

Should emerging countries intervene in foreign exchange rate markets?

A critical review of the literature in light of 21st century developments

João Pedro S. Macalós¹

1 Introduction

Recently, the modern money theory (MMT) branch of post-Keynesianism, which has Wray (2015) as its main reference, is gaining traction in the economic debate worldwide. Challenging the conventional orthodoxy, these authors claim that monetarily sovereign countries do not face any binding budget constraint since they can never go bankrupt in their own money. As a consequence, austerity policies are not only theoretically flawed but are also detrimental to the economic activity as it depresses effective demand. In contrast, these authors defend that only real constraints can bind government activity, and that the role of the government is to intervene in the economy as the ultimate guarantor of full employment, regulating the economic cycles.

When confronted with the criticism that these set of policies are only valid for the United States since other countries would face the external constraint if they attempted to run these policies (see, for instance, Epstein (2019); Vergnhanini and De Conti (2018) for recent critiques), MMT authors reaffirm that the theory is valid for every country that operates with its own sovereign currency and do not commit to defend any exchange rate peg. Therefore, one important corollary of MMT theory is an emphatic defense of floating exchange rate regimes. The difference between the United States and other countries is that practically all foreign-held debt is denominated in USD², making it easier for Americans to serve their external debt, and the global demand for USD-denominated assets is high, allowing them to run persistent trade deficits without much pressure in their exchange rate markets³. Thus, “the question is not *whether* these “nonspecial” countries can exchange their currencies to buy imports, but at what exchange rate” (Wray 2015, p. 125). In this scenario, exchange rate policies have only a limited importance.

Nonetheless, two groups of Latin American structuralist post-Keynesian authors (henceforth structuralists) have been arguing for long that the balance of payments and the exchange rate are crucial to understand the macroeconomic dynamic of peripheral countries, especially the emerging market economies (EME) that have engaged in the process of financial globalization⁴. The first group, that we denote as the “currency hierarchy school” mainly emphasizes the asymmetrical structure of the international monetary and financial system (IMFS) and argues that unrestrained financial flows in this scenario create disruptive booms and busts cycles and financial crises. On the other hand, the “new developmentalist” school emphasizes the real constraints created by the Dutch disease and claims that a

¹ Ph.D. candidate at the CEPN – Université Paris 13 Sorbonne Paris Cité. Email: joaomacalos@gmail.com.

² U.S. dollar. All currencies are referred by their international codes.

³ Another crucial difference between the United States and other countries is that American foreign trade is denominated in USD. This feature, underestimated by MMT authors, limits the pass-through between currency volatility and domestic consumer prices.

⁴ We use here the definition proposed by Prates (2017).

competitive and stable exchange rate is essential for technological catch-up and long-run development. For both groups, exchange rate policies are an essential tool of economic policymaking.

The objective of this paper is twofold. First, we will propose a synthesis of these post-Keynesian branches, arguing that an understanding of the structural features of the world economy leads to the recognition of the importance of exchange rate policies in EMEs, and that the highest policy space is enjoyed by the countries that keep their right to intervene in foreign exchange markets when it is convenient. Secondly, we will support our arguments with empirical evidence from a group of EMEs that supports the claims that exchange rate policies are important to avoid exchange rate crises and to stimulate investment in these economies.

2 Modern money theory in EMEs

To fully grasp the arguments of MMT and its policy recommendations, we have to start from its understanding of money and monetary sovereignty. MMT adopts a “chartalist” theory of money that is influenced by the works of Knapp (1924) and Lerner (1947). This theory emphasizes that money is a creature of the state in the sense that it is the necessity to pay taxes in a specific token that makes it money. Since it is impossible to settle a transaction with something that does not yet exist, MMT monetary theory logically implies that the state must first create its own money and spend it in order to supply enough money for society to settle their taxes liabilities⁵. It is only later that taxes are collected in order to drain these resources from the economy (Tcherneva 2016; Wray 2014a).

Therefore, it is a logical consequence of MMT theory that taxes cannot “finance” government spending. In this sense, there is no “budget constraint” on governments that issue their own money since they will always be able to make payments with their own money when they come due. Hence, the government is monetarily sovereign when it issues and uses its own sovereign currency⁶ (Wray 2015). The concept of monetary sovereignty is intimately related to the principle of functional finance (Lerner 1943). Briefly, the functional finance principle relies on the fact that a country cannot be forced to default on its own currency. Thus, both government expenditure and taxation should be judged by their effects or their function in the economy and not by any abstract measure of the sustainability of public debt. For Lerner, the government has two main responsibilities: it must keep aggregate spending at a level that would eliminate unemployment and inflation, raising expenditures if there is involuntary unemployment or raising taxes if there are inflationary pressures; and it should balance the supply of government bonds and money in order to target the interest rate at a level consistent with the desired investment in the economy.

The policy space acquired by monetary sovereignty and the principles of functional finance are the main contribution of MMT to advise economic policymaking in EMEs. It theoretically claims that a sovereign government does not have any objective constraint to pursue its domestic objectives. Thus, it is not only

⁵ MMT authors adopt the important institutional simplification of consolidating the treasury and the central bank in a single entity – the “state”. This simplification obscures several real-world constraints, even if they are arguably “self-imposed”. See Lavoie (2013) for an overview of these limitations.

⁶ A sovereign government must hold the power to determine which money of account it will recognize in its accounts and it must have the monopoly power to issue this same currency. Finally, it should be able to determine how monetary contracts will be enforced, and decide how it will make its own payments. See Prates (2017) for a discussion of the concept of monetary sovereignty

about financial stability but about policy space to implement independent policies. According to Wray (2015, p. 41), these principles “apply to both developed and developing nations, and regardless of the exchange rate regime”. However, governments that peg their currency must take the maintenance of their fixed parity into consideration when executing their economic policies, which objectively limits their policy space. Therefore, the exchange rate regime is not neutral and a floating exchange rate would offer the maximum policy space according to MMT authors. In the words of Tymoigne and Wray (2013, p. 2): “only floating currency regimes are ‘fully’ sovereign in the monetary sense.”

Therefore, a common theme in MMT (Sardoni and Wray 2007; Tcherneva 2016; Wray 2014b, 2015, among others) writings is the unequivocal defense of floating exchange rate regimes based on the premise that it would guarantee the maximum policy space to undertake economic policies aimed at domestic objectives due to the absence of any commitments to defend a fixed exchange rate peg. Even if they do not borrow or use foreign currency in their daily operations, governments that peg their currencies have to take into consideration the effects of the chosen base interest rate and of the current level of fiscal expenditures on the exchange rate. In this sense, they are not completely independent to pursue full employment domestically and can be forced to break their promise to defend a parity.

The analysis of MMT resembles the mainstream perspective of the monetary trilemma. For Sardoni and Wray (2007), fixed exchange rate regimes are only useful in the context of almost perfect capital immobility. In the contemporaneous context, however, financial markets determine international capital flows and their size and volume make it almost impossible for single countries to defend a fixed exchange rate. In this context, floating exchange rate regimes are preferable even if they can create external instability in terms of currency volatility since they allow the government to focus on its domestic issues and avoid the disruption of peg abandonments. Hence, there would be a trade-off between external and internal instability, with the former being less damaging. Since it is difficult to impose capital controls on an ever more financially globalized world (although it could be desirable), the choice for macroeconomic autonomy must rely on the flexibility of the exchange rate.

Furthermore, MMT authors underline that a monetarily sovereign country that allows its exchange rate to float is free to set the domestic base interest at its discretion while “dollarized” (and, implicitly, any fixed exchange rate regimes) countries are objectively constrained to set their base interest rate by three factors: i) the U.S. base interest rate, that constitutes an objective floor; ii) a risk-premium measured by the market’s assessment of the country’s creditworthiness; and iii) the need to keep the exchange rate fixed to another currency (Sardoni and Wray 2007)⁷. Thus, MMTers defend floating exchange rate regimes because sovereign countries that float can afford to buy anything for sale in their own currency and they can freely determine the level of their policy interest rate. Moreover, they can always bid for foreign currency in the exchange rate markets to pay for their imports – although the exchange rate can vary significantly⁸.

⁷ As we are going to see in the next section, authors from the ‘currency hierarchy’ argue that EMEs with floating exchange rate regimes will face exactly the same constraints. Given the lack of international liquidity, interest rates lower than in central economies would lead to capital outflows in the absence of capital controls. In theory, exchange rate movements could absorb all the external movements; however, the effects of currency depreciation would jeopardize other policy objectives – particularly price stability – and shrink political support for government policies.

⁸ According to Wray (2015, p. 128), this principle is valid for both developing and developed countries, and there is no meaningful difference between the issuer of the reserve currency (the U.S.) and the rest of the countries. He

Given the importance of monetary sovereignty and the degrees of freedom allowed by floating exchange rate regimes, it is natural that MMT authors (Sardoni and Wray 2007; Tymoigne and Wray 2013; Wray 2015; among others) argue that the most efficient way to reduce external vulnerability is to avoid external debt altogether. “The position should be clear: MMT argues that sovereign currency increases policy space, so issuing debts in foreign currencies should be avoided.” In another passage, they argue that “[i]n terms of development policy, the Treasury and the central bank of a country should avoid issuing financial claims that promise the delivery of a foreign currency. That would include the prohibition of ‘bailing-out’ domestic financial institutions that have issued liabilities in foreign currency. Let private sector firms go through the bankruptcy process if needed” (Tymoigne and Wray 2013, p. 40-41 and 49-50). Wray (2015, p. 127) also emphasizes this point, noting that countries indebted in foreign currency must service this debt and could run into debt servicing problems. “Thus, it is almost always a mistake for government to issue foreign currency bonds.”

Given that the problem of private indebtedness in foreign currency is ignored and the government should avoid it completely, the accumulation of international reserves for precautional reasons is briefly acknowledged as a wise policy⁹ but considered unnecessary and a costly substitute for capital controls, which should be adopted to avoid the instabilities of international financial flows. For Bibow (2008, 2010), they consist in fact of “sunk costs” for EMEs. In a cost-benefit analysis, he argues that this policy is misguided since there would be no clear benefit from joining financial globalization and thus there is nothing to be covered by this insurance. He proposes instead the adoption of capital controls that should be aimed to regulate both aggregate financial flows and their composition¹⁰.

On the other hand, the accumulation of international reserves for competitive reasons are criticized by MMT authors. In their analysis, net exports are a “cost” in real terms for the nation since goods produced locally are consumed abroad (Sardoni and Wray 2007; Tcherneva 2016; Wray 2015). Instead, Sardoni and Wray (2007) argue that sovereign countries could allow their currencies to float and reap the benefits of net trade deficits while preserving their policy space to achieve full employment domestically¹¹. Even if they recognize two caveats to this argument: net exports could fill the demand gap in economies that are operating below full employment, and net exports could have multiplier effects and stimulate the growth

admits that the global demand for the USD might allow bigger current account deficits in the U.S., but claims that the question for EMEs is just at which exchange rate they will be able to acquire their imports. For him, “the sovereign government always gets ‘free lunches’ by keystrokes. [The difference is that] The US government potentially gets bigger lunches”.

