



MASTERS'S THESIS

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**How could an International Exchange Rate Regime that
fosters economic development on a global scale be
designed?**

An MMT-consistent Proposal

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Abstract

This paper outlines a possible design for an international exchange rate regime that minimizes the shortcomings of the current non-system – from floating to fixed regimes – and expands the policy space for currency-issuing governments in order to foster economic development. As such, this paper extends the theoretical body of Modern Monetary Theory by incorporating its principles in the design of an international exchange rate regime. The international exchange rate regime as proposed is designed as a rule-based managed float based on obligatory and symmetric forex interventions by cooperating central banks and thereby ensures that an agreed and rule-based nominal exchange rate target is realized at every point in time. The corresponding rule is that the nominal exchange rate adjusts according to the inflation rate differentials between the corresponding currency areas at a defined frequency. On top of that, it is recommended – though not obligatory - that countries establish a permanent zero interest rate policy and maintain or reintroduce their own national fiat currency to maximize their benefits from the international regime. Model-based comparisons show that the international regime outperforms the floating and fixed regimes in terms of level of investment and output respectively. The key comparative advantages of the international exchange rate regime are that it ensures stable real exchange rates, which both the floating and the fixed regimes fail to achieve, and greater policy space for fiat currency issuing governments, which is a major constraint in fixed exchange rate regimes.

Keywords: Exchange Rates, Modern Monetary Theory, Economic Development, Trade, Investment, Central Banking

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1 Introduction

“A well-functioning currency system is crucial because it is the valve that regulates the pressure in all parts of the system, preventing any increase in pressure in certain parts that would endanger the survival of the whole system. There is ample proof that, left to its own devices, the market is unable to set exchange rates that reflect the fundamentals of the countries wishing to exchange goods and services.” – UNCTAD (2011), p. 180

In times of globalization, supranational institutions, increasing numbers of trade- and investment agreements and globally fragmented supply chains, there is yet one area where global integration and cooperation are missing although desperately needed – exchange rates. In this light, this paper theoretically outlines an international exchange rate regime that aims at fostering economic development on a global scale. Unmasking the current non-system¹ as a liability to economic development, this paper provides an alternative solution that builds on international cooperation and corrects for the shortcomings of the current non system. The design of the alternative system – the international exchange rate regime - is heavily inspired by the theoretical body of Modern Monetary Theory (MMT) and thus incorporates many of its theoretical insights.

The current non-system ranging from floating to fixed exchange rate regimes fails to deliver stable real exchange rates that reflect the fundamentals of the corresponding economies and – in the case of fixed regimes – constraints the national policy space necessary to operate policies that foster economic development. As UNCTAD (2011, p. 180) puts it: “In the current non-system, individual countries can find only temporary and pragmatic solutions to their problems of over- or undervaluation.”. Such solutions might also include capital controls. However, capital controls are only a means to dampen the symptoms of a non-functioning system and do not address the problem at its cause. To address the cause, it needs thorough consideration of the underlying problems and a fundamental rethinking of how to solve them.

The cases of Brazil and Greece underline the relevance of the shortcomings of the current non-system and demonstrate the need for international cooperation on exchange rates – Brazil being an example for a floating regime and Greece being an example for a fixed regime. In the years after the great financial crisis, Brazil experienced massive speculation-driven capital inflows, which led to a major appreciation – and overvaluations of up to 40% - of its currency relative to the US dollar. The consequences were that the Brazilian manufacturing sector lost international market shares – the manufacturing trade balance turned from +24bn USD (2004) to -35bn USD in 2010 - and Brazil experienced a harmful deindustrialization (Gaulard, 2012). Greece, as part of the European Monetary

¹ The term “non-system” as also being used by UNCTAD (2011) refers to the current non-existence of an international exchange rate regime and includes the wide range of unilateral regimes – from floating to fixed exchange rate regimes.

Union (EMU), suffered twice from its fixed exchange rate regime: firstly, it experienced a huge increase in its real effective exchange rate – an increase of around 20% between 2000 and 2010, which alleviated its international competitiveness and secondly, due to the adoption of the EURO it lost its domestic policy space to counter the negative consequences induced by the loss of competitiveness causing unemployment to skyrocket up to 27% – with all its harsh social consequences (Bank for International Settlements, 2019; Flassbeck & Bibow, 2018; OECD, 2019b). Those short cases demonstrate the urge of finding adequate solutions. As much as the world is concerned about a well-functioning trade system, it should be equally concerned about a well-functioning monetary system.

Since the term “economic development” and the theoretical body of MMT are being referred to regularly throughout the paper, both are to be defined. The term “economic development” as being used in this paper refers to the commonly used definition as improvement of living standard of a nation’s citizens on both economic, social and political level (Szirmai, 2015). By that definition economic growth is but one aspect of economic development. Also, by that definition economic development is hard to measure in quantitative or monetary terms although concepts like the human development index established by the UN try to objectify the measurement (Szirmai, 2015). However, the intuition behind the concept of economic development by means of improving living standard is considered to be sufficient for the scope and purpose of this paper as it rather focuses on the theoretical means to improve economic development and does not require any concrete measurement.

Concerning MMT, it refers to the scholarly work and theoretical body named “Modern Monetary Theory” located in the heterodox school of thought close to Post-Keynesianism and considered as an evolution of Chartalism². While concrete applications and explanations are elaborated throughout the paper, the core concepts of MMT are the following: it acknowledges that the fiat currency is a monopoly of the government, that has to be spent into existence first, before it can be used to pay taxes or purchase bonds. Logically, neither taxes nor bond sales finance government spending. As monopoly issuer of the currency, the government faces no purely financial constraints (the only constraints are political and real resource constraints), has no economic default risk on debt denominated in the currency it issues, can make all payments denominated in its own currency as they come due and hence is able to purchase everything that is for sale in its own currency - including all idle labor. As currency issuer, the federal government operates under a completely different logic than currency users such as local governments, corporations and households, which have to fund their spending by either income, asset sales or borrowing (limited by their creditworthiness), do. The primary means of taxes is not to fund government spending, but to create demand for the currency. As secondary means, taxes serve as a drain to lower inflationary pressure, address inequality or (dis)incentivize certain behaviors. MMT has coined the term “monetary sovereignty”, which is being used often in this paper. It refers to

² An economic theory of money that goes back to Knapp (1924) and refers to the argument that money originated due to states’ attempts to provision themselves and direct economic activity. It further argues that the currency derives its acceptance from the power of the state to levy taxes on its citizens only payable in the currency the corresponding state issues (Knapp, 1924).

the conditions that the federal government of a nation issues its own fiat currency, is able to enforce its tax liabilities denominated in its own currency, does not issue any debt instruments not denominated in its own currency and does not promise to exchange that currency into anything else (foreign currency or commodity) at a fixed rate (Bell, 2001; Ehnts, 2016; Hail, 2018; Mitchell et al., 2019; Mosler, 2012; Wray, 2015a). For unilateral exchange rate regimes, the condition of monetary sovereignty as defined above is only fulfilled in floating regimes since fixed regimes promise to exchange the currency into foreign currency at a fixed rate. This is the reason why the scholars of MMT are in favor of floating regimes when it comes to the question of exchange rate regimes (Mitchell et al., 2019; Mosler, 2012; Wray & Sardoni, 2007). A discussion of an international regime based on corporation has not yet been included into the theoretical body of this school of thought.

The academic literature on the design of an international exchange rate regime based on cooperation between central banks has not really progressed since Keynes' proposal of the Bancor and the implementation of the Bretton Woods System. This might be due to the dominance of the neoliberal zeitgeist, in which markets are assumed to function best if left to themselves (Senker, 2015). It seems that the mainstream orthodoxy - most prominently the neoclassical school of thought - applies that equally to the foreign exchange market. Flassbeck (2000) and the United Nation Conference on Trade and Development (UNCTAD) (2011), at that time led by Flassbeck as Head of Macroeconomics and Development, however, have published working papers in which they explicitly argue in favor of international cooperation on exchange rate regimes. This paper picks up the work of Flassbeck and combines it with the theoretical body of MMT thereby extending the theoretical body of MMT by incorporating its principles on the design of an international exchange rate regime.

The paper is structured in the following way. Chapter 2 discusses the shortcomings of the current non-system, in which countries choose a regime from the range of floating to fixed regimes and try to find individual solutions to cope with the problems induced by the exchange rate regime³. In chapter 3, four criteria that determine whether an exchange rate regime fosters economic development on a global scale are established. Each of the four criteria – a stable and predictable real effective exchange rate, a fair and efficient international trade system, monetary sovereignty and financial stability – are being elaborated and justified thoroughly in this chapter. Chapter 4 outlines the proposal of an international exchange rate regime that explicitly corrects for the shortcomings of the current non-system and – on top – expands the policy space for currency issuing governments to foster economic development. The proposal is developed along the subchapters, which consider the aspect of international cooperation on exchange rates, how to find an adequate rule-based exchange rate as well as the features of a permanent zero interest rate policy and the one country one currency rule – inspired by the theoretical body of MMT. Chapter 5 includes a model-based comparison of the international regime and the floating and fixed regime respectively. The two comparisons undertaken evaluate the regimes with regards to output

³ For reasons of simplification, the chapter is only divided into floating and fixed regimes reducing the issue into a binary, while the middle way – managed floating – is incorporated into the fixed regime part.

measured as nominal GDP. Chapter 6 discusses potential economic issues that the regime either has to respond to or may even induce itself. More concretely, issues related to trade imbalances, economic shocks, transitioning to monetary sovereignty as well as the effects of foreign exchange market interventions by the central banks on the policy (interest) rate and inflation are being considered. Moreover, this chapter sheds light on potential political obstacles that an implementation of an international regime might encounter, such as conflicting interests grounded in profit or power aspirations. Chapter 7 concludes the previous chapters and entails a summary of the key points.

2 What are the shortcomings of the current non-system?

Currently, there is neither such a thing as an international exchange rate regime nor relevant international cooperation on exchange rates leading to the issues that nations like Brazil and Greece, as shortly explained in chapter 1, are facing. Rather, each country - or as in the case of monetary unions such as the EMU or the CFA franc zone a group of countries - has and follows its own exchange rate regime. Thus, from a global perspective the landscape of exchange rate regimes being in place is quite diverse and ranges from free floats over managed floats to hard pegs or even monetary unions each having its shortcomings that impede economic development. These shortcomings are related to the four criteria, - which will be elaborated on in more depth in chapter three -, which an exchange rate regime needs to fulfill in order to foster economic development on a global scale: a stable and predictable, real effective exchange rate, monetary sovereignty, financial stability as well as free and fair trade.

Since exchange rates express the external value of one currency relative to the external value of another currency, they are – if we exclude the real consequences for a while - by the very nature a zero-sum game. If one currency appreciates against another, the corresponding counterpart currency depreciates proportionally. A change in the relative external value of a currency affects the international competitiveness of actors in international trade (importers and exporters) since goods and services become cheaper or more expensive respectively expressed in the foreign currency. This applies equally for international financial flows where exchange rate changes affect the value of financial assets expressed in the foreign currency. This fundamental logic implies that exchange rates are a source of international political conflict since always at least two parties are affected by changes in exchange rates and each time the benefits of one party are the costs of another party. This is especially relevant given the globalized environment characterized by international trade- and capital flows nowadays and already implies the need for international cooperation to avoid these kinds of conflicts, although this argument is rather related to international relations than purely economic.

Before the individual shortcomings of the different regimes are being discussed, it is worth to elaborate on the common shortcomings that both fixed and floating regimes have. At this point, I simplify the whole range of regimes into the binary of fixed and floating without paying attention to the detailed characteristics of nuanced versions of those regimes. The managed float as the typical middle-way is considered as a nuanced version of a fixed regime, as it needs foreign reserves to be able to

manage a regime in both upward and downward direction. The current implementations of both regimes follow to a significant extent the prescriptions of orthodox economic theory - most dominantly the Neoclassical and New-Keynesian school of thought - in a sense that the exchange rate regimes are based on the notion that there is a necessity for capital mobility across countries in order to allocate existing savings to its most productive use, i.e. investment. As the literature of Post-Keynesianism and Modern Monetary Theory has convincingly demonstrated, the framework of “loanable funds” that underlies the idea that savings do finance investment, is not accurate and hence neither is the reasoning for capital mobility. Money is not a scarce resource, thus “crowding out” does not apply (Lavoie, 2014; M Mazzucato & Wray, 2015; McLeay, Amar, & Thomas, 2014; Sheard, 2013). Plus, required investments by the federal government, if denominated in the national currency, are not financially constrained, which means that scarcity of funding can never be a valid argument for a fiat currency issuing government (Bell, 2001; Ehnts, 2016; Mitchell et al., 2019; Mosler, 2012). Moreover, both types of regimes are ultimately outcomes of supply and demand on foreign exchange markets and, consequently, are prone to speculative attacks as history has shown (Flassbeck, 2000, 2001; Heath, Galati, & McGuire, 2007; Krugman, Rogoff, Fischer, & McDonough, 1999). While the fixed peg can only be maintained as long as the corresponding country has the required foreign reserves, speculators may undertake bets via financial derivatives against the maintenance of the peg, which often lead to a self-fulfilling prophecy when the falling (rising) forward exchange rate (induced by speculation) induces a capital flight draining foreign reserves that would have been necessary to maintain the peg (Flassbeck, 2000, 2001, 2018). The cases of financial and exchange rate crises in Latin America (1980s) and Asian (1990s) underline the relevance of this point (Mitchell et al., 2019). On the other hand, the floating regime is subject to so called “carry-trade” speculation - which will be elaborated on in depth in chapter 2.1 - that aims at making profits by using interest rate differentials between currencies - often in combination with profits due to market value gains. On top of that and – even more important - human

Before the consequences of over- and undervaluation of currencies for the real economy are being explained, it needs to be defined under which condition an exchange rate is to be considered as over- or undervalued. An exchange rate is considered to be overvalued (undervalued) when the spot rate is higher (lower) than the exchange rate that would be justified according to purchasing power parity. In essence, this means that the exchange rate is not in line with the inflation differential between the exchange rate regimes and affects the real effective exchange rate – a measure for international competitiveness (Santaella, 2015). Consequently, this decreases (increases) the international competitiveness of actors in the tradeable sector (Flassbeck, 2001, 2018; Gaulard, 2012; Griffith-Jones & Gallagher, 2011; UNCTAD, 2011). How does over- or undervaluation of the external value of a currency affect the real economy?

