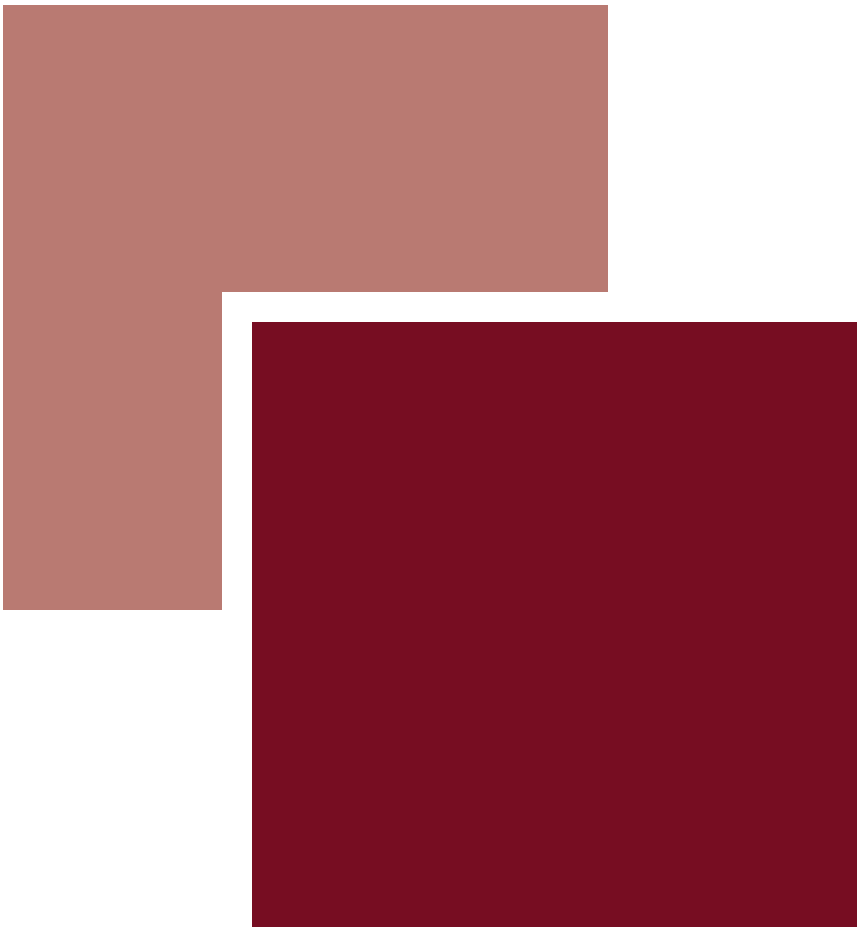
Financialization and its Implications on The Determination of Exchange Rates of Emerging Market Economies

Occasional Paper No. 184



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FINANCIALIZATION AND ITS IMPLICATIONS ON THE DETERMINATION OF EXCHANGE RATES OF EMERGING MARKET ECONOMIES

This study is based on the doctoral dissertation titled "Financialization and its Implications on the Determination of Exchange Rates of Emerging Market Economies" selected as the award winning entry for the EXIM Bank BRICS Economic Research Annual Award (BRICS Award) 2017. The dissertation was written by Dr. Raquel Almeida Ramos, currently Research fellow at the Centre d'Économie de Paris Nord, Université Paris 13, Sorbonne Paris Cité, France, under the supervision of Professor Dominique Plihon (Université Paris 13), Professor Dany Lang (Université Paris 13), and Professor Daniela M. Prates (Universidade Estadual de Campinas). Dr. Ramos received her doctoral degree in 2016 from the Université Paris 13, Sorbonne Paris Cité, France and Universidade Estadual de Campinas, Brazil.

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August 2017

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1. INTRODUCTION

The study investigates the impacts of financialization on the dynamics of exchange rates in emerging market economies (EMEs) – the developing countries that are most integrated to the international financial system. From a focus on the international level, financialization is defined as the patrimonial and increasingly speculative logic of finance at the international level. With financialization, the role of finance at the international level is decoupled from functions related to the productive economy, as financing production or trade. Instead, finance follows an increasingly speculative logic, manifested by innovations of usages and products.

The implications of these developments in EMEs' exchange rates (hereafter emerging currencies) vary according to the extent of the use of these countries' assets and currencies in the different strategies of money managers – the portfolio investors funded in advanced countries. As it will be demonstrated in the study, financialization-related developments are revealed in the characteristics of emerging countries' integration, which are associated with a specific exchange rate pattern, marked by fragility for being vulnerable to the international financial conditions.

1.1 Motivation

1.1.1 Exchange Rate's Relevance

The study is focused on nominal exchange rates, the relative price of two currencies. From the post-Keynesian (PK) perspective, the relevance of nominal exchange rates derives from direct impacts and indirect ones through the real exchange rate. First, turbulent exchange rates can be a shock to entrepreneurs' animal spirits for increasing uncertainty thus discouraging trade, investment and growth. This is key in the PK framework given the understanding of uncertainty as fundamental, thus the role of expectations. Secondly, nominal exchange rates determine real exchange rates, the relative price of goods in two countries: the latter are the former adjusted for inflation.

The real exchange rate is a key relative price. Pervading an economy in several forms, its effects on growth through trade and investments enjoy better empirical support. Real exchange-rate 'undervaluation'

positively impacts growth as it favors trade and investment in tradable sectors, relaxes the foreign exchange constraint on growth, and promotes resource reallocation from the non-tradable to the tradable sector, a locus of learning-by-doing externalities and technological spillovers. 'Overvaluation' has the opposite effect. Exchange rate volatility also negatively impacts growth for discouraging trade and investment (Cottani et al. (1990); Dollar (1992); Eichengreen (2007); Missio et al. (2015); Rapetti et al. (2012); Razmi et al. (2009); Rodrik (2008)).

1.1.2 Emerging Currencies: a Constant Upheaval

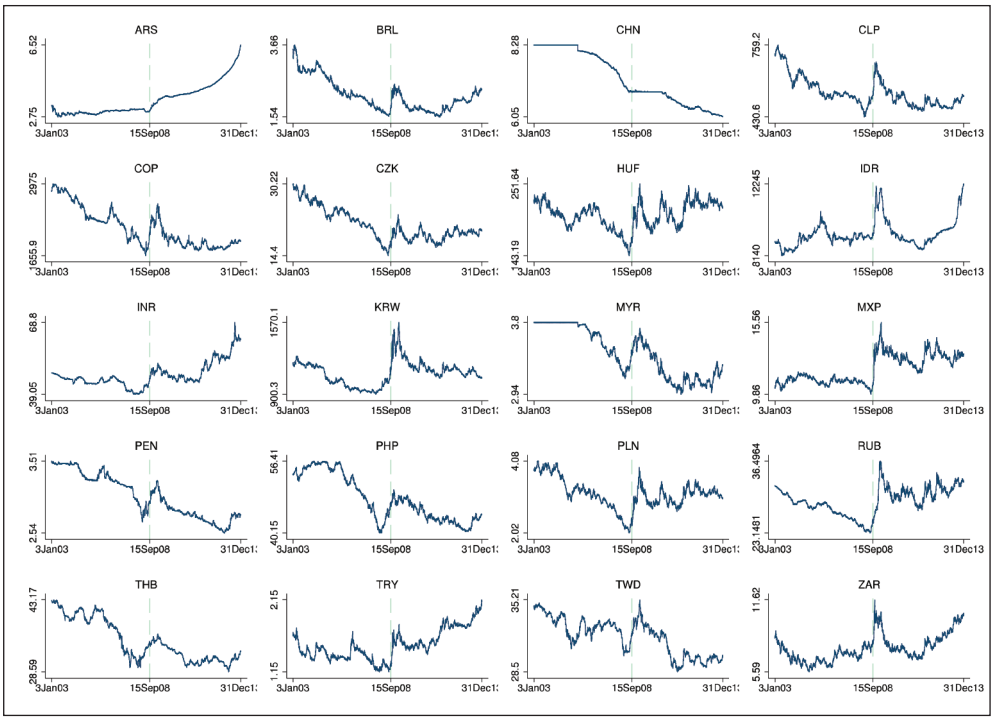
A new expansionary phase of the international liquidity cycle, with its consequent capital flows to EMEs, started in 2003, only a few years after the implementation of floating exchange-rate regimes in several EMEs in the late 1990s (Prates, 2015). Since then, exchange rates of EMEs have been 'a constant upheaval'. Moreover, the adoption of these regimes did not bring about monetary policy autonomy. Accordingly, EMEs authorities' policy trilemma is reduced to a dilemma, namely, absence of monetary policy autonomy with capital account convertibility independently of the exchange rate regime (Flassbeck (2001); Rey (2015)).

From 2003 to the outbreak of the Global Financial Crisis (GFC) with the collapse of the investment bank Lehman Brothers in September 2008, many emerging currencies faced strong appreciation trends – higher than 30% for the Brazilian real, the Czech koruna, and the Polish zloty (Figure 1). On average, there was a 17% appreciation of emerging currencies. Note that these estimations include the year prior to the collapse of the Lehman Brothers, when EMEs' assets continued booming despite numerous signs of crisis in the US and Europe, leading to the debate on whether emerging economies would have decoupled from advanced countries' outlook (Brunnermeier (2008); Dooley and Hutchison (2009); Frank and Hesse (2009); Gorton (2008); Milesi-Ferretti and Tille (2011)).

The collapse of Lehman Brothers was an immediate and immense shock on emerging currencies as investors across the globe liquidated their holdings abroad (Milesi-Ferretti and Tille (2011); Frank and Hesse (2009)). In many EMEs, the vast exchange rate appreciation since 2003 disappeared within a few weeks. Specifically, daily depreciations peaks as high as 5% were seen in the South African rand, the Polish zloty, the Brazilian real, the Colombian peso and the Chilean peso.

However, these major depreciation shocks were relatively short-lived. In a context that combined a more

Figure 1: Emerging currencies: 2000 to 2013



Data Source: Ecowin.
Note: The vertical line indicates the collapse of the Lehman Brothers, September 15th, 2008. Throughout the article the exchange rates are presented in direct quotation, where a lower value implies that the domestic currency is appreciating.

favorable growth outlook in EMEs than in advanced countries (the 'two-speed recovery'), as well as massive policies of quantitative easing (QE) including historically low interest rates in advanced countries, capital flew back to EMEs and their exchange rates went through major appreciations in the following year (Bernanke (2010); Brunnermeier (2008); Fawley and Neely (2013)). In this period, appreciation hit daily peaks of more than 3% in the Colombian peso, the Polish zloty, the Brazilian real, the Mexican peso, and the South African rand. In about half of the EMEs the total appreciation in this period was greater than the previous, GFC-related, depreciation.

The period from 2010 to 2013 was very turbulent, and the market sentiment guiding emerging currencies was tied to the Euro crisis (that hit peaks in the second half of 2011 and May 2012) and to the fear of tapering with Bernanke's (2013) statement that the Fed could increase interest rates by 2015 (Ahmed and Zlate (2014); Eichengreen and Gupta (2015); Prates and Cunha (2013)). As a result, in the period marked by the Euro crisis,

11 of the 20 emerging currencies depreciated, and in the six months following Bernanke's announcement, 18 currencies depreciated. In the first case, the changes of the Argentinean peso and the South African rand accumulated about 40% depreciation, those of the Brazilian real, the Turkish lira, and the Indian rupee, about 25-30%. In the six months that followed, marked by the fear of tapering, the Argentinean peso depreciated almost 60%, the Russian ruble, 35%, and the Indonesian rupiah, the Turkish lira, and the Chilean peso depreciated about 15-20%.

The significance of external financial conditions in determining the turbulence of emerging currencies since 2003 is unambiguous. In terms of daily exchange rate depreciation, EMEs were much more impacted by these developments than the advanced economies themselves: Although the US and the Europe were the locus of the crises, the daily changes of the U.S. dollar/euro pair were limited to 3% from 2003 to 2013.

The manifest turbulence of emerging currencies, in addition of being a problem per se might indicate their external determination, what is also of concern since it demonstrates that these countries' exchange-rate levels are not coherent with their underlying economy. The striking similarity of these currencies' path is an evidence in this sense. These dynamics indicate the fragility of emerging currencies to the conditions prevailing in international financial markets.

1.1.3 Policy Makers' Concerns

The repeated cases of turbulence in the aftermath of the GFC have not gone unnoticed by EMEs' policy makers. On the contrary, countries' authorities expressed concern over the impacts of the international context on their currencies to the IMF (Roy and Ramos, 2012) and the two public manifestations of concern by Brazilian authorities became broadly known – over the 'currency war' (in the context of broad implementation of capital controls in 2010) and over the 'monetary tsunami' caused by the QE policies in 2012. In light of the turbulence emanating from the international context, several countries also decided to accumulate reserves of international assets.

The accumulation of reserves started only a few years after the late-1990s crises (whose roots were said to partially rely on the inadequacy of reserves, provoking a change of the related policy recommendations). Reserves were relatively not used during the GFC, a choice that underscores both how treasured they are by policy makers, the latter's relative contentment with the GFC exchange-rate depreciation after a period marked by appreciation and the fear of these authorities of losing their investment grade (Aizenman and Lee (2007); Aizenman and Hutchison

(2012); Garcia and Soto (2004); Feldstein (1999); Fischer (2001); Prates (2015); Rodrik and Velasco (1999)). Another policy response was the capital account management or regulation, especially in the form of residency-based taxes in the wake of the return of capital flows to EMEs after the GFC. Not only spot, but also derivatives markets were subject to new regulation, evincing the impact of pressures coming from these markets. At that moment, there was a major debate over the use of capital controls, including a review of IMF's position on the subject (Claessens et al. (2010); Ostry et al. (2010); Ostry et al. (2011)).

1.1.4 The Exchange-Rate Literature

Mainstream exchange-rate theories are marked by a dichotomy between studies related to exchange-rate determination and others focused on crises. This very construction of two separate bodies of literature reveals the incapacity of the first strand for accounting for sharp exchange rate movements – that are frequent in EMEs. This literature is indeed focused on long-term dynamics where the exchange rate is a market-clearing price. However, whether the exchange rate will be found at its PPP-predicted value after five years of 'misalignment' is irrelevant: It does not provide us with any information on the causes of the turbulence seen in those years that likely affected entrepreneurs' animal spirits.

Because it is focused on fixed exchange rates, most of the dynamics are not present in mainstream crisis literature, and, in these models, internal disequilibrium plays an important role, but it was clearly absent in recent emerging currencies' crises.

Heterodox theories explain that puzzle and have more to add to our understanding of emerging currencies for considering that crises are inherent to these currencies' dynamics. Their patterns emerge from their subordinated place in the hierarchical financial and monetary systems that reflects their inability to perform the functions of money in the international scenario. Specifically, two main characteristics of emerging currencies explain why they are massively sold in case of turbulence. First, they are not used as reserve of value, and during crisis, the preference for the most liquid currency increases. Second, they are not used as denominator of financial liabilities, that are needed when crises emerge and financial obligations must be met (Andrade and Prates (2013); Kaltenbrunner (2015)).

These explanations are in line with the evidence of fragility of some emerging currencies to the developments of the international financial markets just discussed, but they do not explain why they occurred in some

emerging currencies but not in others. They also do not explain why this pattern happens to some emerging currencies but not to currencies of other developing countries that also do not exercise the functions of money in the international sphere. This is the gap in the knowledge that the study aims at enlightening. As seen from the brief description of events, exchange rate fragility seems to be concentrated in a few currencies only. Why were the Brazilian real and the Turkish lira frequently mentioned among the most turbulent, but not the Korean won or the Peruvian nuevo sol?

Emerging countries are different from other developing countries for being highly integrated to financial markets. Is it the different magnitude of integration among emerging countries that explains the occurrence of turbulence or would it be associated to a different type of integration?

1.2 The Purpose of the Study, Theoretical Framework and Methodology

The study aims at contributing to the exchange-rate literature with the study of why some emerging currencies are more marked by fragility to international conditions than others. Specifically, it suggests different indicators that characterize exchange-rate dynamics – exchange rate volatility, frequency of extreme depreciations, co-movement with international financial scenario and with other emerging currencies – and studies the implications of financialization in determining these features as revealed from the characteristics of EMEs' financial integration.

With financialization, the logic of finance at the international level is associated with capital gains related to the patrimonial decisions of money managers, and the focus on exchange rate returns is a marked feature of its innovations, as observed from the innovations of products (such as FX derivatives) and usages (such as carry trade or currency trading). The analyses assume that the extent of the use of a country's assets or currency in these strategies is revealed from the characteristics of its financial integration. Based on this assumption, the study suggests an indicator that characterizes integration with regards to financialization and studies how the level of financialization of countries' integration is associated with exchange rate fragility.

The study follows a post-Keynesian framework. As opposed to the orthodox instrumentalism, this framework insists on the importance of the 'realisticness' of theories for understanding the phenomena under study. 'Realisticness' refers to whether a representation is about reality or observables, while 'unrealisticness' defines the oversimplified, implausible, practically irrelevant (Lavoie, 2014).

Post-Keynesians value 'realisticness' and ''believe it is better to develop a

model which emphasizes the special characteristics of the economic world in which we live than to continually refine and polish a beautifully precise, but irrelevant model'' (Davidson, 1984). Orthodox frameworks, on the contrary, value a model's ability to provide precise predictions more than the truth of its assumptions.

For valuing realisticness, the study underscores the need to understand the structure formed by the rise of money managers as well as the fact that their decisions (key for exchange rates) are constrained by balance-sheet considerations. The focus on balance-sheets is a key feature of Stock Flow Consistent models (Chapter Three) and of Minsky's analyses (Chapter Seven).

As a reflection of the concern over realisticness, in-depth analyses of the potential effect of financialization on exchange rates at a theoretical level is the methodology used to test this hypothesis (Chapter Two and Three), followed by a detailed empirical assessment of the manifestations of financialization in financial integration (Chapter Four and Five), and in the exchange-rate dynamics (Chapter Six). To characterize integration and exchange-rate dynamics, the study uses graphical analyses, descriptive statistics, correlation coefficients, principal component analyses and a VAR model.

1.2.1 Major Finding

The study concludes that a group of emerging currencies is characterized by higher exchange rate volatility, more frequent extreme depreciations than the euro/U.S. dollar pair, closer association with international financial conditions, and high correlation with other emerging currencies. The intensity of these features can be explained by the level of financialization of these economies' financial integration, or by the use of these countries' assets and currencies in money managers' innovative strategies and through innovative products. Other findings are highlighted in the Study's Structure Section.

1.2.2 Relevance

The study's findings call the attention of regulators to the need of avoiding this development to continue, thus decreasing the vulnerability of emerging economies to international developments and fostering a more stable context that favors these economies' capital and human development. The theoretical relevance of the findings is presented in the study's conclusions, and their policy implications, in Chapter Seven.

1.3 The Structure of the Study

The study is divided in eight chapters. The first two are focused on the two bodies of literature the study

discusses the most: financialization and exchange rates. They are followed by three empirical chapters. The last chapter provides a framework that explains the mechanisms behind the exchange rate determination found in the empirical chapters.

1.3.1 Chapter Two

The chapter reviews the literature on the changes of capitalism known as financialization. Its broad tenets are grouped into three main types of developments: i) the increasing importance of finance at the international level with the decoupling from its earlier functions and logic; ii) the changes within the financial system, including the sophistication of finance through major innovations of products and usages; and iii) the changing relationship between finance and other economic sectors. The chapter argues that, in the concerned countries, financialization might have changed exchange rate determination not only through the increasing weight of finance internationally, but also from its patrimonial and strengthened speculative logic, in line with its innovation of products (such as FX derivatives) and usages (such as carry trading). With financialization, capitalism saw the rise of money managers, whose assets and liabilities are located in different markets and labeled in different currencies. The result is an international financial system characterized by a network of different countries' markets, interconnected through money managers' balance-sheets. The chapter argues that exchange-rate dynamics must be analyzed as a result of the dynamics of this broad network, i.e. through money managers' decisions, specifically their balance-sheet constraints.