⁹ For instance, Wray (2015, p. 130) notes that one of the lessons that Asian nations learned from the 1990s crisis is that “massive reserves are necessary to fend off speculators” and Sardoni and Wray (2007, p. 3) argue that “the size of capital markets and the volume of daily transactions makes it very hard for single countries to effectively counteract and neutralize decisions made in these markets to defend their rate of exchange – unless they are able to accumulate huge “war chests” of international reserves.”

¹⁰ Therefore, Bibow (2008, 2010a, 2010b) considers that self-insurance policies and capital controls are substitutes. This position is controversial and several authors (see, for instance, Bussiere et al. (2013)) are presenting evidence of the complementarity of the two.

¹¹ This argument is only true if you pay for your imports in your own currency. As MMT authors always emphasize, a balance of payment is never in disequilibrium since a trade (current account) deficit is always balanced by a financial surplus (ignoring the unsustainable depletion of official reserves). However, it is not reasonable to believe that foreigners will lend to EMEs running current account deficits and offering interest rates lower than in the global financial centers. Only the issuer of the reserve currency can have at the same time an independent monetary policy and net deficits, even with capital controls.

path of the economy, they claim that from a functional finance perspective, it would make more sense to adopt domestic fiscal policies aimed at full employment and let the current account and the government balance to adjust accordingly. Hence, persistently targeting current account surpluses would be a “beggar thyself”¹² strategy (Wray 2015). Furthermore, it would also be a “beggar-thy-neighbor” strategy since it is not possible for all countries to run this strategy at the same time. If every country on the planet was to follow this strategy, there would be a deflationary bias in the world economy that could potentially trigger trade wars (Bibow 2010a; Kregel 2015; Wray 2015).

The greatest contribution of MMT authors to the exchange rate policies and external vulnerabilities debate is their particular emphasis on monetary sovereignty. Any country will have more policy space to pursue its domestic goals if it issues and uses only its own sovereign currency since it can never be forced to default on its own currency. Furthermore, any country that uses only its sovereign currency should have the ability to determine its own policy interest rate. Therefore, there would be no substance in the arguments that external debt is needed to fund the government due to the lack of domestic savings nor that external debt is cheaper than domestic debt.

However, MMT proponents fail to understand the structural differences between distinct currencies in the international monetary and financial system (IMFS) that is asymmetrical and hierarchical. As a consequence, they generalize arguments that would be valid in principle only for the United States and, perhaps, to other central countries. This failure is at the root of their trilemma-based insistence on the advantages of floating exchange rate regimes. In particular, there is nothing that prevents floating regimes to face real appreciations as their fixed peers. Furthermore, the international demand for USD makes the United States a special country in the sense that it can almost freely run current account deficits. For EMEs, a current account deficit can only exist if there is an equivalent financial surplus (assuming away the unsustainable depletion of international reserves), and financial investment will not take place if local rates of return are smaller than what can be safely obtained in central markets. In this context, the adoption of an MMT policy mix of low-interest rates and expansionary fiscal policy can lead to a fast depreciation of the currency (as higher imports would be combined with financial outflow) that would be transmitted to domestic prices, causing inflation that would undermine the whole set of economic policies. EMEs cannot neglect their trade balance if they want to run a truly independent monetary policy.

Finally, their insistence that exports are a “cost” and imports are a “benefit” is only true from a static, short-term, perspective. A steady flow of imports is crucial for EMEs that are trying to catch-up with state-of-the-art technology and the failed experiences of import substitution strategies in Latin America in the last half of the 20th century is an example of the constraint imposed by the scarcity of foreign currency. Moreover, international markets are the arena where these countries can test their own technological developments. Therefore, far more paradoxical that it can look, the persistent achievement of current account surpluses (external dissaving) can, in fact, stimulate domestic investment, making exports a “benefit” and imports a “cost” from a dynamic perspective. Obviously, it is not possible for every country to adopt this strategy at the same time. However, given the constraints of the IMFS, advanced countries that issue international currencies should be more flexible to accept current account deficits than their EMEs peers. It is to develop these arguments that we turn next.

¹² Wray (2015, p. 219)

3 The structural specificities of EMEs

Contemporaneous structuralist scholars have made important contributions to the understanding of the structural features of the world economy that affect emerging and other peripheral economies. On the one hand, we have the “currency hierarchy” school that emphasizes the structural asymmetries of the international monetary and financial system (IMFS) (Carneiro 2008; De Conti, Prates, and Plihon 2014; Kaltenbrunner 2015; Ramos 2016, among others). On the other hand, we have the “new developmentalist” school that emphasizes the existence of the Dutch disease and underlines the importance of a competitive exchange rate for long-run development (Berr and Bresser-Pereira 2018; Bresser-Pereira 2010, 2016; Gala 2008, among others). These schools share a similar understanding that the exchange rates in EMEs behave in cycles of over-appreciation followed by sharp depreciation and a balance of payments crisis; furthermore, they emphasize that these cycles are the expected outcome of market mechanisms. However, while the currency hierarchy school emphasizes the monetary asymmetry and other financial aspects, the new developmentalists highlight the deleterious effects of the Dutch disease.

3.1 Currency hierarchy

According to Prates and Cintra (2007), the contemporaneous IMFS is characterized by a hegemony of a “flexible, financial and fiduciary” USD. It is flexible because the Fed does not intervene to keep the USD at par with any currency or commodity, financial because its reserve of value status is not connected to any physical attribute but to the sovereignty of the United States government and because it is the main currency used on global financial, trade and commodity markets. The bills and bonds of the U.S. Treasury, considered to be the world’s safest assets¹³ and a safe haven against disorders in international markets, are the main symbol of this hegemony. Finally, the USD is also fiduciary because the U.S. government is not obliged to convert it to anything. According to Serrano (2002), this combination of factors gives an unparalleled policy space to the U.S. government since it can run persistent current account deficits without any pressure on its policy interest rates and it can borrow internationally without default risk since its external debt is denominated in its own currency. Therefore, the United States benefits from monetary sovereignty not only at home but also on the world markets (Prates 2017). In this system, the Fed is effectively the lender of last resort of the world markets since it is the only agent capable of providing liquidity in the safest currency in times of stress¹⁴. In parallel and as a consequence of it, the USD became the main “funding” currency in global financial markets, which only reinforces the hegemony of the USD and the crucial role of the Fed. Therefore, the USD benefits from the highest liquidity premium among the world currencies (Andrade and Prates 2013; Kaltenbrunner 2015a).

The concept of liquidity is crucial for structuralist authors to develop their concept of currency hierarchy and the asymmetries of the IMFS. For De Conti, Prates, and Plihon (2014), liquidity is the capacity of an asset to be quickly transformed in means of payment without capital losses. In a national context, money, as defined by the national state, is the liquid asset by excellence since it is the unit of account and a means of payment by definition. After money, there is a hierarchical sequence of IOUs – promises of payment in the future – with different degrees of liquidity (Bell 2001; Mehrling 2013). Therefore, central bank liabilities play a central role in the system. This interpretation is rooted in Minsky (1975, p. 74), who derives

¹³ This preference is obvious when we regard the currency composition of international reserves.

¹⁴ The swap lines that were open with major central banks during the 2008 crisis is the perfect example of this fact. See Mehrling (2010) for a detailed analysis of the central place of the Fed in world financial markets.

the “endogenous determination of the effective quantity of money” from the introduction of near monies (liabilities that are created by institutions that are not the central bank). The diffusion of financial institutions and layers of near monies progressively increase the illiquidity of the system, despite the appearance of tranquility. If not controlled, this diffusion can generate a situation in which the agents end up holding significant risks of capital loss despite the apparent safety of their assets. If something triggers a fire-sale of assets in the distant layers of monies, the price of these assets could fall abruptly, generating margin calls on “safer” layers that could fall and take down even “safer” layers in a domino effect that is likely to wreak havoc in the financial system if the central bank does not intervene as a lender of last resort. This is the paradox of liquidity – the apparent expansion of liquidity through near monies implies, from a macroeconomic perspective, its effective reduction (Lavoie 2014).

The fact that only a handful of currencies are used and accepted internationally adds an important dimension to this concept of liquidity. In fact, the different currencies are, at the international level, like the layers of near monies, with the USD being the most liquid and the currencies issued by hyperinflationary countries¹⁵ being the least liquid since they are effectively rejected by their own population, with a continuum of currencies in the middle that are sovereign in their own territories and can be exchanged on exchange rate markets for other currencies. This international dimension of liquidity is labeled by De Conti, Prates, and Plihon (2014) as “*devis*e liquidity”. This monetary asymmetry is crucial to understand the other asymmetries in the IMFS (Prates 2005). It is important to underline that the *devis*e liquidity depends critically on the use of the currency in the international sphere, either in financial markets or for external trade. Thus, it is a structural feature of the IMFS, with geopolitical determinations, and cannot be created through a voluntarist liberalization of domestic financial markets.

Drawing a parallel with the “taxes drive money” approach from MMT, it is the necessity to settle transactions in one or other currency that determines its position in the currency hierarchy. The USD is obviously the hegemonic currency since it is the most used on international financial markets, in trade transactions and on key commodity markets like oil. This international acceptability of the USD makes it the favored currency for storing value and for intervening in exchange rate markets, thereby reinforcing its key position in the system (De Conti and Prates 2018). For the rest of the currencies, their liquidity premia are connected not only to their capacity of settling international transactions and storing value but also with their ability to be transformed in the reserve currency quickly and without a capital loss (Bonizzi 2017; Kaltenbrunner 2015a). Using Keynes (1936) terminology, the virtual irrelevance of peripheral currencies for international transactions and as a store of value means that the international speculative demand largely surpasses the transactional and precautionary demand for them. Therefore, even in floating exchange rate regimes in which peripheral currencies can be converted to central ones in their own exchange rate markets, EMEs must offer a higher premium – in the form of higher interest rates, for instance – if they expect to have the assets denominated in their domestic currencies to be demanded by international investors (Carneiro 2008; Prates 2005)

De Conti, Prates, and Plihon (2014, p. 353) provide a representation of the monetary hierarchy, its national and international dimensions, with a matrix, in which the “money” hierarchy à la Bell (2001) and Mehrling (2013) would be in the vertical dimension, with money and government liabilities being the most liquid

¹⁵ The Brazilian hyperinflationary case of the 1980s and early 1990s is an interesting case since the institution of indexation and deposits invested on overnight instruments effectively created a division of the functions of money. An understanding of the monetary aspects of the “indexed money” is an important avenue for future research.

assets, followed by bank liabilities and the other different layers of monies and financial assets, and the currency hierarchy, *à la* De Conti, Prates, and Plihon (2014) and Prates (2002), would be in the horizontal dimension, with the reserve currency – the USD – as the most *devis*e liquid currency followed by the other central currencies and the peripheral currencies. This matrix helps us understand why peripheral currencies and the assets denominated in these currencies are considered high-yielding risky assets on the international markets that lack “investment” grades similar to those given to central countries and are correlated with high-yielding assets in the United States (Carneiro 2008). A similar pattern is identified by Frenkel (2008), who characterizes this structural aspect of the world economy as “segmented integration” of peripheral countries into the world capital markets. Therefore, it should be clear that there is no such thing as perfect asset substitutability in international markets.