From the global perspective, the changes in competitiveness exactly outweigh each other since exchange rates are a relative concept. However, since changes and volatility in the real effective exchange rate affect the profits expressed in foreign currency, investors are exposed to currency risk

which means uncertainty about expected profits. In this context, this paper builds on the theoretical conclusions by Keynes (2018) and the theoretical body of Post-Keynesianism concerning uncertainty about expected profits being a harmful factor for investments. That leads to the situation in which some of the potential investments that could be made won't be made, get postponed or, as is common practice, actors in the tradeable sector use some of their financial resources to hedge against the currency risk (Butler, 2016; Ferrari-Filho & Conceição, 2005). In any case, it means that the total amount of investment is smaller than the amount that could potentially be invested. This applies even more to long-term fixed investments in the tradeable sector (UNCTAD, 2011). A lack of these kind of long-term fixed investments leads to a lack of capital development and ends in unused potential for growth in productivity and wealth. Moreover, since prices and their signaling function in the market economy are to bring the most efficient allocation of resources, misaligned prices may induce an inefficient allocation of resources. If the exchange rate does not express the real competitiveness – based on fundamentals – of actors in the tradeable sector, it may undermine the beneficial productivity gains from (international) labor division. In some cases, this could also lead to a change in the flows of goods and service that are ecologically more harmful than those under earlier exchange rate relations, e.g. if the change in competitiveness makes goods with higher transport-related emissions comparatively cheaper and induces a change in demand.

From a national perspective, an overvaluation decreases the competitiveness of the tradeable sector and, in general, reallocates international demand towards those who are more competitive. As the overvalued sector loses market share it threatens its existence and may induce deindustrialization which in turn – without counterinitiatives being undertaken by the government - leads to unemployment leaving productive capacity and potential wealth unused – and comes with harsh social consequences for the people affected. On the other hand, an overvaluation means that imports become cheaper, which improves the real terms of trade for the corresponding country. However, imports may substitute beforehand domestically produced products, which might lead to negative ecological consequences. On the contrary, an undervaluation strengthens the competitiveness of the tradeable sector leading to an increase in market share, production and employment. However, imports become relatively more expensive leading to an imported inflation and a decline of the real terms of trade. In the case of countries that are dependent on food and energy imports, an undervaluation may come with significant real costs. More generally, exchange rate misalignments – especially those over a relevant time period - are a source of trade imbalances (Gaulard, 2012; Griffith-Jones & Gallagher, 2011; UNCTAD, 2011). Trade imbalances, especially long run current account deficits, may force a country to accumulate debt denominated in a foreign currency – unsovereign debt – that has a significant risk of default and influences the power allocation between nations. Typically, creditors are in a more powerful position than debtors affecting the international relation between nations (Flassbeck, 2001). On the other hand, long run export surpluses undermine the real terms of trade and consequently, the real living standard of a nation since logically the export surplus nation net trades goods and services for financial claims

on the foreign counterparty. What is the rationale behind this since exports are real costs – time and effort are invested, but the output is consumed by foreigners - and imports are real benefits – time and effort are invested by foreigners, but the output is consumed domestically? Firstly, the neoliberal export-oriented growth model promotes this strategy as a potential path for development and, consequently, has been applied by many countries (Rodriguez & Rodrik, 2000; Szirmai, 2015). Secondly, countries that try to manipulate the external value of their currency or even follow a fixed regime that needs to be defended by interventions on foreign exchange markets need to have foreign reserves to be able to fight depreciation tendencies of their own currencies. In this light, export surpluses that enable the accumulation of foreign reserves can be considered as rational.

2.1 Major Shortcomings in Floating Exchange Rate Regimes

While the previous section has discussed the consequences for the real economy arising from exchange rate misalignments as well as the commonalities of fixed, managed and floating exchange rate regimes, this section will address the major shortcomings of floating exchange rate regimes.

In a floating exchange rate regime, the external value of a currency is solely determined by supply and demand on the foreign exchange market for that currency relative to other currencies. The exchange rate is allowed to fluctuate according to the foreign exchange market mechanisms. The supply and demand for currencies can be linked to trade and capital flows between countries and also to relative interest and inflation rates as well as to expected changes thereof (Flassbeck, 2001; Mitchell et al., 2019). However, as Mitchell et al. (2019, p. 379) add: “The determination of exchange rates is exceedingly complex, and movements of rates are impossible to predict. No theory or model of exchange rates has been capable so far of predicting exchange rate movements.”. On the contrary, the mainstream theories of Neoclassis and New-Keynesianism state that the market determines exchange rates either according to purchasing power parity (PPP), whereby inflation rate differentials are expected to be compensated by a corresponding currency appreciation/depreciation, or according to uncovered interest rate parity (UIP), whereby interest rate differentials are expected to be compensated by a corresponding currency appreciation/depreciation (Feenstra & Taylor, 2014; Krugman, 2008). Those theories build on the assumptions of perfect capital mobility, rational choices, absence of information asymmetry, frictionless trade and perfect competition (Feenstra & Taylor, 2014; Krugman, 2008; Mankiw, 2016). Plus, it builds on the efficient market hypothesis, which claims that market prices reflect all information available as well as immediate changes once new information are available, thereby creating the most efficient allocation of resources at any point in time (Boffa & Flassbeck, 2009; Malkiel & Fama, 1970).

Putting those theories to the test by comparing actual exchange rates of the Real, the Euro and the US dollar with its respective simulated PPP and UIP paths, it becomes clear that for the case of the exchange relation between the Brazilian Real and the US Dollar as well as for the relation between the Euro and the US Dollar the actual market outcomes differ significantly from the simulated PPP and UIP paths as Figure 1 and 2 display respectively. Figure 1 and 2 depict the comparison of the actual

exchanges rates with two simulated exchange rate paths of the Brazilian Real and the Euro against the US dollar. For both the PPP (see equation 2.1) and the UIP (see equation 2.2) simulation, the Real and the Euro are put as “home currency” while the US dollar is put as “foreign currency” into the respective equations 2.1 and 2.2. The simulated paths show the hypothetical development of the exchange rates based on PPP and UIP, taking the first data point as the initial exchange rate. Considering the differences between the actual values and the PPP paths displayed in Figure 1, the Real faced a real appreciation of its currency relative to the US Dollar that decreased the international competitiveness of Brazil significantly. Logically, the international competitiveness of the US increased equally relative to Brazil. As Figure 2 shows, the Euro faced two periods of significant overvaluation between 2009 and 2011 before experiencing a huge and lasting undervaluation from mid-2014 onwards, increasing the international competitiveness of the Eurozone relative to those of the US remarkably. Moreover, the differences between the actual values and the simulated PPP and UIP paths are very volatile, which makes it even harder for both actors in the real economy and actors on financial markets to predict the future external value of currency. The bottom line of both figures is that the free-floating regimes seem to fail with regards to finding the exchange rate relation that fits with the fundamentals of the economies and expresses their relative competitiveness adequately. Demonstrably, and in line with Mitchell et al. (2019) as well as UNCTAD (2011), neither the UIP nor the PPP path are able to sufficiently explain floating exchange rate movements. Although a broad empirical study is still missing in the literature, the results from Al-Zyoud (2015), who by means of empirical tests finds that the movements between the Canadian and the US dollar in the period of 1995 to 2008 aren’t explainable by PPP either, underline the finding. If market-based outcomes differ constantly and significantly from exchange rates that could be justified by the fundamentals, the rationale of floating exchange rates is put into question. Clearly, these volatile changes in international competitiveness come with consequences for the real economy as already explained in the beginning of this chapter.

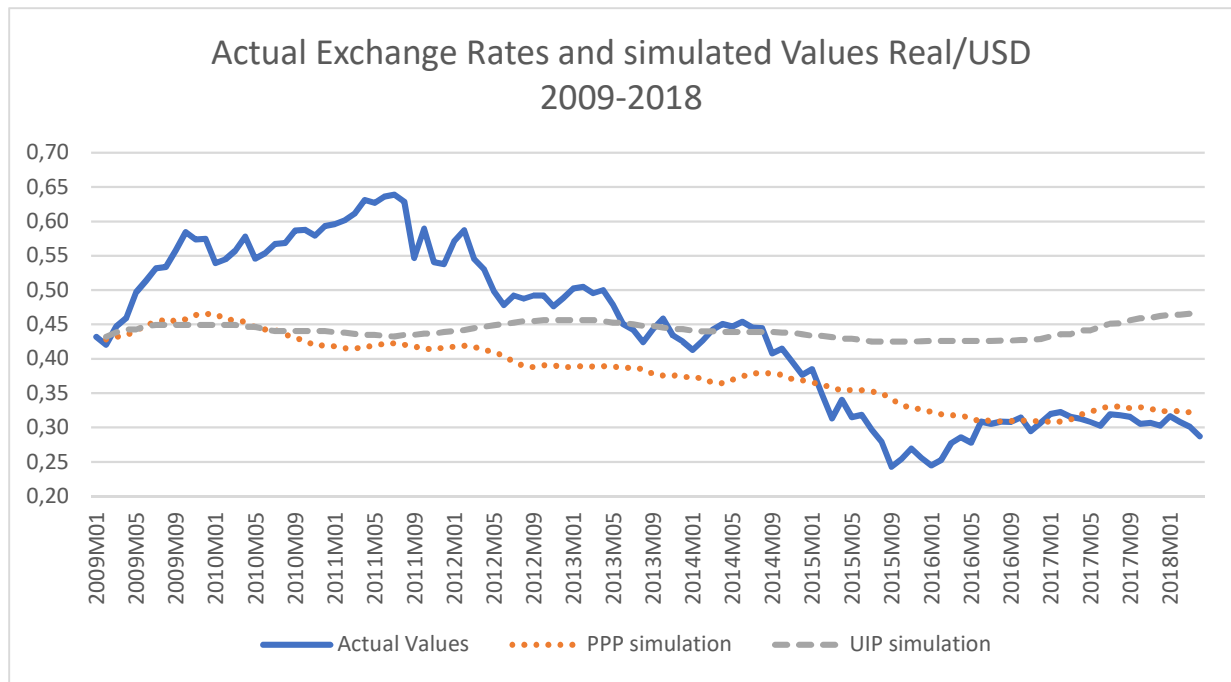


Figure 1 Actual Exchange Rates and simulated Values - Real/USD (Source: author's calculations based on (Board of Governors of the Federal Reserve System, 2019; International Monetary Fund, 2019))

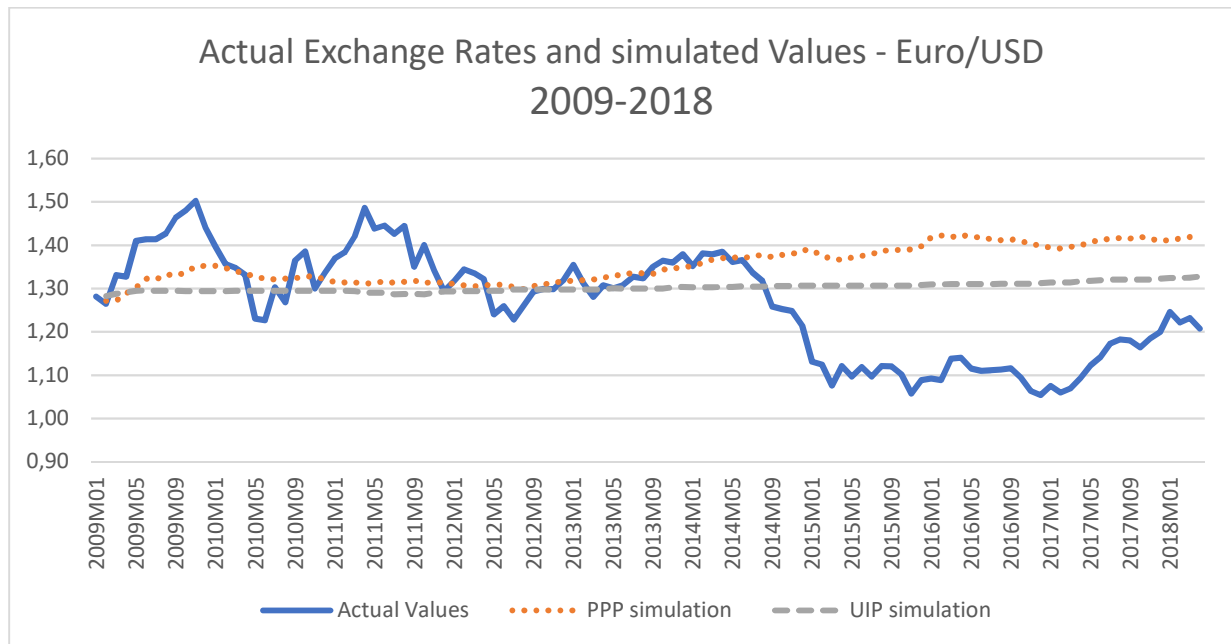


Figure 2 Actual Exchange Rates and simulated Values - Euro/USD (Source: author's calculations based on (European Central Bank, 2019; International Monetary Fund, 2019))

$$(2.1) \text{ PPP Path Simulation: } EX_{hf}^t = (1 + ((PPI_f^t / PPI_f^{t-1}) - (PPI_h^t / PPI_h^{t-1}))) * EX_{hf}^{t-1}$$

$$(2.2) \text{ UIP Path Simulation: } EX_{hf}^t = (1 + ((I_f^t / I_f^{t-1}) - (I_h^t / I_h^{t-1}))) * EX_{hf}^{t-1}$$

EX = Exchange Rate, h = Home Currency, f = Foreign Currency, PPI = Producer Price Index (All Commodities), I = Interest Rate (Central Bank Policy Rate)

What are the macroeconomic costs of those volatile exchange rate misalignments? The macroeconomic costs are related to the unpredictability of the future, real external value of a currency itself as well as to the fact that foreign exchange market mechanisms fail to prevent constant and

significant exchange rate misalignments, i.e. the spot value of a currency being significantly different from the value that would have been justified by UIP or PPP (whereby PPP is more important for trade flows and UIP for financial flows respectively as is being further discussed in chapter 4.2).

The unpredictability of the future, real external value of a currency, which is due to volatile exchange rate misalignments as displayed in Figure 1 and 2, increases the uncertainty for all participants in the tradeable sector since they neither can't reliably calculate the external value of their future profits nor reliably anticipate their international competitiveness. Both negatively impact the decisions about long-term investments in the tradeable sector, causing a lack of long-term fixed investments, which would expand the productive capacity, thereby increasing potential GDP. This does potentially harm economic development. Logically, the effect induced by volatile misalignments even applies to the global scale, thereby harming growth of potential GDP globally. According to Mitchell et al. (2019), the lack of investment and sluggish in expansion of the productive capacity also increases inflationary biases since full utilization of resources is reached sooner than it would have been if the expansion of the productive capacity would have taken place. Currently, producers and investors in the tradeable sector affected by these kinds of uncertainty have the possibility to sterilize the effect by hedging the currency risk. This, however, is an undeniable cost factor, which lowers the amount of financial resources that could be used for investment, thereby also harming potential long-term investments. Only big multinationals that have the opportunity to sterilize the effects by having perfectly diversified revenue streams might be less affected (Butler, 2016).

The logical questions that arises at this point is why does the foreign exchange market mechanism fail to deliver exchange rates that are consistent – at least in the long run – with the economic fundamentals of the countries concerned? The two reasons of dominant importance are related to the behavior of actors in financial markets in general as well as to the phenomenon of huge, speculative financial flows, that aim at making profits by using interest-rate differentials between currencies, referred to as “carry trade” speculation.

