ratios have prevented depreciations of their real exchange rates in the aftermath of the external financial shocks. Second, in line with Aizenman and Sun (2012) and Aizenman and Hutchison (2012), a high currency mismatch ratio tends to be accompanied by a "fear of losing international reserves" in the aftermath of external financial shocks. In other words, financial vulnerability reduces the maneuvering room to adopt counter-cyclical policies. However, the results show that emerging European countries with high currency mismatch ratios suffer from both fear of floating and fear of losing reserves

Allegret and Sallenave (2015) find that the level of currency mismatch exerts an influence on the determination of the short-term interest rates in emerging Europe, particularly during the crisis period (2007-2013). Their result suggests that countries with high currency mismatch adopt procyclical monetary policy.

5. Conclusion

This chapter investigated the macroeconomic impact of the boom-bust cycle in capital flows for a sample of 9 emerging European countries. As previous experiences in emerging economies, we show that the boom episode resulted in credit boom and, in turn, in macroeconomic overheating. The contractionary impact of the bust in capital flows rested on domestic deleveraging process. Specifically, the main finding of this study is to identify a clear relationship between the imbalances due to the boom-bust cycle and the exchange rage regimes adopted by the sample countries. Indeed, we stress that economies with fixed exchange rate regimes face dramatic difficulties to manage both the surge and the sudden stop in capital flows.

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