Finally, the absence of *devis*e liquidity ties the demand for peripheral currencies to the international “liquidity cycles”. When global liquidity preference is weak and international investors are inclined to take more risks in exchange for higher returns, peripheral currencies are highly demanded and they can look almost as safe as central currencies. However, this demand can suddenly vanish if something happens in the international markets that triggers a flight to safety. Therefore, peripheral currencies are *cyclically* liquid (De Conti, Prates, and Plihon 2014). It is the paradox of liquidity but at the international dimension.

3.2 Dutch disease

Structuralist authors from the new developmentalist school emphasize another structural feature of the world economy that mainly affects middle-income countries with an abundance of natural resources: the Dutch disease¹⁶. The origin of the term is associated with the negative effect that the real appreciation of the guilder as a consequence of the discovery of gas reserves had in the manufacturing sector of the Netherlands in the 1960s. Although attempts to theoretically formalize this phenomenon exist at least since Corden and Neary (1982), we will focus mainly on the new developmentalist interpretation of it which has the works of Bresser-Pereira (2008, 2010, among others) as its main references.

For the new developmentalists, the Dutch disease is a market failure that exists in countries that have abundant and cheap natural resources and in which the costs involved in their production are particularly low and below the cost of production of its international competitors. The exploitation of natural resources under these conditions generates “Ricardian” rents in these sectors (Bresser-Pereira 2010). Guzman, Ocampo, and Stiglitz (2018) make a similar argument. For them, market forces in the presence of abundant and cheap natural resources will lead to suboptimal allocation of resources on tradable sectors with large learning spillovers, constituting a market-failure that must be corrected with active policies.

To understand the impact of the Dutch disease on exchange rate markets, we have to keep in mind that it is a real phenomenon. Hence, its effects are better understood if we ignore the effect of financial flows and government interventions and suppose an economy that is only open to commercial flows. Given the abundance of natural resources and cheapness of its extraction and commercialization, the equilibrium exchange rate will be lower¹⁷ than necessary to make the manufacturing sector of this economy competitive since it would reflect the production costs of the commodities sector. It is from this insight

¹⁶ Bresser-Pereira is careful in distinguishing the Dutch disease, which has strict economic reasons, to the resource-curse, a concept connected to corruption and rent-seeking associated with the exploration of natural resources. We only deal with the former in this work.

¹⁷ The exchange rate here is defined as the price of a foreign currency in terms of the domestic currency.

that new developmentalist authors argue that there are two equilibrium exchange rates in an economy that suffers from the Dutch disease: the “current” equilibrium exchange rate, that reflects the production costs of the natural resources sector; and the “industrial” equilibrium exchange rate, that makes the manufacturing and other non-tradable sectors that utilize state-of-the-art technology competitive in international markets. The two equilibrium exchange rates are central to the structuralist theory of the Dutch disease. First, it serves as a measure of the disease: the higher the ratio between the industrial exchange rate and the current equilibrium exchange rate, the more severe the Dutch disease is. Secondly, the two exchange rates theoretically explain how a country can have an inter-temporally balanced current account and an overappreciated exchange rate at the same time (Bresser-Pereira 2010, 2018).

New developmentalist authors stress the importance of industrialization – understood as the development of non-tradable sectors that embed technological progress – because these activities are known by their learning-by-doing externalities and technological spillovers, stimulating technological progress and structural change in the economy. Furthermore, the economies of scale associated with industrial activities leads to higher employment and productivity gains in such sectors¹⁸, leading to higher real wages that would balance the negative effect that a depreciated currency have on them (Gala 2008; Missio et al. 2015). A stable and competitive exchange rate is crucial to develop these sectors, as it would increase the attractiveness of domestic goods abroad and on domestic markets. In other words, it would foster import substitutions and the promotion of exports. As Bresser-Pereira (2018, p.2, italics on the original) argues, “the exchange rate acts as a *switch* that grants or withholds *access* to existing demand, be it international or domestic.”

Furthermore, it is important to remark that the profitability of manufacturing sectors in countries that fail to neutralize the Dutch disease will be structurally attached to the price of commodities in international markets; when these prices are high, the difference between the two equilibrium exchange rates will increase, augmenting the severity of the disease and diminishing the incentives to invest in manufacturing sectors. In this sense, the severity of the Dutch disease is cyclical and independent of domestic factors. Hence, the Dutch disease is a structural phenomenon that, together with structurally high-interest rates, is behind the tendency of overvaluation of the exchange rates in these countries that can either block the process of industrialization or lead to deindustrialization. In the latter case, it can happen as new natural resources are discovered or as a consequence of policy decisions that prioritize the exploitation of the ‘Ricardian’ competitive advantages (Bresser-Pereira 2010; Palma 2005).

3.3 Global liquidity cycles

The last few decades witnessed significant growth and deregulation of the financial sector worldwide, together with the fast development of financial products and the expansion of derivatives markets. This expansion, together with the diffusion of the short-sighted decision-making rationale of the financial markets to other sectors are behind what some authors call the “finance-led” era of capitalism, in which decisions to spend are increasingly speculative and dominated by portfolio decisions of massive institutional funds that manage the ever-larger private wealth of developed and emerging economies (Braga 2000; Epstein 2005; Guttman 2016; Minsky 1975; Morin 2015). In this context, global financial factors and international liquidity preference have become one of the main factors behind the international flows of capital and the price of commodities – in a process called as the financialization of

¹⁸ This argument can also be found in the work of Kaldor (1966).

commodities (Cibilis and Allami 2019; Tang and Xiong 2012) – and are crucial to understand currency movements worldwide.

Structuralist authors close to the currency hierarchy school argue that investors' expectations about future movements of the fundamentals of the central economies – in particular interest rates – are far more important than the fundamentals of peripheral countries in the determination of the financial flows to EMEs. As a consequence, the IMFS is characterized by periods of high and low availability of finance in international markets, making the availability of external financing far beyond the immediate control of EMEs authorities (Biancarelli 2007, 2009). In this context, domestic fundamentals are only important to the extent that they mitigate the consequences of sudden drains and floods of external capital. Starting from a historical analysis of the financial flows to EMEs in the last 40 years, Akyüz (2012) argues that these flows were characterized by cycles of booms and busts, in which periods of financial euphoria (surges in capital flows) were followed by sudden stops. He notes that periods of low-interest rates in the United States act as a catalyzer of financial flows by making institutional investors search for higher yields in EMEs, which places the Fed at the center of the global financial cycle.

It is important to note that the most important decision of these institutional investors is their asset allocation, due to the rigidity of their liabilities. Therefore, it is not a genuine preference for emerging markets but the profit constraint that drives them to EMEs when interest rates are low in central markets (Bonizzi 2017). As a consequence, they often prefer “liquid” positions in these economies, like stocks in the stock market and public bonds, that could, ideally, be easily liquidated when global conditions change. Therefore, even if they invest in locally denominated assets, their investments constitute a contingent liability in foreign currency as they can be quickly reversed, creating sudden pressures on the exchange rate markets (Kaltenbrunner 2015b). Recently, this cyclical behavior was reinforced by the rise of carry trade operations – a speculative financial strategy executed generally through derivatives markets in which investors borrow low-interest currencies and invest into high-interest rate currencies. The profitability of these operations depends on the currency movements of the target countries, and its success is a clear violation of the uncovered interest rate hypothesis (BIS 2015; Rossi 2016).

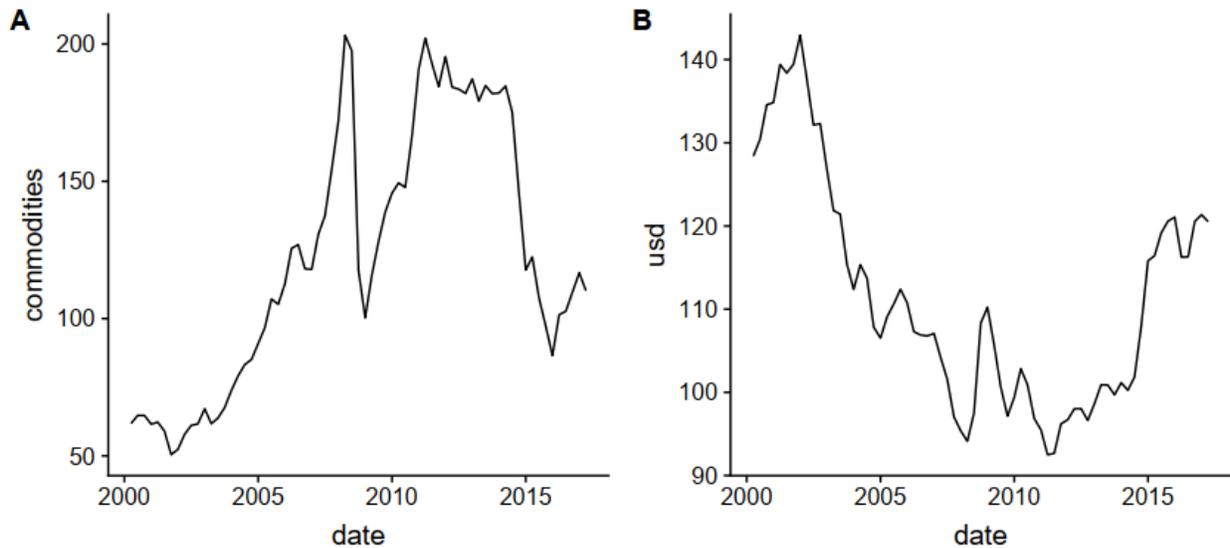
Akyüz (2012) also notes the concomitant movement between the global liquidity cycle, the price of commodities and the effective nominal exchange rate of the USD in relation to other currencies. According to the author:

“the parallel movements in capital flows, commodity prices, and the dollar are driven not only by such common influences as market assessments of risks and return and global liquidity conditions. They are also directly linked to one another. A weaker dollar often leads to higher commodity prices because, *ceteris paribus*, it raises global demand by lowering the non-dollar prices of commodities. Moreover, changes in commodity prices have a strong influence on investments in commodity-rich DEEs [EMEs in our terminology]” (Akyüz 2012, p. 76).