To have a well-functioning market and consistent behavior of market participants, price signals are of crucial importance. As Flassbeck (Flassbeck, 2000, 2012a, 2012b, 2018) points out, the price signals in financial markets work different to those in consumer good markets. While a price rise in consumer good markets signals scarcity and reduces the demand, a price rise in the financial markets is seen as a signal for a rally, i.e. a period of sustained increases in prices of financial assets, that comes with perceived profit opportunities for the actors. Accordingly, a price rise in financial markets can even increase demand, thereby basically turning the most important factor for efficient market allocation off. While an investor in consumer good markets succeeds when he achieves to differentiate his product from that of the masses, an investor in financial markets succeeds when he achieves to anticipate the buying behavior of the masses (Flassbeck, 2012a, 2018). Moreover, Flassbeck (2000), referring to Hayek's theory of markets, adds the point that the availability and diversity of information in consumer good markets is fundamentally different to those in financial markets. According to Hayek, what makes

a market efficient is the huge number of participants that collect even more individual information units and that process and diversity of independent information collection enables prices to reflect scarcity perfectly. On the contrary, the government is not able to collect and process the information and as such cannot set prices that reflect scarcity adequately (Boettke, 2018; Flassbeck, 2000). Flassbeck (2000) continues his argument by applying this finding to the working mechanisms of foreign exchange markets, where information mostly stem from government source like statistical office or central banks and are interpreted in a certain, uniform way by traders, who try to match their views in order to anticipate the behavior of the majority, while the aim of that is not to buy/sell a certain good but to find the financial asset that offers the highest profit. That is essentially what drives herd behavior leading to excessive overshooting of prices and currency values, which is closely linked to financial crises that occurred post Bretton-Woods (Boffa & Flassbeck, 2009).

Related to the herd behavior and overshooting in financial markets is the phenomenon of carry trade speculation. Typically, investors carry huge amounts of money from currency areas with low nominal interest rates to those with high nominal interest rate, e.g. borrowing in Japan (very low interest rates) and investing in short-term financial assets in Brazil (high interest rates), in order to gain profits from the interest rate arbitrage. As this trade means demand for the targeted currency and sale of the funding currency, it leads the targeted currency to appreciate although it would need to depreciate to sterilize the interest rate differential. Due to the herd behavior and the above described price signals in financial markets, this typically triggers other investors to do the same, thereby increasing the demand for the target currency even more and, consequently, leading to an even stronger appreciation. In that sense, it becomes clear that carry trade speculation feeds on itself and even enables profits due to market valuation increases for those big investors that enter and leave the speculation first. Once investors or groups of investors are big enough to trigger the herd, there is not much risk at all included in these type of speculation (Boffa & Flassbeck, 2009; Flassbeck, 2000, 2001, 2012a, 2018; Gaulard, 2012; Gilmore & Hayashi, 2011; Heath et al., 2007; La Marca, 2007; Santaella, 2015). “The amounts involved in carry trade have been huge in recent years, and they have dominated most of the other determinants of overall capital flows. There may be statistical limitations to establishing the full amount of such movements, but their existence and domination is the only logical explanation for the fact that, despite massive interventions, exchange rates have been moved against the fundamentals repeatedly, with interruptions only during financial crises.” (UNCTAD, 2011, p. 163). This finding is very consistent with those of Heath et al. (2007), Gilmore and Hayashi (2011) and Gaulard (2012). Clearly, such a carry trade speculation doesn’t serve the real economy and is to be considered a very unproductive use of financial resources as those short-term capital movements are not related to trade or real investment. On the contrary, as outlined above, the misalignments induced by carry trade have negative consequences for the real economy. Moreover, all the non-financial resources, e.g. labor and energy, that are put into the facilitation and organization of speculation are also being used unproductively and come with significant opportunity costs. Plainly speaking, instead of facilitating speculation those people could do meaningful

jobs that serve the public purpose and increase the real living standard, e.g. research on illnesses, or ecological transformation.

Given the inefficient price mechanisms in the foreign exchange markets and the destructive consequences for the real economy, the following quote perfectly reflects the consequence for economic policy: “The policy lesson is simple: macroeconomic prices are too important to be left to the vagaries of these markets” (Boffa & Flassbeck, 2009, p. 204). To follow up on this, the floating regime is being incorporated into a model-based comparison with the proposed alternative regime in chapter 5.

2.2 Major Shortcomings in Fixed Exchange Rate Regimes

While the previous section has discussed the shortcomings arising from a solely market based, floating exchange rate regime, this section will address the major shortcomings of fixed exchange rate regimes.

In any type of fixed exchange rate regime, the external value of the corresponding currency is fixed against either the value of another currency or a certain commodity, e.g. gold. The central bank typically uses open market operations to achieve and maintain the targeted exchange rate without significant deviation. In doing so, the central bank commits itself to buy/sell its currency at a fixed price at any point in time. In the case of arising depreciating pressure, the central bank uses its foreign reserves to buy its own currency, thereby sterilizing the depreciating pressure. In the case of arising appreciating pressure, the central bank sells its own currency to buy the foreign currency, thereby sterilizing the appreciating pressure (Feenstra & Taylor, 2014; Mitchell et al., 2019). While such a regime is said to foster trade and capital flows by stabilizing the nominal value of the exchange rate relation, it is ultimately based on the notion of money as a mere medium of exchange thereby understating the potential of being able as a government to expand the money supply with regards to steering the economy towards its full capacity (Feenstra & Taylor, 2014; Wray & Sardoni, 2007).

The most important shortcoming of all types of fixed exchange rate regimes is related to the concept of monetary sovereignty. A promised convertibility constrains a country’s ability for independent fiscal and monetary policy, thereby undermining the benefits of monetary sovereignty. While a monetarily sovereign government, i.e. a government that issues its own fiat currency and does not promise to convert its own fiat currency at a fixed rate into anything else (currencies or commodities), faces no purely financial constraint in its ability to operate fiscal spending, a government operating under a fixed exchange rate regime, ultimately, is financially constrained by the amount of foreign reserves that this country is able to acquire. Those constraints increase the possibility that productive domestic resources remain unused, which most likely disproportionately affects the poorest, e.g. through the creation of involuntary unemployment. While a monetarily sovereign government, for example, might be able to introduce a job-guarantee program in order to employ all idle labor, a government operating under a fixed exchange rate regime faces the risk of running out of foreign reserves, which, ultimately, comes with the decision between either maintaining the peg or employing idle resources and as such limits the policy space (Kelton, 2011; Mitchell et al., 2019; Mosler, 2010). Next to the constrained policy space,

a nation operating a fixed exchange rate regime is subject to insolvency and default risk because it has promised to deliver something, the pegged foreign currency, it might not be able to deliver (Wray, 2015a).

It becomes clear that countries operating under a fixed regime have an incentive to accumulate foreign reserves in order to be able to intervene in the foreign exchange market to maintain a certain peg. The most typical way to accumulate foreign reserves is by having an export surplus. However, as explained above, an export surplus is to be considered as a cost in real terms of trade since it means that such a country exchanges real goods and service that it could have consumed domestically for financial claims. Hence, the rationale of this tradeoff is at least questionable if the policy aim is to maximize the real living standard (Mitchell et al., 2019; Mosler, 2010; Wray, 2015a).

Moreover, operating a fixed exchange rate regime requires high and permanent convergence from the home country's to the foreign country's monetary policy as well as the need to converge to a common inflation target, which also makes convergence of unit labor costs a necessary condition (Flassbeck & Spiecker, 2011). If a country fails to converge, this will lead to real exchange rate distortions, i.e. either over – or undervaluation, and comes with the negative consequences for the real economy that were outlined above. If a country follows a unilateral peg, it needs to copy the monetary policy and achieve the same level of inflation as the foreign country to avoid creating an incentive for currency speculation and a distortion of the real exchange rate unless it is willing to adjust the rate of the peg. However, it is quite probable that copying foreign monetary policy does not match perfectly the domestic policy needs (Feenstra & Taylor, 2014).

As the case of the EMU, which can be considered as the deepest form of fixed exchange rate regimes, has clearly demonstrated, a significant and long-lasting deviation of the target inflation rate for one country from those of its main trading partners leads to unsustainable external deficits, puts a heavy burden on this country and thereby may even puts the currency arrangement itself into question (Höpner, 2014; Mitchell et al., 2019; UNCTAD, 2011). As Flassbeck and Spiecker (2011) show, the non-convergence in terms of the inflation rate of member states in the EMU has led to the significant trade imbalances among the member states and has brought involuntary unemployment and deindustrialization to the external deficit countries, e.g. Greece, Spain and Italy. On the other hand, Germany is the most prominent beneficiary of the EMU since it used the existing currency arrangement to follow an internal devaluation strategy, which led to an increase of the competitiveness of Germany's tradeable sector against those of the other EMU member states driving industrialization and increasing employment domestically (Flassbeck, 2007; Flassbeck & Spiecker, 2011; Weeks, 2014). Mitchell (2015) adds the point that the lack of currency sovereignty on the national level in the EMU as well as the lack of fiscal policy operated on the EMU level has made the problems arising from non-convergence in terms of the common inflation rate even worse since countries with external deficits lack the fiscal policy space to counteract the negative consequences for their real economy, e.g. involuntary unemployment and deindustrialization (see the cases explained in chapter 1). The lessons from the EMU

case are of high relevance for all fixed exchange rate regimes since the EMU case demonstrates two crucial points: first, to avoid significant real exchange rate misalignments (and its consequences for the real economy) countries should not operate under too rigid exchange rate arrangements and, second, the lack of currency sovereignty puts a significant burden on a country's ability to counteract negative consequences, like involuntary unemployment, arising from real exchange rate misalignments.

The question that arises at this point is whether a managed float, which can be considered as a rather loose type of fixed regime, might be a superior alternative. A managed float faces similar obstacles in terms of monetary sovereignty and the corresponding space for independent fiscal and monetary policy although to a lesser extent. If a country aims for a specific exchange rate band, the domestic policy space is a function of the available foreign reserves. That means that such a country also needs foreign reserves to be able to achieve its targeted exchange rate and as such has a similar incentive to accumulate foreign reserves, even if it comes at the cost of leaving productive domestic resources unused. However, since exchange rates are a relative concept, it is logically impossible that each country achieves its exchange rate target unless it is outcome of an international cooperation. Hence, the question that remains is whether a managed float based on international cooperation might be a superior option?

3 What makes an alternative regime fostering economic development?

As the previous section has outlined, the current international non-system comes with major shortcomings on both the national and the global scale. While fixed regimes constrain national fiscal policy thereby increasing the risk of leaving productive resources un- or underutilized, floating regimes lead to volatile and significant misalignments of real exchange rates, thereby harming long-term fixed investment globally and creating problems of over- and undervaluation on a national level. Moreover, both regimes are prone to massive and unproductive speculation, thereby decreasing financial stability. In the current framework, individual countries can only find temporary and pragmatic solutions to deal with those problems. This, however, is rather to be considered as symptom- rather than cause fighting. In consideration of the above-described shortcomings, this section discusses which criteria an alternative regime needs to fulfill in order to serve the purpose of fostering economic development on a global scale. In that sense, this chapter elaborates on the means of a stable and predictable, real effective exchange rate, fair and efficient international trade, monetary sovereignty as well as financial stability in order to foster economic development on a global scale. Figure 3 displays a summary of the main shortcomings of both floating and fixed regimes in relation to the four criteria a regime needs to satisfy in order to foster economic development.

	Fixed Regimes	Floating Regimes
Stable real effective exchange rate	<ul style="list-style-type: none"> - only stable <u>nominal</u> exchange rate - internal revaluation → misalignment of REER 	<ul style="list-style-type: none"> - flawed price signals and carry trade → misalignment of REER
Fair and efficient international trade	<ul style="list-style-type: none"> - misalignment of REER distorts country's competitiveness - artificially induced trade imbalances 	<ul style="list-style-type: none"> - misalignment of REER distorts country's competitiveness - artificially induced trade imbalances
Monetary sovereignty	<ul style="list-style-type: none"> - promise to exchange the domestic currency at par into foreign currency undermines monetary sovereignty 	<ul style="list-style-type: none"> - features generally allow for being monetarily sovereign
Financial stability	<ul style="list-style-type: none"> - prone to speculation, which transmits into real economy 	<ul style="list-style-type: none"> - prone to speculation, which transmits into real economy

Figure 3 Fixed vs. Floating Regimes

3.1 Stable and predictable real effective exchange rate

While a fixed exchange rate regime ensures only a stable nominal exchange rate and the stability of the real exchange rate is a function of convergence in terms of monetary conditions – again, with the major cost of losing space for independent monetary and fiscal policy –, and a floating exchange rate regime, letting the nominal value be an outcome of market mechanisms, is linked with volatile and significant misalignments of the real exchange rate time and again, the alternative regime needs to be focused on ensuring a stable and predictable real effective exchange rate.

In order to avoid the problems of over- and undervaluation on a national level as well as the arising harms for long-term fixed investment on a global level stemming from uncertainty due to volatile exchange rate misalignments, it is of crucial importance to have a system that ensures a stable and predictable real effective exchange rate. For long-term fixed investment in the tradeable sector, investors need to be able to calculate the real external value of their expected future returns for a reasonable time period as this heavily affects the investment decisions. For investors in the real economy, this would reduce the incentive to use their limited financial resources for unproductive currency hedging and instead increases the possibility to use the resources instead for the investment itself thereby increasing the positive effects of investment on the productive capacity of the economy even more (Butler, 2016; Kosteletou & Liargovas, 2000; Serven & Solimano, 1992). Clearly, the decrease in uncertainty is likely to trigger investments, which in turn expand the productive capacity of the economy, thereby fostering economic development (Keynes, 2018). Moreover, once the international competitiveness of actors in the tradeable sector is no longer distorted by real exchange rate misalignments, it creates a level playing field for companies to compete productively and enables a more efficient allocation of resources – both among and across the tradeable and non-tradeable sectors –, which means that productivity increases can be gained from increased investment and more effective specialization among trading partners, increasing the welfare effects of trade (UNCTAD, 2011). Additionally, if producers lose their

competitiveness time and again due to reasons not under their control, this is a disincentive to engage in long-term oriented measures to develop the business in a sustainable way as well as making gains from learning curves, thereby driving productivity. So, a stable and predictable real effective exchange rate is a central component in fostering economic development on both a national and a global scale.