1.3.2 Chapter Three

The chapter analyzes exchange-rate theories on exchange-rate determination and crises, both from mainstream and heterodox perspectives, including analyses that have a broad focus and that are specific to emerging currencies. The chapter concludes that mainstream models have been gradually taking financialization-related features into account, but without relaxing the idea of exchange rates as a market-clearing price, which is not coherent with the pattern of capital flows (and thus exchange-rate dynamics) in times of financialization. The chapter also points to a dichotomy inside the mainstream exchange rate theories: a set of analyses has emerged to explain exchange rate crisis episodes independently from the existing literature on exchange rate determination, revealing the failure of the first set of models to explain exchange-rate dynamics.

Heterodox approaches, on the other hand, provide many insights on the characteristics of FX markets, on

investors' decision-making processes and on the specific dynamics of financial flows to EMEs due to the attributes of these countries' currencies. The chapter contributes to this literature by including the role of the temporal dynamics of liquidity preference in the determination of the demand for emerging currencies. In an attempt to approximate financialization and exchange-rate debates, and to resemble the discussion of heterodox authors on exchange rates through different approaches, the chapter suggests ways to model their main insights on a Stock Flow Consistent framework. The use of the SFC approach echoes the need of considering exchange rates as the result of the decisions of money managers, and their balance-sheet constraints discussed in Chapter Two without neglecting the productive side of the economy and the impact of trade-related flows on exchange rates.

1.3.3 Chapter Four

Given the importance of money managers' decisions and the idea of EMEs' assets being interconnected through money manager's balance sheets, Chapter Four analyzes the stock of foreign liabilities of EMEs. It discusses the changing international insertion of EMEs and their associated vulnerabilities with a focus on the implications related to the increasing weight of equities among foreign portfolio investment. It contributes to the literature by highlighting other features of equity than its higher volatility. One of the findings is the manifest co-movement of equity liabilities across EMEs, that hints to the relevance of the international scenario in their determination. Due to its price variability, equities are a privileged locus of capital gains, making them attractive to money managers given their increasingly speculative focus. Equities could therefore be not only more volatile, but a type of investment that is more subject to contagion. The empirical analyses also conclude for the presence of a bidirectional causality between stock markets and exchange rates in some EMEs, indicating that the rise of equity foreign financing can contribute to the creation of a mechanism where the exchange rate is an equilibrium-deviation system.

1.3.4 Chapter Five

Chapter Five studies the different characteristics of financial integration. The chapter presents evidence of the decoupling of FX transactions not only from the productive economy, but also from the economy's financial integration. With this evidence, the chapter contributes to the validation of the financialization thesis and argues for the importance of analyzing the implications of financial integration not only through its magnitude, but also from its characteristics. It suggests a

composite index of the level of impact of financialization on integration.

In addition, through the analyses of the different characteristics of integration, the chapter argues that emerging countries' insertion in the IFS is characterized by an asymmetrical type of demand for their assets. While the demand for EMEs' assets is marked by speculative motives, part of the demand for advanced country's assets is marked by the stability and stabilizing features of emerging countries' policies of accumulating reserves. Finally, the chapter also suggests ways of identifying carry trading currencies based on different ratios involving their foreign liabilities and FX markets vis-a-vis their economy's GDP and trade.

1.3.5 Chapter Six

The features of emerging currencies and their relationship with the types of integration are the focus of Chapter Six, that provide in-depth analyses of exchange rate volatility. The study of histograms and analyses of the frequency of extreme exchange rate changes concludes that the latter better characterizes emerging currencies than the standard deviation. Chapter Six also analyzes two other emerging currencies' features: their correlation with the conditions of international financial markets and their co-movement with other emerging currencies. As shown, the four characteristics are associated: the group of emerging currencies to present the highest volatility, the highest frequency of extreme depreciations, the highest correlation with the VIX, and correlation with a higher number of emerging currencies is very similar, indicating the relevance of the international financial conditions in determining the volatility of emerging currencies.

Next, the occurrence of these features is compared with the level of financialization of the countries' integration. The analyses conclude that the two are strongly associated and that this index can better explain exchange-rate features than measures of the magnitude of financial integration. These results underscore the need of analyzing the impacts of integration not only from its magnitude, but also from its characteristics (as also revealed from the analyses of Chapter Five).

1.3.6 Chapter Seven

The chapter presents a Minskyan account of the dynamics leading to the exchange rate patterns found throughout the study. The contributions of the chapter are around two main axes. The first is related to the utilization of Minsky's framework: it identifies its main elements and suggest how to transpose them not only to an international context, but also to a case where the main decisions are related to assets, not liabilities – in this case, money managers' international

portfolio allocation. The second is related to exchange-rate theory: through an empirical analysis of how emerging currencies' fragility was built in the 2000s, the framework proposed details the transmission mechanisms.

In the open economy context, the exchange rate is the additional element of uncertainty that differentiates hedge from speculative and Ponzi units. This allows emphasis on the role of currency mismatch of balance sheets and differentiating investing in assets labeled in a currency from an EME or from an advanced country in line with Chapter Six findings on the higher volatility of emerging currencies.

The main point of the model is on the build-up of fragility with the appreciation of the emerging currency, that is based on self-feeding mechanisms: appreciation leads to an expectation of further appreciation, higher demand, further appreciation that confirms expectations and make other money managers decide to invest in these countries.

With the self-feeding mechanisms, emerging currencies dynamics are best described as a 'deviation amplifying system', backed by money managers' decisions. When the system is fragile, any 'not-unusual' event might trigger a crisis. In times of financialization, given the interconnection of markets across the world through money managers' balance-sheets, the sources of shocks are enlarged. When hit, EMEs' assets are sold, in an asset/exchange-rate deflation spiral.

An exchange rate determination based on amplifying deviations that reverses in the advent of an external shock is however markedly different than the view of exchange rates as equilibrium-seeking system with market-clearing properties. Policy alternatives to hinder the self-feeding cycle to emerge are discussed: capital inflow controls, reserves of foreign assets and derivatives management techniques.

2. FINANCIALIZATION AND ITS POTENTIAL IMPACT ON EMERGING CURRENCIES

Studies on financialization cover a large range of changes seen in capitalism that, although not directly associated with finance at the international level, have a major impact on it. To facilitate the discussion, the chapter suggests to group the different phenomena into three main sets:

i) the increasing magnitude of finance at the international level with the decoupling from its earlier functions and logic;

ii) the changes within the financial system, with the increasing importance of markets, the evolution of banks, and the sophistication of finance through innovations of products and practices; and

iii) the changing relationship between finance and other economic sectors, with the increasing importance of the first and its associated class group, the rentiers.

The chapter is focused on the first phenomena, which is certainly the least studied of the three. As it will be seen, although some of the analyses of financialization mention some qualitative changes related to finance at the international level, most economic studies in this sphere are quantitative. The study of finance at the international level from the background of financialization however adds to our understanding of international economics for demonstrating that financial integration has not only changed in magnitude, but also in its function and dynamics. The analysis of the first phenomena, and the derived suggestion of a definition of financialization at the international level, must therefore be done from the broader picture of the ample changes of capitalism. Accordingly, this chapter discusses the two latter phenomena before analyzing the first. The second will be more extensively analyzed for its direct and strong implications on the first.

2.1 The changing relationship between finance and other economic sectors

One aspect of financialization is that profit-making increasingly occurs in the financial sphere: financialization would be a change towards a pattern of accumulation in which profit making occurs increasingly through financial channels rather than trade

and commodity production (Krippner, 2005), what reflects, for instance, into the increasing importance of profits from financial transactions in non-financial companies (Epstein and Power, 2003).

Another aspect is the share-holder orientation of companies, that led to the adoption of sophisticated techniques of financial engineering (Plihon, 2003; Lazonick and O'sullivan, 2000). Indeed, financialization would have contributed to the slowdown in accumulation of capital goods since the Golden Age in France, the USA and the UK (but not in Germany; Stockhammer, 2004). Financialization could also have negative impacts on growth through a decreased potential to innovate and by worsening distribution (Minsky, 1990; Epstein and Power, 2003).

Financialization is thus closely related to the rise of rentiers who have especially benefited not only from the prioritization of paying shareholders, but also from the financial innovations of products and practices analyzed next – two features that are also a consequence of the rentiers' increasing power (Epstein and Power, 2003; Lapavitsas, 2009; Palley, 2007).

A second important group of phenomena includes the changes within the financial system. A main change in banks is the increasing role of markets (Bourguinat, 1992). Aglietta (1999) argued that the financial system would have shifted from being "banking-based" to "market-based", but a more accurate picture might be that of a financial system that is still mainly based on banks, that also have access to markets, characterizing a market-based banking system (Minsky, 1990; Plihon, 1995). Indeed, fund management is a current function of banks alongside commercial banking, investment banking, private wealth management, and insurance – the "do-it-all" groups (Pastré, 2007; Plihon et al., 2006), where capital markets are used as a source of income besides the traditional functions of commercial banks (Prates and Farhi, 2015).

Also risk management techniques changed from private evaluations to the use of statistical data to infer probability distributions of risk characteristics (Aglietta, 2001), a practice that allowed financial institutions to "originate and distribute" their loans to other institutions, substituting the prior practice of "originating and holding" them (Brunnermeier, 2008).

These changes have increased risks: while banking liquidity was permanent, assured by the access to the Central Bank, in markets is a collective "imaginary" of participants (Aglietta, 1999). In this environment, money managers determine liquidity and prices, because they are a limited number of agents, who hold significant

amounts of capital, and tend to make similar decisions (Plihon and Ponsard, 2002).

2.2 The changes seen inside of the financial system and the financial innovations

Financial innovations are crucial for understanding financialization as they favor speculation. In the words of Minsky, speculation changed the focus of financial markets towards the "quick turn of the speculator, upon trading profits", from its earlier focus upon the capital development of the economy (Minsky, 1992, p. 111). Similarly, Aglietta (1999) argues that finance no longer has its function of serving capital accumulation. Instead, in the new phase of capitalism priority is given to fictitious capital with the objective of speculation (Guttmann, 2008).

The new weight of speculation is seen in innovations of products and practices. The rapid pace of these two types of financial innovations can be explained by their profit prospects (Lapavitsas, 2008) as well as by their characteristics: unlike industrial innovations, financial innovations are simply contractual arrangements, being easily implemented and readily copied for being devoid of protection by intellectual property rights (Guttmann, 2008).

2.2.1 Innovations of products

The broad use of products as futures, options, forwards, or swaps reveals the current speculative function of finance. These are excellent tools of speculation due to the leveraging possibilities they offer that make risk-taking cheaper and more available for requiring only a margin requirement or the payment of a premium to be carried out (Dodd (2005); Farhi (1999); Guttmann (2008); Prates and Fritz, 2016).

Apart from favoring speculation, derivatives add pressure on spot markets through arbitrage, or for being an extra conduit of spot exchange-rate determination: as the pricing of forward exchange rate is given by the spot rate plus a cost of carrying the asset any change in one of the markets translates into a change in the other. When derivatives markets gain in weight, the rates in the two markets constantly influence one another (Farhi, 1999).

Indeed, the consequences of speculation in terms of stability are well known. Differently from Friedman's view of stabilizing speculation on FX markets, speculation led to notorious crises in EMEs and advanced economies. Risks have recently increased with the emergence of high frequency trading and dark pools. With

a combination of the two, investors can trade according to algorithms, benefiting from privileges such as greater or faster access to information in a completely opaque environment. The risks associated with these two instruments include “Flash Crashes” and the determination of market prices at the will of few large institutions (Prates and Farhi, 2017).

2.2.2 Innovations of practices

The current sophistication of finance is also revealed by innovation of practice. Carry trading operations and the financialization of assets (as commodities and currencies) are two examples. Commodities’ financialization refers to the observation that commodities are traded as an asset class given that i) their price dynamics follow more the logic of financial markets than that of a typical goods market, and that ii) this change of dynamic was associated with an increase of portfolio investors’ position on these markets (UNCTAD, 2009, 2012, 2015). The use of these different commodities as a part of a common portfolio diversification strategy has however resulted in higher volatility, higher correlation between their prices and increasing sensitiveness to international market conditions (Kyle and Xiong (2001); UNCTAD (2009)). The higher correlation between asset markets is explained by contagion: the need of liquidity in a market calls for withdraws in another (Aglietta, 1999), as the strategy of financial investors is determined by their “own needs” that are related to financial markets in general (UNCTAD, 2009, p. 23).

The financialization of currencies is the consideration of a currency as an asset class per se, with the expectation of incurring gains from the changes in their values. The results from the financialization of currencies are similar to the one of commodities. Kaltenbrunner (2011) found that the the Brazilian real became characterized by large exchange rate swings and by a higher vulnerability to international market conditions.

Carry trading is another innovation that has a direct impact on finance at the international level. Canonical carry trade is a non-hedged investment strategy based on borrowing in a currency of lower interest rate (the funding currency) and investing in a high-interest-paying currency (the investment or target currency; Burnside et al. (2006); UNCTAD (2007). It can therefore be seen as a bet that “the exchange rate will not change so as to offset the interest rate differential” (Galati and Melvin, 2004, p. 69). Derivatives carry trade, on the other hand, involves being sold in the funding currency and bought in the investment currency through currency futures and forward contracts (Gagnon and Chaboud, 2007). Derivatives carry trading is thus a form of currency financialization.

For being difficult to tract in data, there is no consensus on when carry trading started. It certainly gained importance by the end of the century, when it funded the bubbles leading to the Asian crisis. It is also in the late 1990s that there is evidence of the consequences of carry trade operations in the yen (Burnside et al., 2006) and that economists (and international institutions, such as the BIS) begun paying more attention to carry trade. It was also by the end of the 20th Century that the definition of carry trade started centering on investments that involve two different currencies, as revealed by the use of the term currency carry trade (Rossi, 2016). In the 2000s they were seen as the reason behind the surge in FX markets from 2001 to 2004 (Galati and Melvin, 2004) – when they were favored by the low interest rates of advanced economies.

In what concerns emerging countries, another relevant innovation with regards to practices is foreign portfolio investment in domestic-currency-denominated assets. The demand for EMEs' assets increased substantially since the beginning of the 2000s, but most importantly, also their share in foreign investors portfolio increased. Goldman Sachs (2010) estimated that the share of EMEs' equities in the MSCI World Index more than doubled from 2000 to 2010 and Bonizzi (2013) shows the same pattern in the portfolios of U.K. pension funds in a similar period.

Seen from Kaldor's (1939) definition of speculation, those innovations of products and practices that accompanied financialization are strongly speculative due to their focus on exchange rate returns. In the case of speculation through FX derivatives, derivatives carry trading or currency financialization more broadly, this is clearly the case. The exchange rate return is however also a crucial part of canonical carry trading and the increasing exposition to domestic currencies as through equity investment, for they are based on the expectation that the investment currency will not depreciate as to offset the assets' returns.

2.3 The increasing importance of finance at the international level and its decoupling from its earlier functions and logic

While there is a growing literature on the evidence of financialization in the productive economy and innovations of finance have been the object of study for some time, not much is said about the manifestations of financialization at the international sphere. As a consequence, only quantitative aspects are analyzed in studies on the international sphere,

based on the synonym concepts of financial integration or globalization.

Financial integration is the result of the combined actions of governments and financial markets. While the first allow it to take place through policies (or non-policies) of deregulation and with liberalization, it is only with financial markets' consensus that a country will be integrated, as they are the ones who define which country and market will be integrated (Chesnais, 1997). Liberalization is therefore a not a sufficient condition for integration (Arestis et al., 2005).

Among advanced economies integration followed the deregulation and liberalization policies in the US and in France in the 1960s (with the interest equalization tax and the deregulation of banking lending rates, respectively) and in the UK with the repeal of foreign exchange (FX) controls in late 1970s (Goldstein and Mussa, 1993). The lack of government intervention on the rising eurodollar market in the 1960s is also a crucial moment – though not a policy, it is a choice of non-intervention that follow the direction of the liberalization policies (Prates, 2002). Among developing countries, integration only substantially rose after the implementation of the Washington Consensus policies of domestic and international liberalization in the 1990s (Epstein and Power, 2003). Other important developments that allowed the rise of financialization are studied by Ramos (2016, Chapter Two), as the ones related to monetary policies, demographic and technological changes.

Having in mind that the dynamics of financialization have an impact on financial integration, and that the use of a given innovative product or practice in a market or a country depend on financial actors' choice, the motive, dynamics and consequences of integration are not expected to be the same across countries, nor with time, demanding analyses of integration to consider its features. In other words, when only the magnitude and not the characteristics are considered, cross-country or time-series studies imply that the integration is of the same type in different countries, or that it has not changed from one period to the other, what is to deny that financial actors have different objectives with investment in different markets and that they innovate according to their change in objective.

The rapid growth of financial integration is mentioned by several authors, as Chesnais (1997) who mentions the rise of ownership of foreign assets in portfolios of U.S. pension funds, from 0.7% in 1980 to 5.7% in 1993. Also the fact that portfolio investment grew faster than other components of international transactions (Chesnais,

1997) or faster than trade is mentioned: Baker et al. (1998, p. 10) shows that the value of funds raised on international financial markets as a percentage of world exports rose from 0.5% in 1950 to over 20% in 1996 in the countries member of the Organization for Economic Co-operation and Development (OECD). Plihon (2010) also compares financial integration with production and trade when he discusses the increasing weight of financial flows on France's balance of payment (from 28.8% in 1980 to 92.8% in 2005) and relative to its GDP (from 14% to 448% in the same period). In addition, the author compares this dynamic with that of current account transactions, that not only lost space in the balance of payments, but were stable in percentage of GDP (around 35%).

The rapid growth of FX transactions is another expression of financialization at the international level that is highlighted by several authors. Chesnais (1997) mentions the rapid growth of FX transactions – they six-folded from 1986 to 1992 in the US, UK and Japan and Epstein (2005) observed that global FX transactions almost four-folded from 1989 to 2004. This is also the subject of several BIS' studies, that more recently also analyze the reasons behind this growth – Moore et al. (2016) write on the "financialization of the renminbi", based on the fall of the share of FX spot transactions; the sophistication of FX derivatives, with FX swaps representing more than 40%; and the falling participation of non-financial counterparties, who are currently responsible for only 8% of transactions involving the renminbi.

From these observations, Chesnais et al. (1996) has argued that financial integration is not the same as in other phases of capitalism, where it was associated with assuring the financing of the international trade and of the balance of payments. For Plihon and Ponsard (2002), finance has only indirect links with these functions and follows its own logic.

2.4 Conclusions

Capitalism is not a stable system, and understanding its developments is key to understand exchange rate dynamics. Featured from the perspective of the three groups of financialization-related developments, and with a focus on the international level, financialization is defined as the patrimonial and increasingly speculative logic of finance at the international level.

With financialization, the role of finance at the international level is decoupled from functions related to the productive economy, as financing production or trade. Instead, it follows

an increasingly speculative logic, manifested by innovations of usages and products.

Interesting points come from the studies of the financialization of commodities and currencies: assets used by money managers in portfolio diversification can be more volatile and more closely linked to international financial conditions for being used as portfolio diversification strategies of financial investors that have operations in other markets. These analyses highlight the need to understand the structure formed with the rise of financialization: different countries' markets are interconnected through money managers' balance-sheets, as their assets and liabilities are located in different markets and labeled in different currencies.

With the inclusion of EMEs' assets in this network, these countries' currencies are potentially more volatile, more closely associated to the conditions of international financial markets, and their currencies would move in an increasingly similar path. In other words, emerging currencies would be vulnerable to international markets' conditions due to their insertion in the financialized international financial system. Fragility could thus be a characteristic of emerging currencies in times of financialization, that instead of being based on trade imbalances, are based on money managers' decisions.

3. EXCHANGE RATE THEORIES FOR TIMES OF FINANCIALIZATION

As discussed in Chapter Two, capitalism has undergone significant changes since the 1980s, which is expected to change how exchange rates are determined. This chapter reviews exchange rate theories in light of the recent context of financialization with the aim of highlighting whether its developments have been considered by these studies. Financialization is marked by the centrality of money managers and their decisions; financial flows are of great magnitude, and follow a patrimonial and increasingly speculative logic, as a reflect of innovations of products, such as FX derivatives, and practices, such as carry trading and currency financialization more broadly, by money managers. These portfolio investors funded in advanced countries are small in numbers and manage the major amounts of liquidity available in these economies, having a great impact on markets. Through their international portfolio allocation decisions, these portfolio investors tie together markets and currencies across the globe, their decisions being key to emerging currencies. The appropriate exchange rate model should take this context into account and account for exchange rate crises or sudden depreciations – as those seen in emerging currencies since the 2000s, specifically with the GFC and the Euro crises mentioned in the Introduction Chapter.