In Figure 1 we compare the evolution of the global commodity index (A) and of the broad effective exchange rate of the USD¹⁹ (B) between 2000 and 2017. As we can see, there is a clear negative and synchronized relationship between the two variables.

¹⁹ Measured as the price of a USD in foreign currency.

Figure 1: Global commodity index and broad effective exchange rate of the U.S. dollar, 2000-2017.



Source: FRED- St. Louis Federal Reserve economic database.

Unorthodox mainstream authors like Rey (2013, 2016) and Shin (2016) also suggest the existence of these global cycles. In line with the post-Keynesian arguments presented in this section, Rey argues that the monetary policy stance of the Fed leads a “global financial cycle” that constrains monetary policy in financially open EMEs, regardless of their exchange rate regimes. These cycles are transmitted to EMEs through two mechanisms: the “credit channel” through which financial flows are associated with asset-price inflation that increases the value of credit collateral and stimulates credit creation through the wealth effect; and the “risk-taking channel” arising from procyclical creditworthiness assessments. If the Fed decides to increase its interest rates, the reverse would happen. Therefore, exchange rate movements in EMEs would not answer to the productive disequilibria reflected in their current account balances but to the interest rate differential between these economies. On the other hand, Shin (2016) emphasizes the crucial role of the USD in the global banking system. He underlines the centrality of the USD in hedge markets for almost every currency, becoming the most important financial-vehicle international currency. This is related to the role of international banks on these markets, and on the fact that they cover their own exposition in USD with USD-denominated assets. Hence, it is cheaper for the banks to cover their positions when the USD is depreciating, allowing them to ease credit conditions in international markets and transmitting the monetary stance of the U.S. to the rest of the globe. Therefore, the “value of the dollar is a barometer of risk-taking and global credit conditions ... a weaker dollar is associated with greater lending in dollars, lower volatility and more risk-taking, but a stronger dollar is associated with higher volatility and a recoiling from risk-taking” (Ibid., p. 9). Ghosh, Tsangarides, and Ostry (2012) present empirical evidence that inflows of capital originated by nonresidents are the main responsible for capital surges in EMEs and that these flows are sensitive to global risk factors like the VIX and also to the U.S. policy rate. Therefore, he concludes that global factors “open the gates” of international flows but domestic factors are important to identify which economy will receive these inflows.

3.4 A structuralist post-Keynesian interpretation of the exchange rate cycles

The cyclical nature of the exchange rate in EMEs open to financial globalization, that follows a pattern of protracted appreciations followed by sharp depreciations, inspired several Minskyan interpretations among post-Keynesians. While the first (Arestis and Glickman 2002; Boyer, Dehove, and Plihon 2004; Kregel 2001) and the second (Bonizzi 2017; De Conti, Biancareli, and Rossi 2013; Kaltenbrunner 2015; Ramos 2016) generations of Minskyan approaches to financial crisis and exchange rates in EMEs are closer to the currency hierarchy school and emphasize the role of financial flows – driven by external debt or by institutional investors portfolio decisions, respectively – the new developmentalists (see Bresser-Pereira, Gonzalez, and Lucinda (2008) for its clearest expression) also rely on a Minskyan framework to explain the tendency toward overvaluation of the exchange rate but link it to misguided policies and to the Dutch disease. The objective of this section is to show that both approaches are complementary, providing the elements for a synthesis of the structuralist post-Keynesian analysis of the exchange rate cycles in EMEs.

The basic post-Keynesian framework underlines the role of financial flows on the short-run determination of the exchange rate but also notes the importance of current account balances in the medium to long run. In this interpretation, financial flows depend on market expectations in a context of radical uncertainty (Harvey 2009; Lavoie 2014; Moosa 2002). These authors distinguish between two ideal market participants: “chartists” (speculators) and “fundamentalists”. The formers are typically trend chasers while the latter guide their investment decisions by macroeconomic fundamentals. In this framework, speculation can exacerbate short-run movements of the exchange rate, but current account balances work as a gravitational center in the medium and long run²⁰ (Lavoie 2014). This framework is a useful starting point to understand the exchange rate cycles in EMEs, but it must be complemented with some specific features. In particular, the weight of international investors is substantial in peripheral markets, making their investments decisions the main light-house of market expectations. However, peripheral assets are not the main investment of their portfolio and are classified together with other risky assets and are the first assets to be liquidated in the case of necessity (Prates 2002, 2005). Therefore, an important distinction of EMEs is that the main “fundamentalist” investors on EMEs are nonresidents that care more about the fundamentals of the center – the liquidity cycle, which includes global interest rates and commodity prices – than about the macroeconomic fundamentals of the countries they are investing.

Thus, in the first phase of the cycle, eased global financial conditions and growing commodity prices increase the profitability of the natural resources sectors in EMEs and increase the supply of foreign currency to the country through commercial flows, appreciating the exchange rate. Here, the first structural cause of the tendency toward overvaluation of the exchange rate comes into play as the current equilibrium exchange rate starts moving away from the industrial equilibrium exchange rate – increasing the severity of the Dutch disease. This process also increases the perceived *devis*e liquidity of peripheral currencies – the second structural cause of the tendency toward overvaluation – augmenting its expected profitability²¹ and attracting financial flows. Together, these processes culminate in the appreciation of the domestic currency, easier local financial conditions and inflation of asset prices. These movements

²⁰ With the notable exception of the hegemonic country.

²¹ Corrected by the liquidity differential. This concept is important because it allows the effective interest rate differential to increase even if the real (inflation-corrected nominal) interest rate differential is falling.

reinforce each other like a financial accelerator which is also reflected in higher relative prices of non-tradables in the domestic market as the economy moves towards higher employment rates.

Here the government faces a policy dilemma²²: if it tries to slow down the economy by raising interest rates it will further attract financial flows that could undermine its objectives. The conventional orthodox solution, with its focus on consumer-price stability, is to raise interest rates and attract financial flows, allowing the exchange rate to appreciate in order to control the price of tradable goods and keep consumer-price inflation in check. This is achieved at the expense of a more severe Dutch disease and the displacement of local production for imported goods, turning the current account balance into a negative position. This is theoretically justified by the presumed capital scarcity in EMEs but in reality it generally leads to the substitution of foreign savings for domestic savings, keeping the investment rate constant²³. The financial flows can take the form of external debt in foreign currency, which also exacerbates the problem of currency mismatches, or can be driven by institutional investors in search for higher returns – interest rate differential and expected profitability of the natural resources sector – and by hedge funds that engage in carry trade operations²⁴ that benefit from the double gains of interest rate differential and currency appreciation. These structural features are behind the perverse combination of appreciating exchange rates and increasing current account deficits, that can last for long periods. When fundamentals change, like the price of commodities or the policy stance of the Fed, institutional investors reallocate their portfolios, increasing the exchange rate market pressure for depreciation. During the EMEs crises of the 1990s, currencies depreciated sharply in the aftermath of the abandonment of currency pegs. However, the adoption of floating regimes in the 2000s did not prevent the abrupt depreciation of EMEs currencies that happened during the 2008 crisis, for instance. Therefore, the structuralist post-Keynesian cycle in EMEs is asymmetrical: the appreciation of the currencies is slow but persistent until a reversion of the liquidity cycle triggers a depreciation that is often abrupt.

4 Policy recommendations

The balance of payments plays a central role in the dynamics of EMEs, especially those open to financial flows. In particular, the cyclical availability of foreign finance makes the monetary authorities hostage of the diktats of global financial markets and force them to act in a procyclical way (Farhi 2006; Ocampo 2012). In this context, the exchange rates have become the main transmission channel of these cycles, becoming the most strategic price of these economies. Hence, they should not be left to market forces alone (Guttman 2015).

Exchange rate policies in EMEs usually target two objectives: to decouple from the global liquidity cycles, minimizing the effects of unstable financial flows, and to preserve a stable and competitive real exchange rate that allows the country to reap the benefits of trade integration. To achieve these objectives, monetary authorities can intervene directly in the foreign exchange rate markets and/or impose regulations on financial flows. We understand that both policies complement each other, as noted by Bussiere et al. (2013) and Prates and Cintra (2007). Nonetheless, this paper is focused on the importance

²² Sometimes referred as the “Tosovsky dilemma” (Lipschitz, Lane, and Mourmouras 2002).

²³ See Gala, Araújo, and Bresser-Pereira (2011) for a theoretical explanation and empirical evidence of this “savings displacement”.

²⁴ See BIS (2015); Brunnermeier, Nagel, and Pedersen (2009) and Rossi (2016) for a detailed analysis of carry trade operations.

of direct market interventions²⁵, which can be analytically divided between the “precautionary” demand for reserves and the “competitive”²⁶ demand for reserves.

As we argued earlier in this section, currency mismatches²⁷ severely reduces the policy space of monetary authorities. These constraints become clear during crisis episodes when there is a sudden stop of financial flows, as was the case during the 1990s crisis. Goldstein and Turner (2004) present evidence that currency mismatches increased the chance of getting into a financial crisis and magnified the output costs of getting out of it. It also undermined the effectiveness of the monetary policy reaction during a crisis. Given the negative patrimonial effect of currency depreciation, monetary authorities were forced to pro-cyclically increase the base interest rates in the middle of the crises in an attempt to stabilize the exchange rate, amplifying its contractionary effects (Kaminsky, Reinhart, and Vegh, 2005). As a consequence of these crises, several EMEs started to significantly accumulate international reserves to increase their war chest against external shocks and to bridge sudden stops of financial flows.

The importance of this “precautionary” demand for reserves can be found already in the work of Keynes (1930, chapter 33). For him, the central bank should decide the appropriate amount of free reserves (which is to be understood in equivalence with international reserves nowadays) in order to create a “war chest” that would provide liquid resources to “meet short-period fluctuations in the international balance of indebtedness, ... the external drain” (Ibid., p. 275). This war chest must consider the probable amount of the “sudden withdrawal of foreign funds” (Ibid, p. 277) and of the temporary fluctuations against which it is unnecessary to make fundamental adjustments. Furthermore, he notes that a country which is “largely dependent on a small variety of crops highly variable in price and quantity – Brazil, for example – needs a larger free reserve than a country of varied trade” (Ibid., p. 277). Finally, he also notes that an appropriate level of free reserves is needed “for merely psychological reasons, to promote confidence” (Ibid., p. 275). We must add that these are structural features of the global economy and that the buildup of this reserves’ war chest is usually undertaken during the upper phases of the liquidity cycle when there is an abundance of foreign currency flowing to the country. Furthermore, the accumulation of international reserves to avoid excessive overvaluation in this phase of the cycle should be considered part of the precautionary policies (Frenkel and Rapetti 2010).