3.2 Fair and efficient international trade

An alternative exchange rate regime should be conducive to a fair and efficient international trading system. This is even more relevant in present times, in which production is fragmented internationally and organized among global value chains (GVC). Once every currency has a fair and stable value, global trade can become more efficient and specialized, thereby realizing the theoretical benefits from global work division and specialization, i.e. increase in productivity through learning curve and long-term fixed investments (Flassbeck, 2018; Krugman, 1993). As such, a stable exchange rate system, which would induce productivity increases - being on key factor in economic development and wealth – would underline the rationale of international trade (Szirmai, 2015). On the contrary, real exchange rate misalignments lead to inefficient allocation of productive resources as actors can't rely any longer on the accurateness of price signals. Especially the volatility of real exchange rate distortions induced by floating regimes is assumed to harm actors involved in the international exchange of goods and services to undertake long-term investment decisions confidently. Hence, this is one factor that causes the non-realization of the potential benefits of global work division and specialization (Flassbeck, 2000, 2001).

Taking the ongoing trial of the WTO to finalize the Doha round as well as the fact of an international increase in signed trade and investment agreements as evidence that the international community is highly concerned about further trade optimizations, they'd need to be equally concerned about setting up a stable monetary system (Baccini, 2018). As UNCTAD (2011, p.179) puts it: "Predictable exchange rates are at least as important for the functioning of the international trading system as abiding by multilaterally agreed rules for trade policy". In the current non-system nations or currency areas try to cope individually with this kind of monetary instability, e.g. by accumulating foreign reserves to intervene in the foreign exchange market. Since the accumulation of foreign reserves for the sake of being able to stabilize the exchange rate through market intervention is an unproductive use of financial resources (and linked with the sale of real goods and services that could have been consumed by domestic actors thereby increasing the real standard of living domestically), an alternative regime should minimize the incentive to accumulate foreign reserves for this sake. Again, the individual interventions in the current non-system are only "successful" if they are not done symmetrically, meaning if not both sides try to achieve different exchange rate. If two central banks follow competing exchange rate targets, it gets a power struggle that ultimately depends on who has or is able to attract more foreign reserves that could be used for the market intervention.

An alternative regime should also prevent nations from following undervaluation strategies that put a burden of unsustainable current account deficits on other nations. Again, logically the undervaluation

of one currency comes with the overvaluation of another currency. In fixed regimes, like the EMU, nations aim for internal devaluation by keeping inflation rates below those of the regime partners thereby manipulating the real effective exchange rate in their favor in order to gain international competitiveness. One concrete example is Germany, which achieved internal devaluation through suppression of unit labor costs (Flassbeck, 2007; Flassbeck & Lapavistas, 2015; Flassbeck & Spiecker, 2011; Mitchell, 2015; Weeks, 2014). In floating regimes, nations with comparatively high amounts of foreign reserves are able to manipulate the exchange rates in their favor thereby improving their competitiveness.

On the international relation side of the argument, an alternative regime would need to ensure a level and fair playing field for companies and, on the other hand, avoid inducing competition between nations as this is a source of international conflict and is likely to induce a race to the bottom in terms of fiscal or financial incentives offered by nations as well as in terms of labor and environmental standards (Flassbeck, 2012a). The alternative regime thus should be built on international cooperation and ensure that companies compete for the best product instead of nations competing among each other for offering the business environment with lowest production costs. Moreover, in times of climate change it is highly relevant to ensure that environmental standards could be implemented easier. A system built on adequate relative prices and international cooperation can only help in this regard.

Consequently, an alternative regime that ensures a stable and predictable real exchange rate thereby fostering an efficient and fair trade system, which enables the realization of potential productivity improvements, is likely to foster economic development on a global scale. Plus, an alternative regime that builds on international cooperation instead of on international competition decreases the risk of inducing international conflicts and increases the possibility of global improvements in terms of labor and environmental standards thereby fostering parts of economic development that are not only related to economic growth.

3.3 Monetary Sovereignty

The concept of monetary sovereignty refers to the condition that the sovereign government of a nation issues its own fiat currency and does not promise to exchange that currency into anything else (foreign currency or commodity) at a fixed rate (Mitchell et al., 2019; Mosler, 2012; Wray, 2015a). In order for an alternative regime to serve the aim of fostering economic development it is highly necessary to ensure monetary sovereignty on a national level to enlarge the policy space for monetary and fiscal policies. Monetary sovereignty ensures that the national government faces no purely financial constraints as it – as the monopoly issuer of the currency – is able to make all payments as they come due. Hence, a monetarily sovereign government logically never lacks the financial resources to employ all idle resources that are for sale in its own currency, i.e. bring all domestic productive resources into a productive use, thereby maximizing macroeconomic output, that comes with all the economic and societal benefits that are linked to having income and employment. The only constraints a monetarily

sovereign government faces are the availability and quality of its real resources as well as the risk of inducing inflation. It follows, that whatever is technically doable, is financially affordable for such a government. Essentially, monetary sovereignty ensures that a nation has all financial means necessary to maximize its economic development, which in turn is a function of available resources and technology (Hail, 2018; Mitchell & Muysken, 2008; Mitchell et al., 2019; Wray, 2015a).

Once monetary sovereignty is in place, it depends on the democratically determined priorities, which policies are implemented. However, since this thesis builds heavily on the theoretical framework of MMT, the job guarantee approach - which is a key component in MMT when it comes to the macroeconomic issues of unemployment, price stability, and business cycles - is being considered as one example of how monetary sovereignty channels into economic development. The job guarantee program (JG) (or employer of last resort) “involves the government making an unconditional job offer to anyone who is willing to work at a socially acceptable minimum wage and who cannot find work elsewhere. It is based on the assumption that if the private sector is unable to create sufficient job opportunities then the public sector has to stand ready to provide the necessary employment. This creates a buffer stock of paid jobs that expands (declines) when private sector activity declines (expands).” (Mitchell & Fazi, 2017, pp. 230-231). Next to the societal benefits, the JG works as an automatic stabilizer, price and wage anchor as well as a macroeconomic tool for aggregated demand management thereby stabilizing the economy at a state of full employment (Mitchell & Muysken, 2008; Mitchell et al., 2019). The concept of the JG is being further elaborated in box 3.3.

Box 3.3 The Job Guarantee

Moreover, the JG increases economic stability as it acts as an automatic (countercyclical) stabilizer and essentially is considered as a superior buffer stock approach to increase price stability. Additionally, the JG program is an effective and sustainable tool for aggregated demand management. While a demand expansion led by the private sector increases private indebtedness and thereby financial fragility, a government led expansion actually enhances financial stability by providing safe assets and income to the private sector (Hail, 2018; Mitchell & Muysken, 2008; Murray & Forstater, 2013a, 2013b). While the pace and size of the implementation might depend on the country’s specifics (e.g. administrative capacity), the principle is that the JG is federally funded, i.e. by the monopoly issuer of the currency, but locally administered. The JG schemes basically includes all types of jobs that tend to be underproduced by the private sector, e.g. community or environment care. However, competition with the private sector is not intended (Mitchell, Wray, & Watts, 2019; Tcherneva, 2018; Wray, 2015a). Essentially, the bottom line of the JG approach is: there is no reason for a monetarily sovereign nation to have involuntary unemployment suffering from its macroeconomic and societal costs, no matter how unproductive or poor the non-human resources in that country are (Mitchell & Fazi, 2017). The wage paid for jobs under the JG scheme essentially becomes the effective national minimum wage.

Box 3.3 The Job Guarantee

Similarly, the working conditions and job benefits become the lower bound of national working conditions (Mitchell & Fazi, 2017; Wray, 2015a). The JG scheme effectively attacks the societal costs of unemployment, such as: poverty, social isolation, crime, regional deterioration, health issues, family breakdowns, school dropouts, loss of human capital and social, political and economic instability. Simultaneously, the JG program fosters the societal benefits of full employment: poverty alleviation, community building, social networking, and intergenerational stability amongst others.

Next to that, the JG increases output in terms of goods and service, offers on-the-job training and skill development and addresses inequality since it hires off the bottom of the income distribution by offering a fixed wage and benefits package to anyone willing and able to work (Kaboub, 2007; Tcherneva & Wray, 2005; Wray, 2015a).

Essentially, monetary sovereignty is the most important financial means to achieve an improvement of the living standard of a nation's citizens. Achieving monetary sovereignty solves the "how to pay for it?"-question and forwards the discussion to the availability and quality of real resources like labor, capital, technology, land and energy necessary to execute policies that enable the living standard of the people to improve. Further examples, next to that of a job guarantee program, are Medicare for all, a green new deal or the provision of public goods – whatever the democratically determined policy program prioritizes and enhances the living standard of the citizens. As such, monetary sovereignty comes also with a component that is linked to democratic practices being part of economic development. Clearly, a monetarily sovereign government is much more likely to be able to pursue its democratically determined political program adequately. On the contrary, a monetarily non-sovereign government that is constrained by its financial resources is less likely to pursue the same adequately. Referring to the case made in chapter 2.2 concerning the fixed exchange rate regime and the necessity of monetary convergence in order to maintain a real stable exchange rate, it might force the government to implement monetary and fiscal policy that are contrary to its democratically determined program, thus undermining the democratic practices in place. The same can be applicable for nations with floating regimes that have to cope with speculative capital flows by introducing monetary policy adjustments that might be contrary to the democratically determined policy program.

Similar to the stable real effective exchange rate, monetary sovereignty is beneficial for the investment climate. Firstly, the usage of the monetary sovereignty enables the economy to be operated at its full capacity, which is likely to trigger investment in order to expand the capacity thereby creating profit and growth opportunities for corporations. Secondly, the government itself has all the financial resources to undertake investments, which is especially relevant for long-term and fundamental research projects, that are hardly undertaken by the private sector – due to its need for short term profits – as Mazzucato (2015) concludes. As such, monetary sovereignty is not only a means to employ the existing

productive capacities in the short run but also a means to expand the capacities via incentivizing private and undertaking public investments in the long run.

In conclusion, monetary sovereignty is a key factor for a nation's path to economic development and as such is one of the most essential criteria that need to be fulfilled for an alternative regime.

3.4 Financial Stability

While both floating and fixed exchange rate regimes are unable to deliver a stable financial environment as chapter 2 shows, an alternative regime needs to fix the destabilizing nature of the international monetary system. Particularly, the frictions and distortions stemming from short-term capital flows need to be addressed in an alternative regime. As outlined by UNCTAD (2011, p.XIII): “[...] international economic policymaking has often assumed that it is mainly real shocks, rather than monetary shocks, that need to be tackled by the international system. However, after several decades of experience it has become clear that monetary shocks, particularly in a system of flexible exchange rates, are much more significant and harmful.”

Financial instability is for many reasons likely to be a liability for economic development. Firstly, financial instability creates uncertainty, which in turn harms investment, the source of productivity and wealth gains (Szirmai, 2015). Secondly, unilateral counter measures taken by a government in order to cope with financial instability may absorb financial and productive resources that could have been used for other purposes, most importantly, to carry out the democratically determined policy program. Additionally, as the history of currency crises has shown, currency crises are likely to trigger debt and/or banking crises, thereby leading an economy into a recession and harming economic development (Montiel, 2011).

As both floating and fixed regimes are subject of speculation affecting the real economy negatively (Chapter 2), an alternative regime needs to minimize the arbitrage opportunities by delivering a stable real exchange rate as well as by making the development of the future exchange rate transparent and anticipatable. Since speculation on the foreign exchange markets needs sellers and buyers of either derivatives or actual currency, a transparent and anticipatable future exchange rate would decrease the incentives on either side to undertake speculative actions, such as carry trade (see chapter 2), on a large scale. Realistically though, it is almost impossible to erase all arbitrage opportunities by adjusting the nominal exchange rate perfectly for both inflation and interest rate differentials simultaneously. In times of high-frequency trade behavior in financial markets the volume of this trades can still be of significant volume. Thus, the sounder approach to tackle this issue is to make sure that the consequences of speculation for the real economy, e.g. loss of competitiveness due to currency overvaluations, are limited, reducing the speculation to a casino-like zero sum game without relevant consequences for the real economy.

4 Outline of an International Exchange Rate Regime

The previous section has outlined that an alternative exchange rate regime needs to ensure a stable real effective exchange rate, monetary sovereignty, financial stability as well as to be conducive to a fair and efficient international trade system in order to avoid the shortcomings of the current non-system and foster economic development on a global scale. Clearly, the proposal developed in this paper firstly aims to minimize the harm for economic development stemming from of current non-system by explicitly addressing its shortcomings. Only on top of that, the proposal aims at creating policy space that creates opportunities to foster economic development. However, the policy space needs to be used by the respective governments and according to its democratically elected socio-economic aims. Only establishing the policy space without making use of it doesn't bring improvements in terms of economic development. That being said, brings up the question of how such an alternative regime needs to be designed in order to fulfill these criteria and serve the purpose of fostering economic development globally. This section introduces the idea of an international exchange rate regime based on international cooperation and operated as a rule-based managed float. More concretely, the regime is based on obligatory and symmetric forex interventions by the cooperating central banks thereby ensuring that the agreed and rule-based nominal exchange rate target is realized at every point in time. The corresponding rule is that the nominal exchange rate should adjust according to the inflation rate differentials between the corresponding currency areas at a defined frequency. On top of that it is recommended – though not obligatory - that countries establish a permanent zero interest rate policy and maintain or reintroduce a national fiat currency to maximize their benefits from the international regime. Figure 4 displays a comparison of the unilateral regimes with the international regime.

	Fixed Regimes	Floating Regimes	International Regime
Stable real effective exchange rate	<ul style="list-style-type: none"> - only stable <u>nominal</u> exchange rate - internal revaluation → misalignment of REER 	<ul style="list-style-type: none"> - flawed price signals and carry trade → misalignment of REER 	<ul style="list-style-type: none"> - frequent rule-based symmetric forex interventions ensure stable REER
Fair and efficient international trade	<ul style="list-style-type: none"> - misalignment of REER distorts country's competitiveness - artificially induced trade imbalances 	<ul style="list-style-type: none"> - misalignment of REER distorts country's competitiveness - artificially induced trade imbalances 	<ul style="list-style-type: none"> - conducive to international trade as misalignments and artificial trade imbalances are prevented
Monetary sovereignty	<ul style="list-style-type: none"> - promise to exchange the domestic currency at par into foreign currency undermines monetary sovereignty 	<ul style="list-style-type: none"> - features generally allow for being monetarily sovereign 	<ul style="list-style-type: none"> - features generally allow for being monetarily sovereign
Financial stability	<ul style="list-style-type: none"> - prone to speculation, which transmits into real economy 	<ul style="list-style-type: none"> - prone to speculation, which transmits into real economy 	<ul style="list-style-type: none"> - minimizes arbitrage opportunities and prevents transmission into real economy

Figure 4 Fixed Regimes vs. Floating Regimes vs. International Regime

4.1 International Cooperation on Exchange Rates

Since exchange rates are a relative concept it is obvious that it's impossible for two counterparties to achieve a certain exchange rate target unless they agree on a certain exchange rate and aim for the same target. Essentially, the proposal of an international exchange rate regime builds on this logical insight. Given the shortcomings of the current non-system, the alternative regime needs to be operated as a rule-based managed float grounded on international cooperation among the corresponding central banks.