Given these objectives, the study presents the different models proposed by both mainstream and heterodox approaches, discussing their appropriateness to analyze emerging currencies. The discussion on the mainstream models of exchange rate determination and crises, can be found in Ramos (2016). This chapter is focused on heterodox approaches.

3.1 Approaches focused on central economies exchange rates

3.1.1 Schulmeister's Foreign Exchange as a 'Trending Market'

With an inductive approach, Schulmeister has been analyzing exchange rate patterns and developing theoretical explanations for them since the 1980s. Main results from his first studies were on

the importance of technical analysis on exchange rates' expectations and determination (Schulmeister, 1988) and that exchange rates do not simply follow a random walk (as inferred from Meese and Rogoff (1983)), but follow a systematic pattern (Schulmeister, 1987). His findings begin with the observation that exchange rates fluctuate around underlying up- or downward trends, that repeats itself across different time scales. Long-term trends result from the accumulation of short-term runs in different directions. The determination of the short-term trend is partially autonomous, reflecting the micro-structure of the market, and partially influenced by the "expectational bias", whose determinants are mostly related to the macroeconomy, but also associated with agents' behavior.

How are the short-term trends built? After the initial trigger, the dynamic is determined by the workings of the trend-following technical trading systems – "trend-following models generate signals according to the current trend"; and the "contrarians" "produce sell (buy) signals when prices are still rising (falling), but at a declining speed" (Schulmeister, 2009, p. 312). Some models generate signals more rapidly than others: fast models act before slow models for using high-frequency data.

How does a trend end? "The longer an asset price trend lasts the greater becomes the probability that it ends", a phenomenon explained by three reasons: i) the decline in the number of traders getting into the bandwagon (in a herd behavior), ii) the higher incentive for cashing-in profits and iii) the increasing amount of traders that will consider the asset overbought or oversold and open a position speculating on the reversal of the trend. Medium-term trends, in turn, are formed by short-run trends in one direction that last longer than counter-movements.

3.1.2 Harvey's Foreign Investor's 'Mental Model'

Harvey's analyses derive from a criticism of the view of the exchange rate as a price that ensures trade balance, a consideration that would not be coherent with the reality of large and developed economies where portfolio flows dominate (Harvey, 2009, p. 54), and that call for the need to understand how portfolio investors form their expectations. Harvey's analysis of expectation formation is based on concepts taken from Keynes and from behavior economics (the heuristics). Based on these principles, agents' decision-making process is influenced by forecast-construction biases (or an "unreasonable influence of some factor" (Harvey, 2009, p. 44)). Given these biases, to Harvey, the foreign

currency market is characterized by volatility, bandwagons, and agents that employ technical analysis, trading limits and engage in periodic profit taking (cash-in).

With his 'mental model', Harvey explains how expectations are built: they depend on expected net exports, expected net direct foreign investments and expected net portfolio foreign investment. As these data are not published often, traders recur to analyses of the expected price differential between the domestic and the foreign country, the expected relative "macroeconomic growth and stability", the expected relative interest rates, and expected liquidity. In his "augmented model", Harvey introduces exchange rate determination from portfolio investment and the workings of his "exchange-rate features" – volatility, bandwagons, technical analysis, trading limits and cash-in.

For Harvey (2009) exchange-rate dynamics are thus marked by feedback loops (cash in, bandwagon effects, and technical analysis) and reversals (cash in) that generate a zigzag pattern around a vector determined by the expectations of market's participants, which, in turn, depend on their mental model and how agents interpret events.

A common point of Schulmeister's and Harvey's analyses is the role of expectations on determining exchange rates, and the weight of the social context in determining expectations. Exchange rates are ultimately influenced by fundamentals, given the current relevance of these variables in forecast formation, but the specific set of variables change with time. In this sense, Harvey's (2009) mental model can be seen as the details of the current financial convention (in the sense of Orléan (1999)) regarding exchange rates.

3.2 Approaches focused on emerging market economies' exchange rates

Another strand of heterodox works on exchange rates are the ones focused on the specificities of emerging currencies. As in other heterodox works, expectations impact exchange rates through investors' decisions on financial investments, but these decisions are now conditioned by a currency's liquidity premium associated with the place it occupies on the hierarchical international monetary and financial system (IMFS). These works are based on structuralist concepts of hierarchy and asymmetries that differentiate the center from the periphery, what lead authors to argue that the IMS is asymmetrical, that a currency's position determines its country's policy autonomy (Carneiro, 1999),

the dynamics of the capital flows it receives, and its exchange rate's main features (Prates, 2002).

The central place of the IMS in the post-Bretton Woods system is occupied by the U.S. dollar, the only currency to fully perform the three functions of money at the international level. It is followed by currencies of other central economies, that are also used to denominate contracts internationally and are relatively demanded as store of value. Currencies from peripheral countries occupy the third place, as they do not exercise any of the three functions internationally (Prates (2002); De Conti and Prates (2014)).

The different positions in the IMFS would thus be translated in different levels of liquidity premium. The analysis of the implications of this different attribute of emerging currencies is facilitated by the use of Keynes' equation on an asset's own rate of interest. With this equation, Keynes (1936) indicated that in a monetary production economy an asset's own interest rate (or total expected returns, r) is determined by four main attributes: its expected appreciation (a), its quasi-rent (q, or yield), its carrying costs (c) and its liquidity premium (l, a power of disposal that confers a potential convenience or security; Andrade and Prates (2013)) – as in Equation 1.

$$r = a + q - c + l \qquad (1)$$

Andrade and Prates (2013) focus on the implications on capital flow dynamics. Given that l is structurally low among EMEs, capital flows would mostly be attracted by the other features – a, q, or c. These changes are analyzed in light of the liquidity preference scenario, which is seen as the major determinant of capital flows. In these moments, there is an increase of the feature a that compensates for the low l, resulting in capital flows. Conversely, when uncertainty and liquidity preference are high, these countries will face capital outflows due to the lower l and consequent incapability of being "a receptacle of uncertainty on a global scale".

Assuming that expected rates of return (r) throughout the world will be driven toward equality Kaltenbrunner (2015, p. 431) presents the following equations (2 and 3), where (*) denotes the equivalent for the world reserve currency. The expected appreciation (a) is considered with regards to the world's money, and it assumes that carrying costs (c) are negligible for short-term financial instruments:

$$r = a + (q - c) + l = (q^* - c^*) + l^* \qquad (2)$$

$$(q - q^*) + a = (l^* - l) \qquad (3)$$

Equation 3 is presented by Kaltenbrunner (2015) as a representation of a reason behind the structurally higher interest rates of some emerging countries: "(...)

similar to Keynes's understanding of interest rate determination in the closed economy, a currency's yield differential (q−q*) has to compensate for its lower liquidity premium relative to that of the leading currency (l*−l) if demand for it is to be maintained (p. 433)". Emerging currencies would depreciate in moments when "investors have to sell these currencies (and acquire the funding currency) to meet their contractual obligations" (Kaltenbrunner, 2015, p. 440).

Andrade and Prates' (2013) and Kaltenbrunner's (2015) analyses therefore argue that emerging countries' currencies are vulnerable to moments of crisis internationally either for being unable to store value (Andrade and Prates, 2013) or for not being used in contractual obligations (Kaltenbrunner, 2015). The consequent major depreciations would occur in specific moments of turbulence internationally, such as in moments of "reversal of the cycle, of monetary/fiscal policy changes in the center or of increase in the liquidity preference" when "investors [...] reassess their investment decisions" (Andrade and Prates, 2013, p. 410), or "moments of market turmoil" (Kaltenbrunner, 2015, p. 442), or change in international "funding" (p. 439), or "liquidity conditions" (p. 440). This specific type of volatility is in line with the empirical assessments of emerging currencies, that, compared to central currencies present lower volatility as estimated by the standard deviation, but higher frequency of "extreme" changes (Chapter Six). This type of volatility is different from that analyzed by Schulmeister and Harvey (simply depicted as zigzags) for being marked by important peaks and subordinated to the conditions of international financial markets.

3.2.1 The temporal aspect of liquidity preference

Liquidity premium differentiates the demand for currencies from advanced and emerging market economies. The analysis of the dynamics that result from this structural difference might however gain in clarity with the inclusion of a variable of how investors value this feature: how the preference for liquid assets evolves with time. There would therefore be two aspects related to liquidity: a structural and a time dimension. The differentiation of the two might be done in the keynesian equation through the inclusion of a variable for the evolving aspect of liquidity preference, β, as in Equation 4 and 5 that are receptively related to assets denominated in emerging currency (r) and one denominated in the currency of a central economy (r*), or in Equation 6. This allows considerations on the impact of a change in liquidity preference on

capital flows to EMEs, thus their exchange rates – as in Biancareli (2011).

$$r = a + (q - c) + \beta l \quad (4)$$

$$r^* = a^* + (q^* - c^*) + \beta l^* \quad (5)$$

The close relationship between EME currencies and the international financial scenario can be explained through these equations. Given that l^* is (structurally) higher than l, the differential of the liquidity premium ($l - l^*$) has a negative effect on the relative return of the EME currency ($r - r^*$). With an increase in liquidity preference (a rise of β) the negative impact of offering a lower liquidity premium ($l - l^*$) is magnified, reducing the relative attractiveness of the EME currency ($r - r^*$) and leading to capital outflows.

From another point of view, Equation 6 argues that an increase of liquidity preference (β) increases the yield differential ($q - q^*$) needed to maintain the stability of capital flows. In other words, in moments of higher liquidity preference, emerging countries would have to increase their policy rate to maintain capital flows. This is a clear representation of the lack of autonomy of monetary policies in emerging countries.

$$r - r^* = (a - a^*) + (q - q^*) - (c - c^*) + \beta(l - l^*) \quad (6)$$

3.3 Heterodox insights in equations à la SFC models

This chapter suggests ways to use the different insights brought by the works discussed above in a SFC model (for a discussion about SFC models and its advantages for exchange rate analyses, see Ramos, 2016, Chapter Three). The intention of the discussion is to provide a common basis for theoretical discussion on exchange rate determination. Added to an empirical model, it can enlighten specific past exchange-rate patterns. This discussion may also be relevant to the SFC literature in general, for adding realism to the treatment of exchange rates in models that focus on different matters.

3.3.1 Exchange-rate expectations in SFC models

Open-economy SFC models are not as numerous as closed economy ones and modeling exchange-rate expectations is still incipient. Three main options are used – static expectations ($e^e = 0$), expectation of a given exchange-rate change ($e^e = x$), or a given exchange-rate value ($E^e = x$). There is also the possibility of having heterogeneous agents in a market formed of a combination of these expectations. To consider that traders expect the exchange rate to remain the same ($e^e = 0$) is a great restriction, but it has been used for

simplicity as it would be to assume that traders are neutral (Godley and Lavoie, 2007).

To consider traders that have in mind a given exchange rate value ($E^e = x$) might be useful for modeling fundamentalist traders. This is done by Lavoie and Daigle (2011), whose specification of exchange rate expectation is drawn from the behavioral finance literature. Similar to De Grauwe and Grimaldi (2006), fundamentalists trade expecting the exchange rate to converge to a given fundamental value, while chartists expect the future change in the exchange rate to be the same as the latest one.

The idea of foreign exchange market participants who trade knowing the fundamental value of the exchange rate is a simplification not for the assumption of fundamentalist traders: even if fundamental values do not exist, there can be traders that believe they do. The simplification is on the fact that the fundamental value does not evolve with the economy and is static – what is not in line with in line with the different PK analyses discussed above nor with the representativeness principle. Modeling floating fundamentalist expectations can be enabled by tying economic variables already estimated by the model to the exchange rate forecast, creating endogenous fundamentalist behavior.

3.3.2 Fundamentalist exchange-rate expectations

Harvey (2009) suggests the variables considered by traders in forming their exchange rate forecasts: trade balance, relative output growth, and interest-rate differential – as in Equation 7 and analyzed in Chapter 2.3. In an ABM approach with heterogeneous agents their focus on each of these variables can be varied, by adjusting their γ, Ω, and θ.

$$E^e_{\#fHarvey} = E_{\#t-1} - E_{\#t-1}[\gamma(X_\# - IM_\#) + \Omega(y_\# - y_\$) + \theta(r_\# - r_\$)] \quad (7)$$

Apart from this, two other options of endogenous fundamentalist behavior could be considered: the UIP and the PPP. The former is to say that a hike of interest rates in the emerging country (a rise of $r_\#$) is expected, by traders, to lead to an appreciation of the country's currency (a decrease of $E_\#$; $E^e_{\#fUIP} < E^e_{\#t-1}$) – as in Equation 8. A PPP-fundamentalist trader, would use price differentials in their forecast (as in Equation 9): Higher prices in the emerging country (a rise of $p_\#$) are associated with a loss of competitiveness internationally and exchange rate depreciation (a rise of $E_\#$; $E^e_{\#fPPP} > E_{\#t-1}$).

$$E^e_{\#fUIP} = E_{\#t-1} + (r_\$ - r_\#)E_{\#t-1} \quad (8)$$

$$E^e_{\#fPPP} = E_{\#t-1} + (p_\# - p_\$)E_{\#t-1} \quad (9)$$

3.3.2.1 Anchoring and representativeness principle

Both the anchoring principle, analyzed by Harvey, and the medium-term expectations, analyzed by Schulmeister, have a similar effect: new forecasts depend on past forecasts. The inclusion of such features is enabled by considering the past forecast in the expectation formation rule as in in Equation 10.

$$E^e_{fAnc} = (0.5)x + (0.5)E^e_{t-1} \quad (10)$$

According to the representativeness principle agents look for causality between two events. As a result, agents consider the new exchange rate value as somehow reasonable and anchor their new forecast to it; as in Equation 11 for an agent that follows an externally defined fundamental value, and in Equation 12 for participants that form exchange rate expectation according to the UIP.

$$E^e_{fRep} = (0.9)x + (0.5)E_{t-1} \quad (11)$$

$$E^e_{fUIPRep} = E_{t-1} + (0.5)(r_{\$} - r_{\#})E_{\#t-1} \quad (12)$$

3.3.3 Chartist behavior

Chartists (c) look at the prior exchange-rate change – as in Equations 13 and 14. More complex chartist behavior can be modeled based on Schulmeister's (2009) fast and slow technical systems by considering a higher value than 2, in Equation 14, for slow traders.

$$e^e_c = e_{t-1} \quad (13)$$

$$E^e_c = E_{t-1} + \frac{E_{t-1} - E_{t-2}}{} \quad (14)$$

3.3.3.1 Orléan's 'contrarian' traders

According to Orléan (1999), financial markets always count with a proportion of contrarian traders, who expect the price of an asset to move in the opposite direction than the majority of the market. The importance of the contrarian trader is on testing the convention. If the conventionally estimated value is not in line with the realized one, the convention falls apart. One approximation for modeling this discussion would be to consider a deviation between expectations and the resulted value, and consider that the share of contrarian traders increase if this deviation increases.

$$e^e_{cCont} = -e^e_c \quad (15)$$

3.3.3.2 Schulmeister's 'contrarian' chartists

Schulmeister(2009) 'contrarian' traders can be considered by changing expectations according to the exchange rate change: if the exchange-rate change of period

t,(e_t) is greater than the average observed since period *t-n*, the agent expects the current trend to revert, as shown in Equation 16 for an expectation of reversal after three periods of falling pace.

$$e^{e}_{t+1} = -e_t \quad \begin{matrix} if\ e_t < e_{t-1} < e_{t-2}\ and\ e\ is\ positive, \text{or} \\ if\ e_t > e_{t-1} > e_{t-2}\ and\ e\ is\ negative \end{matrix} \quad (16)$$

3.3.4 Liquidity premium and country-bias

The analyses of the specificities of EMEs' currencies can be done through changes in the portfolio allocation equations of SFC models – presented in Equations 17 to 20. This analysis assumes that country $ is a central country, and that country # is an EME.

$$B^{\$}_{\$d} = V_{\$}(\lambda_{20} + \lambda_{21}(r_{\$}) - \lambda_{22}(r_{\#} + e^{e}_{\#})) \quad (17)$$

$$B^{\#}_{\$d} = V_{\$}(\lambda_{30} - \lambda_{31}(r_{\$}) + \lambda_{32}(r_{\#} + e^{e}_{\#})) \quad (18)$$

$$B^{\#}_{\#d} = V_{\#}(\lambda_{50} + \lambda_{51}(r_{\#}) - \lambda_{52}(r_{\$} + e^{e}_{\#})) \quad (19)$$

$$B^{\$}_{\#d} = V_{\#}(\lambda_{60} - \lambda_{61}(r_{\#}) + \lambda_{62}(r_{\$} + e^{e}_{\#})) \quad (20)$$

The dynamics created by Lavoie and Daigle (2011) include country-bias: investors' preference for its own country assets. Liquidity-premium asymmetry is a different phenomenon: as central currencies offer a higher liquidity premium, investors prefer investments in a central currency, regardless of their country of origin. With regards to the behavior of the central country's investors, both liquidity-premium asymmetry and county-bias result in biases towards their own country's assets, which can be modeled by considering $\lambda_{20} > \lambda_{30}$. With regards to the demand of the emerging-country investor, if the two biases are considered equally important, $\lambda_{50}/\lambda_{60}=1$. If country bias is more important, $\lambda_{50}/\lambda_{60}=1$.

3.3.5 Liquidity preference

The temporal aspect of liquidity preference should be added next to liquidity premium, as in in Equation 21. λ^{lpf}_{i0} increases in times of turbulence, leading to a shift of demand from emerging to central economy's assets from both types of investors.

$$\lambda^{lp}_{i0} = \lambda^{lpm}_{i0} . \lambda^{lpf}_{i0} \quad (21)$$

3.3.5.1 The gradualism of changes in liquidity preference

The Minskyan aspect that agents gradually change their decisions with the establishment of tranquility (Chapter Seven) can be modeled in an agent-based (AB) framework from the consideration of individual and subjective preference for liquid assets (λ^{lpf}_{t}) that floats according to changes in a general level of uncertainty *(σ_t).* Liquidity preference

of investor i at period i ($\lambda_{i,t}^{lpf}$), would be a positive function of uncertainty in period *t* (σ_t) and, in case of low uncertainty ($\sigma_t < x$), would decrease with time. This can be done as shown in Equation 22, the value of n varying among investors and the higher the n, the longer the agent will take to invest in the EME after a peak of uncertainty.

$$\lambda_{i,t}^{lpf} = \begin{cases} f\left(\frac{1}{n}\sum_{t-1}^{-n}\sigma\right) & if\ \sigma_t < x \\ f(\sigma_t) & otherwise \end{cases} \quad (22)$$

3.3.6 Cash-in

Cash-in can be included through a limit in the profits accumulated (L^i=; in Equation 23 for n periods. In a AB framework, its modeling asks for a rule where agents sell an asset when the stock of profits achieves a given percentage of its wealth. The fact that this feature partly explains the reversal of a trend makes it an important inclusion.

$$L^i = \frac{V_t^i - V_{t-n}^i}{V_{t-n}^i} \quad (23)$$

3.3.7 Equities

The SFC framework also allows the inclusion of equity markets, which is interesting given the different dynamics it triggers in EMEs due to the magnitude of foreign investors' assets relative to the size of EMEs' markets (Chapter Seven). The modeling of equity markets asks for a distinction of the return of a countries' assets into returns from bonds and from equities, that can be simplified to the expected change in stocks prices (sp_j^e). This would demand adding $\lambda_{i3}\left(sp_j^e + e_j^e\right)$ to Equations 17 to 20, as exemplified by Equation 17b.

$$B_{\$d}^{\$} = V_{\$}(\lambda_{20} + \lambda_{21}(r_{\$}) - \lambda_{22}(r_{\#} + e_{\#}^e) - \lambda_{23}(sp_{\#} + e_{\#}^e)) \quad (17b)$$

3.3.8 Forecast errors and crisis

A reason for the end of a trend might be the deviation of the actual rate from the expected value. Orléan argues that such deviations lead to panic and crisis in a market as liquidity evaporates with participants' preference for more liquid assets. This could be done by a forecast error variable (μ) that compares past exchange-rate expectation with actual rates and an impact from this variable in liquidity preference (λ^{lpf}) – as in Equations 24 and 25.

$$\mu = \frac{E^e}{E_t} \quad (24)$$

$$\lambda^{lpf} = f(\mu) \quad (25)$$

3.4 Concluding Remarks

Exchange-rate expectations were a main feature of one of the first exchange rate analyses, the UIP, being neglected among mainstream works in favor of models focusing on the links between the exchange rate and macro aggregates in the keynesian models. From this moment on, the exchange rate became a variable "supposed to arrive at a level that 'clears' macro balances" (Taylor, 2004, p. 211). In the mainstream, expectations were later modeled in behavior finance models, though in a simplified form of expectations. They are however a main feature across heterodox theories, where they are treated in a realistic fashion. While Orléan highlights that expectations are associated with a financial model, an evolving convention, Harvey's 'mental model' describes what could be seen as the current convention regarding exchange-rate expectations. The complexity of expectation formation is a main take from his work, where it not only depends on the analysis of relevant indicators, but is also done through behavior biases, and accounts for the specific dynamics of the foreign exchange markets described by Schulmeister. However, expectations are not the sole determinants of exchange rates.