Structuralist post-Keynesian authors, especially those related to the new developmentalist school, also emphasize the importance of stable and competitive real exchange rates (SCRER) to neutralize the Dutch disease and preserve the external competitiveness of the industrial sector of the economy. Frenkel and Rapetti (2015) argue that a SCRER is growth-enhancing because it relaxes the external constraint on the domestic activity, minimizing the risks of sudden stops and financial crises and stimulating modern tradable sectors that are crucial for economic development. A corollary of this strategy is the export orientation of these sectors, which is also important to avoid the distortions of protected markets and to expose the industry of these countries to international competition, as Fajnzylber (1992) argues. The

²⁵ The importance of the regulation of financial flows is widely accepted by the literature and should not be underestimated (Akerlof et al. 2014; Bibow 2008; De Paula, Fritz, and Prates 2017; Flassbeck and La Marca 2007; Fritz and Prates 2014; Ghosh, Ostry, and Qureshi 2018; IMF 2012; Rey 2013, among others).

²⁶ Mainstream authors usually refers to these policies as “mercantilist” (see, for instance, Aizenman and Lee (2007)).

²⁷ Eichengreen, Hausmann, and Panizza (2007, p. 130) define currency mismatch as “differences in the values of the foreign currency-denominated assets and liabilities on the balance sheets of households, firms, the government, and the economy as a whole.”

frequent balance-of-payments crises of the import substitution industrialization of the 1950s and 1960s in Latin America due to the always higher demand for imported capital goods²⁸ (Tavares 1972) contributed to this renewed focus on current account balances. Rocha and Oreiro (2013), for instance, explicitly model an investment function with an external constraint in order to capture the fact that investment is restricted by the capacity to import. As Bresser-Pereira (2010) argues, there is no contradiction between an export-oriented strategy and the development of the domestic markets. For him, a competitive exchange rate allows EMEs to compete internationally and to diversify towards technological intensive products. As a result, they are not only a source of demand from the external side but also encourage the growth of investment in the economy. As Rodrik (1994) noted when analyzing the development of Korea and Taiwan, export-oriented policies were important to enable a steady rise in imported capital goods while the main growth engine was the substantial rise of industrial investment. The works of Dullien (2015), Gala (2008), Missio et al. (2015) and Rocha and Oreiro (2013) present robust empirical evidence of the positive relationship between growth and competitive exchange rates.

In a world marked by imperfect asset substitutability, direct market interventions of the central bank can help²⁹ to achieve both objectives of decreasing the external vulnerability of the country (precautionary demand for reserves) and by preserving the competitiveness of its industrial sector. Moreover, the accumulation of international reserves together with persistent balanced or positive current account results can help EMEs authorities to safely reduce the interest rate differential in relation to global reference rates, as they do not need foreign resources to finance a trade deficit. It is important to remark that there is no technical constraint on the government to accumulate reserves, as the central bank uses its own money to purchase foreign currency and it can always compensate this policy on the domestic interbank market to keep the base interest rate stable³⁰. The main caveat of these policies is that they can create inflationary pressures when the economy is close to full employment. However, as Bresser-Pereira (2010) emphasizes, the use of the exchange rate to control consumer prices is a form of “exchange-rate populism” that generally ends in a financial crisis.

On the other hand, the policy space of the authorities is objectively constrained by the stocks of international reserves in the central bank in the descendant phase of the cycle, when the exchange rate is depreciating and capital is outflowing the country. In this situation, the main objective of the central bank should be to smooth the depreciation of the exchange rate and to assure that hedge markets are functioning to avoid disruption in the private sector. However, the attempt to preserve indefinitely the exchange rate at an appreciated level that is incompatible with economic fundamentals – reflected by current account deficits – will not only harm the productive sector of the economy but also exhaust the international reserves of the central bank. In this sense, if fundamental adjustments are needed, the government can smooth the process but must allow the exchange rate to depreciate. Doing otherwise will just postpone the adjustment and increase the possibility of a crisis.

To conclude this section, it is important to remark that exchange rate policies are intrinsically asymmetric, with monetary authorities having a larger policy space during the ascendant phases of the liquidity cycles

²⁸ Kaldor (1966) present the same argument.

²⁹ In addition to the regulation of capital flows, Bresser-Pereira (2010) and Guzman, Ocampo, and Stiglitz (2018) also defend the imposition of a tax on the export of raw materials, which would effectively create a system of multiple exchange rates.

³⁰ Obviously, an unreasonable large intervention of the central bank would imply an ever higher exchange rate, which makes no sense as a policy.

– when precautionary and SCRER policies should be adopted to neutralize the Dutch disease and reduce the external vulnerability of the economy. In this sense, the polar view of hard-pegs or pure floating regimes is misleading. In fact, the higher policy space is found exactly in intermediate regimes, since the government conserves the right to intervene when it considers convenient – reducing the uncertainty derived from unstable capital flows and volatile exchange rates –, but does not commit to defend any specific parity. Hence, the pros and cons of different exchange rate regimes depend on the circumstances. Therefore, we agree with Bresser-Pereira (2010, p. 160) when he argues that “the pragmatic solution is to reject the “fix or float” alternatives and to manage the exchange rate to prevent its appreciation, whether by keeping the domestic interest rate at a low level, by acquiring international reserves, by levying taxes on the goods that cause the Dutch disease, or during temporary periods by imposing controls on capital inflows.”

5 Empirical evidence

The objective of this section is to present some empirical evidence that supports the structuralist post-Keynesian analysis developed in the first part of this paper. First, we present evidence indicating that contagion effects and increasing current account deficits are associated with higher odds of exchange rate market pressure in a group of 14 EMEs between 2011 and 2018, a period marked by the taper tantrum in 2013, the reversal of the quantitative easing policies in central countries and the fall in the price of commodities between 2014 and 2015. We then present evidence supporting a positive relationship between exchange rate policies and investment in a group of 19 EMEs between 2003 and 2013, during the upper phase of the cycle.

5.1 Exchange rate market pressure and precautionary policies

In order to assess the relevance of precautionary exchange rate policies, we build an indicator of the “exchange rate market pressure” (EMP), following the works of Eichengreen, Rose, and Wyplosz (1996) and Gonzalez (2007). This indicator combines data of the variation of the exchange rate of the domestic currency in relation to the USD, measured as the price in USD of one unit of the domestic currency; the interest rate differential between the domestic policy interest rate and the 1 month-libor interest rate, and the variation of reserves from a sample of 14 EMEs³¹ and is measured as follows:

$$EMP_{i,t} = \frac{\frac{\Delta \log(E_{i,t})}{sd_{E,i}} + \frac{\Delta \log(I_{i,t})}{sd_{I,i}} + \frac{\Delta \log(R_{i,t})}{sd_{R,i}}}{3}$$

Where *sd* means standard deviation, the subscript *i* indicate the country, *t* the year, *E* the exchange rate, *R* the international reserves and *I* the interest rate differential, measured as follows:

$$I_{i,t} = \frac{1 + \text{libor}_t}{1 + \text{polrate}_{i,t}}$$

Defined in this way, the EMP decreases when the domestic currency depreciates, when the spread between the local policy rate and the libor augments and when the country depletes international reserves. We choose to take logarithms to approximate the changes to percentual changes and normalized each item by its standard deviation. Since the variables are taken in first differences, the first

³¹ List of countries: Argentina, Brazil, China, Colombia, India, Indonesia, Mexico, Malaysia, Philippines, Peru, Russia, Thailand, Turkey and South Africa.

non-differenced observation is taken from 2009 in order to have a complete annual series from 2010 to 2018. In Figure 2 we plot the average value for the EMP for every country in each period of time. As we can see, the EMP was mainly negative in the period, particularly between 2013 and 2015, the years of the “taper tantrum” and of the fall in the price of commodities.

Figure 2: Exchange-rate market pressure, 2010-2018.



The next step in the analysis is to assess the relationship between years of stress in the exchange rate market, measured with the EMP index and a set of control variables. In order to do that, we define stress as extreme values of EMP:

$$STRESS_{i,t} = 1 \text{ if } EMP_{i,t} < av_{EMP} - 1.5sd_{EMP}$$

$$= 0 \text{ otherwise}$$

Where av is the average value for the whole sample of EMP. The next step is to use the binary variable $STRESS_{i,t}$ as the dependent variable in a random-effects logit model³², adding a set of explanatory variables³³. The variable $cemp_{i,t}$, that is measured as the contemporaneous average of EMP for every country but country i at period t , is included contemporaneously in the model to capture the contagion effects between markets. The current account balance ($cab_{i,t}$), government nominal balance ($def_{i,t}$), external debt as a proportion of total reserves ($edebt_res_{i,t}$), the percentual growth rate of the ($gdp_{i,t}$) and the percentual annual change of consumer prices ($dcpi_{i,t}$) are lagged by one year to identify the risk factors that can be associated to the stress event one year before its occurrence and the Chinn and Ito (2006) index of capital openness is lagged by two years ($kaopen_{i,t}$) to account for the capital openness of the country in an early moment of the cycle.

We are especially interested in the first three variables. If the contagion variable $cemp$ is negative, it provides some evidence of the global liquidity cycles, indicating that stress is correlated between markets. We also expect a negative sign from the cab variable since the structuralist post-Keynesian literature claims that the current account balance moves into negative field prior to stress in the exchange rate

³² We used a maximum likelihood function to estimate the model (Henningsen and Toomet 2011).

³³ The methodology for the estimation is explained at Croissant and Millo (2019).

market; finally, we expect a positive sign at the *edebt_res* variable as it would indicate external fragility of the economy. On the other hand, mainstream authors would claim that an increase of the government deficit – negative sign of *def* – would be seen together with an increase in the current account deficit – the twin crisis – prior to stress in the exchange rate market. The inflation rate is also expected to have a positive sign, as higher rates of inflation usually leads to higher policy interest rates. The index of capital openness and previous growth rate of the GDP are included as control variables.

We estimated five models. In the first model, we included all variables; then, in the second, we remove the rate of inflation due to correlations smaller than -0.3 with *cab*, *edebt_res*, *def* and *gdpg*. Then, in the sequence, we remove the least significant regressor until model 5.