While in a unilateral managed float a central bank is only unlimited in its ability to defend upward pressures over a period of time by buying foreign currency with their own currency, which they can create without limit, it is limited by its foreign currency reserves in regards to its ability to defend downward pressure on the exchange rate. In a regime based on international cooperation, however, two central banks could, if they agree on a certain exchange rate, intervene symmetrically in the foreign exchange market by using their own currency respectively and thus would be able - without financial constraints - to achieve a certain, agreed exchange rate target at every point in time. By manipulating the demand and supply of both currencies, those central banks would be able to defend a certain exchange rate against any deviation. In times of high-frequency financial trading, cooperating central banks would need to make use of computer programs in order to intervene as rapidly and frequency as other market participants do. Since exchange rates always express the values between two currencies, it requires two central banks per bilateral exchange rate relation to operate the symmetric intervention, but the logic outlined for two central banks can be scaled up to any dimension, even globally, and applies for integration in a framework of global financial governance (UNCTAD, 2011). In order to make the international exchange rate regime work globally it is recommended to have a global institution supervising compliance with the rules and being responsible to moderate arising conflicts. However, questions such as which existing institution would be the most qualified to fulfill this task or, more general, what are the politics and governance related implications, are outside the scope of this paper and need to be elaborated in further research.

The cooperation between central banks and the symmetric obligation to intervene constantly in the foreign exchange market would erase the need/incentive to accumulate foreign reserve for the purpose of exchange rate management. In the current system, this incentive makes countries selling goods and services in exchange for foreign reserves thereby deteriorating their real terms of trade (Mitchell et al., 2019; UNCTAD, 2011). Also, the major shortcoming of the unilateral fixed regime, i.e. that the national policy space is constrained by the amount of foreign reserves that this country is able to acquire thereby undermining its monetary sovereignty, does not apply in the proposed international regime with symmetric interventions as cooperating central banks can never run short of the required currency.

In order to avoid distortions of the real exchange rate the alternative regime needs to be flexible enough to adapt the nominal exchange rate frequently according to a change in either interest or inflation rate differentials, but also needs to be stable enough to avoid short term distortions stemming from speculation. Clearly, a managed float approach based on international cooperation suits these

requirements best, because a typical fixed regime doesn't allow for frequent adaption of the nominal exchange rate and a floating regime determined by the market offers speculators arbitrage opportunities thereby inducing carry trade speculation (see chapter 2), hence, both regimes fail to fulfill the requirement of a stable real exchange rate. In order to make the international regime transparent and symmetric interventions obligatory, it is necessary to have the exchange rate targets and frequency of intervention based on a rule according to which all cooperating central banks operate. The central question that arises at this stage of analysis is: how does the adequate rule-based exchange rate look like?

4.2 Finding an adequate rule- based exchange rate

Next to the approach of cooperation among central banks through symmetric foreign exchange market intervention, finding the adequate rule for how nominal exchange rates should adapt and according to what criteria is the key component of the international exchange rate regime. Linking to chapter 3, this rule to be outlined needs to suit the four criteria that make an alternative exchange rate regime foster economic development: stable and predictable real effective exchange rates, conduciveness to a fair and efficient international trade system, monetary sovereignty and financial stability. Ultimately, the nominal exchange rate as one of the most important macroeconomic prices should reflect the fundamentals of the respective economies as well as express their relative competitiveness. Essentially, there are two major options on what to base the exchange rate rule on: either inflation rate differentials (PPP path) or on interest rate differentials (UIP path).

An adaption of a certain bilateral exchange rate according to the PPP path would mean that the inflation differential between two countries finds reflection in the exchange rate, thereby stabilizing the real exchange rate. To give an example, if country A has an inflation of ten percent and country B has an inflation of one percent, then the currency of country A needs to devalue by nine (ten minus one) percent relative to country B. As such, the PPP path ensures that the nominal exchange rate adequately reflects the country's competitiveness. If the exchange rate in the given example would allow the currency of country A to devalue by less (more) than nine percent, this country would face a real appreciation (depreciation), which implies a loss (gain) in competitiveness since domestic products become more (less) expensive relative to foreign products. This underlines the importance of purchasing power parity for international trade. On the more technical side, the question is which measure of inflation is the most adequate in this context? According to UNCTAD (2011): "There can be significant differences in the measurement of the REER, depending on whether it is calculated on the basis of changes in the consumer price index (CPI) or on changes in unit labour costs [i.e. the sum of wages paid to generate one unit of a product – editor's note]". As Flassbeck and Spieker (2007) show, unit labor costs are the key domestic determinant for inflation for developed countries and might qualify as an alternative measure. However, for less developed countries that don't have a sufficiently diversified economy and might be heavily depended on commodity prices, which can experience huge price shocks,

the unit labor cost approach might be less appropriate. On the other hand, the CPI is quite selective in building on a certain basket of goods and is solely focused on consumer goods. Thus, a broader approach that also includes price changes of intermediates, which in times of internationally fragmented production along GVCs account for a significant share of trade, seems more appropriate (Mitchell et al., 2019; Worldbank, 2016). As such, the producer price index (PPI) seems most qualified because it is a broader measure and incorporates intermediate goods (OECD, 2019a).

Instead of targeting a real exchange rate, it is also possible to adapt the nominal exchange rate frequently according to the UIP path thereby sterilizing interest rate differentials between countries and essentially minimizing arbitrage opportunities. To give an example, if country A has a domestic interest rate of ten percent and country B has an interest rate of one percent, then the currency of country A needs to devalue by nine (ten minus one) percent relative to country B in order to sterilize the interest rate differential. Only under the assumption that the interest rate and the inflation rate are highly correlated would the UIP path also be able to ensure a stable real exchange rate although only on an indirect way. Consequently, the UIP path is more important with regards to capital flows and speculation opportunities than with regards to international trade and competitiveness.

Given the four criteria outlined for an exchange rate regime to be fostering economic development (see chapter 3), the PPP path suits best to the aim of a stable and predictable real effective exchange rate and a fair and efficient international trading system, while the UIP path suits best to undermine carry trade speculation thereby serving the aim of financial stability. Is fair to say though, that the PPP also fosters financial stability through establishing stable and predictable real exchange rate relations, which minimize arbitrage opportunities and potentially discourage short term capital flows and carry trade speculation, although to a lesser extent than the UIP does. On the contrary, the UIP only fulfills the criteria of a stable and predictable real exchange rate if the interest rates set by the central banks are linked to inflation. Otherwise, which is the case for Real/USD and Euro/USD as shown in figure 1 and 2, the UIP path doesn't fulfill this criterion. Technically, since central banks set the interest rate, data on interest rates are very accurate and up to date. On the contrary, inflation data are only available with a significant time lag and suffer from measurement biases (Mitchell et al., 2019; UNCTAD, 2011). Additionally, in a framework of cooperation among central banks and symmetric market intervention, speculation is no longer able to drive the nominal exchange rate thereby causing distortionary effects in the real economy. Thus, the motivation to sterilize arbitrage opportunities is distinctly smaller in a cooperative than in a unilateral framework. Moreover, both the UIP and the PPP path are perfectly consistent with the aim of achieving monetary sovereignty since it is the act of cooperation itself which removes the financial constraint present in unilateral fixed regimes, i.e. the national policy space being limited by available foreign reserves (Mitchell et al., 2019; Wray & Sardoni, 2007). All in all, the PPP path seems more qualified for the purpose of the international regime. Although, the PPP approach comes with a time lag and bears the risk of inexactness in measurement, it is the best approach to ensure a stable and predictable exchange rate, which is of crucial importance for

the trade system and – although to a lesser extent than the UIP approach - fosters financial stability. Due to the fact that the PPP path is not able to minimize arbitrage opportunities on financial markets completely, I recommend accompanying the PPP rule with a permanent zero interest rate policy as outlined in the following chapter 4.3.

This brings up the question of how frequent the nominal exchange rates should adjust according to the PPP rule. Ideally, nominal exchange rates should be adjusted as fast as possible in order to keep the real exchange rate as stable as possible. The longer (shorter) the period without adjustment, the higher (lower) the risk of real exchange rate deviations. This gets even more (less) relevant, the higher (lower) the inflation differentials, which determines the effect on the real economy. Essentially, the major constraint here is availability of inflation data. While the frequency of measurement varies among countries, I argue that in times of moderate inflation, i.e. up to single digit inflation per annum, a biweekly adjustment is perfectly fine for the purpose of the regime and would prevent major deviations for the real effective exchange rate. In times of persistent low inflation like as in the eurozone a period of a month or even a quarter is also reasonable since it is about the prolonging and significant real exchange rate distortions, those identified in figure 1 and 2, that are problematic for the real economy (EUROSTAT, 2019b). In times of exceeding inflation, it might be necessary to shorten the period of adjustment though. The bottom line is that the timelier the adjustment can be made the better. With regards to potential feasibility issues and given the importance of these data, national governments should increase their efforts to ensure an accurate measurement of inflation at least every month.

While it is determined how frequent and according to what rule the nominal exchange rate should adapt, it is yet open what the right real and nominal exchange rate is that central banks defend in the international regime. As the examples of the Real and the Euro relative to the USD (Figure 1 and 2 in chapter 2.1) have shown, the current nominal exchange rates are likely to be inaccurate reference points since they haven't followed the PPP path adequately. Ideally, the exchange rate makes sure that identical products, i.e. products with identical inputs, have the same price when expressed in domestic and foreign currency. Simplified, one way to find the adequate initial exchange rate is to compare the absolute value of identical baskets of goods and services between countries and set the nominal exchange rate so high that it perfectly erases price differences between distinctive currencies. Based on that, the above outlined rule for exchange rate adjustment could make sure that the real exchange rate remains stable. However, this approach faces the serious issue that products across countries are hardly identical since they often contain different inputs and are of different quality, which is a reasonable, even necessary source of price differences. Another approach is to compare the differences in unit labor costs and adjust the initial nominal exchange rate so that differences in unit labor costs are compensated. Particularly in developed countries, unit labor costs are the most important determinant of inflation and an expression of competitiveness (Flassbeck & Spiecker, 2007, 2011). However, for very low developed countries, especially those heavily dependent on but a few commodities that they export almost unprocessed, I assume that commodity prices play a comparatively larger role that is not reflected

adequately in unit labor costs. Consequently, it is tough to find a one-size fits all solution. Since the proposal for the international regime builds on cooperation, the exchange relations need be acceptable for all trading partners. Since the most suitable exchange rate depends on the country's specifics, the initial exchange rate on which the PPP path is to be applied should be result of negotiations between countries, ideally moderated by the global institution that also supervises compliance with the rules. To avoid power asymmetries playing out too much to the disadvantage of countries with less bargaining power, e.g. developing countries that are dependent on food and energy imports, the agreement should be based on the unit labor cost difference but also needs to be open for adjustment in case of low diversified developing economies. In those cases, the price development of the according commodities and the long-term trade balance development need to be considered as well. If the initial exchange rate differs significantly from the current exchange rate, it is recommended to smooth the initial adjustment over time by announcing both the aim and the sub-steps that are targeted in order to allow market participants, particularly actors in the tradeable sector, to adapt accordingly.

In a nutshell, the rule-based exchange rate adjustment approach is based on the PPP path and sterilizes inflation differentials, measured by the PPI, as frequently as possible thereby ensuring a real and predictable real exchange rate. The frequency depends on both the level of inflation as well as on the availability of inflation data. The initial exchange rate at which the regime starts is subject to negotiation between the cooperating country's guided by the global institution responsible for supervision and based on the principle that the exchange rate should reflect the differences in unit labor costs.⁴ Remaining unsterilized interest differentials that offer arbitrage opportunities are further reduced by applying a permanent zero interest rate policy.

4.3 Permanent Zero Interest Rate Policy

In the context of the international exchange rate regime, the permanent zero interest rate policy is proposed in order to minimize interest differentials between currencies thereby reducing arbitrage opportunities that remain after adopting the PPP path based exchange rate adjustment rule. Since the cooperation between central banks ensures already that speculation is not able to drive the exchange rate into the wrong direct, i.e. decoupling the exchange rate from the fundamentals, the permanent zero interest rate policy is a recommendable but not compulsory competent of the international exchange rate regime. Put into the context of monetary sovereignty, countries taking part in the international regime are still able to freely choose their interest rate policy, however, a permanent zero interest rate policy is the recommended approach for the reasons being explained below.

The proposed policy follows the zero nominal overnight rate proposal that is inferred from the theoretical body of MMT. (Forstater & Mosler, 2005; Fullwiler, 2009; Mosler, 2013; Tymoigne, 2008).

⁴ The layout of the international regime and its dependence on adequate data on inflation might come with an incentive, especially for countries that followed an undervaluation strategy in the past, to manipulate data on inflation to achieve an undervaluation of the currency. This makes the case for an international institution responsible for supervising compliance with the rules even stronger.

As Forstater and Mosler (2005) outline theoretically, the natural rate of interest in monetary systems with a state (or tax-driven) fiat currency is zero. They put it as follows: “It has been shown that in this context [monetary sovereignty - added by editor], the government budget will normally be in deficit, corresponding to net savings of financial assets in the non-government sectors. Deficit spending will result in net central bank reserve credits in the aggregate system, which will drive the short-term overnight inter-bank lending rate to zero. While government security sales may be used to drain the excess reserves to maintain some positive overnight rate, or the central bank may pay interest on reserve balances, absent such government intervention the base rate of interest is zero. In other words, the natural rate of interest is zero.” (Forstater & Mosler, 2005, p. 15).

Additionally, there are also economic arguments why interest rate policy is not an effective tool at all to manage the economy. As Mosler (2013), Fullwiler (2009), Wray (2015b) and Tymoigne (2008) outline theoretically, monetary policy is hardly able to steer the economy as bank credit, the increase (decrease) of which is the central bank’s aim of lowering (increasing) the interest rate, is mainly demand-driven and not interest rate sensitive at all. The empirical investigation of Lee and Werner (2018) confirms this. Especially in comparison to fiscal policy it becomes obvious that monetary policy is a comparatively weak and ineffective tool. An increase (decrease) in net government spending via fiscal policy directly increases (decreases) aggregated demand while the manipulation of the interest rate is a rather indirect, more supply-oriented incentive to trigger the private sector to increase/decrease total spending, especially in the form of investment. As Mosler (2013) and Tymoigne (2008) explain, an increase (decrease) in the interest rate works actually contrary to the inverse relationship between interest rates and loan demand that the economic mainstream (Neoclassical and New Keynesian) as well as actual central bank policies in place assume. A decrease (increase) in the interest rate does not (does) have an expansionary effect because it decreases (increases) the total spending of the government, which is a net payer of interest. Again, this is supported by the empirical analysis of Lee and Werner (2018), who find that periods of economic growth are, if at all, correlated with increases in the interest rates. Mosler (2013) and Tymoigne (2008) further conclude that interest payments, although they can always be paid as they come due by a monetarily sovereign government, may decrease the non-inflationary spending space for the government and have negative distributional effects.