Based on the keynesian equation, Andrade and Prates' and Kaltenbrunner's analyses complement the prior ones by highlighting that currencies are not all the same: they offer different liquidity premia, creating a link between international liquidity conditions and EMEs currencies' demand. This idea gained in clarity in the study, with the introduction of a temporal aspect of liquidity condition internationally, and in precision with the consideration that the impact of the state of uncertainty is not the same for every agent, nor does it have a linear impact on the desirability of a currency.

The SFC framework was used to assemble the different insights of the heterodox literature: for allowing portfolio allocation to impact exchange rates, it is in line with financialization, and the rise of money managers; it is precise and flexible; simultaneously accounts for stocks and flows and for financial and productive sectors' variables.

The modeling of exchange-rate expectations presented

in this Chapter is an important outcome as it might be the first account for modeling endogenous fundamentalist behavior. A second important outcome is the modeling of emerging currencies' specificities (low liquidity premium) and the mechanism that allows realistic emerging currencies dynamics to emerge, through the inclusion of liquidity preference concerns. A third important outcome is the consideration of individual liquidity preference, that gives the subjective character of expectations and of forming an opinion about the economic scenario. Finally, the details of chartist behavior also add complexity, and thus realisticness, to exchange rate models.

On the theoretical front, this chapter has argued that emerging currencies are subject to an additional source of exchange rate volatility, stemming from international shocks. International financial cycles influence these currencies behavior due to their different liquidity premium and the fact that investors value this feature differently in time. This configures a different type of volatility that is not associated with daily (small) deviations around the trend, but occasional major depreciations.

4. EMERGING COUNTRIES FOREIGN LIABILITIES AND VULNERABILITIES

The 1990s was a period of important changes in developing countries in the wake of what became known as the 'Washington Consensus' policies. If financial globalization started in the 1970s and consolidated among advanced countries in the 1980s, it was in the 1990s that some developing countries became part of this process. This boom of inflows in the beginning of the 1990s was followed by crises some years later and by a new boom since 2003. Analyses of this new phase of financial globalization cannot be dissociated from the sophistication of finance and the context of floating exchange rates. The study's three empirical chapters are dedicated to the analysis of whether financialization-related features have an impact on emerging currencies' dynamics. The first of these three highlights some of the associated potential risks. It contributes to this literature by suggesting an analysis focused on the pattern of EMEs' foreign liabilities and with different methodologies, including analyses of cross-country comovement of the stock of foreign liabilities and the interactions between exchange rates and stock price returns, that hint to the the impacts of foreign equity liabilities.

As discussed in the Introduction, EME are the developing countries that actively participate in the process of financial globalization. In line with Chesnais' (1997) point that financial globalization is defined by the decisions of portfolio managers, the study proposes to operationally define EME according to which countries the financial community saw as emerging in the period under study, based on the countries who are part of the MSCI index: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, South Africa, Taiwan, Thailand and Turkey. Financial integration data presented in the next chapters are based on an updated version of Lane and Milesi-Ferretti (2007).

4.1 The Volatility of Emerging Market Economies' Foreign Liabilities

In 2011, foreign liabilities were rather diversified among EMEs: in seven of the 20 countries, any of the three types of foreign capital – equities, debt and foreign direct investment (FDI) – represented more than 45%

of the total. FDI represented the most important type of liability in half of the countries. Debt represented the most important type in six of them. This is a very different picture than ten years before, when debt was the most important form of liability in over two thirds of the countries, and was at least two times more important than FDI in half of them. In 2001, equities were not much significant, representing an average of 9% of total liabilities. In 2011, this share increased to 17%, achieving more than 30% in Taiwan, Korea and South Africa, and more than 23% in India, Brazil and Thailand.

In order to study the potential implications of these changes, the volatility of the different types of capital is analyzed. Portfolio flows are broadly seen as most volatile, and FDI as most stable, but this difference should however not be taken for granted. Claessens et al. (1995) and Kregel (1996) have long argued that foreign direct investment can be as volatile as the other types of flows. But Chuhan et al. (1996), Sarno and Taylor (1999), Moguillansky (2002) and Sula and Willett (2009) have reached the opposite conclusion.

In an aggregate form, for all EMEs, the yearly change of stocks of the three types of foreign liabilities show that the series of equities seem to be the most volatile: there are significant changes in values and alternates periods of increase and periods of decrease of stocks. The year-by-year cross-country averages confirm that the equity stock varied more than the other stocks of capital: for instance, between 2003 and 2011, the yearly change in the stocks of equities varied from a decrease of 47% (in 2008) to an increase of 82% (in 2003), while changes in FDI varied from a 4% decrease (in 2008) to a 29% increase (in 2009) and the stock of debt has increased every year (varying from 2% in 2008 to 23% in 2007).

The standard deviation of the series of changes in the stocks in different countries confirm that the stock of equity liabilities is the most volatile in every one of the 20 countries. In fact, the cross-country average volatility of the stocks of equities (0.48) is four times higher than the volatility of debt (0.12) and 2.5 times higher than the volatility of FDI (0.19). Analyses of a longer period, from 1970 to 2011, and of every one of its three sub-periods (1970-1989, 1990-1999 and 2000-2011) have the same result.

The volatility of equities is not only due to the volatility of the flows themselves, but also to the rapidly changing capital gains (and losses) that are characteristic of this type of asset. This is especially important given that in the analyzed period stock markets have sky-rocketed and also suffered large losses in some EMEs. This very characteristic of equities is seen as a means of improving risk

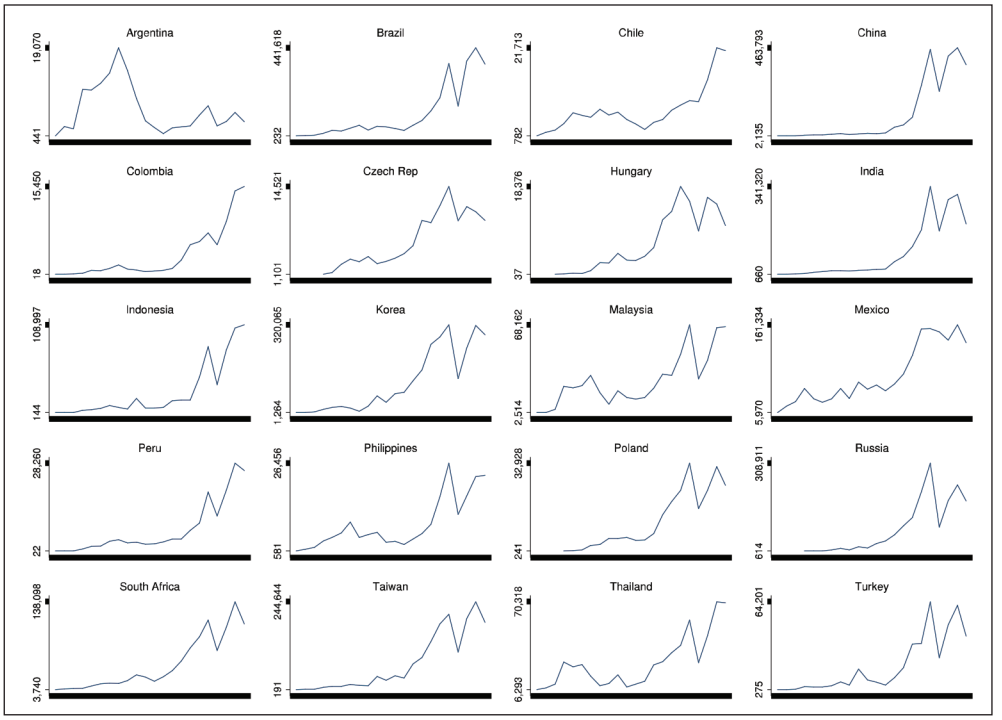
sharing: in times of crisis, creditors have lower amounts to withdraw from countries due to the losses in capital values. But from a macro perspective the available withdrawal amounts at a given point, can also be substantially larger. This calls attention to the need of studying the price changes of the different types of capital.

4.2 The Pattern of the Stock of Foreign Equity Liabilities

Another point of concern related to equity liabilities is that it is more easily affected by crises in other countries, its stock following a path that is more closely associated with the international financial conditions. Indeed, the recent evolution of the stock of equities present a very similar pattern, forming a N- or M-line across several countries (Figure 2). This striking similarity is unique to the stock of equities, not occurring in the cases of FDI nor debt.

After important increases in the mid-2000s, 2008 was a major inflexion point: following the collapse of the Lehman Brothers and the repatriation of capital to advanced economies with the consequent fall of stock prices in EMEs, the stock of equity liabilities decreased considerably – an average

Figure 2: Stocks of Foreign Assets in EMEs, Equities, 1990-2011



US$ Million. Data source: Updated and extended version of dataset constructed by Lane and Milesi-Ferretti (2007).

of 47% across the 20 countries. In 2009, the great recession in advanced countries and the relatively quick recovery of EMEs resulted in inflows of capital to these countries and the stocks of equities increased significantly, reaching a cross-country average of 72%. With this increase, by the end of 2009, the stock of equities achieved end-2007 levels – indicated by the third inflection point of the N- or M-like lines in the plots. The years of 2010 and 2011 were characterized by uncertainties related to the Euro crises. In 2010 the stock of equities still presented an increase (31%), but in 2011 it decreased (16%).

The fact that the stock of equity liabilities followed a specific N- or M-pattern in several countries calls attention to two important aspects. First, it sheds light on the importance of push factors in their determination – given that these countries' fundamentals, thus pull factors, were markedly different at this moment (Kaltenbrunner and Painceira, 2014). Secondly, this pattern is similar to the evolution of uncertainty in international financial markets, as proxied by the VIX index. The VIX suggests that the 2000s were marked by low level of uncertainty from the dot-com bubble to the GFC, when it hit a historical peak. The period after the GFC was marked by much smaller but frequent peaks of uncertainty (related to crisis in Europe). This similarity of the inflection points of the two series indicates a close association between the stock of equity liabilities in EMEs and the international financial markets.

In order to further analyze whether the pattern of liabilities is becoming increasingly similar across EMEs the study looks at the comovement of stocks of different types of capital across EMEs in different periods through a principal components analysis (PCA, a mathematical technique that reduces the dimensions of a dataset into a series of principal components – that explain as much of the variance of the original series as possible).

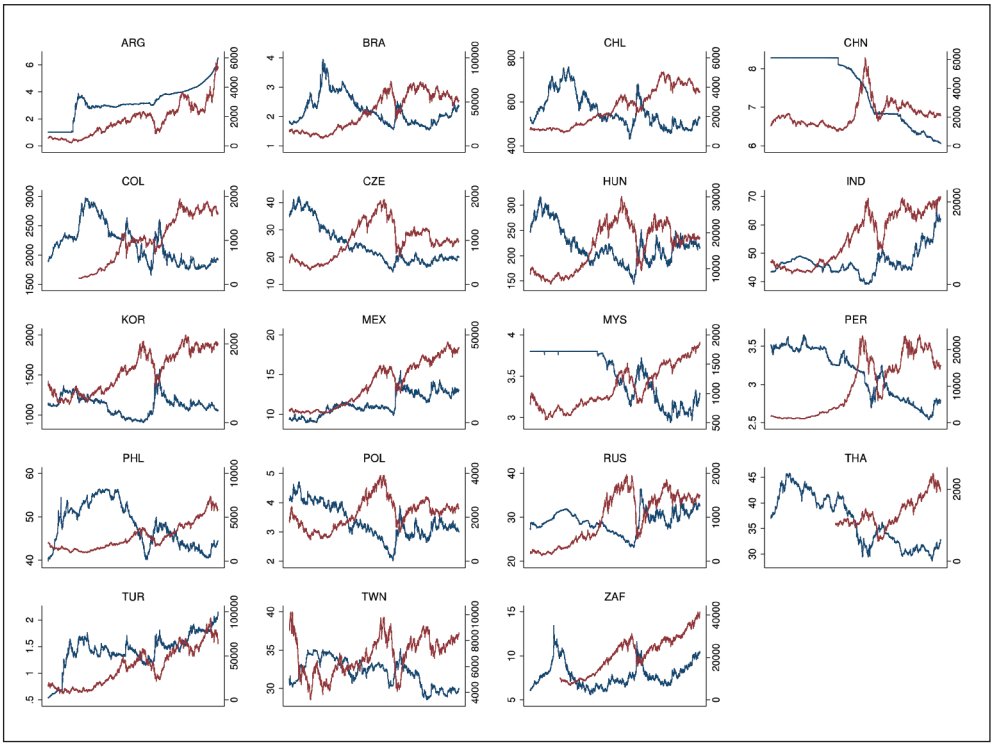
The results indicate a higher comovement of the countries' series of equities in the most recent period: while three components were needed to explain 90% of the variance of the evolution of the stock in different countries for the 1990s period, for the 2000s, two components explained more than that percentage. The pattern of the stocks of these two types of capital have also been moving in an increasingly similar pattern. With regards to FDI, two components were needed to explain the variance of the series of different countries in the 1990s, with the first one explaining 86%. Yet, in the 2000s, only one component explained 91% of the variance. With regards to debt, four components were used to explain 67% variance in the 1990s, while in the 2000s only three components

explained more than that, 85%. The analyses conclude that all three forms of capital are now more similar across EMEs.

4.3 Stock Prices and Exchange Rate Dynamics

This chapter further discusses the potential impacts of equity-financing by analyzing the interactions between equity markets and exchange rates, which are expected to have become more important due to the rise of foreign equity financing. The relationship between stock exchange and exchange rates is not the same across EMEs. In some countries or in certain periods the two seem to move in tandem, while in others, they go in opposite directions (Figure 3). The case of Brazil from 2003 to the GFC is a good example of the latter: the stock market rallied and the exchange rate appreciated (a decrease in the USD value of one Brazilian real); after, with the crisis and capital outflows, the stock exchange index lost value and the exchange rate depreciated. The same pattern is observed in Korea, India, Peru, and Poland.

Figure 3: Stock Exchange and Exchange Rates, 2000 to 2013



Stock Exchange Indices are presented in red, exchange rates are presented in blue. Data Source: Ecowin (exchange rates) and Bloomberg (stock exchange).

To model the short-run dynamic relationships between stock prices and exchange rates among EMEs a VAR model is used to test whether the exchange rate suffers impacts from the stock markets, and if the opposite causality also exists. The hypothesis behind the case of bi-directional causality among EMEs is that: i) that rising (decreasing) stock prices attract more (less) foreign investors, leading to exchange rate appreciation (depreciation); and ii) an exchange rate appreciation (depreciation), by increasing (decreasing) foreign investors' expected total returns, attracts (discourages) foreign investors; as they partially invest in stocks, there will be a rise (fall) of stock prices. Combined, these two mechanisms form a self-fulfilling spiral that can be either of a constantly appreciating exchange rate and booming stock exchange or the opposite, which is characteristic of country-runs. Kaltenbrunner and Painceira (2009) raise this point in the case of Brazil, and how this mechanism is built is studied in Chapter Seven. The bi-directional causality (with the expected signs) is found to exist in Brazil, India, Korea, the Philippines, Taiwan and Thailand; and the specific causality from exchange rates to stocks is also found in Chile, Malaysia, Mexico, Poland, and Turkey. The analyses also concluded that the magnitude of a country's stock market and the share of equities on its total foreign liabilities are good predictors of whether a change in stock prices will have an effect on exchange rates.

4.4 Conclusions

This chapter has debated the international insertion of EMEs in the last decade through an analysis of its stock of foreign liabilities, calling attention to the vulnerabilities built with new forms of integration. In absolute terms the most important increases were seen in FDI liabilities, but the potential impacts of the rise of equities as a portfolio liability is crucial. Regardless of different sizes of the economies, different fundamentals and different types of flows that are attracted, in almost all EMEs the stock of equities presented strikingly similar paths across EMEs, that coincide with the conditions of global financial markets, indicating the high importance of international conditions in their determination. This calls attention to

an extra source of vulnerability from equity liabilities: it is subject not only to domestic, but also to international shocks, being an important source of contagion of turbulence from other markets. An evidence of this risk is the association of equity prices with exchange rates found in some EMEs. In addition, given that exchange rates can also affect stock prices, a self-feeding interaction can be triggered with the rise of equity financing, leading exchange rates that behave in a deviation amplifying system.

5. THE CONCEPT OF FINANCIALIZED INTEGRATION

Within the context of the rise of financialization in advanced economies, some developing countries opted for liberalizing their financial markets and capital accounts, allowing their integration to the international financial system, characterized, in times of financialization, by the interconnectedness of markets from advanced countries and EMEs through money managers' balance-sheets and by the high level of sophistication of finance (as discussed in Chapter Two). With the rise of these features, financial integration could have implications on the determination of exchange-rates of EMEs. To test this hypothesis, this chapter suggests estimating how important financialization-related features are in characterizing these countries' integration. Or, how financialized their integration is.

Two financialization features are related to integration. The first is the higher importance of finance at the international level with its decoupling from earlier functions – what differs from financial integration for focusing on the changing function of finance internationally (Chapter Two). It should therefore not be measured by the absolute magnitude of integration, but by its characteristics. The second aspect is the sophistication of finance, through its innovations of products and usages. In this sense, a financialized integration is marked by large financial integration and sizable foreign exchange (FX) transactions relative to the underlying economic activity and trade. The relative weight of FX markets also points to the sophistication of finance, that can also be proxied by the weight of derivatives FX contracts.

This chapter discusses the presence of these characteristics in EMEs and advanced countries. It presents an account of the early 2000s and of current levels, indicating the velocity of the financialization process.

5.1 Data Used

Two main sets of data are used to characterize financialized integration. The first, the updated and extended version of the dataset constructed by Lane and Milesi-Ferretti (2007), as in the last chapter. The second set of data used relates to FX markets: the total size and weight of their derivatives contracts. It is based on the Bank of International Settlement's

(BIS) Triennial Surveys of FX Markets (BIS, 2001, 2013). The change in the structure of FX markets is analyzed by comparing two years, 2001 and 2013. The 2001 survey was chosen to represent an early stage of the impacts of financialization on EMEs and to avoid potential biases from currency-crises. The BIS dataset only includes data on over-the-counter markets, which are indeed the predominant places of derivatives trade in most countries, but not in Brazil, Korea and India (McCauley and Scatigna, 2011).

The analysis was done for the currencies for which data are available in both the 2001 and the 2013 surveys: the Brazilian real (BRL), the Chinese yuan (CNY), the Hungarian forint (HUF), the Indian rupee (INR), the Korean won (KRW), the Mexican peso (MXN), the Polish zloty (PLN), the Russian ruble (RUB), the Turkish lira (TRY), the New Taiwanese dollar (TWD), and the South African rand (ZAR). Data on countries' GDP and foreign trade are taken from the World Bank's (2015) World Development Indicators.