Table 1: Random-effects logit model

	logit1	logit2	logit3	logit4	logit5
(Intercept)	-4.43 (1.38)**	-3.76 (1.23)**	-3.68 (1.15)**	-4.18 (1.01)***	-3.89 (0.91)***
<i>cab</i>	-0.19 (0.13)	-0.21 (0.12)	-0.21 (0.12)	-0.21 (0.11)	-0.23 (0.11)*
<i>cemp</i>	-2.57 (1.04)*	-2.34 (1.01)*	-2.32 (0.99)*	-2.39 (1.01)*	-2.31 (0.99)*
<i>def</i>	-0.07 (0.17)	-0.10 (0.16)	-0.08 (0.14)	-0.11 (0.13)	-0.11 (0.13)
<i>edebt_res</i>	0.11 (0.94)	0.67 (0.82)	0.60 (0.74)	0.59 (0.75)	
<i>gdpg</i>	-0.04 (0.12)	-0.09 (0.11)	-0.09 (0.11)		
<i>kaopen</i>	0.17 (0.38)	0.07 (0.36)			
<i>dcpi</i>	0.11 (0.08)				
<i>sigma</i>	-0.00 (0.54)	0.00 (0.63)	0.00 (0.63)	0.00 (0.71)	0.00 (0.77)
Log-Likelihood	-33.19	-34.17	-34.19	-34.54	-34.83
Num. obs.	112	112	112	112	112

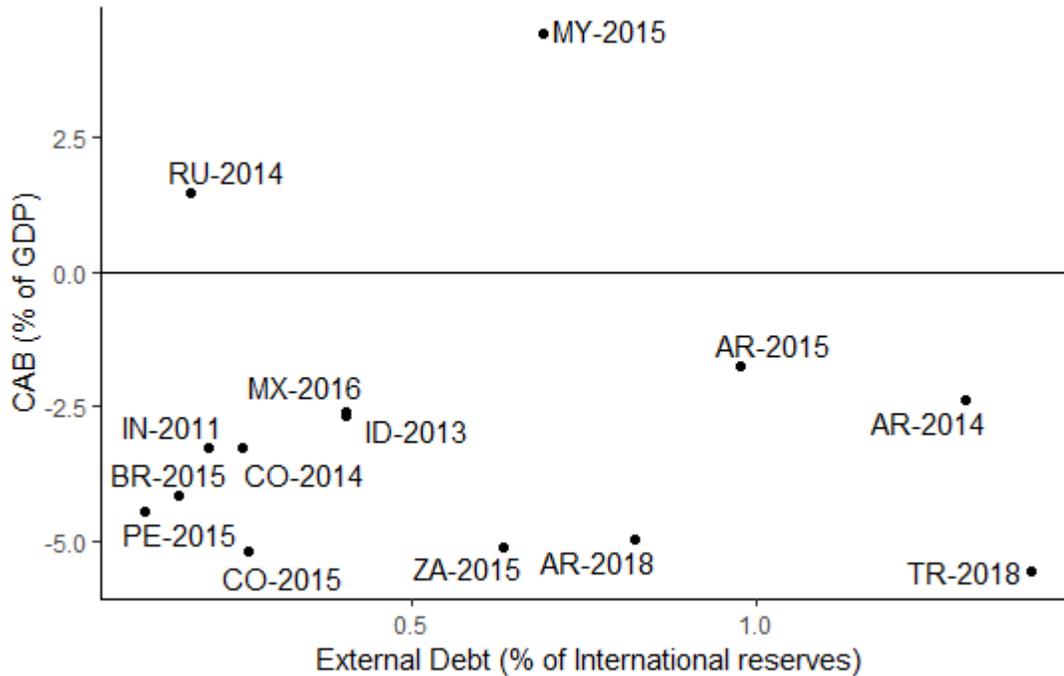
*** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.1

Note: standard deviation in parentheses.

As we can see in Table 1, the contagion effect is the only significant variables across the 5 models, and both have the expected sign, providing evidence of the correlation between stress in the EMEs' exchange rate markets. Furthermore, *cab* has the expected negative sign but is only statistically significant at the 10% threshold when we remove the inflation rate from the model, with the exception of model 5 when it is significant at the 5% threshold. The importance of the short-term external debt in relation to stocks of international reserves has the expected sign but it is not statistically significant. This result is in contrast with Gonzalez (2007) and also with the literature of the early 2000s (see, for instance, Fischer (2001)) that emphasized the importance of this indicator. One hypothesis to explain this difference is the fact that EMEs answered to the crisis of the late 1990s by accumulating reserves, which could also be related to the fact that stress events in the exchange rate markets were not as harmful in the years 2010s as they were at the end of the 1990s. For instance, only in three cases – in Argentina (2014 and 2018) and in Brazil (2015) – did the stress event coincide with a negative growth of GDP, and while Brazil had a moderate level of external indebtedness, *edebt_res* in Argentina was one of the highest in our sample. In Figure 3 we plot the relation between the lagged current account balance and external debt as a percentage of international reserves for all the stress events. With the exception of Russia in 2014 and Malaysia in 2015,

all countries were running current account deficits in the years previous to the stress events. On the other hand, there is no discernible relation between stress and external debt.

Figure 3: Current account balance and external debt for stress events



It is important to remark that only two countries in our sample – Turkey and Argentina – were responsible for the 10 observations in which *edeb_res* was higher than 1, and the two most negative values of EMP in our sample happened in these two countries in 2018. Hence, these remarks suggest that this variable should not be neglected. It remains as an avenue for future research to refine the model of stress in exchange rate markets to account for its effects on the overall growth rate of the economy. Finally, the fiscal variable is not significant in any model, suggesting the absence of a direct relation between budget deficits and stress in the exchange rate markets.

5.2 Competitive policies

We now turn to the empirical evidence concerning the importance of competitive exchange rate policies in EMEs. Since several studies (Gala 2008; Missio et al. 2015; Rocha and Oreiro 2013; among others) have presented evidence of the relationship between competitive exchange rates, current account balances and economic growth in EMEs, we decided to focus in this work on the relationship between exchange rate policies and investment as one of the important claims made by the structuralist post-Keynesian authors is that continuous investment in EMEs is “allowed” by overcoming the external constraint. Razmi, Rapetti, and Skott (2012) provide the main inspiration for this section. These authors find, in a panel with 150 countries and from 5-year averages data covering the period from 1960 to early 2000s, a positive relationship between investment and currency undervaluation that is especially significant for developing countries

However, we decided to take a different approach, limiting our analysis to a group of 19 EMEs³⁴ between 2003 and 2013. Our objective is to capture the relationship between exchange rate policies and investment in this group of countries during the upper phase of the liquidity cycle that started after the dot-com crash and roughly finished at the taper tantrum in 2013. We decided to consider this period, despite the great financial crisis of 2007-08 because of the rebound of the commodity prices and the aggressive response of central banks in central countries which led to “sudden floods of capital” in the early 2010s (Pereira da Silva 2016).

Furthermore, we decided to estimate directly the relationship between exchange rate policies, measured as variations in the official stocks of international reserves, and investment as a proportion of GDP. We estimated a first-difference panel model, that eliminates the unknown individual fixed effects by design³⁵. We transformed the variables in logarithms to measure the elasticities and selected as controls the GDP per capita ($gdpch_{i,t}$), the inflation rate ($cpi_{i,t}$), trade openness as a percentage of GDP ($trade_{i,t}$), international debt securities issued by domestic companies other than banks as a percentage of GDP ($nfids_gdp_{i,t}$), government consumption as a percentage of GDP ($govc_{i,t}$) and our main variable of interest, the stocks of international reserves ($reserves_{i,t}$) and a quadratic term. The decision to include a quadratic term aims to capture possible decreasing effects of the relationship between exchange rate policies and investment, as it is not realistic to suppose a linear relation between the two variables. We estimated two models: in the first (1), we included both the *reserves* variable in levels and in the second model (2) we included the *reserves* variable as a percentage of GDP.

The estimation results are presented in Table 2. Both *reserves* variables are statistically significant at 1% and 5% threshold levels and have the expected sign in model (1). Furthermore, the parameter of the linear relationship is the single most economically significant variable. On the other hand, the variables are not statistically significant when measured as a percentage of GDP. What this result indicates is that exchange rate policies should not aim to hoard an ever-larger stock of international reserves but should absorb the excessive inflows of foreign currency during the upper phases of the liquidity cycle. Furthermore, it is interesting to note that trade openness also has a positive relationship with investment in these economies. The Wooldridge’s first-difference test for serial correlation in panels has a p-value of 0.838 and 0.444 for models (1) and (2), respectively, meaning that there is no evidence to reject the null of no serial correlation in the models.

³⁴ List of countries: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Hungary, India, Indonesia, Korea, Mexico, Malaysia, Philippines, Poland, Peru, Russia, Thailand, Turkey and South Africa.

³⁵ See Wooldridge (2015) for details on the methodology.

Table 2: First-difference panel model

	Model 1	Model 2
(Intercept)	-0.04 (0.01)***	-0.04 (0.01)***
log(gdpch)	1.04 (0.16)***	0.94 (0.15)***
log(trade)	0.11 (0.05)*	0.14 (0.05)*
log(govc)	0.19 (0.10)	0.15 (0.11)
log(nfids_gdp)	0.03 (0.02)	0.03 (0.02)
log(cpi)	0.35 (0.15)*	0.37 (0.15)*
log(reserves)	1.11 (0.43)**	
I(log(reserves)^2)	-0.02 (0.01)*	
log(resgdp)		0.02 (0.09)
I(log(resgdp)^2)		-0.00 (0.02)
R ²	0.29	0.27
Adj. R ²	0.26	0.24
Num. obs.	190	190

***p < 0.001, **p < 0.01, *p < 0.05, †p < 0.1

Note: standard deviation in parentheses.

6 Final remarks

The objective of this paper was to analyze the importance of exchange rate policies in EMEs from a post-Keynesian perspective, illustrating these theoretical claims with evidence from the last 16 years. In the theoretical part, we saw the importance of monetary sovereignty, an argument defended by MMT authors, but also saw the importance of taking into consideration the structural specificities of EMEs, in particular the subordinated position of their currencies in the IMFS and the existence of the Dutch disease in several of these countries, features that can harm their development. Furthermore, we saw how these structural features are also cyclical, alternating between periods of international euphoria in which capital flow to EMEs in search for higher returns and commodity prices increase and periods of international high preference for liquidity. As a consequence of these features, exchange rate policies become crucial for the development of these countries not only by limiting the influences of the global cycles on these economies and providing a war chest against the sudden stops of capital flows but also by providing a stable and competitive exchange rate that helps to develop state-of-the-art industries.