As Wray (2015b) and Minsky (1995) argue, fiscal policy operated in a monetarily sovereign government leads to a financially more sustainable outcome than interest rate policy does. While the aim of monetary policy is to trigger an increase in private debt in order to stimulate the economy, fiscal policy builds up public debt in order to stimulate the economy and puts purchasing power directly into the pockets of actors in the private sector. Clearly, since the currency issuer and the currency user operate under a completely different logic – the users of a currency being constrained by revenue while the issuer of the currency is not –, public debt induced by fiscal policy is financially more sustainable than private debt induced by monetary policy. Hence, a permanent zero interest rate policy combined with an adequate fiscal policy are recommended.

4.4 Monetary Sovereignty

For the international exchange rate regime to serve the means of monetary sovereignty, which constitutes the central shortcoming of the unilateral fixed regime and is crucial to foster economic development, the principle of one country one currency needs to be established. Referring to the Chapter 3.3, in order to achieve monetary sovereignty on a national level, it is necessary that each nation issues its own fiat currency as well as that it only issues debt denominated in its own currency. While this is already the case for most of the countries, the biggest exceptions are the nations part of the currency unions EMU and the CFA franc, in which the national member states share a common currency. A country that does not issue its own fiat currency or promises to exchange it into anything that it can run out of, e.g. gold or foreign currency, at a fixed rate acquires the status of a currency user and cannot be considered as monetarily sovereign, which means that it gives up policy space and financial means that it could need in order to maximize economic development. Again, currency users operate under a completely different logic than currency issuers as outlined in Chapter 3.3. The monetarily sovereign government as the monopoly issuer of the money of account is never to be subject of default risk on liabilities denominated in its own currency – it can never become illiquid in its own currency. That is what makes the government, as currency issuer, different from other actors in the economy, e.g. households, who are to be considered as currency users. A currency user has to refinance its spending somehow – either through reduction of savings, through generation of income, through borrowing or through the sale of assets -, while, in contrast, the government as currency issuer does not have to do so (Bell, 2001; Kelton, 2011; Mitchell, Wray, & Watts, 2016; Mosler, 2012; Wray, 2015b).

Based on that, the government budget as measure of fiscal policy is of no great importance for a fiat currency issuing government as it is not an actual liability (or debt) that such a government has to repay to someone at some time in the future.⁵ As such, the monetarily sovereign governments are able to switch from a sound finance approach to a functional finance approach as outlined by Lerner (1943). Instead of seeing the balancing of the government budget as an end in itself, the functional finance approach opts for balancing the economy at full employment and relative price stability and let the government budget adjust accordingly. Ultimately, the inflation rate and the level of employment are of major importance to serve the public purpose and are more adequate measures of the economic success of a certain fiscal policy (Wray, 2015a, 2018).

Moreover, only if each country issues its own currency, can the exchange rate mechanism as proposed make sure that the real exchange rate is stable on the country level. Being part of a monetary

⁵ Besides, it is reasonable to argue that it is beneficial for the stability of the economy if a fiat-currency issuing government is in permanent deficit. It is a matter of accounting that a government deficit equals a nongovernment financial surplus, i.e. the government deficit enables the nongovernment sector to accumulate wealth. As the nongovernment sector as currency user (in contrast to the government as currency issuer) has to refinance its spending somehow, it could be followed that a deficit of this sector is not as sustainable as a deficit of the government (Godley & Lavoie, 2016; Kelton, 2011). Second, households for instance, as part of the nongovernment sector, have a demand to save for the future (due to uncertainty), which makes it necessary that another sector is actually in deficit to accommodate the private sector's demand for saving (Keynes, 2018). Due to the first point made, a deficit of the government is to be considered as more sustainable.

union means that the nominal exchange rate would adjust according to the average inflation rate of all nations in that currency union. If a country experiences an inflation above or below the currency union's average, it risks facing a distortion of its real exchange rate, e.g. via internal devaluation.

To summarize, the proposed framework ideally builds on the principle that each country issues its own fiat currency in order to maximize the policy space that can be used to employ all productive resources available for each nation thereby fostering economic development as well as erasing the risk of real exchange rate distortions on a national level. Although, I argue that the one country one currency principle comes with major benefits linked to monetary sovereignty and real exchange rate stability for the individual nations, it is not ultimately necessary for the international regime to function well. As the case of the EMU shows that it is not only about economic but also about political arguments, there might be reasonable political arguments to implement the international regime without reintroducing national currencies.

5 A model-based comparison with the current non-system

Having discussed the shortcomings of the current non-system in Chapter 3 as well as the having outlined the proposal of an international rule-based managed float regime, this chapter compares the proposed international regime with both the fixed and the floating regime. This paper presents two frameworks, in which the international regime as well as the fixed and the floating regime respectively can be compared with regards to their effect on nominal GDP being one quantitative indicator of economic development. Both models are mostly deterministic and incorporate the main input variables – foreign reserves (chapter 5.1) and volatility of exchange rate misalignment in (chapter 5.2) – as exogenous variables. Moreover, both models are short term models. i.e. productivity and prices as assumed to be fixed.

Of course, the level of GDP alone is not a perfect measure as already indicated in the introduction (chapter 1). However, as the results of both frameworks demonstrate, leaving potential productive resources or potential investment opportunities unused for no other reason but exchange rate regime related financial constraints and uncertainty respectively, clearly is the opposite of fostering economic development. As already indicated in the outline of the international exchange rate regime (chapter 4), it first aims to minimize the harm for the economic development stemming from the current non-system by addressing its shortcomings. Only on top of that, it creates opportunities or policy space that needs to be used by the respective governments and according to its socio-economic aims. That is what makes the system fostering economic development on a global scale.

The features of the international regime – established in chapter 4 – are not being tested separately or in an isolated way in the models developed. Rather, it is the aggregate of the features that is being compared against the aggregate of the features of the floating and fixed exchange rate regimes respectively. However, it can be said that the crucial difference can be pinned down to monetary

sovereignty (see chapter 3.3) as for the comparison with the fixed regime and to a stable real exchange rate (see chapter 3.1) as for the comparison with the floating regime.

5.1 International Regime vs. Fixed Regime

The following section compares a fixed exchange regime to the outlined international rule-based managed floating exchange rate regime regarding total output (GDP). The model as displayed in figure 5 allows to analyze the effect of financial constraints for the total spending and consequently, for the total output as part of the potential output. The model is based on the following premises:

1. The “Potential GDP” is the output that can be produced if all productive resources are employed at a certain productivity at a certain point in time.⁶ Equally to the actual GDP, the potential GDP is considered in nominal terms.
2. For the fixed regime (see equation 5.1), nominal GDP is a function of total spending, which in turn, ultimately, is a function of available foreign exchange reserves. Moreover, the nominal GDP is a function of the velocity of total money spent into the economy.
3. For the international regime (see equation 5.2), nominal GDP is a function of total spending, which in turn, is a function of available domestic currency. Moreover, the nominal GDP is a function of the velocity of total money spent into the economy.
4. For a global perspective (closed economy), total spending consists of the spending of the private sector, and the public sector.
5. For a national perspective (open economy), total spending consists of the spending of the domestic private sector, the foreign sector and the domestic public sector.

$$(5.1) \text{ GDP}_{FiR} = T_{FiR} * V_{FiR}; T_{FiR} = f(R_f)$$

$$(5.2) \text{ GDP}_{IR} = T_{IR} * V_{IR}; T_{IR} = f(R_d)$$

T = Total Spending; V=Velocity of Money; R_f= Foreign Reserves; R_d=Domestic Reserves

As the purpose of this paper is to develop an exchange rate framework that fosters economic development globally, the model is firstly considered from a global perspective, i.e. a closed economy view.

For the fixed exchange regime, the relationship between GDP and total spending is upward sloping. The concrete value of the slope depends on the fiscal multiplier as well as on the velocity of money, which both are for reasons of simplification ignored here. What is of crucial importance though, is the constraint that in the fixed regime total spending is a function of availability of foreign exchange reserves. For reasons of comparison on a global scale, the fixed regime needs to be scaled up to the

⁶ Of course, potential output is a function of average productivity times employment while the average productivity is not a fixed value. However, for reasons of simplification I assume the average level of productivity to be fixed in the short run. For the sake of the comparison and the relation between total spending and GDP, it is only necessary to define a certain level of potential GDP as dependent on employment. A more accurate depiction of the potential GDP would not bring any advantages for the model.

global level. To sketch global dimension of the fixed regime, the global total spending is the sum of the total spending of each country the same as the global nominal and potential GDP are the sum of all national GDPs. The main point is that every country operating under a fixed regime faces a challenge when it comes to spending as much as necessary to bring all domestic productive resources into employment in order to reach the potential GDP. The challenge is that it also needs to have sufficient foreign reserves that enable the maintenance of the peg. Due to that constraint it is possible that the amount of total spending is not sufficient to employ all available productive resources, i.e. not reaching the level of potential GDP. So, as long as not all individual countries have sufficient foreign reserves with regard to the total spending needed to reach the potential GDP, global potential GDP is not reached. Point A and B in the model mark those situations, in which total spending (T_1 and T_2) is constrained by a shortage of foreign reserves leading to nominal GDP (G_1 and G_2) below the level of potential GDP (G_P). Point “a” and “b” highlight the corresponding output gaps (dotted red line). The reach of point C, which marks full employment and the achievement of potential GDP, i.e. no output gap, is only achieved under the condition of sufficient foreign exchange reserves. However, as chapter 3.2 argues, fixed regimes suffer from the permanent risk of falling short of reserves rather than having sufficient to employ all resources. As the unemployment rate of 7,8% (January 2019) in the Eurozone indicates, individual countries operating under the fixed regime (monetary union) lack the financial resources to reach potential GDP (EUROSTAT, 2019a).

On the contrary, the relationship between GDP and total spending in the international exchange rate regime is a fully vertical slope indicating that due to the absence of financial constraints for the currency issuing governments, as analyzed in Chapter 4, total spending can infinitely adjust to the amount needed to achieve the level of potential GDP (G_P) and bring all available resource into productive use. For the international regime, there are no financial reasons why either situations of point A or point B with the corresponding amount of total spending (T_1 and T_2) and output gaps “a” and “b” should occur. Only political reasons that lead to a non-usage of the available financial space can create situations in which point A or B are reached. Otherwise, countries operating under the international regime are always able reach the potential GDP (G_P) by spending the amount necessary marked as T_P in the model. If all countries use their space, the potential global GDP can be reached thereby fostering economic development. Under these circumstances, ultimately, the government chooses the unemployment rate by determining its spending plans.

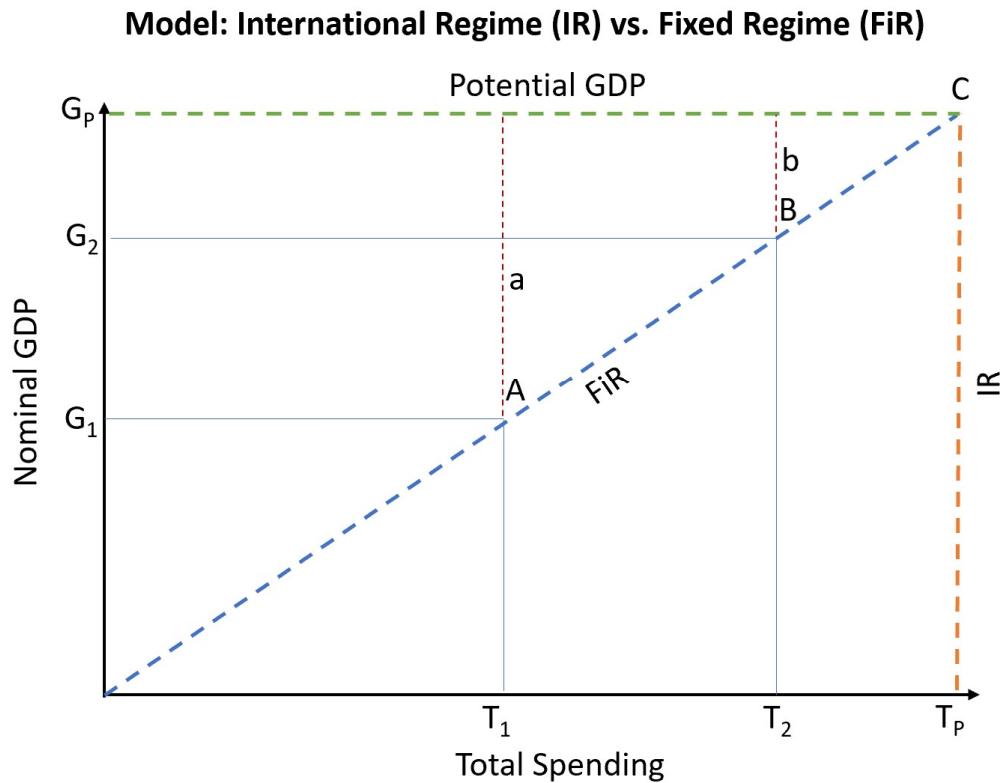


Figure 5 International Regime (IR) vs. Fixed Regime (FiR)

Point A is T = Total Spending; V =Velocity of Money; R_f = Foreign Reserves; R_d =Domestic Reserves

The model works both from a national and a global perspective, the difference being the incorporation of a foreign sector for the national perspective making it an open economy. From the national perspective, total spending adds not only to the domestic GDP but also to foreign GDP, e.g. via spending on imports and outward FDI flows. The principle and bottom line, however, is that depending on the level of total spending by the non-government sector, the government sector needs to adjust its spending accordingly to make use of all domestic productive resources and achieve the potential domestic GDP. While national governments operating under fixed regimes are constraint in their ability to do so thereby facing the risk of leaving material and non-material wealth on the table, governments operating under the international regime wouldn't face that constraint. In total, if all national governments in the international regime would use their financial space accordingly, which they possibly could, global GDP could be equal to the potential GDP as marked in point C.

5.2 International Regime vs. Floating Regime

This section compares a floating exchange rate regime to the outlined international rule-based managed float exchange rate. The model as displayed in figure 6 allows to analyze the effect of uncertainty for the level of investment and consequently for GDP from a global perspective. The model is structured into three parts each displaying a relationship between two variables. The causality goes from volatility of exchange rate misalignment to uncertainty to investments to GDP. Moreover, for reasons of simplification, the model is built on linear relationships and only considers the effects within one time

period and ignores long-term effects, e.g. from higher (lower) levels of investment on productivity and GDP. The premises for each of these relations are outlined below.