5.2 Measuring Financial Integration

The empirical literature on financial integration uses two main types of indicators, based on the asset prices (returns) ruling in financial markets of two countries or indicators focused on the actual liberalization or integration. The first strand of the literature assumes that every participant faces a single set of rules, has equal access and are treated equally (Baele et al., 2004). This would lead to a trend towards more similar returns of assets of identical risks in integrated markets (or the observation of the law of one price). A second expected effect is the diversification of country-specific risks and of their significance in the pricing of assets (Garcia-Herrero and Wooldridge, 2007). Two types of indicators of integration are accordingly used: the correlation among asset prices in different countries, and the importance of domestic factors in determining prices.

The strand of the literature that takes a more macro perspective examines what is now known as de jure or de facto measures. While the first analyzes the related legislation and regulation that could restrain capital mobility, the second focuses on estimations of the actual flow of capital between countries or the countries' stock of foreign assets and liabilities. The most common in the de jure literature is to use indicators of the legal restrictions on cross-border capital flows based on information from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (Chinn and Ito (2008); Garcia-Herrero and Wooldridge (2007)).

Although widely used, de jure measures have several shortcomings: restrictions may not be binding, respected or enforced; capital flows

might not have existed in the first place; the measures cover a narrow aspect of all possible impediments; and they provide the picture of one day, so temporary and permanent measures are not differentiated (Garcia-Herrero and Wooldridge, 2007). In addition, de jure measures can be biased in the case of regulatory circumvention.

Most importantly, liberalization does not mean integration, given that it only allows it to take place, not necessarily inducing it to actually happen (Bekaert and Harvey, 2000). Although the terms 'financial openness' and 'capital account liberalization' are often used as synonyms of 'financial integration', the latter does not imply open or liberalized, but something that actually happened; while openness or liberalization are sounder to indicate developments that could have taken place. In this sense, de jure measures could only be used to indicate the former (being useful for instance in studying capital controls), but integration might be better proxied by de facto measures. Moreover, while capital account openness reflects governments' choices, actual integration reflects money managers' decisions – being in line with the view of financial integration as the result of money manager's decisions

The literature on de facto measures gravitates around two main indicators: the sum of gross capital flows over GDP (following Kraay (1998)), and the sum of the gross stock of capital (assets plus liabilities) over GDP (following Lane and Milesi-Ferretti (2001)). Stock measures have advantages over flow measures. They are used in the chapter due to the study's overall focus on the dynamics of the structure that emerges with financialization of interconnection of markets through money manager's balance sheets rather than capital flows, that are seen as (part of) the outcomes of these dynamics.

Second, stock measures are sounder than net-flows measures as most financial transactions yield zero-net flows (Borio and Disyatat, 2011). This might be more frequent in countries where there are restrictions on the use of foreign currencies in domestic territory, such as in Brazil (Rossi (2014); Fritz and Prates (2014)).

Thirdly, stock measures are less ''noisier'' thus depicting a more structural picture. Fourth, because they include capital gains, stock measures provide a better indication of the vulnerability faced by countries. Finally, flows measures could be biased estimations due to their recent high volatility in EMEs. Stock variables were thus chosen for the study's analyses.

5.3 From Financial to Financialized Integration

Apart from being used by the literature on financial integration,

indicators based on foreign assets and liabilities have also been used to proxy financialization. For instance, Chesnais (1997) mentions the ownership of foreign assets in portfolios of U.S. pension funds and Baker et al., (1998) cites the value of funds raised on international financial markets. The latter is taken as a percentage of world exports, yielding in a comparison between financial and trade integration. Another direct form of comparing financial and commercial integration is to look at their weight in a country's balance of payment or GDP (Plihon, 2010).

Analyzed through the value of assets plus liabilities, China, Brazil, Russia and Korea were the ones to present the largest financial integration. When looking at integration relatively to GDP, the picture is however different. China, Brazil and Russia presented high integration for being among the largest economies. When GDP is considered, Hungary has the highest integration, followed by South Africa, Poland and Korea.

The financial-to-trade integration is especially interesting for an exchange rate analysis for indicating the relative weight of two sources of FX transactions. In this analysis, the sum of assets and liabilities over the sum of exports and imports is used. An increasing financial-to-trade integration would reflect the aspect of international finance decoupling from its prior role of financing trade and production (or the autonomy of financial globalization from production (Chesnais, 1997)), and it is evidence that at an international level, finance follows its own logic (Plihon and Ponsard, 2002).

Among advanced economies, the average indicator increased from 4.65 to 6.38, boosted by considerable increases in the United Kingdom and in the US. This different path reflects that, among advanced countries, the growth of assets' trade was huge while of goods' trade, only modest. Brazil (3.12), Hungary (2.49), South Africa (2.38), and Russia (1.86) present above average financial-to-trade integration. The average EMEs indicator is stable because in some countries there were major decreases reflecting the commodities' boom.

The total size of FX markets and the relative weight of derivatives and spot markets are crucial for characterizing integration. Both measures are used as proxies of financialization in the literature. The first, the size of FX markets, indicates both the aspect of increasing importance of finance internationally (as did Chesnais (1997) and Epstein (2005)) and the sophistication of finance, as it is evidence of the rise of carry trade operations (as argued by Galati and Melvin (2004)). The second measure, the size of derivatives markets, proxies the sophistication of FX markets

and the importance of operations as derivatives carry trading.

Between 2001 and 2013 FX markets underwent major changes in different aspects. Its total size four-folded from 2001's level and the participation of emerging currencies in total contracts doubled, achieving 8.4%. In some countries, this rise might be associated with a higher demand from trade transactions, while in others it might be associated with higher financial integration, or with an integration that involves more derivative contracts or more spot transactions as investors try gaining with exchange rate fluctuations.

When compared with GDP, FX markets have grown faster among emerging currencies than in advanced ones. While the ratio increased 108% among advanced currencies (from 0.11 in 2001 to 0.23 in 2013), it increased 158% among emerging currencies (from 0.04 to 0.10), indicating a more intense process of financialization in EMEs and a higher financialization level among advanced countries. In 2013, the highest FX-to-GDP ratios among EMEs were observed in Hungary (0.16), South Africa (0.16), Mexico (0.1) and Turkey (0.08).

The FX-to-trade indicator hints at whether ''trading has become more financial'' (McCauley and Scatigna, 2011, p. 68). The indicator demonstrates the degree of financialization, for underscoring which part of the transaction relates to trade, and which are related to 'finance'. The average FX-to-trade ratio across EMEs was 0.04 in 2001 and increased to 0.09 in 2013. The EMEs that presented the most financialized structure was South Africa (0.25), followed by Mexico (0.16) and Turkey (0.14). The financialization process was more intense in EMEs (the FX-to-trade ratio increased 136%; while among advanced economies it increased 101%) but advanced countries present a more financialized structure.

As argued in Chapter Two, derivatives contracts are essential to understand the possible consequences of financial integration on emerging currencies, because their leverage possibilities make them excellent tools for speculation and because they can also increase exchange rate volatility for being an extra conduit of determination of spot rates. Derivatives FX markets also proxy the overall level of sophistication of a country's markets, evincing the extent of the investment possibilities offered to money managers. Among advanced countries spot contracts increased more (444%) than derivatives (274%) and the opposite happened among emerging currencies: derivatives contracts grew faster than spot contracts (931% and 766%, respectively), indicating a more intense process of financialization among emerging currencies.

With the high growth of derivatives markets in EMEs, the average derivatives-to-spot ratio increased from 1.53 to 2.25 – while in advanced economies it decreased from 2.99 to 1.91 – suggesting a rather financialized structure in EMEs. In 2013, the highest derivatives-to-spot ratios among emerging currencies were the Turkish lira, the Taiwanese dollar and the Brazilian real, with around three times more derivatives than spot contracts. Compared to advanced countries, these ratios are considerably higher – only lower than that of the Danish koruna (4.7). Ratios higher than two were seen in the Chinese yuan, the Indian rupee, the Korean won, and the Polish zloty. On the other end, oil exporters Mexico and Russia (among the three largest EMEs spot markets) presented relatively low derivatives-to-spot ratios.

5.4 Measuring Financialized Integration

For having an overview of the impact of financialization among EMEs, this chapter proposes a composite index based on the above studied indicators: the stock of foreign assets and liabilities relative to i) GDP and to ii) foreign trade, the weight of FX markets relative to iii) GDP and to iv) foreign trade, and the v) importance of derivatives relative to spot contracts. Their level in the recent period indicate how financialized these countries' integration are and the changes observed between the two periods indicate the intensity of the financialization process in the 2000s.

There are different associations of these five indicators with the two aspects of financialization that have the highest potential impact on exchange rates. The first four indicators point to aspects of the financialization of growth of finance at the international level, and its decoupling from earlier functions related to the globalization of trade and production.

The characteristic of a country's FX market (the fifth indicator) and its size (the third and the fourth) point to the use of derivatives, indicating the level of sophistication of financial markets and the possibilities of speculation offered. These three series are thus used as indicators of (part of) the second aspect of financialization: the innovations of products.

The innovations of usages, such as carry trading and currency trading result in higher FX markets (the third and fourth indicators). Canonical carry trading results in high integration (first and second indicators), derivatives carry trading in higher derivatives markets and FX contracts (third, fourth and fifth indicators).

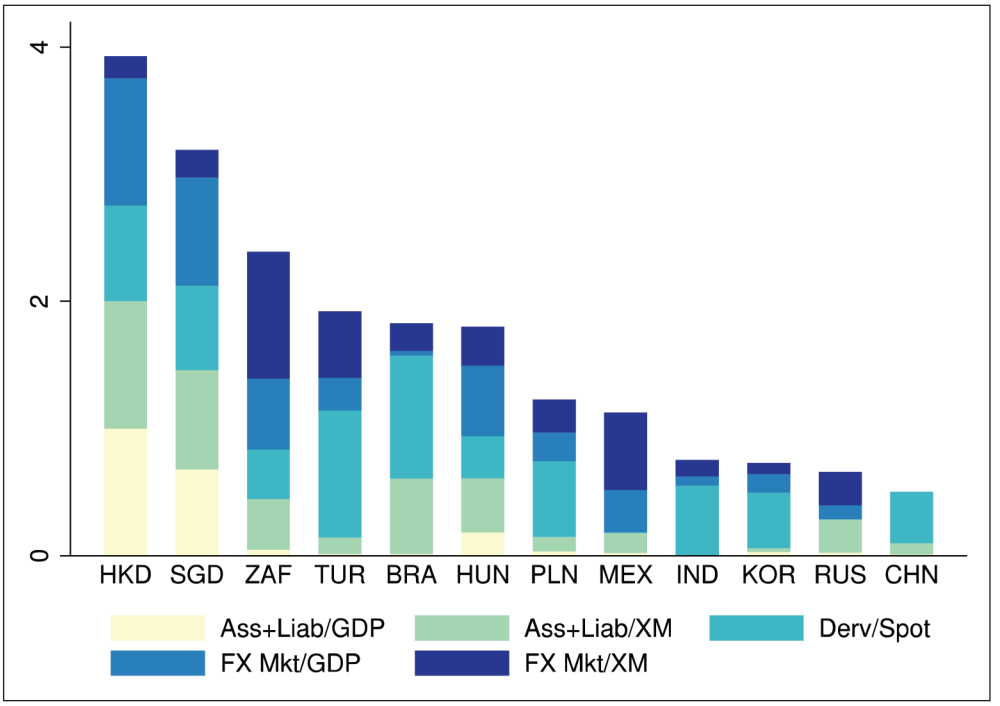
With the aim of building a financialization indicator with respect to the type of integration, these five indicators are combined in an index that proxies the level of financialization of the countries' integration, or, in

other words, of how financialized their integration are. It is presented in Figure 4.

South Africa, Turkey, Brazil, Hungary and Poland are the five EMEs to present the most financialized integration. The relative size of FX market to trade in South Africa is much higher than in other EMEs. In Turkey and Brazil the derivatives-to-spot ratio is the variable responsible for the highly financialized characterization. Poland appears with its important FX market relative to GDP and an above average financial-to-trade integration. This indicator will be used in the next chapter to analyze if financialized integration has an impact on exchange rate dynamics.

The comparison of the financialization process observed by the relative magnitudes of integration and FX markets is an interesting evidence of financialization. For instance, among EMEs, while integration grew 48% more than GDP, FX contracts grew 158% more than GDP. Being a flow, not a stock measure, FX markets are a smaller part of GDP than financial integration. Its growth, however, was higher than the growth of integration. This indicates the dissociation of

Figure 4: Index of Financialized Integration, 2011/2013



Source: Author's estimation. Data source: financial integration from the updated and extended database of Lane and Milesi-Ferretti (2007); FX turnover statistics from BIS (2013); GDP and foreign trade from World Bank (2015).

FX transactions not only from the productive economy (as proxied by GDP or trade), but also from financial integration itself. These developments demonstrate financialization, underscoring not only a decoupling from production, but also the new logic of finance at the international level.

5.5 Conclusions

The analyses of the FX markets of advanced and emerging currencies resulted in very different characteristics in the two country groups. FX markets of emerging currencies have grown at a faster pace. This development was not due to potentially different growth of GDP or trade. This evidence demonstrates a decoupling of FX contracts from the globalization of production or trade, and a more intense process of financialization among emerging currencies and EMEs. Emerging FX markets are also marked by a higher weight of derivatives contracts, showing the high sophistication of these markets and the importance of carry trading.

If international finance follows a different dynamic, the impacts of financial integration on a country are not the same, which requires an understanding of the characteristics of finance and integration: as EMEs' levels of integration vary, so do their types of integration. This chapter's analyses of EMEs' integration has four main contributions.

First, the chapter presents evidence that supports the idea of a decoupling of finance from productive economy's factors and from financial integration, among advanced and EMEs. The dissociation of finance at the international level from the productive economy is observed in the faster growth of financial integration and FX transactions than that of trade or GDP. Its dissociation from financial integration is observed in the faster growth of FX transactions than that of financial integration. In other words, there have been more FX transactions per patrimonial changes than before. As the transactions are daily and the patrimonial value is taken by the end of the year, a higher number of transactions might be associated with more frequent changes inside the year.

Seen from Kaldor's (1939) definition of speculation, this more rapid change might be understood as a rise of speculation: investors would hold assets more for their changes in prices (or expected changes) then for the returns paid by the assets, what demands frequently purchasing and selling the asset.

The second contribution of this chapter is the suggestion of the concept of financialized integration to characterize integration with regards to the presence of financialization features. The index proposed is focused on indicators that measure the

extent of the decoupling of integration from the economy's features, from financial integration, and the sophistication level of its FX market. This composite index suggests that South Africa, Turkey, Brazil, Hungary and Poland are the EMEs to present the most financialized integration to international markets.

The third main contribution of the study's fifth chapter is related to the different type of integration of EMEs vis-a-vis of advanced countries. The overall low level of the asset-to-liability ratios of EMEs when reserves are not considered support the view that EMEs have a function in the IFS of suppliers of financial assets. The chapter has also argued that the IFS is marked by an additional asymmetry with regards to emerging and advanced currencies: The demand for advanced countries' assets include purchases from developing countries' public institutions whose behavior is strongly marked by stability and is counter cyclical, while the demand of EMEs' assets stems from international money managers whose behavior is marked by speculation of assets around the globe. The low assets-to-liabilities ratio of the Brazilian real, the Turkish lira, and the Indian rupee confirm their use as target currencies. These are also among the EMEs to present the five highest interest rate differentials with the US Fed Fund rate.

Fourth, the different types of integration were also analyzed in the study through a principal components analysis, that allowed looking at countries' characteristics without first grouping them as emerging or advanced countries. The analyses confirmed that New Zealand and Australia present some 'EMEs' features' while Hong Kong and Singapore are, in some respects, more similar to advanced countries than to EMEs.

Fifth, the chapter contributes to the carry-trading literature by suggesting ways of identifying currencies used in carry trading operations through the countries' assets-to-liabilities ratio, its FX-to-trade ratios.

6. EMERGING COUNTRIES EXCHANGE RATE DYNAMICS

This chapter discusses currency features and whether they can be associated with a different type of financial integration. In addition to the financialization and the exchange-rate literatures presented in Chapters Two and Three, this hypothesis also dialogues with two important literatures: the one on the consequences of capital account liberalization or financial integration, and the push vs. pull debate on the determinants of capital flows. The analyses in this chapter suggest an impact from integration to growth prospect through the exchange rate, a transmission channel that is not considered in the financial integration literature. While this chapter's analyses are based on a type of financial integration, in the literature the impacts of integration are based on its size or magnitude. With regards to the push vs. pull literature, the analyses suggest the relevance of the international condition, a push factor. The impact is analyzed directly on exchange rates, while that literature focuses on consequences on capital flows not necessarily linking it to exchange rate dynamics.

Whether or not a country should open its capital account is an important question in economic literature. The main arguments for capital account liberalization and integration focus on the possible economic growth from the flow of capital, from abundance to scarcity, that would make cheaper loans available and reduce investors' risks by diversifying assets. The efficiency of domestic financial markets would be enhanced due to exposure to competing foreign firms; and technologies, institutions, and property rights would improve with a country's exposure to global financial markets and by the 'macroeconomic discipline' it imposes (which from another perspective, might be seen as a loss of policy autonomy). Liberalization would also allow for consumption smoothing over time (Fischer (1997); Kose et al. (2006); Levine and Zervos (1996); Mishkin (2006); Neely (1999)).

The arguments against financial integration are mainly focused on the instability brought by capital flows, which are a consequence of the procyclicality of financial markets (Borio, 2014) and of portfolio flows,

that results in an intensification of boom and bust cycles (Edwards, 2001). It is argued that developing countries crises are due to the early stage of development of financial markets (Bekaert et al. (2005); Edwards (2001); Eichengreen (2001); IMF (2001); Eichengreen and Leblang (2003); Obstfeld (2009)), an argument that persist since the debate on the sequencing of liberalization, but the mainstream position on the subject might be evolving (Blanchard et al. (2012); Claessens et al. (2010); Ostry et al. (2010); Ostry et al. (2011); Fritz and Prates (2014); Roy and Ramos (2012)). The empirical results on the impact of capital account liberalization portray mixed findings, what is confirmed by meta-analyses that led Jeanne et al. (2012) to conclude that "free capital mobility seems to have little benefit in terms of long run growth and because there is a good case to be made for prudential and non-distortive capital controls" – similar to Rey (2015); Eichengreen (2001); Kose et al. (2006), and Obstfeld (2009).

6.1 Exchange rate volatility

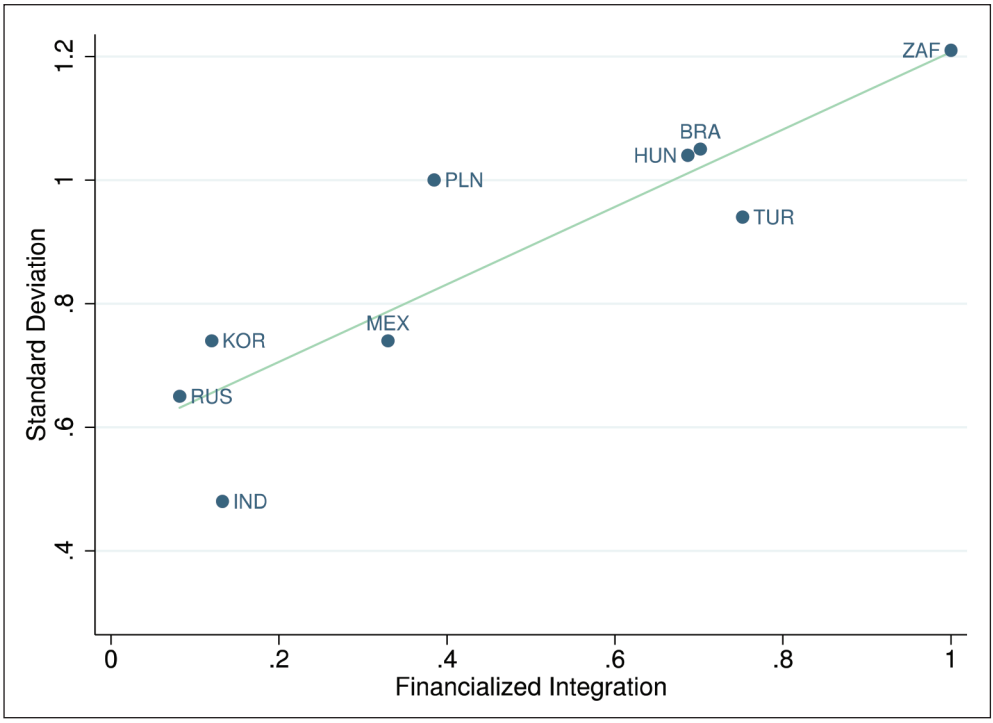
The standard deviation of the exchange rate change, the most broadly used indicator of volatility, informs the variability of the exchange rate change vis-a-vis its trend. Currencies with low exchange rate volatility, lower than emerging currencies' average, are the Chinese yuan (volatility index of 0.1), the Taiwanese dollar (0.29), the Peruvian nuevo sol (0.34), the Malaysian ringgit (0.36), the Philippine peso (0.39), the Argentinean peso (0.39), the Indian rupee (0.48), the Indonesian rupiah (0.48), and the Thai bath (0.43). A second group includes currencies with middle-high volatility, between the EMEs' average level and the euro's: the Russian ruble (0.65), the Chilean peso (0.67), the Colombian peso (0.7), the Mexican peso (0.74), the Korean won (0.74), and Czech Republic (0.86). Five currencies are on the high-volatility end, higher than the euro's, the South African rand (1.21), the Brazilian real (1.05), the Hungarian forint (1.04), the Polish zloty (1), and the Turkish lira (0.94; Figure 6).