Furthermore, we argued that exchange rate policies are asymmetric and dependent on the phase of the cycle, i.e., the authorities must absorb the excessive foreign currency flows to preserve competitiveness during the upper phase of the cycle and must limit the damages of the scarcity of foreign currency during the descendant phase of the cycle. If left to market forces alone, exchange rates in EMEs tend to move together and in cycles of overvaluation-cum-current account deficits that are followed by sharp depreciation and economic crises when global economic conditions changes. To support these ideas, we presented empirical evidence of a positive relationship between exchange rate policies and investment during the upper phase of the cycle – between 2003 and 2013 – as well as evidence of synchronized stress in EMEs' exchange rate markets and of its association with current account deficits.

7 Acknowledgments

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 665850.

8 References

- Aizenman, Joshua, and Jaewoo Lee. 2007. "International Reserves: Precautionary Versus Mercantilist Views, Theory and Evidence." *Open Economies Review* 18(2): 191–214.
- Akerlof, George, Olivier Blanchard, David Romer, and Joseph Stiglitz, eds. 2014. *1 What Have We Learned? Macroeconomic Policy After the Crisis*. 1st ed. The MIT Press.
- Akyüz, Yilmaz. 2012. "The Boom in Capital Flows to Developing Countries: Will It Go Bust Again." *Ekonomi-tek-International Economics Journal* 1(1): 63–96.
- Andrade, Rogerio P, and Daniela Magalhes Prates. 2013. "Exchange Rate Dynamics in a Peripheral Monetary Economy." *Journal of Post Keynesian Economics* 35(3): 399–416.
- Arestis, Philip, and Murray Glickman. 2002. "Financial Crisis in Southeast Asia: Dispelling Illusion the Minskyan Way." *Cambridge Journal of Economics* 26(2): 237–60.
- Bell, Stephanie. 2001. "The Role of the State and the Hierarchy of Money." *Cambridge Journal of Economics* 25(2): 149–63.
- Berr, Éric, and Luiz Carlos Bresser-Pereira. 2018. "Du Développementisme Classique Au Nouveau Développementisme." In *L'économie Post-Keynesienne: Histoire, Théories et Politiques*, Paris: Éditions du Seuil, 413–27.
- Biancareli, André Martins. 2007. "Integração, Ciclos e Finanças Domésticas: O Brasil Na Globalização Financeira." Tese de Doutorado. Universidade Estadual de Campinas.
- . 2009. "International Liquidity Cycles to Developing Countries in the Financial Globalization Era." In *XI Reunión de Economía Mundial*,.
- Bibow, Joerg. 2008. "Insuring Against Private Capital Flows: Is It Worth the Premium? What Are the Alternatives?" *International Journal of Political Economy* 37(4): 5–30.
- . 2010a. *Global Imbalances, the U.S. Dollar, and How the Crisis at the Core of Global Finance Spread to "Self-Insuring" Emerging Market Economies*. Levy Economics Institute. Economics Working Paper Archive.
- . 2010b. *The Global Crisis and the Future of the Dollar: Toward Bretton Woods III?* Levy Economics Institute. Economics Working Paper Archive.
- BIS. 2015. *Currency Carry Trades in Latin America*. Bank for International Settlements.
- Bonizzi, Bruno. 2017. "An Alternative Post-Keynesian Framework for Understanding Capital Flows to Emerging Markets." *Journal of Economic Issues* 51(1): 137–62.

- Boyer, Robert, Mario Dehove, and Dominique Plihon. 2004. *Les Crises Financières*. La Documentation française Paris.
- Braga, José Carlos de Souza. 2000. *Temporalidade Da Riqueza: Teoria Da Dinâmica e Financeirização Do Capitalismo*. Universidade Estadual de Campinas, Instituto de Economia.
- Bresser-Pereira, Luiz Carlos. 2008. "The Dutch Disease and Its Neutralization: A Ricardian Approach." *Brazilian Journal of Political Economy* 28(1).
- . 2010. *Globalization and Competition*. Cambridge University Press.
- . 2016a. "Reflecting on New Developmentalism and Classical Developmentalism." *Review of Keynesian Economics* 4(3): 331–52.
- . 2016b. *Why the 'Rest' Doesn't Need Foreign Finance*. FGV EESP - Escola de Economia de São Paulo, Getulio Vargas Foundation (Brazil). Textos para discussão.
- . 2018. *Neutralizing the Dutch Disease*. FGV EESP - Escola de Economia de São Paulo, Getulio Vargas Foundation (Brazil). Textos para discussão.
- Bresser-Pereira, Luiz Carlos, Lauro Gonzalez, and Cláudio Lucinda. 2008. "Crises Financeiras Nos Anos 1990 e Poupança Externa." *Nova Economia* 18(3): 327–57.
- Brunnermeier, Markus, Stefan Nagel, and Lasse Pedersen. 2009. "Carry Trades and Currency Crashes." In *NBER Macroeconomics Annual 2008, Volume 23*, National Bureau of Economic Research, Inc, 313–47.
- Bussiere, Matthieu, Gong Cheng, Menzie Chinn, and Noémie Lisack. 2013. "Capital Controls and Foreign Reserve Accumulation: Substitutes or Complements in the Global Financial Crisis?"
- Carneiro, Ricardo. 2008. "Globalização e Inconvertibilidade Monetária." *Revista de Economia Política* 28(4): 539–56.
- Chinn, Menzie, and Hiro Ito. 2006. "What Matters for Financial Development? Capital Controls, Institutions, and Interactions." *Journal of Development Economics* 81(1): 163–92.
- Cibilis, Alan, and Cecilia Allami. 2019. "Financialisation of Commodities, Accumulation of Reserves and Debt in Argentina." In *Financialisation in Latin America: Challenges of the Export-Led Growth Model*, eds. Noemi Levy and Jorge Bustamante. London: Routledge, 134–53.
- Corden, W. Max, and J. Peter Neary. 1982. "Booming Sector and De-Industrialisation in a Small Open Economy." *The Economic Journal* 92(368): 825–48.
- Croissant, Yves, and Giovanni Millo. 2019. *Panel Data Econometrics with R*. First. Oxford: Wiley.
- De Conti, Bruno, André Martins Biancareli, and Pedro Rossi. 2013. "Currency Hierarchy, Liquidity Preference and Exchange Rates: A Keynesian/Minskyan Approach." *Congrès de l'Association Française d'Économie Politique, Université Montesquieu Bordeaux IV*.

- De Conti, Bruno Martarello, and Daniela M Prates. 2018. *The International Monetary System Hierarchy: Current Configuration and Determinants*. Campinas: Instituto de Economia - Unicamp.
- De Conti, Bruno Martarello, Daniela Magalhães Prates, and Dominique Plihon. 2014. "A Hierarquia Monetária e Suas Implicações Para as Taxas de Câmbio e de Juros e a Política Econômica Dos Países Periféricos." *Economia e Sociedade* 23(2(51)): 341–72.
- De Paula, Luiz Fernando, Barbara Fritz, and Daniela M Prates. 2017. "Keynes at the Periphery: Currency Hierarchy and Challenges for Economic Policy in Emerging Economies." *Journal of Post Keynesian Economics* 40(2): 183–202.
- Dullien, Sebastian. 2015. "A Question of Strategy: What Characterizes Top Growth Performers?" In *Rethinking Development Strategies after the Financial Crisis - Volume II: Country Studies and International Comparison*, eds. Alfredo Calcagno et al. UNCTAD, 9–20.
- Eichengreen, Barry, Ricardo Hausmann, and Ugo Panizza. 2007. "Currency Mismatches, Debt Intolerance, and the Original Sin: Why They Are Not the Same and Why It Matters." In *Capital Controls and Capital Flows in Emerging Economies: Policies, Practices and Consequences*, University of Chicago Press, 121–70.
- Eichengreen, Barry, Andrew Rose, and Charles Wyplosz. 1996. *Contagious Currency Crises*. National Bureau of Economic Research, Inc. NBER Working Papers.
- Epstein, Gerald. 2005. *Financialization and the World Economy*. Edward Elgar Publishing.
- . 2019. *The Institutional, Empirical and Policy Limits of "Modern Money Theory"*. Amherst: Political economy research institute - University of Massachusetts Amherst.
- Fajnzylber, Fernando. 1992. "Industrialización En América Latina: De La Caja Negra" Al 'Casillero Vacío.'" *Nueva Sociedad* 118: 21–28.
- Farhi, Maryse. 2006. "O Impacto Dos Ciclos de Liquidez No Brasil: Mercados Financeiros, Taxa de Câmbio, Preços e Política Monetária." *Política Econômica em Foco* 7: 152–83.
- Fischer, Stanley. 2001. "Opening Remarks at the IMF/World Bank International Reserves: Policy Issues Forum." Presented at the Washington D.C. <https://www.imf.org/en/News/Articles/2015/09/28/04/53/sp042801>.
- Flassbeck, H, and M La Marca. 2007. "Coping with Globalized Finance: Recent Challenges and Long-Term Perspectives." *Geneva: Unctad*.
- Frenkel, Roberto. 2008. "From the Boom in Capital Inflows to Financial Traps" eds. Joseph Stiglitz and José Antonio Ocampo. *Capital market liberalization and development*: 101–20.
- Frenkel, Roberto, and Martin Rapetti. 2010. *A Concise History of Exchange Rate Regimes in Latin America*. University of Massachusetts Amherst, Department of Economics. UMASS Amherst Economics Working Papers.

- Frenkel, Roberto, and Martín Rapetti. 2015. "The Real Exchange Rate as a Target of Macroeconomic Policy." In *Rethinking Development Strategies after the Financial Crisis - Volume I: Making the Case for Policy Space*, eds. Alfredo Calcagno et al. UNCTAD, 81–92.
- Fritz, Barbara, and Daniela Prates. 2014. "The New IMF Approach to Capital Account Management and Its Blind Spots: Lessons from Brazil and South Korea." *International Review of Applied Economics* 28(2): 210–39.
- Gala, Paulo. 2008. "Real Exchange Rate Levels and Economic Development: Theoretical Analysis and Econometric Evidence." *Cambridge Journal of Economics* 32(2): 273–88.
- Gala, Paulo, Eliane Araújo, and Luiz Bresser-Pereira. 2011. "Poupança Doméstica e Externa e a Taxa de Câmbio." In *Taxa de Câmbio No Brasil*, eds. Marcio Holland and Yoshiaki Nakano. São Paulo: Elsevier, 78–101.
- Ghosh, Atish R, Jonathan D Ostry, and Mahvash S Qureshi. 2018. *Taming the Tide of Capital Flows: A Policy Guide*. MIT Press.
- Ghosh, Atish R, Charalambos G Tsangarides, and Jonathan David Ostry. 2012. "Shifting Motives: Explaining the Buildup in Official Reserves in Emerging Markets since the 1980s."
- Gonzalez, Lauro. 2007. "Crises Financeiras Recentes e Poupança Externa." Ph.D. Thesis. FGV/EESP.
- Guttman, Robert. 2015. "Chronic Macro-Economic and Financial Imbalances in the World Economy: A Meta-Economic View." *Revista de Economia Polític* 35(2): 203–26.
- . 2016. *Finance-Led Capitalism: Shadow Banking, Re-Regulation, and the Future of Global Markets*. Springer.
- Guzman, Martin, Jose Antonio Ocampo, and Joseph Stiglitz. 2018. "Real Exchange Rate Policies for Economic Development." *World Development* 110(C): 51–62.
- Harvey, John T. 2009. *Currencies, Capital Flows and Crises: A Post Keynesian Analysis of Exchange Rate Determination*. New York: Routledge.
- Henningsen, Arne, and Ott Toomet. 2011. "MaxLik: A Package for Maximum Likelihood Estimation in R." *Computational statistics* 26(3): 443–58.
- IMF. 2012. *The Liberalization and Management of Capital Flows: An Institutional View*. Washington D.C.: International Monetary Fund.
- Kaldor, Nicholas. 1966. *Causes of the Slow Rate of Economic Growth of the United Kingdom: An Inaugural Lecture*. Cambridge University Press.
- Kaltenbrunner, Annina. 2015a. "A Post Keynesian Framework of Exchange Rate Determination: A Minskyan Approach." *Journal of Post Keynesian Economics* 38(3): 426–48.
- . 2015b. "Financial Integration and Exchange Rate Determination: A Brazilian Case Study." *International Review of Applied Economics* 29(2): 129–49.