The first quadrant (see figure 6) shows the relationship between the volatility of exchange rate misalignment i.e. inconstant deviations from a stable real exchange rate and its effect on uncertainty. The relationship for both the floating regime and the international regime between volatility of exchange rate misalignment and uncertainty is upward sloping, i.e. the higher (lower) the volatility of the misalignments the higher (lower) the level of uncertainty for investors. Concretely, exchange rate misalignment is here defined as a change in the real exchange rate. It is the volatility aspect of the misalignment that plays the crucial role in this model as it is assumed that a constant misalignment over a given time period would enable investors to adapt their behavior and adjust their cash flow calculations. A constant misalignment is assumed to not necessarily increase uncertainty although it depends on the time horizon of both the investment projects in consideration and the steadiness of the misalignment. On the contrary, the volatility of the misalignment is what creates the uncertainty as it affects the real value of nominal profits and costs in the future. While the international regime is designed in a way to ensure a stable real exchange rate through frequent rule-based adjustments, the extent of the volatility of misalignments is assumed to be lower than in the floating regime. Why is it that the international regime can experience misalignments at all? The reason is that the time during the adjustments offers opportunity of potential misalignments, although in absence of hyperinflation only to a minimal and not significant extent. On the other side, as analyzed in Chapter 2.1, the floating regime fails to deliver stable real exchange rates and is characterized by volatile misalignments. As such, it is assumed to have a steeper slope than the international regime, while the concrete value of the slope depends on several factors that are not considered in this model. As long as the assumption that the slope of the floating regime is steeper than that of the international regime, the absolute value of the slope doesn't change the results that are inferred from this model. Additionally, it is assumed that the y-intercept of both regimes isn't at zero. While the volatility of the exchange rate misalignment changes over time, even a situation in which either regime ensures a perfectly stable real exchange rate over a certain time period wouldn't drive uncertainty towards zero as investors would still be considering times in the past or in the future in which this wasn't/won't be the case. However, since the international regime actively manages the nominal exchange rates to ensure the steadiness of the real exchange rate while the floating regime has not such a functioning mechanism, I assume the y-intercept of the floating regime to be higher than that of the international regime. Again, the absolute values depend on several factors beyond the scope of this paper. The equations 5.3 and 5.4 express the mathematical relationship between uncertainty and volatility of the exchange rate misalignment for the international and the floating regime respectively.

$$(5.3) U_{IR} = m_{IR} + n_{IR} * V; [m_{IR} < m_{FIR} > 0], [n_{IR} < n_{FIR} > 0], V = f(EX_{t-1} + schock) - EX_{PPP}$$

$$(5.4) U_{FIR} = m_{FIR} + n_{FIR} * V; [m_{IR} < m_{FIR} > 0], [n_{IR} < n_{FIR} > 0]$$

U = Uncertainty; m=Constant; n=Slope; V=Volatility of exchange rate misalignment; EX = Exchange rate, EX_{PPP}= Exchange rate according to purchasing power parity theorem

The second quadrant (see figure 6) depicts the relation between uncertainty and the level of investment. It is based on the inverse relationship of investment and uncertainty about the future established by the theoretical body of Post-Keynesianism. In the given context, uncertainty about the forward nominal and real value of an investment is assumed to lead to a decrease in investment, hence a downward sloping relation between uncertainty and investment (Dow & Hillard, 2002; Ferrari-Filho & Conceição, 2005; Keynes, 2018; Lavoie, 2014; M Mazzucato & Wray, 2015). The equations 5.5 and 5.6 express the mathematical relationship between the level of investment and uncertainty for the international and the floating regime respectively.

$$(5.5) I_{IR} = m_I - n_I * U_{IR}; [m_I > 0 > n_I]$$

$$(5.6) I_{FIR} = m_I - n_I * U_{FIR}; [m_I > 0 > n_I]$$

I = Investment; U = Uncertainty; m=Constant; n=Slope; V=Volatility of exchange rate misalignment

The third quadrant (see figure 6) shows the effect of the level of investment on GDP. Since the viewpoint taken is a global one, GDP consists only of spending on consumption and investment. For the sake of the argument the spending of consumption is assumed as fixed. Hence, changes in the level of investment lead ceteris paribus to changes in GDP. The relationship between level of investment and GDP is upward sloping. Again, for reasons of simplification, the model only considers the effects within one time period. As such, long-term productivity effects induced by the level of investment are not considered. The equations 5.7 and 5.8 express the mathematical relationship between the level of nominal GDP and level of investment for the international and the floating regime respectively.

$$(5.7) GDP_{IR} = m_{GDP} - n_{GDP} * I_{IR}; [m_{GDP} > 0], [n_{GDP} > 0]$$

$$(5.8) GDP_{FIR} = m_{GDP} - n_{GDP} * I_{FIR}; [m_{GDP} > 0], [n_{GDP} > 0]$$

I = Investment; U = Uncertainty; m=Constant; n=Slope

Having outlined the premises of the model, it allows to compare the effect of volatility of the exchange rate misalignment on nominal GDP for both regimes at hand. Essentially, two cases are displayed in figure 6 and are to be compared: V_1 and V_2 .

First, point V_1 in quadrant 1 marks the situation of a rather low volatility that applies equally to both regimes. Given the higher constant and the steeper slope of the floating regime, it means that the equal amount of volatility leads to a comparatively higher level of uncertainty. From this follows, that the level of investment (see quadrant 2) according to the levels of uncertainty of the floating regime and the international regime respectively is comparatively higher in the international regime. Applying this to quadrant 3, which depicts the ceteris paribus relation between level of investment and nominal GDP, the according level of nominal GDP is higher for the international regime.

Secondly, point V_2 is considered. Similar to the case of point V_1 , both regimes are assumed to face an equal volatility of exchange rates, however, in this case the volatility is greater than in case V_1 . Given the difference in slope, the level of uncertainty is over proportionally greater than in case V_1 . Following the same logic as applied to point V_1 , the gap in nominal GDP between the international

regime and the floating regime gets greater than in case V_1 . Similar to case of V_1 , the international regime reaches a higher level of nominal GDP than the floating regime.

Lastly, given that the international regime actively manages the nominal exchange rates in a frequent and rule-based way to ensure a stable real exchange rate, the more realistic case to compare is one at which the volatility for the international regime is at point V_1 while the volatility for the floating regime is at a higher point, say V_2 , which means that the volatility of the exchange rate misalignment is lower for the international than for the floating regime. Applying the same logic going through the steps of the model, the difference in terms of the nominal GDP is even higher than in the previous two cases explained. It needs to be acknowledged though that this case is not best expressed in the model at hand since volatility is treated as a purely exogenous variable.

The bottom line of this model is that the international regime *ceteris paribus* achieves higher levels of investment and nominal GDP than the floating regime, even in the case of equal volatility of the exchange rate misalignment. The main explanations for that are the difference in the extent of volatility itself as well as its effect on uncertainty. The crucial assumption is that the international regime as outlined leads to smaller deviations from the real exchange rate than in the floating regime. This assumption is backed by the analysis of the shortcoming of the floating regime in chapter 2.1.

Model: International Regime (IR) vs. Floating Regime (FIR)

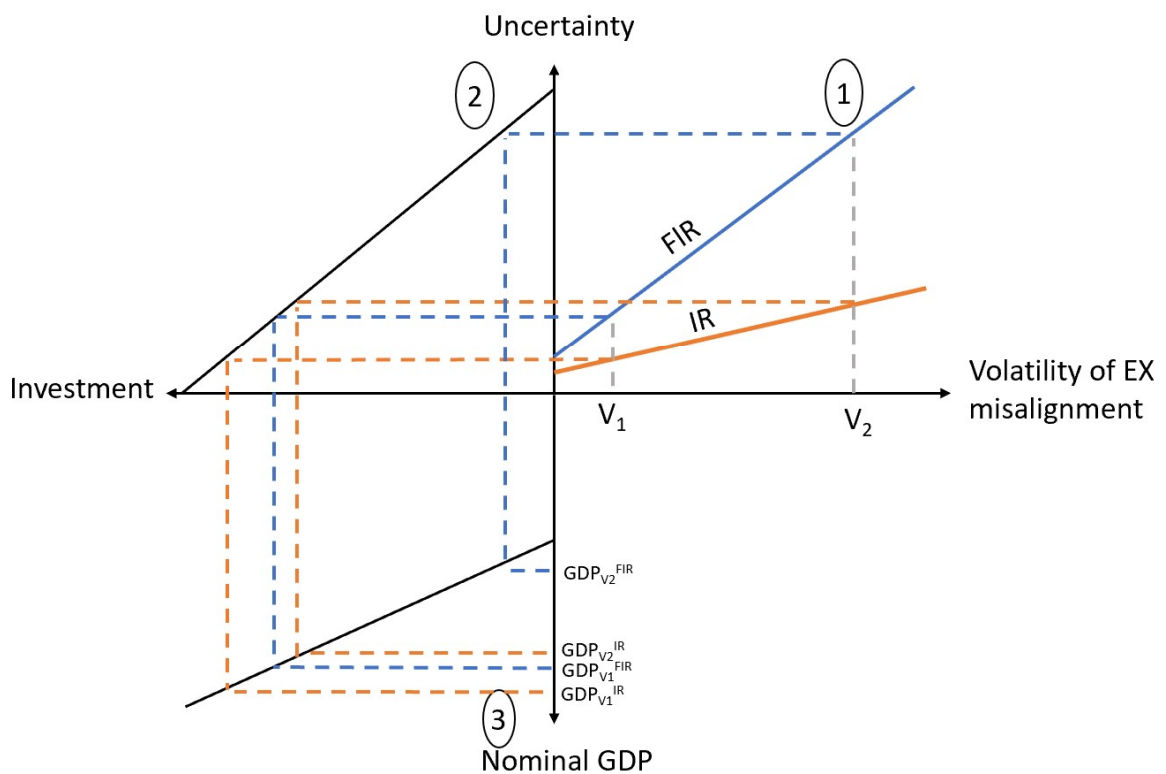


Figure 6 International Regime (IR) vs. Fixed Regime (FiR)

6 Challenges of an International Exchange Rate Regime

This section discusses how the international exchange rate regime as proposed could respond to economic issues and which issues itself it may induce by its implementation. Moreover, political barriers related to the outlined framework and the chances of an implementation are discussed. The economic issues being discussed are both external challenges that an international exchange rate regime need to respond to as well as internal issues related to the implementation. More concretely, external challenges refer to the phenomena of trade imbalances and related balance of payment problems, especially for developing countries heavily dependent on food and energy imports, as well as to the question of how the regime could respond to economic shocks. On the other hand, internal issues relate to the question of how to transition to monetary sovereignty, i.e. reintroducing a national fiat currency, as well as to the question of what the effects of symmetric central bank forex interventions on inflation and interest rate are.

As for the political barriers to an implementation of an international regime the political power and interest struggle is considered. The question in who's interest the implementation is and in who's it is not is being discussed. Hereby, different characteristics of countries such as stage of development and integration into global trade are being used.

6.1 *Economic Issues*

The question of how trade imbalances, especially the link from trade deficits to balance of payment problems, are to be evaluated is a tough one and needs a careful and nuanced discussion. As outlined in chapter 3.2, in real terms exports are a cost decreasing the real living standard of a nation and imports are a benefit increasing the real living standard of a nation – simply because real living standard is determined by consumption and not by production (Mitchell et al., 2019; Wray, 2015a). Plus, logically the net trade balance of the world is equal to zero as all trade surpluses and deficits net to zero. While the international exchange rate regime as designed in this paper aims at avoiding artificial over- and undervaluation of currencies by having a stable real effective exchange rates, the buildup of trade imbalances that are mainly due to artificially created competitive (dis-)advantages, such as in the case of Germany via internal devaluation, is prevented in the first place (Flassbeck, 2007; Flassbeck & Lapavistas, 2015; Flassbeck & Spiecker, 2011). Moreover, since the rationale of export surpluses for the sake of accumulating foreign reserves in order to manage the exchange rate gets erased by the regime's feature of obligatory, symmetric central bank interventions in the forex market, the incentive for countries to run huge trade surpluses, which by the very logic of macroeconomic accounting means equally huge trade deficits for the rest of the world, gets minimized. However, that does not mean that there won't be any trade imbalances at all. Still, the reason for a nation to export is to generate higher returns, which means an increased capacity to buy imports. Alternatively, a nation that net exports might do so because it desires to accumulate net financial assets denominated in the importer's currency (Mitchell et al., 2019).

At that point, the question regarding the risk of a balance of payment problem for the net importing country comes up. Given the limited scope of this paper, two factors regarding the financial sustainability of the trade deficit are addressed: firstly, since trade deficits reduce national income and by the very logic of sectoral balances are a financial drain for the domestic economy, it needs at least an equally great government deficit in order to avoid the domestic private sector to run into a deficit position, which the domestic private sector as being a currency user - that needs to fund its deficit positions by income, asset sales or borrowing - can't sustain for very long (Mitchell et al., 2019). As the international exchange rate regime builds on ensuring monetary sovereignty for the national governments, it perfectly enables the national governments to prevent the deficit position of the domestic private sector by running adequately high deficits. Secondly, - as applies mainly to developing countries - countries that are dependent on imports to serve the basic needs of its citizens, e.g. food and energy, and have a thin export base, might encounter the situation in which foreigners don't want to accumulate financial (or other) assets denominated in that currency. In that case, the importing nation might be forced to borrow the foreign currency and consequently build up foreign debt in order to finance its imports. Under the current non-system, those trade deficits are likely to depreciate the domestic currency vis a vis the foreign currency thereby effectively pricing the disadvantaged developing nation out of international markets, resulting in imported inflation and making it even harder for them to access the essential resources it needs to serve the basic needs of its citizens (Mitchell, 2018; Mitchell et al., 2019; Wray & Sardoni, 2007). With the international regime as proposed being in place the trade deficit wouldn't put depreciating pressure on the external value of the currency. Moreover, since the proposal for the international builds on international cooperation and an international institution (see chapter 4.1) that supervises compliance as well as participates in negotiations on the target exchange rates and exceptional adjustment of the rules, permanent assistance for such disadvantaged countries that are dependent on essential resources but struggle with having a thin export base should be incorporated in the framework of such multilateral institution. The concrete outline of such an institution is beyond the scope of this paper though. This discussion leads to a fairly general point: the international exchange rate regime is a financial construct. Ultimately, all possible issues located in the real economy – say a shortage of any real resource – can only be solved in the real economy and not in the financial system. The financial system might help to move existing resources and allocate them properly, but it can't solve the ultimate cause of a shortage of any real resource. Concretely, if a developing nations runs into the accumulation of foreign debt due to its import dependency on essential products, the international exchange rate regime and international assistance might smooth the symptoms, but eventually the nation has to build its own production capacities to overcome the dependence on imports and related foreign debt issues.