At a first sight, this overall low value of emerging currencies volatility when compared to the euro/dollar pair contradicts claims that emerging currencies are more volatile due to their peripheral insertion in the international monetary and financial systems, but the review of these analyses done in Chapter Three argues that a different insertion would not necessarily lead to exchange rate volatility in general, but to major depreciations in moments of crisis. Furthermore, this chapter will argue that a higher exchange rate volatility would not be a characteristic of all EMEs, but only of those whose integration is more impacted by the changes of capitalism known as financialization, notably the sophistication of finance

and the decoupling of finance at the international level from its earlier functions related to trade and production (Chapter Two). Indeed, exchange rate volatility and a more financialized integration have a clearly positive relationship for floating currencies: the countries with the most financialized integration – South Africa, Turkey, Brazil, and Hungary – also present the highest exchange rate volatility. On the other end, Mexico, Korea, Russia and India have low levels of financialized integration and of volatility (Figure 5). This association is confirmed by a correlation coefficient of 0.89, significant at the 1% level.

The standard deviation does not capture the theoretical claim of sudden major depreciation. In addition, it is too narrow when compared to definitions of volatility, that point to three aspects: velocity, predictability and direction – something that is "liable to change rapidly and unpredictably, especially for the worse" ("Volatile", 2015). Deviation only partially captures these aspects. Velocity refers to how rapidly the deviation takes place, or its magnitude of the deviation. This aspect is captured by the standard deviation, which is formed by the average of every deviation. However, because it presents the same average without reflecting distribution, the

Figure 5: Exchange Rate Standard Deviation and Financialized Integration



Author's estimation. Data source: exchange rates, ecowin; for financialized integration, see Figure 4.

standard deviation does not capture the aspect of predictability. This is however very relevant given its weight on decision-making, especially relating to decisions concerning exchange rates in open economies. Specifically thinking of the decisions of foreign investors, predictability affects expectations concerning possible loss of investments. This concern calls attention to the aspect of direction of the deviation – that cannot be captured by the standard deviation, that is based on absolute values. In other words, the distribution of exchange rate changes is fat-tailed and are in the realm of what Taleb (2007) called Extremistan. As opposed to Mediocristan, where a particular unexpected event cannot have a significant consequence on the outcome of total events, in thick tailed Extremistan the one event can dominate the outcome of all other. This feature affects how money managers see a currency, being most important given the representativeness principle.

There are also problems related to the specific application of the standard deviation to time series, where the definition of normality, or of a reference value is not trivial. The standard deviation of exchange rate changes to the period's average might result in biased indicators when the volatility in different countries is compared, given that their deviations would not be compared to the same norm. For instance, in the cases just analyzed, Brazil's exchange rate appreciated 49% while India's depreciated 6%.

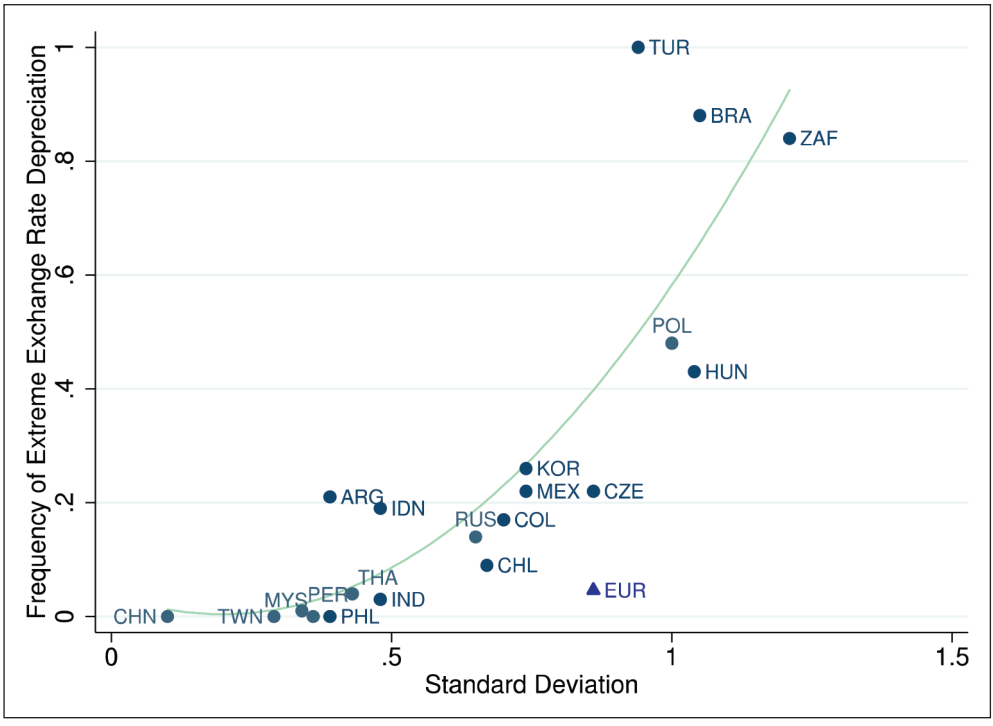
6.2 The Frequency of Extreme Exchange Rate Depreciation

Exchange rate features as 'jumps' call for estimators of volatility that take them into account not only for methodological reasons, but also because we cannot expect the economic impact of small exchange rate changes to be the same as the one of a major shock. Apart from the immediate impact of creating uncertainty, extreme exchange rate changes also impact the memory of agents: given the workings of associative memory in our intuitive thinking (or 'System 1', as labeled by Kahneman (2011)), the process of constructing a coherent interpretation of such event will create an association of the currency in question with risk. Once such association is created it is considered by investors in their decisions, even if unconsciously. This is in line with the representativeness principle, according to which the more available something is in our memory, the more frequent or likely that event is deemed to be, resulting in agents overrating the importance of dramatic events. Indeed, there is evidence that a more unstable currency is seen as riskier and investors demand a higher risk premium for holding them (Plihon, 2010).

To account for these features, the study proposes the characterization of exchange rate volatility based on the probability distribution of extreme daily exchange rate depreciations. As the definition of 'extreme' is arbitrary, analyses are done based on the frequency of exchange rate change higher than five thresholds: 2%, 3%, 4%, 5% and 6%. This measure captures the volatility aspects of velocity (or magnitude), predictability and direction (see Figure 6 for the result of the max-min indices, where one denotes the currency where the frequencies were the highest and zero indicates no extreme depreciation in the analyzed period). Emerging currencies tend to have more extreme exchange rate depreciations than the euro. Only the volatility of the Philippine peso, the Taiwanese dollar, the Peruvian nuevo sol, the Indian rupee, and the Thai baht are lower than that of the euro – apart from the non-floating Chinese yuan and Malaysian ringgit.

As expected, there is a positive relationship between the two estimators of volatility: the standard deviation and the frequency of extreme depreciation. This relationship is

Figure 6: Frequency of Exchange Rate Depreciation and Standard Deviation

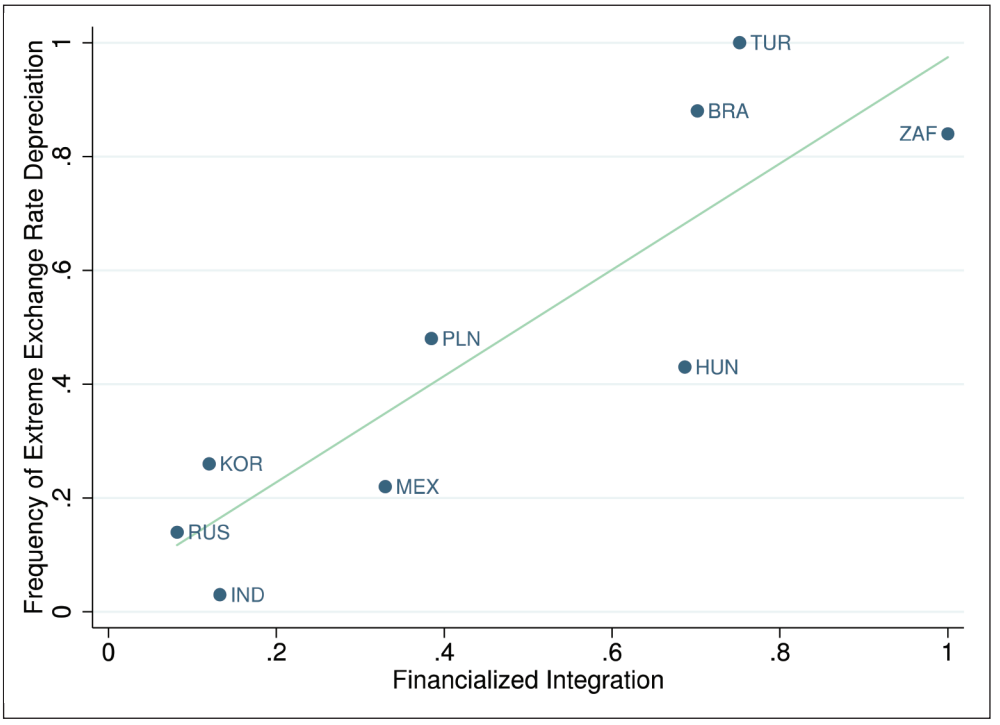


Author's estimation with exchange rate data from Ecowin.

better described by a quadratic fit than by a linear one: countries with a higher frequency of extreme depreciations only have slightly higher standard deviation. This relationship supports the argument that the use of the standard deviation as a measure of volatility can veil extreme values and thus hide the existence of 'micro-crisis'. As seen, the euro has behaved differently than emerging currencies with a standard deviation that is much higher than what would have been predicted by its frequency of extreme depreciations: while most of the deviations of the euro are higher than the ones of emerging currencies, these are not extreme deviations.

The frequency of extreme depreciations is strongly correlated with a more financialized integration (Figure 7): The countries with most financialized levels of integration also present the the highest frequencies of extreme depreciations: South Africa, Brazil, Turkey, and Hungary. The relationship between these two variables is positive and strong: the Person correlation coefficient is very high, 0.9 and significant at the 1% level.

Figure 7: Frequency of Extreme Exchange Rate Depreciation and Financialized Integration



Author's estimation with exchange rate data from Ecowin. For financialized integration, see Figure 4.

6.3 Subordination to international financial conditions

Heterodox analyses focused on measuring risk aversion or liquidity preference mostly use the VIX index (Baumann and Gallagher (2013); Bonizzi (2013); Hoffmann (2013); Kaltenbrunner and Painceira (2009); Kaltenbrunner (2011); Da Silva and Da Fonseca (2015); Prates and Biancareli (2009); Weiss and Prates (2015)) and its use is also spread in mainstream circles (Bekaert et al. (2013); Rey (2015); Basu and Bundick (2012); Forbes and Warnock (2012)). Although the VIX index is estimated with regards to the S&P500 index, it reflects the conditions of financial markets in all major centers, due to the interconnectedness of global financial markets and the particular depth and therefore central role of US markets in international financial markets.

Several empirical studies use the VIX as a proxy for risk aversion or liquidity preference internationally and conclude for the importance of these factors in explaining capital flows, pointing to the importance of push factors in their determination (Ahmed and Zlate (2014); Weiss and Prates (2015); Obstfeld (2015); Bruno and Shin (2015); Rey (2015)). The causality from the VIX to higher capital flows is not the same across these studies. According to the 'risk-taking channel' approach, a lower VIX enables Value-at-Risk constrained banks to take on a greater leverage and then invest in EMEs, leading to an appreciation of their currencies and a decline in measured risks that allows a second round of capital flows (Bruno and Shin, 2015). The study however follows Kaltenbrunner and Painceira (2009) and Weiss and Prates (2015), that see the VIX as an indicator of liquidity preference. High levels of liquidity preference – and of the VIX – would lead to flight to assets denominated in highly-liquid currencies capital flowing to EMEs only if liquidity preference is low. According to this view, it is expected that a moment of low liquidity preference, marked by a low and stable VIX would allow appreciation of the emerging currency, while a hike in liquidity preference would lead to depreciation.

To examine the association between the VIX and emerging currencies, the correlation between the two was calculated for the 2003-2013 period: The Pearson correlation coefficients vary significantly across the countries, from 0.46 in Mexico to 0.005 in Russia. The countries where the correlations of their exchange rates with the VIX index are the highest are: Mexico (0.46), Brazil (0.38), Hungary (0.32), Poland (0.33), Turkey (0.36) and South Africa (0.35).

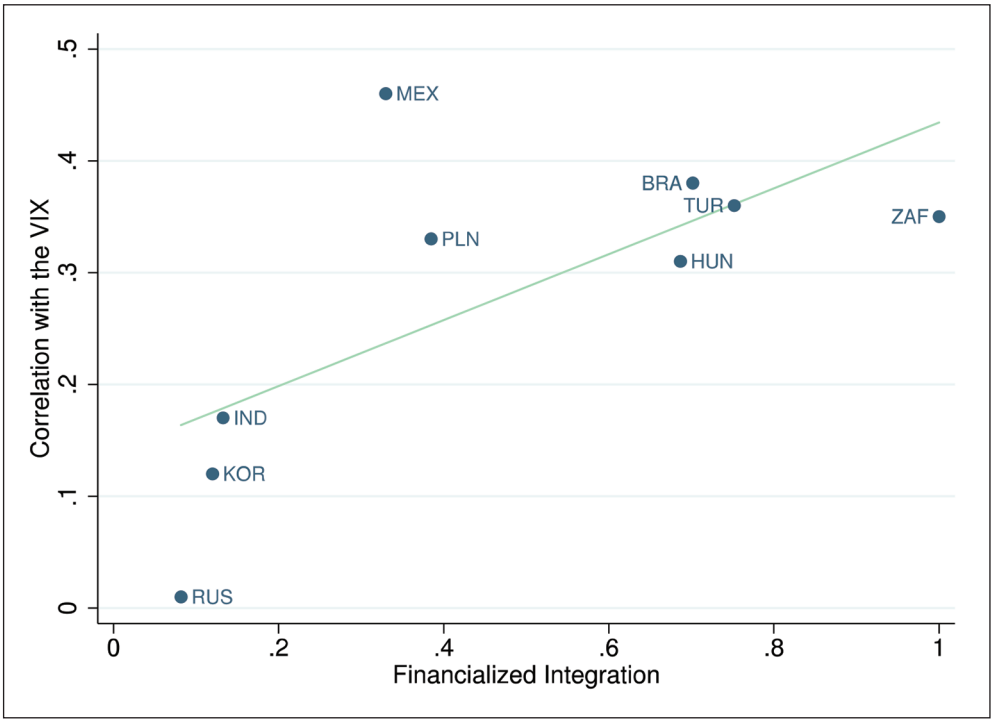
Could the different level of correlation with the VIX be explained by the type of integration these countries have?

Examining the list of countries with the highest correlation with the VIX, it is found that five out of the six countries present the most financialized type of integration: Brazil, Hungary, Poland, Turkey and South Africa (Figure 8) supporting the hypothesis that a more financialized integration leads to a higher influence of the conditions of the international financial markets on emerging currencies.

6.4 Correlation of Currencies

It is also interesting to note the correlation among the different emerging currencies that arise form the fact that two currencies are determined by one external factor. It is expected that the currencies of neighboring countries are more correlated among themselves, given their similar ties and that foreign investors build their expectations upon the same set of variables. But relevant correlations are also found among currencies of different regions. Six currencies are highly correlated with at least three currencies of other continents: the Brazilian real, the Hungarian forint, the Mexican peso, the Polish zloty, the South African rand, and the

Figure 8: Exchange Rate Correlation with the VIX Index and Financialized Integration



Author's estimation. Source: exchange rates, ecowin, VIX, CBOE (20015), for financialized integration, see Figure 4.

Turkish lira. This suggests that these currencies have a higher influence on international financial conditions, and, indeed, these are the ones to present a more financialized integration.

6.5 Conclusions

This chapter analyzed emerging currencies' features and whether they are associated to the country's type of integration to international financial markets. It presents intriguing evidence that support the following ideas. First, a high level of financialization of a country's integration (Chapter Five) is strongly associated with significant deviations of the currency from its trend and with frequent extreme depreciations. As shown in the study, the relationship between this indicator and exchange rate volatility is stronger than variables as the interest rate differential, de jure indicators of openness, several de facto indicators of integration, and indicators of the size of FX markets. Among these other variables, the country's interest rate differential is the only meaningful explanatory variable. The strong association between financialized integration and exchange rate volatility is also robust to different country groupings: all of the EMEs, only those with floating exchange rates, or only those with important FX markets.

Secondly, EMEs with a more financialized integration have currencies which are more correlated with international liquidity conditions. The interest rate differential is also a relevant variable in explaining the correlation with the VIX, but the level of financialization of its integration has a higher explanatory power.

Thirdly, floating emerging currencies have been presenting an increasingly similar path; the countries with more financialized integration have presented a strikingly similar path in the turbulent (most recent) period and present the highest number of relevant out-of-the-region correlation.

These findings raise important theoretical- and policy-related concerns. The evidence of comovement of currencies indicate a high influence of external factors in determining these currencies, while the high correlation with the VIX indicates one possible external factor: the condition of international financial markets. Such an exchange rate determination seems at odds with the mainstream theories (Chapter Three). In mainstream models, the impact of the international scenario is limited to interest rate differentials, which is a measure of return, not of uncertainty. These findings are also not in line with the mechanisms focused on bank constraints as major exchange rate changes, as those related to the Lehman Brothers' collapse or the Euro crisis, are not associated with changes in monetary policies, but a change of uncertainty levels. In this

sense, the chapter indicates the role of external conditions, rather than country fundamentals. The importance of liquidity preference in determining investments in low-liquid currencies (Chapter Three) are the most appropriate theoretical background for these findings. They explain both the comovement of currencies (as they all have the same characteristic), the correlation with the VIX (that proxies liquidity preference) and the high frequency of depreciations (due to turbulence of international financial markets and liquidity preference).

With regards to the pull-vs-push literature, the comovement among currencies and with the VIX supports the role of push factors and the correlation of currencies with the VIX supports indicate that this factor is related to the conditions of international financial markets. With regards to the literature on the implications of financial integration, the comparison of the explanation power of level of financialized integration to the indicators of financial openness and integration revealed the higher relevance of the first in underscoring the relevance of the characteristics or type of a country's integration instead of its magnitude in determining emerging currency patterns.

7. THE FRAGILITY OF EMERGING CURRENCIES, A MINSKYAN ANALYSIS

The prior chapter presented the main features that characterize some exchange rates: frequent extreme depreciations, volatility, and subordination to international financial markets. This chapter proposes an explanation of how this pattern of fragility. Based on an enlargement of Minsky's framework, the analysis has at the central stage money managers' decisions and how they interact with the macro environment determining emerging currencies' dynamics. The analysis is in line with the findings of the heterodox literature and makes use of the insights brought by the literature focusing on emerging currencies' attributes. It however offers a broader framework that allows the account of larger sets of events in determining emerging currencies, further enlightening our understanding of their dynamics.