- Keynes, John Maynard. 1930. 2 *A Treatise on Money: The Applied Theory of Money*. AMS Press.
- . 1936. “The General Theory of Interest, Employment and Money.”
- Knapp, Georg Friedrich. 1924. *The State Theory of Money*. McMaster University Archive for the History of Economic Thought.
- Kregel, Jan. 2001. “Yes, `it’ Did Happen Again – the Minsky Crisis in Asia.” In *Financial Keynesianism and Market Instability*, Edward Elgar Publishing.
- . 2015. *Emerging Markets and the International Financial Architecture: A Blueprint for Reform*. Levy Economics Institute. Economics Working Paper Archive.
- Lavoie, Marc. 2013. *The Monetary and Fiscal Nexus of Neo-Chartalism: A Friendly Critique*. HAL. Post-Print.
- . 2014. *Post-Keynesian Economics: New Foundations*. Cheltenham: Edward Elgar Publishing.
- Lerner, Abba P. 1943. “Functional Finance and the Federal Debt.” *Social Research* 10(1): 38–51.
- Lerner, Abba P. 1947. “Money as a Creature of the State.” *The American Economic Review* 37(2): 312–17.
- Lipschitz, Leslie, Timothy Lane, and Alex Mourmouras. 2002. “The Tosovsky Dilemma: Capital Surges in Transition Countries.” *Finance & Development* 39(3).
- Mehrling, Perry. 2010. *The New Lombard Street: How the Fed Became the Dealer of Last Resort*. 1st ed. Princeton University Press.
- . 2013. “The Inherent Hierarchy of Money.” In *Social Fairness and Economics: Economic Essays in the Spirit of Duncan Foley*, eds. Lance Taylor, Armon Rezai, and Thomas Michl. Routledge, 394.
- Minsky, Hyman P. 1975. *John Maynard Keynes*. New York: Columbia University Press.
- Missio, Fabricio, Frederico Jayme Jr, Gustavo Britto, and José Luís Oreiro. 2015. “Real Exchange Rate and Economic Growth: New Empirical Evidence.” *Metroeconomica* 66(4): 686–714.
- Moosa, Imad A. 2002. “A Test of the Post Keynesian Hypothesis on Expectation Formation in the Foreign Exchange Market.” *Journal of Post Keynesian Economics* 24(3): 443–57.
- Morin, François. 2015. *L’hydre Mondiale: L’oligopole Bancaire*. Lux.
- Ocampo, José Antonio. 2012. “Balance of Payments Dominance: Its Implications for Macroeconomic Policy.”
- Palma, Gabriel. 2005. “Four Sources of De-Industrialization and a New Concept of the ‘Dutch Disease.’” In *Beyond Reform: Structural Dynamics and Macroeconomic Vulnerability*, ed. Jose Antonio Ocampo. Stanford: Stanford university press.

- Pereira da Silva, Luiz A. 2016. "Issues Faced by Emerging Market Economies in the Evolving International Monetary and Financial System: What Has the Global Financial Crisis Revealed?"
- Prates, D, and M Cintra. 2007. "Keynes e a Hierarquia de Moedas: Possíveis Lições Para o Brasil." *Texto para Discussão IE/Unicamp* (137).
- Prates, Daniela Magalhães. 2002. "Crises Financeiras Nos Países 'Emergentes': Uma Interpretação Heterodoxa." Thesis (PhD). Universidade de Campinas.
- . 2005. "As Assimetrias Do Sistema Monetário e Financeiro Internacional." *Revista de economia contemporânea* 9(2): 263–88.
- . 2017. *Monetary Sovereignty, Currency Hierarchy and Policy Space: A Post-Keynesian Approach*. Campinas: Instituto de Economia - Unicamp.
- Ramos, Raquel. 2016. "Financialization and Its Implications on the Determination of Exchange Rates of Emerging Market Economies." PhD Thesis. CEPN/Paris 13 and IE/Unicamp.
- Razmi, Arslan, Martin Rapetti, and Peter Skott. 2012. "The Real Exchange Rate and Economic Development." *Structural Change and Economic Dynamics* 23(2): 151–69.
- Rey, Hélène. 2013. "Dilemma Not Trilemma: The Global Financial Cycle and Monetary Policy Independence, London Business School, CEPR."
- . 2016. "International Channels of Transmission of Monetary Policy and the Mundellian Trilemma." *IMF Economic Review* 64(1): 6–35.
- Rocha, Marcos, and José Luís Oreiro. 2013. "Capital Accumulation, External Indebtedness, and Macroeconomic Performance of Emerging Countries." *Journal of Post Keynesian Economics* 35(4): 599–620.
- Rodrik, Dani. 1994. *Getting Interventions Right: How South Korea and Taiwan Grew Rich*. National Bureau of Economic Research, Inc. NBER Working Papers.
- Rossi, Pedro. 2016. *Taxa de Câmbio e Política Cambial No Brasil: Teoria, Institucionalidade, Papel Da Arbitragem e Da Especulação*. Rio de Janeiro: FGV Editora.
- Sardoni, Claudio, and L. Randall Wray. 2007. *Fixed and Flexible Exchange Rates and Currency Sovereignty*. Levy Economics Institute. Economics Working Paper Archive.
- Serrano, Franklin. 2002. "Do Ouro Imóvel Ao Dólar Flexível." *Revista Economia e Sociedade* 19.
- Shin, Hyun Song. 2016. "Global Liquidity and Procyclicality." In *World Bank Conference*, Washington D.C., 1–16.
- Tang, Ke, and Wei Xiong. 2012. "Index Investment and Financialization of Commodities." *Financial analysts journal* 68(6): 22.

- Tavares, Maria da Conceição. 1972. *Da Substituição de Importações Ao Capitalismo Financeiro: Ensaio Sobre Economia Brasileira*. Rio de Janeiro: Zahar.
- Tcherneva, Pavlina. 2016. *Money, Power, and Monetary Regimes*. Levy Economics Institute. Economics Working Paper Archive.
- Tymoigne, Eric, and L. Randall Wray. 2013. *Modern Money Theory 101: A Reply to Critics*. Levy Economics Institute. Economics Working Paper Archive.
- Vergnhanini, Rodrigo, and Bruno De Conti. 2018. "Modern Monetary Theory: A Criticism from the Periphery." *Brazilian Keynesian Review* 3(2): 16–31.
- Wooldridge, Jeffrey M. 2015. *Introductory Econometrics: A Modern Approach*. Nelson Education.
- Wray, L. Randall. 2014a. *From the State Theory of Money to Modern Money Theory: An Alternative to Economic Orthodoxy*. Levy Economics Institute. Economics Working Paper Archive.
- . 2014b. *Outside Money: The Advantages of Owning the Magic Porridge Pot*. Levy Economics Institute. Economics Working Paper Archive.
- Wray, L Randall. 2015. *Modern Money Theory: A Primer on Macroeconomics for Sovereign Monetary Systems*. Springer.

9 Appendix – Data definitions and sources

Variable	Code	Description	Source	Model
Commodities	PALLFNINDEXQ	Global Price Index of All Commodities	FRED	DS
USD	NNUSBIS	Narrow Effective Exchange Rate for United States	FRED	DS
Nominal exchange rates to the USD	EDNE_USD_XDC_RATE	Exchange Rates, US Dollar per Domestic Currency, End of Period	IMF-IFS.	L
Libor	USD1MTD156N	1-Month London Interbank Offered Rate (LIBOR), based on U.S. Dollar	FRED	L
Policy rates		Policy rates (monthly)	BIS	L
International reserves	Q.1C0.1C0.C.9A.MOA.RXGT.1.ALL.MV.TO1.ALL	International reserves (excluding gold)	World Bank.	L
GDP growth	NGDP_RPCH	Gross domestic product, constant prices, percent change	IMF – WEO April 2019	L
Inflation (cpi)	PCPIEPCH	Inflation, average consumer prices, percent change	IMF – WEO April 2019	L
Kaopen	Kaopen	See (Chinn and Ito 2006)		L
Government deficit (def)	GGXCNL_NGDP	General government net lending/borrowing, percentage of the GDP	IMF – WEO April 2019	L
External debt	DT.DOD.DSTC.CD	Short-term external debt is defined as debt that has an original maturity of one year or less. Available data permit no distinction between public and private nonguaranteed short-term debt. Data are in current U.S. dollars.	World Bank – IDS.	L

Current account balance (cab)	BN.CAB.XOKA.GD.ZS	Current account balance (% of GDP)	World Bank	L
Nominal GDP	NY.GDP.MKTP.CD	GDP (current US\$)	World Bank	FD
Investment (inv)	NE.GDI.FTOT.ZS	Gross fixed capital formation (% of GDP)	World Bank	FD
GDP per capita (gdppc)	NY.GDP.PCAP.KN	GDP per capita (constant LCU)	World Bank	FD
Trade openness (trade)	NE.TRD.GNFS.ZS	Degree of openness - Trade (% of GDP)	World Bank	FD
Government consumption (govc)	NE.CON.GOVT.ZS	Government consumption - General government final consumption expenditure (% of GDP)	World Bank	FD
(nfids_gdp)	Q.5B0.5B0.M.3P.ALL.DSIT.1.ALL.NV.TO1.NBK	International debt securities, nonbanks	World Bank	FD