Another question to be considered is in how far the international regime as out outlined offers different options to respond to economic shocks than the current non-system does. First and foremost, the international regime prevents exchange rate induced shocks as one source of crises in the very first

place by ensuring a stable real exchange rate. Since the international regime in contrast to floating or fixed regimes builds on cooperation and persistent market intervention it offers the opportunity to commonly absorb shocks and smoothing the effects over time thereby preventing contagions as commonly experienced in history when banking crises, debt crises and currency crises triggered each other (Laeven & Valencia, 2012). Clearly, as the international regime aims at ensuring monetary sovereignty the cases for accumulating foreign debt are much fewer than in other regimes. As such, debt crises and economic pressure for debt default is much less likely to occur. Also, the monetary sovereignty and the related policy space broadens the available opportunities for governments to react to banking crises by having all the financial means to bail out or assist the banking sector in times of turmoil. On top of that, the international regime prevents currencies from experiencing panic overreactions by symmetric obligations for the central banks to intervene in the foreign exchange market. In cases of inflationary shocks, the avoidance of panic overshooting of the exchange rate helps to prevent importing inflation, which would make the problem only worse.

Given the aim of reintroducing monetary sovereignty on a national level, it comes with the need of reintroducing a national fiat currency for each nation that is currently using a foreign currency as is the case for EMU and CFA member states amongst others. Clearly, the reintroduction of a national fiat currency needs thorough preparation as a national central bank needs to be set up as well as the new currency need be designed, printed etc. The insights of Knapp, which are also heavily incorporated into the theoretical body of MMT, offer important inferences on the question of how to best introduce a new chartal fiat currency (Knapp, 1924; Wray, 2014). Given the scope of the paper, I only layout the main points using Germany as an example case. First and foremost, Germany would need to start by redenominating the tax liabilities it imposes on its citizens in its new currency as it is the tax liability and the government's ability to enforce it that, ultimately, create the demand for the new fiat currency. Once the tax liability is redenominated, the German government would need to start spending in its new currency – otherwise, logically, its citizens won't have the means to fulfill the tax liability. On top of that, all new debt instruments that the German treasury and central bank issue, such as bonds, need also be denominated in its new currency (Bell, 2001; Lerner, 1947; Mitchell & Fazi, 2017; Wray, 2004, 2014). To make it as simple as possible for its citizens, the tax liabilities and spending plans could be redenominated 1:1 into the new currency – or, alternatively, at any other exchange rate that would have agreed on with its partners in the framework of the international exchange rate regime. To make the transition slowly and avoid panic and overshooting reactions, existing bank accounts and financial assets denominated in Euro are not to be converted into the new currency. If people want to maintain the old currency, that would just create sellers of the new currency thereby creating downward pressure that need be sterilized. The people who want to exchange their Euros into the new currency could easily do so at the given rate with their bank, which in turn could exchange their Euro into the new currency at its central bank (Mitchell, 2019; Mitchell & Fazi, 2017; Wray, 2014). The question of debt denominated in Euro would remain. Firstly, the government would collect Euros in the process of people requesting the

new currency in exchange and could use those to pay off Euro denominated debt. Secondly, every sovereign government has the option to default on its foreign debt though this has consequences which are beyond the scope of this paper. The bottom line is that a country that is able to enforce its tax liabilities simply needs to redenominate its taxes, spending and debt issuance. Once that is done, it is able to make use of its monetary sovereignty (see chapter 3.3) (Lerner, 1947; Mitchell, 2019; Mitchell & Fazi, 2017; Mitchell et al., 2019). As a last step and as participant of the international exchange rate regime, Germany would need to agree with its partners on the initial exchange rate that is to be targeted by using the approach outlined in chapter 4.2. The approach outlined applies universally to all countries that exit a foreign currency in order to introduce their own national fiat currency.

Lastly, the effects of symmetric forex interventions on both the interest rate and inflation are being discussed. It is best to start with the balance sheet effects of such an intervention. A central bank buying foreign currency by selling/issuing its own currency *ceteris paribus* creates an asset swap in the commercial banking sector by adding domestic reserves and reducing foreign currency assets (see figure 7). On the central bank's balance sheet, it's a balance sheet extension by adding foreign currency assets on the asset side and domestic reserves on the liability side (see figure 7) (Ehnts, 2016; Fullwiler, 2008; Gadanecz, Mehrotra, & Mohanty, 2014). A central bank buying domestic currency by selling foreign currency would have the reverse effects. Essentially, a central bank selling (buying) its own currency expands (contracts) the monetary base. What are the effects of this on both the interest rate and inflation? Firstly, an expansion of the monetary base *ceteris paribus* puts downward pressure on the interbank interest rate driving it towards zero. If, as proposed in chapter 4.3, the central bank follows a permanent zero interest rate policy, it's reasonable to just leave the excess reserves in the banking system (Forstater & Mosler, 2005; Mosler, 2013). However, if the central bank aims for an interest rate target other than zero, it might need to sterilize the expansion of the monetary base. For that, it has two options: first, it can issue illiquid debt instruments such as bonds to drain the excess reserves from the banking system; second, it can pay the target interest rate on reserves and leave excess reserves in the system – both approaches can be applied without quantitative limits (Fullwiler, 2008, 2009; UNCTAD, 2011; Wray, 2015a). To make the case for inflationary pressure arising from increases in the monetary base, the presumption need be that banks would use the expansion of reserves for an expansion of credit thereby inducing demand-side inflationary pressure. The presumption is to be rejected since bank's credit expansion does not rely on preexisting funds (Bundesbank, 2017; Kumhof & Jacab, 2015; Sheard, 2013; Werner, 2014). As the cases of quantitative easing in Europe and the US have demonstrated, expanding the monetary base is not able to trigger credit and thereby inflation. There is no stable "money multiplier" that channels reserves into credit (Fullwiler, 2008; Sheard, 2013). As the presumption is invalid, the whole case of arguing that forex interventions, which *ceteris paribus* lead to an expansion of the monetary base, create inflationary pressure is rejected.

Central Bank		Commercial Bank	
Asset	Liabilities	Asset	Liabilities
+ Foreign Currency Assets	+ Reserves	+ Reserves - Foreign Currency Assets	

Figure 7 Simplified Balance Sheets Effects of Forex Intervention

6.2 Political barriers

As with all multilateral arrangements, the more parties are at the table the harder it gets to find consensus. The same is the case for such an international exchange rate regime as proposed in this paper. Since the exchange rate is considered as one of the most important prices in today's monetary economies – next to wages, interest rates and maybe oil – the topic is highly related to politics as well as to profit and power interests. This section is dedicated to shed light on the opposing interests that might be reasonable to anticipate and in how far those might be of an obstacle for the implementation of an international exchange rate regime. To find the interests that get touched by replacing the current non-system with an international regime, it is necessary to point out the three major differences: firstly, the international exchange rate regime prevents artificial over- and undervaluation of currencies; secondly, it minimizes profitable speculation and arbitrage opportunities; thirdly, it ensures monetary sovereignty for the currency issuing government thereby expanding the policy space.

Clearly, countries that follow a mercantilist-like undervaluation strategy, such as Germany, are hardly to be in favor of the international regime (Cesaratto & Stirati, 2010; Flassbeck & Lapavistas, 2015; Lucarelli, 2011; Ochsenfeld, 2017). More concretely, it would be against the interest of the large export corporations, such as the automobile industry, which currently benefit from the undervaluation of the euro. The German government promotes the export-led employment boost as a success story (CDU, 2019). However, it is wage depression that has led to the internal devaluation and the huge export surplus (Cesaratto & Stirati, 2010; Flassbeck, 2007; Flassbeck & Spiecker, 2011; Lucarelli, 2011). As such, it is hardly in the interest of the working class, which also has to pay more for its imports, e.g. for consumption, due to the undervalued Euro. Given that the international regime would implement a fair external value of the currency and enables the government to use its spending capacity to employ all labor resources, it would be clearly in the interest of the majority of the working class. For the EMU, the southern countries that struggle the most would majorly benefit from the international regime since their currencies are overvalued and the hands of their governments – financially speaking – tight behind their backs by the absence of monetary sovereignty (Mitchell, 2015). They suffer from huge unemployment rates and output gaps and clearly would benefit from the international exchange rate regime (EUROSTAT, 2019a; Flassbeck & Bibow, 2018; Mitchell, 2015). Based on the observation presumption that the private sector has been failing to achieve full employment for the last decades, the international regime offers each national government the policy space to by ending unemployment

through an adequate fiscal policy, e.g. by implementing a job guarantee program (Mitchell & Muysken, 2008). Conclusively, the international regime is in the interest of workers and eventually in the interest of political parties that strike for reelection as full employment and higher living standards are likely to resonate with the majority of voters.

Although both open and closed economies benefit from monetary sovereignty and the expanded policy space, it is likely that the regime is of even greater relevance for open economies since a fair exchange rate valuation becomes the more important the more integrated an economy is into global trade, it is expected that the international regime is more important to open economies than it is to closed economies. Especially for economies that experienced currency crises and financial instability through speculation, such as Thailand, Brazil, Argentina and Iceland amongst others, the international regime is expected to be in their interest. Regarding private corporations engaged in the tradeable sector, they as well are expected to be in favor of an international regime, which decreases their currency risk and thereby minimizes the incentive to use scarce resources to undertake currency hedges.

When it comes to developing countries, they are expected to be in favor of the international regime, because their often less diversified economies are more prone to shocks, which can be absorbed more smoothly by cooperation on exchange rates as well as by monetary sovereignty (UNCTAD, 2011). The feature of monetary sovereignty helps them to make use of their productive resources in order to raise domestic living standards by producing valuable output. The international regime prevents them from being priced out of international markets due to currency speculation.

Not only is it political power that needs to be considered in discussing interests but also profit motivation. The German automobile industry is one example for actors in which interest the international regime won't be - as explained above. However, this can essentially be made for all business that operate under and lobby for undervalued currencies. Next to that, and most obviously, the international regime won't be in the interest of the finance sector as it minimizes profit and arbitrage opportunities. Banks and other financial brokers that currently facilitate the speculation in the foreign exchange market might be expected to lose turnover in that segment from which they gained profits through charging the speculators transaction costs. On top, the speculators themselves are most likely in opposition of such a regime for losing arbitrage opportunities.

Lastly, as the regime builds on permanent market intervention, the proposal to implement such a regime might face intellectual and ideological opposition of free-market proponents. Equally, I expect other proponents that fear profit or power losses to use that kind of reasoning too. Since neoliberalism is deeply embedded into today's institutions and zeitgeist, I consider the intellectual and ideological opposition as a serious obstacle to the implementation of such a system.

To overcome the political barriers, the approach of cooperation on exchange rates can also start on a multi- or even bilateral basis and prove to deliver the benefits outlined in this paper. Next to that, existing institutions like the United Nations, the International Monetary Fund or the OECD could

promote the establishment of such a system by using its political power to bring international cooperation of that form to live.

7 General Conclusion

This paper outlines a possible design for an international exchange rate regime that minimizes the shortcomings of the current non-system – from floating to fixed regimes – and expands the policy space for currency-issuing governments in order to foster economic development. This paper extends the theoretical body of MMT by applying its principles on the design of an international exchange rate regime.

The current non-system is a harm for economic development. Firstly, floating exchange rate regimes fail to deliver stable real effective exchange rates due to herd behavior and carry trade speculation on the foreign exchange markets. Exchange rate related uncertainty harms investment in the tradeable sector leading to an economy operated below its capacity. Secondly, fixed exchange rate regimes undermine the monetary sovereignty of its governments and decrease their policy space leading to the situation that productive resources remain unused for no other economic reason but exchange rate regime related financial constraints. Essentially, neither floating nor fixed regimes fulfill the four criteria, established throughout the paper, that need to be fulfilled in order for the exchange rate regime to foster economic development: a stable and predictable real effective exchange rate, conduciveness to a fair and efficient international trade system, monetary sovereignty and financial stability (see figure 3).

On the contrary, the proposal of the international exchange rate regime is designed to correct the shortcomings and fulfill the four criteria (see figure 4). It is designed as rule-based managed float based on obligatory and symmetric forex interventions by cooperating central banks and thereby ensures that an agreed and rule-based nominal exchange rate target is realized at every point in time. The corresponding rule is that the nominal exchange rate adjusts according to the inflation rate differentials between the corresponding currency areas – measured by the producer price index (PPI) - at a defined frequency. Through the symmetric obligation to intervene in the forex market and the frequent rule-based adjustment of the nominal exchange rate target, the real effective exchange rate gets stabilized. The initial exchange rate at which the regime starts is subject to negotiations between the cooperating countries - preferably guided by a global institution responsible for supervision of compliance with the rules - and should be based on the principle that the nominal exchange rate should reflect the differences in unit labor costs. On top of that, it is recommended – though not obligatory - that countries establish a permanent zero interest rate policy and maintain or reintroduce a national fiat currency to maximize their benefits from the international regime. Model-based comparisons show that the international regime outperforms the floating and fixed regime in terms of level of investment and output respectively. The key comparative advantages of the international exchange rate regime are that it ensures stable real exchange rates and greater policy space for fiat currency issuing governments.

Regarding economic challenges of an international regime, systematic trade imbalances due to artificial over- or undervaluation of currencies are prevented in the first place. However, trade imbalances justified by availability of resources and stage of development as well as by desires to accumulate financial assets in a foreign currency will remain. While the latter is not related to balance of payment problems, the former might be so and qualifies for international assistance. Undoubtedly, a system built on cooperation and preferably coordinated by a multilateral institution can only help in this regard. The same is to be concluded for economic shocks, which can be absorbed much smoother through the exchange rate channel. On top of that, the space of the national government to respond to economic shocks, such as banking crises, is enhanced and prevents crises from being contagious. Forex interventions executed by the central bank – if not sterilized - lead to an increase in the monetary base which *ceteris paribus* puts downward pressure on the interest rate -, which is recommended to be permanently at zero anyways. As the research on how commercial banks operate supports and as the experience of quantitative easing programs demonstrates, an expansion of the monetary base through forex interventions by the central bank *ceteris paribus* does not increase inflationary pressure.

Political barriers for an implementation of the international regime are based on conflicting interests grounded in power and profit aspirations of different actors. Countries like Germany that follow an undervaluation strategy, large export corporations benefitting from undervaluation, the financial sector brokering the massive speculation and neoliberal free-market proponents are likely to oppose the implementation. On the contrary, countries, like Greece or Italy, which are experiencing artificially induced trade imbalances and a constrained policy space, developing countries, countries that experienced severe currency crises, like Brazil or Argentina, as well as the working class are expected to be in favor of such system. Although the scope of the proposal is a global implementation, the system works equally fine on a multi- or even bilateral basis.

Given the limited scope of this paper, several areas that have been touched qualify for further research. Firstly, further research with regards to the international institution that would be responsible for supervision of compliance with the rules and in how far it would be able to support countries facing balance of payment related problems is recommended. Additionally, as the section of political barriers has touched, research on political barriers and the willingness of governments currently in place is necessary to evaluate how realistic an implementation of such a regime is. Moreover, while the current proposal leaves the forex market in place and only relies on interventions, it might be worth it to consider a system that circumvents the forex market altogether. Lastly, since the model-based comparisons of the floating and the international regime rely on simplified and static models a next step could be to further develop the model-based comparison into a dynamic model with more endogenous variables.

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