They key role of money managers in the analysis derives from the manifest role of international financial conditions in the determination of emerging currencies. These institutions have great impact in any market for being a limited number of agents who hold significant amounts of capital and tend to make similar decisions (as they are guided by the same assets' ratings and tend to simulate important indices; Plihon, 2003). For having their liabilities in these countries and assets in markets across the globe, money managers created a network where different countries' markets and currencies are interconnected through money managers' balance-sheets, making their decisions key for exchange rates. The importance of portfolio investors in exchange rates is broadly recognized by the heterodox literature as well as by the most recent mainstream frameworks (such as behavior finance, micro-structure, and carry trade).

The centrality of money manager's balance-sheet in interconnecting markets makes the Minskyan framework, centered on a unit's decisions and its balance-sheets, ideal for the analysis. In addition, Minsky's framework sheds light on the dynamics of the expansionary phase of the cycle, the moment when fragility is built. With this focus, it explains not only exchange rate depreciation, but also its previous appreciation. Although both might be equally undesirable, the crisis literature is devoted to depreciation episodes, the reasons

behind the major appreciation being left aside. Finally, Minsky's framework is explicit on interactions among different agents what is recognized as key in complex systems (Arthur, 2013) and behavior models, but not yet contemplated by the models that deal with the specificities of emerging currencies.

7.1 The Financial Instability Hypothesis

As a 'post-Keynesian institutionalist', Minsky provided great attention to the institutional structure of his analyses (Wolfson, 2002). In the financial instability hypotheses (FIH), the background is specific: "a capitalist economy with expensive capital assets and a complex, sophisticated financial system" (Minsky, 1992). As production must be financed, capitalist economies are characterized by a system of borrowing and lending based upon 'margins of safety' (Minsky, 1993) – the 'cushions' between the cash commitments and the prospective cash receipts involved in the investment decision (Kregel, 2008). According to the desired margins of safety, each firm (or, more generally, an economic unit) has a combination of cash inflows and outflows, which is at the heart of Minsky's famous hedge, speculative and Ponzi characterization.

For hedge units, "flow of funds that result from the normal functioning of the assets it owns (...) are sufficient to fulfill current and future expected payment commitments due to liabilities" (Minsky, 1993, p. 80). Speculative units, on the other hand, "expect the cash flows (...) to be less than the cash payment commitments in some, typically near-term, periods" (Minsky, 1986, p. 230). A Ponzi unit "is similar to a speculative financing unit in that, for some near-term periods, the cash payment commitments exceed the expected cash receipts on account of owned assets" and not even the interests on debt can be paid (p. 231), demanding new debt to be issued (Minsky, 1993).

But Minsky also offers us an enlarged form of seeing his framework, that broadens its potential use to different contexts. Speculative and Ponzi are differentiated from hedge units for having an additional "element of uncertainty in financial relations" (p. 80): "speculative – and Ponzi-financing units have to meet changing financial market conditions, whereas a hedge unit will be impervious to such changes" (Minsky, 1986, p. 231). The differentiation between speculative and Ponzi is subtle: in the latter, margins of safety are shrinked.

The differentiation of units composes the FIH, that is divided into two theorems. The first defines the fragility of the economic system based on the relative presence of each type of unit:

If hedge finance dominates, then the economy may well be an equilibrium seeking and containing system.

In contrast, the greater the weight of speculative and Ponzi finance, the greater the likelihood that the economy is a deviation amplifying system. (Minsky, 1993, p. 8)

The second theorem is the increase of fragility over periods of prolonged prosperity: over a run of good times the structure changes as hedge loses weight to speculative and Ponzi financing (Minsky, 1992, 1993). The weight of Ponzi units evolves because the choice of margins of safety depend on the stability of the economic environment: in a run of good times, expectations are constantly being confirmed, leading units to reassess their prior decisions as too conservative and to reduce margins of safety.

In a fragile situation a crisis can be triggered by any 'not-unusual' shock, or 'not-abnormal' event (Minsky,1993, p. 81). The emphasis on the shock being 'not-unusual' is meaningful: it is an event that can occur at any time, but that only triggers crisis because the system is fragile when hit. Crisis are endogenous: they occur because the economy is fragile, and fragility is endogenously built, although the event itself might be exogenous.

7.2 Emerging Currencies' Fragility

Although created for studying the fragility of a closed economy based on the behavior of firms, the FIH has also been used in other context, specially since the late-1990s developing countries' crisis. These work's methodologies consist of examining the new context from 'the lenses of Minsky's framework'. More precisely, of identifying the manifestation, in the new context, of the most important Minskyan elements – the taxonomy of units according to their margins of safety; the confirmation of expectations; the interconnection among units; the 'not-unusual' event; the debt-deflation and the spread of the crisis (Kregel (2004, 2008, 2016); Dymski (1999); De Paula and Alves (2000); Arestis and Glickman (2002); Wolfson (2002)).

In the same vein, the fragility of emerging currencies is analyzed by transposing the Minskyan elements to the context of money managers' investment decisions as well as the causalities of the traditional phases of the cycle – its tranquility and trigger of the crisis, the build up of fragility with self-feeding interactions, the 'not-unusual' event, and debt-deflation, which, in this case, is an asset/exchange-rate deflation. Policy implications are also discussed.

7.2.1 The Economic Units: Money Managers

In the analysis proposed, central units are not productive units, but money managers, whose survival constraint is to maximize profits (as because flows migrate to the successful fund managers; Minsky, 1990, p. 32). More than dividends distributed or interest

paid, money managers are interested in asset's total returns, that include capital gains (Minsky, 1990) – and, in an international context with floating exchange rates, include exchange rate returns (which, are indeed a common focus of the products and practices that emerged with financialization as seen in Chapter Two).

7.2.2 Exchange Rates and Margins of Safety

Margins of safety have the crucial function of connecting assets and liabilities. In Minsky's original analysis, they represent the cushion between the expected inflows and the payment commitments. When thinking of money managers with the possibilities of allocating their assets abroad, the exchange rate is the key element in determining the margins of safety as it adds a currency mismatch to their balance-sheets.

Money managers have three general possibilities for portfolio allocation: i) assets of the country where they have their funding from, ii) assets of another advanced country, or iii) assets labeled in emerging currencies (that are an increasing part of the EMES' assets). The exchange rate is the major difference among these three options, as a return and a risk variable. The first possibility represents the hedge case, of the highest margin of safety, as money managers are not exposed to exchange-rate risk. In the other two cases, units' exposition to exchange rates is the parallel to being exposed to changes in financial markets conditions in Minsky (1993). These are speculative and Ponzi units. The third allocation possibility is the Ponzi case, with the lowest margins of safety because of the mentioned higher frequency of extreme depreciation of emerging currencies, thus higher risks of loosing assets' value.

7.2.3 Self-Feeding Interactions, Tranquility and the Build-up of Fragility

In Minsky's original analysis, the expansionary phase of the cycle begins in a period of tranquility as "the apparent 'stability' (…) generates changes of expectations" (Papadimitriou, 1997, p. 14). In the aftermath of the Dotcom bubble in the early 2000s, the return differential paid by EMEs increased following lower interest rates in the US and was also favored by the rise of tranquility in the international financial sphere and among of emerging currencies.

7.2.3.1 Self-feeding interactions

The special combination of higher return differential and tranquility caused an initial hike in demand for EMEs' assets, which in turn created the conditions for the expansionary phase of the cycle through spirals of increasing price and increasing demand. The higher demand for any of the country's assets (including the currency itself) put appreciation pressure on the currency, leading to

an expectation of further appreciation, that increases the expected return differential, increasing capita flows and appreciation. If the higher demand is targeted at equity prices, the impact will be greater, for creating an expectation of higher capital gains from the appreciation and the stock price.

These self-feeding interactions might be more easily triggered in EMEs for two these countries' attributes. The first is the bias of the money manager attracted by EMEs given the mentioned higher volatility of their currencies: they are likely to be more drawn to exchange rate returns and respond more quickly to a first exchange rate appreciation. The second is the small size of their markets vis-à-vis the magnitude of foreign portfolio investors (seen in Chapter Four).

7.2.3.2 Tranquility and the evolution of assessments

Whether a first surge of demand for EMEs' assets will be sustained depends on the extent that it changes expectations of agents. In the 2000s, the increase of demand of EMEs' assets from money managers guaranteed the stability of EMEs' FX markets, combined with the absence of crisis in EMEs' economies – in some EMEs, the boom of commodities prices also favored demand of their assets through an expected exchange rate appreciation. Thus, after the initial moment of tranquility, crisis became too far in memory and prior investment decisions of not investing in EMEs were considered as excessively conservative and reviewed.

Parallel to that, money managers that decided not to invest in EMEs (hedge or speculative money managers) were also propelled to do for having lower returns than those that did (Ponzi money managers), which can decrease their funding. This pressure certainly existed in the 2000s: from 2003 to the GFC, emerging market returns as proxied by the MSCI Emerging Market index have grown 230%, far outpacing returns in advanced countries that, proxied by the S&P 500, grew 41%.

The impact of money managers' decisions in appreciating EMEs' assets and currencies, and in guaranteeing the stability of their FX markets is crucial. It confirms Ponzi money managers' decisions of investing in these markets as sound and lead speculative units to reassess their decisions. As more money managers assess that not investing in EMEs is too conservative the self-feeding cycle of appreciation and tranquility is self-fulfilled.

A subsequent step to further increase its exposure to emerging currencies is through the leveraging possibilities of FX derivatives. Ponzi money managers are exposed to emerging currencies; to be exposed through

FX derivatives could characterize another type of Ponzi, a 'super Ponzi' unit. With the rise of this practice, emerging currencies receive an additional pressure, strengthening the appreciation cycle and reaffirming money managers' decisions as sound.

The confirmation of expectations led to the rise of a convention in favor of EMEs, as shown by the increasing use of the BRIC acronym by the financial media evoking excitement about investment opportunities (Fourcade, 2013); the decoupling study in 2007; the continued capital inflow to these countries in 2009; and the expectation that EMEs' share in global portfolios would continue to rise (Goldman Sachs, 2010).

The boom phase of the cycle is thus characterized by self-feeding interactions where money managers' expectations and decisions confirm themselves creating a convention favorable to EMEs further fueling the cycle through the appreciation of EMEs' asset and currencies (as it will be seen next). This is a very important mechanism for resulting in exchange rates that are a deviation-amplifying system, the opposite of the convergence mechanism characteristic of when exchange rates clear markets.

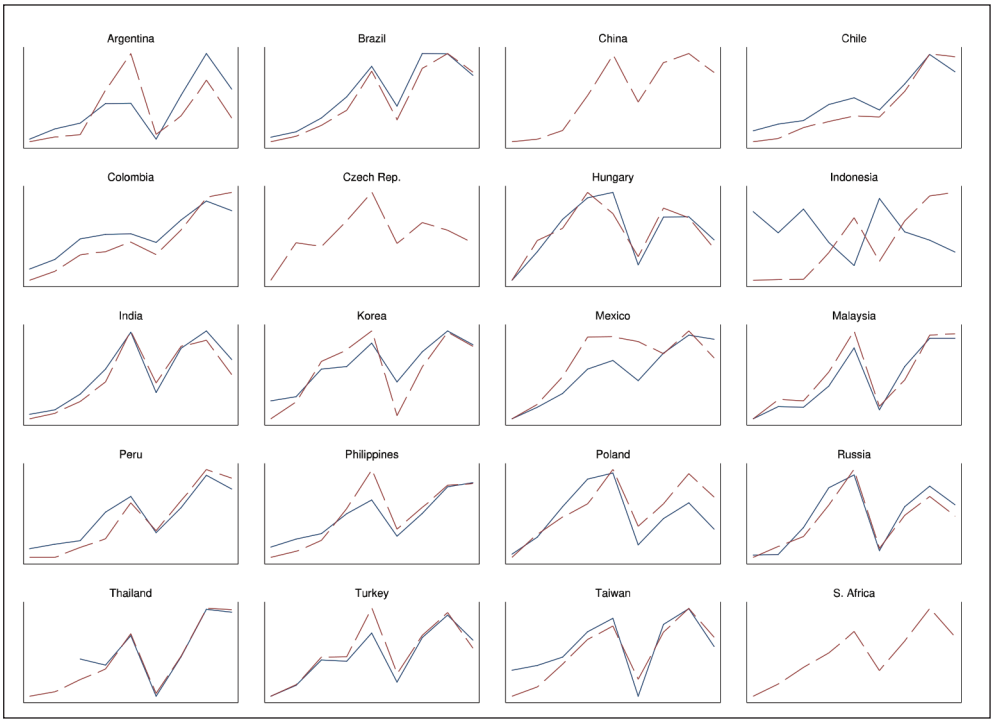
7.2.3.3 The Impact on Markets

The build-up of fragility is reflected in markets. Pre-GFC low levels of the J. P. Morgan's Emerging Market Bonds Index (EMBI) are evidence of the peak in the desirability for EMEs' assets. EMEs' assets were not only more in-demand in this period, but their share in money managers' portfolio also increased. This demonstrates the changing margins of safety, being a direct evidence of the second theorem of the FIH when applied to this chapter's context. Indeed, the share of EMEs' equities in the MSCI World Index increased from 5% in 2000 to 13% in 2010 (Goldman Sachs, 2010) and in 2012 the share of EMEs' assets in the portfolios of U.K. pension funds nearly doubled from the 2001's 6.5% (Bonizzi, 2013).

EMEs' stock prices boomed with the increasing demand from foreign investors as demonstrated by the similarity of their pattern with the stock of foreign equity liabilities (Figure 9). The cross-country increasingly similar pattern of EMEs' foreign equity liabilities, as seen through the N– or M-shaped curves of the series, is also evidence of money managers' increasing weight in these markets.

As argued, not only EMEs' assets, but also their currencies inflated with money managers' investment. This interaction is evident in Figure 10: in many EMEs the increase (decrease) of the stock of foreign portfolio liability is associated with exchange rate appreciation (depreciation). Indeed, a bi-directional causality of stock prices

Figure 9: Stock of Foreign Equity Liabilities and Stock Exchange Index: 2003-2011

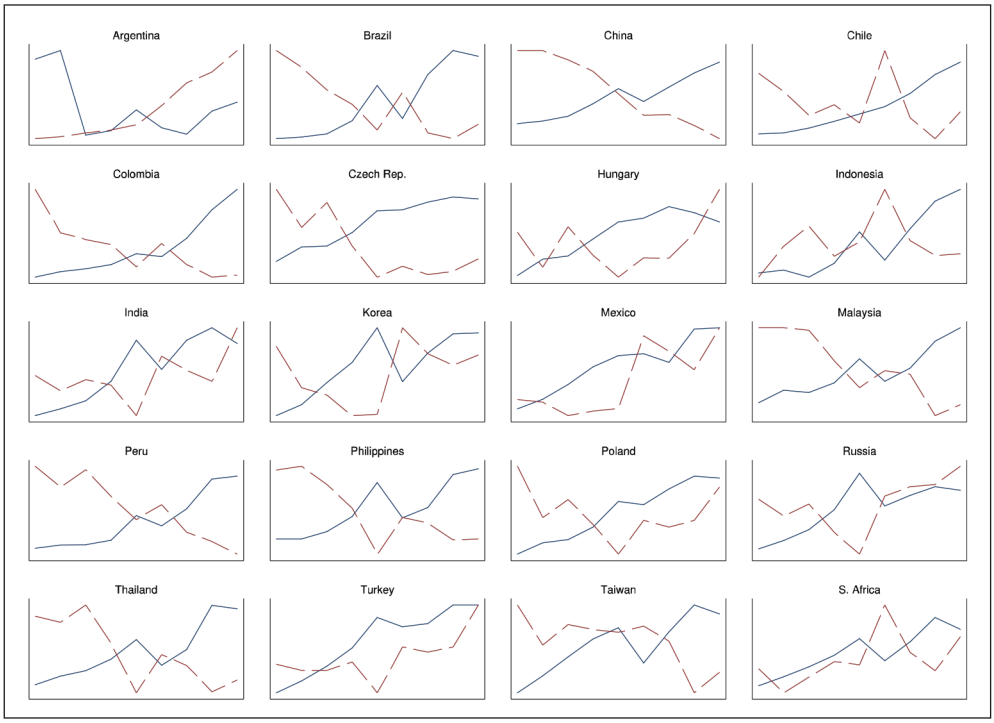


Data source: the stocks of foreign equity liabilities, Lane (2007); stock exchange indices, Bloomberg. The first are presented in dashed red lines, the latter, in solid blue lines.

and exchange rates, that empirically supports the idea of self-feeding mechanism between stock prices and exchange rates is found in almost half of the EMEs with floating exchange rates: Brazil, Hungary, India, Korea, Peru, Russia, Taiwan, and Thailand (Chapter Four).

Similar to what happened with EMEs' foreign liabilities, the external determination of exchange rates resulted in the different EMEs' currencies following similar patterns – the correlation with other emerging currencies is especially noteworthy for the Brazilian real, the Hungarian forint, the Mexican peso, the Polish zloty, the South African rand, and the Turkish lira, that were highly (coefficient higher than 0.4) correlated with at least three emerging currencies of other continents from 2003 to 2013. The fact that this correlation emerges from the high influence of international financial conditions is demonstrated through their high correlation with the VIX index. The highest correlations are the ones of the Mexican peso (0.46), the Brazil real (0.38), the Hungarian forint (0.32), the Polish zloty (0.33),

Figure 10: Stock of Foreign Portfolio Liabilities and Exchange Rates: 2003-2011



Data source: exchange rates, Bloomberg; the stocks of foreign portfolio liabilities, Lane (2007). The first are presented in dashed red lines, the latter, in solid blue lines. Both are end-of-year values.

the Turkish lira (0.36) and the South African rand (0.35; Chapter Six).

These evidence show that by investing in EMEs, money managers put appreciation pressure in emerging currencies and increase the stock of foreign capital of these economies. This is a fragile situation, where an event that would make money managers decide to sell EMEs' assets could trigger a currency crisis.

Fragility is endogenously built, according to the discussed self-feeding interactions, the reassessments of decisions and the confirmation of these decisions. However, it is exogenous to EMEs, depending mostly on money managers' decisions (EMEs interact to the extent that they do not pass by crises that would change the tranquil scenario). The fact that emerging currencies' fragility is endogenous to money managers' decisions and exogenous to EMEs underscores their subordination to the conditions in the international financial markets and explains why the currencies that suffered the greatest depreciations with the GFC are the same that passed through the greatest appreciations until that point, the turbulence at

that moment not being related to the countries' fundamentals (Kohler, 2010; Kaltenbrunner, 2014).

7.2.4 The end of the Boom Phase: Fragility and Exchange Rate Turbulence

The end of the booming phase of the cycle is followed by a sell-off of assets in an asset-exchange-rate deflation dynamic. As mentioned, exchange rates interconnect money managers: when some money managers sell their assets, they push for an exchange rate depreciation that decreases the value of other money managers' portfolios (as measured in their funding currencies) and create an expectation of further depreciation, leading other money managers to sell their EMEs' position, fueling the spiral further. This negative spiral is intensified given money managers' focus, and the reliance of their total returns, on exchange rate returns (Chapter Two).

In the 2000s, the collapse of Lehman Brothers was a major event that caused substantial turbulence in emerging currencies as these were sold due to money managers' balance-sheet constraints. Concerning the assets' side, money managers preferred to hold more liquid currencies, the ones used as store of value, in order to face uncertainty (Andrade and Prates 2013). From the liabilities' side, they purchased the advanced countries' currencies needed to meet their financial obligations (Kaltenbrunner, 2015). More generally, by selling EMEs' assets, money managers reduced the currency mismatch of their balance-sheets and, with one less element of uncertainty, increased their margins of safety.

The reasons for selling the emerging currencies could have been others, as due to an expectation of reversal of the exchange rate appreciation trend due to assessments that this was overvalued (as in Orléan (1999, 2004) or Harvey (2009)), or because of crisis in EMEs. The specific trigger of the crisis is not the point of the Minskyan analysis, as much as how fragility is created, allowing a crisis to take place. Given EMEs' role in financialization as provider of financial assets, the smaller magnitude of their markets, and their currencies' attributes, they are structurally fragile to money managers' assessments, in general, and to exchange-rate crisis related to the international sphere, specifically.

7.3 Conclusions

Minsky's original crisis analysis is based on the indebtedness and investment decisions of firms, but applied to other situations it also resulted in in-depth analyses through the understanding of decisions of a core agent, specially of how expectations evolve creating the fragility that allows a crisis to take place. As proposed in the chapter, these studies are based

on the analysis of how the following elements manifest in the new context: the taxonomy of core units' margins of safety according to expected inflows and outflows; the interconnection among units; the rise of tranquility; the self-feeding interactions and the confirmation of expectations; the 'not-unusual' event; and the 'debt'-deflation and the spread of the crisis.

In the dynamics defining emerging currencies' pattern since the 2000s, money managers are the core units, their portfolio allocation decisions evolve with tranquility in international financial markets and in EMEs' FX markets. Given the centrality of exchange rate returns in times of financialization and the volatility of emerging currencies, to be exposed to emerging currencies is the Ponzi investment decision, of lower margins of safety. As crises become far in memory, some speculative money managers reassess prior decisions of avoiding emerging currencies as too conservative. Accordingly, demand for EME's assets progressively increases. Given the small magnitude of EMEs' markets, a first hike of demand for their assets triggers a self-feeding cycle of appreciating assets and currency and increasing demand. Ponzi money mangers' decisions confirm themselves, and create a convention favorable to EMEs.

Through the cycle of increasing appreciation, fragility is built: emerging currencies are subject to sharp depreciations according to money managers' decisions. As argued in the chapter, their decisions can be related to balance-sheet constraints, as in the case of the GFC, when emerging currencies were sold for eliminating the currency mismatch of money managers' balance-sheet, and/or for providing them with the advanced countries' currencies that store value (Andrade and Prates, 2013) and/or are needed to meet the financial commitments due (Kaltenbrunner, 2015) – which are, respectively assets' and liabilities' concerns. Given that EMEs' markets are tied to each other and to those of advanced countries through money manager's balance-sheets, the impact of balance-sheet considerations might be enlarged with financialization: when fragility is installed, crisis in markets around the globe might trigger exchange rate crisis in an EME. Fragile currencies can also suffer crisis from a change of money managers' expectations – if the currency is believed to be overvalued (as in Orléan's analysis) or if portfolio inflows are expected to decrease (as in Harvey's (2009) analysis). Moreover, the two cases might be rooted in external or domestic events. The focus of the Minskyan approach presented is not on the trigger of the crisis, but on the build-up of fragility that subordinates emerging currencies to money managers' decisions significantly enlarging the possibilities

of crisis. Accordingly, the analysis underscores the need for policies to limit self-feeding interactions in the expansionary phase, when fragility is built. Accordingly, three main policies are recommended: capital inflow controls, reserves of international assets, and derivatives management technique (these are deeply discussed in the study's seventh chapter).

The analysis of emerging currencies' dynamics demonstrated a very different pattern than that of mainstream exchange-rate theories: instead of being determined by a country's fundamentals in an equilibrium-seeking mechanism that characterizes market clearing, they are marked by a deviation-amplifying system subordinated to external scenario and by constant crisis.

In comparison to heterodox exchange rate theories, the Minskyan framework and the analysis of exchange rates through money managers' decisions denotes a shift of focus from the attributes of emerging currencies, or from expected portfolio inflows, to the decisions of money managers. It does not contradict those models, but is a broader framework, where balance-sheet considerations are neatly accommodated.

8. CONCLUSIONS

The study is centered on how financialization influences emerging currencies' dynamics. The analysis has a theoretical and an empirical axis. Theoretically, it analyzed how different financialization-related phenomena impact exchange rate determination (Chapter Two) and how the mechanisms brought about by these phenomena are taken into account by the exchange rate literature (Chapter Three).

Empirically, the financial integration of EMEs and their currencies' FX markets were subject to in-depth analyses that aimed at assessing the manifestation of financialization-related phenomena in these countries (Chapters Four and Five). The hypothesis of the impact of financialization on exchange rates was tested by comparing the different levels of financialization of a country's integration with the fragility of its exchange rates (Chapter Six).

Based on the findings from the theoretical and empirical analyses, the study proposed to investigate exchange rates through Minsky's framework (Chapter Seven). The analysis presented is in line with the financialization-related phenomena, accounts for the specificities of EMEs and their currencies, and results in the exchange rate features found in the empirical part. Through this framework, the mechanisms at place that determine exchange rate dynamics are presented in detailed form, allowing an assessment of how vulnerabilities are built, and accordingly, indicating policy implications.

The main findings of the study's chapters are presented in the Introduction Chapter. This chapter discusses the study's main contributions to two fields: financialization and exchange rates.

8.1 Financialization and EMEs' Integration

The term financialization is used in many different contexts as reference to various different phenomena. The review (Chapter Two) indicated three main developments that are referred to as financialization, for a more precise use of the term:

i) the increasing importance of finance at the international level with the decoupling from its earlier functions and logic;

ii) the changes within the financial system, with the sophistication of finance through major innovations of products and usages, the increasing importance of markets, and the evolution of banks; and

iii) the changing relationship between finance and other economic sectors, with the increasing importance of the first and its associated class group, the rentiers.

From a focus on the international level, the study suggested a definition of financialization as the patrimonial and increasingly speculative logic of finance at the international level – as revealed from the innovations of usages and products and the amounts traded. As analyzed, the major volumes traded internationally relative to the underlying productive economy led authors to argue that finance was no longer attached to its prior functions of financing trade and production, following its own logic. The 'excess' increase of finance was related to financial integration, that grew considerably with liberalization and materialized in important increases in the volumes traded on the financial account vis-a-vis the current account. The study refers to this phenomenon as the (re)emergence of a patrimonial logic of finance at the international level. The analysis of the recent innovations of usages and products concluded that this new logic is centered on exchange rate returns, what characterizes it as increasingly speculative. This argument was confirmed by the marked rise of FX transactions vis-a-vis financial integration in both advanced countries and EMEs. These innovations include FX derivatives, and practices focused on exchange rate returns, as derivatives carry trading and currency financialization more broadly, or that are exposed to exchange rate returns, as canonical carry trading and equities or other instruments denominated in local currencies. As these practices and products are not used in every country or currency, financial integration has different rationales in different contexts, what requires the consideration of their features in analyses of their impacts. This is a major finding of the study and the argument underlying the empirical analyses.

The rise of money managers is a major change seen with financialization that pervades the three aforementioned developments. They are portfolio investors funded in advanced countries; small in numbers and managing the major amounts of liquidity available in these economies, they have a great impact on markets. As the study suggests, these institutions are key in determining exchange rates for creating a network, through their funding and portfolio allocation choices, where different countries' markets and currencies

are interconnected through money managers' balance-sheets.

The study argues that with the integration of EMEs to this network, and the use of their assets and currencies in the most innovative practices, emerging currencies are now subject to money managers' decisions, which, based on their balance-sheet constraints, depend on

conditions of the funding markets in advanced countries and markets where they have assets, across the globe.

Therefore, understanding the exchange rates of EMEs involves understanding the dynamics of this network and of money managers balance-sheet constraints. This position is revealed in different methodological choices of the study, such as the utilization of stock data in empirical studies to characterize this network; and the Minskyan and the SFC approaches to discuss exchange rates emphasizing the decisions of money managers and how they interact with the economy more broadly.

8.2 Integration and Emerging Currencies' Dynamics

Although all EMEs are subject to money managers' decisions for being, by definition, the developing countries that are the most financially integrated, their currencies' dynamics are not all the same, some presenting more turbulence than others. The study has raised the hypothesis that the different exchange rate dynamics are a result of a country's type of integration according to the mentioned different rationales.

To test this hypothesis, the study proposes an index that characterizes integration in regards to financialization. This is a strong contrast to analyses of financial integration, which are based on indicators of magnitude, and a clear consequence of the centrality of the changes of finance associated with financialization and of the importance given to country specific dynamics. The indicator of financialization of integration is based on measures of integration and of the magnitude of FX derivatives markets vis-a-vis the underlying economy: the stock of foreign assets and liabilities relative to i) GDP and ii) foreign trade; the weight of FX markets relative to iii) GDP and iv) foreign trade; and v) the importance of derivatives relative to spot FX contracts (Chapter Five). The analyses conducted concluded that the EMEs with the most financialized integration are Brazil, Hungary, South Africa, and Turkey.

The level of financialization of integration was compared to exchange rate features that characterize the concerned dynamic of turbulence – volatility and high frequency of extreme depreciations – and subordination

to the international financial sphere (Chapter Six). The index was also compared to emerging currencies' correlation with emerging currencies of other continents, reflecting the importance of the external component in their determination. Based on critical reviews of the methodologies used to estimate currencies features, these analyzes resulted in a rich depiction of emerging currencies.

The study thus tested the association of the currency features with the financialization level of the integration, revealing a strong relationship: a more financialized integration is related to exchange rates that are more subordinated to the international financial conditions and more volatile due to their higher frequency of extreme depreciations. The exchange rate features were also compared to measures of the magnitude of integration, revealing a higher explanatory power of the type of integration. These results are crucial for studies on exchange rates, on the determination of capital flows, and on the impacts of integration.

The correlation of exchange rates with the VIX and with other emerging currencies hints to the impacts of an external component in determining exchange rates, thus to a higher importance of push forces in determining the demand for these countries' assets. Although the analyses of the push vs. pull literature are focused on their impacts on capital flows (Chapter Six), their study using exchange rates is complementary and interesting, making use of more frequent data, it more precisely indicates the impact of the rapidly changing external conditions, especially given the increasing shot-term focus.

The higher explanatory power of the type, rather than the magnitude, of integration is most relevant for the literature that analyzes the impact of capital account liberalization and financial integration on an economy. This literature measures integration through its size, but the focus on magnitudes overlooks the fact that financial markets lead integration with different aims and through different practices, leading to different outcomes in terms of flows.

Countries' integration are different and so are their impacts on exchange rates. To consider the type of integration also implies adding concerns over exchange rates, which are indeed an important transmission channel: in the case of turbulence of nominal rates, through its impact on uncertainty, and thus on investments; and indirectly, for affecting the level of the real exchange rate, through its impacts on trade.

A broad implication of the empirical results on exchange rate theories is the need for theoretical frameworks that are in line with the countries' type

of integration. In a small open economy that trades a commodity, the price of this good might be the most relevant variable in explaining the countries' exchange rate. In the case of EMEs, as the most turbulent exchange rates are the most correlated with the international sphere, the decisions of international portfolio investors are crucial in understanding exchange rate patterns. Accordingly, this result indicates the need to analyze exchange rates through the decisions of the main actors of international financial markets, the money managers. The higher turbulence of the currencies from highly integrated countries and where FX derivatives are important underscores the need to consider the role of derivatives FX markets and focus on exchange rate returns that might be behind the important magnitude of FX markets.

This is done in Chapter Seven through a Minskyan analysis, based on money managers' decision concerning the desired exchange rate exposure, that evolves with the macro environment. This analysis is a relevant contribution of the study to the use of Minsky's approach in other contexts: it suggests a form of transposing his original framework not only to the international sphere, but also presents the insights when units' decisions refer to assets, instead of liabilities – in this case, money managers' portfolio allocation decisions. Investment in EMEs' assets and currencies are affected by the international condition by the impact of uncertainty. As emerging currencies offer lower liquidity premium, a decrease of uncertainty and liquidity preference positively impacts demand for emerging currencies. The tranquility of the currency's FX markets is also important. It is a feature that progressively increases demand, in tandem with the gradual distance to crisis. This is clear in a framework with heterogeneous agents: as crises become far in memory some money managers reassess prior decisions of avoiding more aggressive investment options as too conservative. Given the centrality of exchange rate returns in times of financialization and the findings on the volatility of emerging currencies, the more aggressive investment option for the money manager is the EME's asset. Accordingly, demand for EMEs' assets progressively increases as crisis are forgotten.

Fragility is built through the cycle of increasing demand, appreciation, expectation of further appreciation, stability of FX markets, confirmation of prior decisions and creation of a convention favorable to EMEs. At this moment, any event that drives money managers to reassess their decisions can result in extreme depreciation. These events can be associated to the EMEs or to any other market that is part of money managers' network, any balance-sheet constraints.

The point of the analysis is less to identify one specific cause, but to discuss how fragility is installed allowing these events to impact emerging currencies. The analysis argues that the fragility of emerging currencies is endogenous to the behavior of money managers, that, in turn, is based on emerging currencies' features of high volatility and is intensified with the availability of liquid derivatives FX markets. Their behavior, combined with the specific features of EMEs' insertion, allows a self feeding mechanism to install, and the build up of fragility that will end up with an extreme depreciation, or crisis. This is an important outcome of the study that contrasts with other exchange rate models.

This explanation of emerging currencies crisis diverges from those provided by the mainstream literature (Chapter Three) revealing the role of foreign portfolio investors, instead of governments, in creating the very reasons for the crisis. Given the variety of policy options (Chapter Seven), if governments have a role to play in these crises it is not for having inappropriate policies that lead to misalignments, but for allowing fragility to take place. With regards to exchange rate determination more generally, the framework demonstrates that these fluctuate according to money managers decisions that are not necessarily related to the country in question, but to their balance-sheet constraints. This greatly contrasts with most exchange rate models.

The focus on investors' decisions differs from models solely focused on macro variables (as most traditional mainstream frameworks, including portfolio and carry trading models), but is similar to some heterodox approaches (Orléan, Schulmeister and Harvey) and the mainstream behavioral finance analyses. It however differs from these latter models for demonstrating that exchange rates can also be impacted by events that are external to the country in question. In this sense, it is similar to the heterodox approaches focused on the specificities of emerging currencies, which emphasize the role of international financial conditions (as Andrade, Prates and Kaltenbrunner), but it includes events other than the ones related to the advanced countries, such as events in another market where money managers have assets, as these impact their balance-sheets.

Another important point of divergence between the results of the suggested framework and the exchange rate theories is the equilibrium seeking behavior. As shown, with the self-feeding mechanism emerging currencies become a 'deviation amplifying system', whose trend depends on an external determinant. This strongly contrasts the idea of equilibrium seeking and market

clearing pattern of exchange rates put forward by mainstream models (Chapter Three). Equilibrium-seeking mechanisms are also included in heterodox models (as technical trading in Schulmeister or as the deviation of a variable from its conventionally estimated value, in Orléan and Harvey), and this mechanism might be at place among emerging currencies. They are however subordinated to cycles depending on international conditions that are broader, resulting in larger swings of these currencies marked by major crisis.

Due to emerging currencies attributes and the characteristics of their countries' insertion, their dynamics are different than those of advanced countries and of other developing countries. Understanding emerging currencies' dynamics demand frameworks that allow its specificities to manifest. The study presented three main contributions in this sense.

The first is the modeling of key elements for explaining emerging currencies, such as liquidity premium and liquidity preference in the SFC framework, which allow their consideration in those models. The study has also suggested ways of modeling investors' expectation formation and FX trading strategies, which are crucial in times of financialization and allow important mechanisms to emerge. The second is the indication of the features to be accounted for by comparing currencies from advanced countries and from EMEs given the importance of their extreme depreciations, and their subordination to international financial markets. Thirdly, the study has presented a framework that details the mechanisms that lead to these exchange rate dynamics: a currency's demand depends on money managers' decisions on their desired exposure to exchange rate returns and the currencies' features; these decisions that evolve with the global macro environment.

8.3 Policy Implications

As shown throughout the study, emerging currencies are subordinated to international financial conditions because of their type of insertion and because their demand depends on international liquidity preference – ultimately due to their currencies' low liquidity premium vis-à-vis of the central ones. In this context, two main policy alternatives emerge (Chapter Seven).

The first is a reform of the IMFS similar to Keynes's suggestion of an 'International Clearing Union', a central bank of central banks that would issue an international currency, as the 'bancor', and liquidate countries' central banks position (Cintra and Prates, 2013). An international

currency to denominate contracts and that allow countries to trade in their own currencies would decrease the asymmetries of the international monetary system where the U.S. dollar is the only currency that exercises the three functions of money, thus reducing the subordination of every other currency, including the ones from EMEs.

The second alternative includes country-level policies focused on decreasing fragility given the structural asymmetry. In this sense, the main options are: capital inflow controls, reserves of foreign assets and 'derivatives management techniques'. As argued, these policies decrease the impact of money managers' innovative strategies in building the fragility of emerging currencies. Accordingly, they could attenuate the deleterious impacts from the hierarchical nature of the IMFS, and are a crucial step in favoring long-term investments, trade, and growth through more stable exchange rates and monetary policy autonomy.

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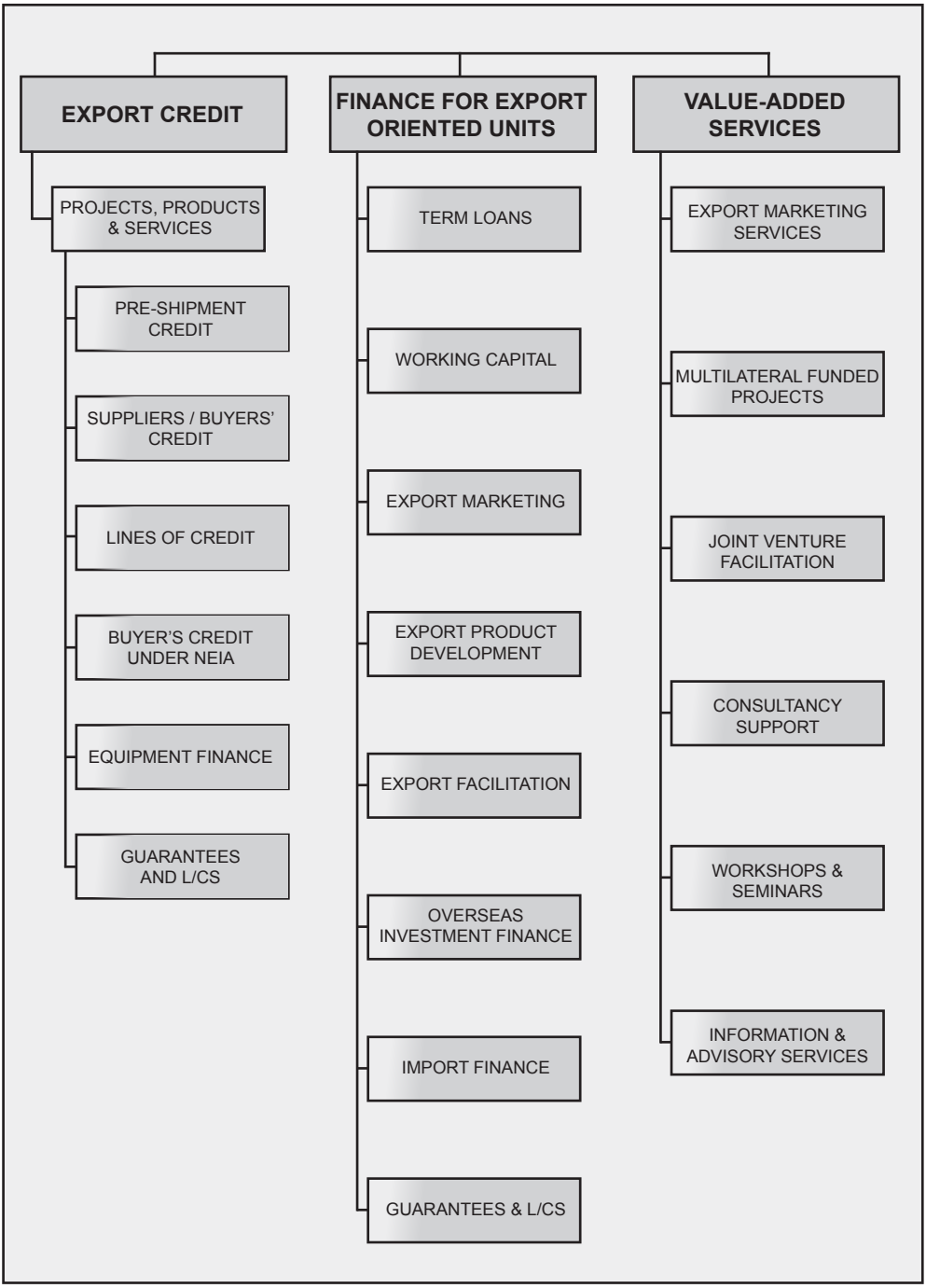

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