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The international monetary system hierarchy: current configuration and determinants

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The international monetary system hierarchy: current configuration and determinants [1]

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Abstract

This paper aims to analyze the current International Monetary System (IMS), focusing on the usage of different national currencies at the international scenario. In fact, only a few currencies are able to fulfill money classical functions beyond the national borders of their issuing country, configuring an IMS that is absolutely hierarchized. It is broadly known that the US dollar is the key-currency, but some questions arise when the analysis is deepened, among which: what is precisely the share of each currency in the fulfillment of the three functions of money at the international level? What determines the current configuration of the IMS? In order to answer to these questions, this paper presents firstly the data for the international usage of currencies, splitting the analysis into the private and the public usage – i.e.: means of payment, price setting and investment currency (private usage); and intervention currency, reference currency and reserve currency (public usage). Although there is not a database that provides all these information, a quest over many sources allows us to provide a map of the current IMS configuration. Secondly, this paper analyses the possible determinants of the international usage of national currencies, proposing three most important ones: i) the dimension of the national economy and its integration in the world economy; ii) the geopolitical power of the country; iii) the government's political will to internationalize the currency. Thirdly, the paper examines the effects of the global financial crisis over the IMS configuration, showing that the US dollar has kept its role almost unaltered, but the euro has suffered a loss in its share in the international fulfillment of some money functions – notably as means of payment and public reserve currency; on the other hand, some peripheral currencies are becoming more and more important at the international sphere, specially the Chinese yuan, whose share in international transactions is still modest, but rapidly increasing.

Keywords: International Monetary System; Currency hierarchy; Dollar, Euro; Yuan.

Introduction

All over the history, the international economy has never had a global currency, in the sense of a currency that is issued and managed by a supranational institution in order to be used by all agents in the whole world. If all countries in the world required the use of its national currency for the international exchanges,

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there would be a clear incompatibility. In the same way that money facilitates economic operations at the national level, choosing one (or some) reference currency(ies) has been essential for the development of international exchanges. Hence, if on one hand international exchange could engender a fractionated international monetary system (IMS) – due to the presence of several national currencies –, on the other hand this possible trend is surpassed by a strongest trend (associated to political and economic reasons) that determines that only a few currencies are used at the international level (Aglietta, 1979). Moreover, historically the currency of the hegemonic country performs the role of the key currency (i.e. means of payment; unit of account and denomination of contracts; and reserve of value at the international level)[4]. Consequently, a hierarchized structure is erected in the IMS.

Some currencies therefore, go beyond the national borders and acquire an international usage. This usage of currencies at the international level is guided by a set of rules that configures the *modus operandi* of the IMS. The three basic axes of an international monetary system are the exchange rate regime, the degree of capital mobility and the characteristics of the key-currency. In the period when the world economy was under the Bretton Woods (BW) Agreement – 1945 to 1971/1973 – there were clear and mandatory rules regarding these three axes for all the signatory countries, since exchange rates were fixed in relation to the US dollar[5]; the dollar convertible in gold played the role of the key-currency; and capital mobility was restricted. With the end of the BW agreement, countries have autonomy – at least from a formal point of view – to choose their exchange rate regime and their financial openness degree[6], so there is no longer a single standard, as in the previous system[7]. That's why some authors name the current IMS as a "non-system" (Faugère; Voisin, 1993; Lago, Duttagupta; Goyal, 2009).

(4) Brunhoff (1996) argues that the establishment of the key currency is the result of an implicit agreement among developed countries that reflects the underlying power relations. In section 3, this paper will discuss the determinants of the international usage of a currency.

(5) The exchange rates were fixed, but with adjustment clauses in the event of fundamental imbalances in the balance of payments of the signatory countries. After adjusting in the early post-war, however, these exchange rates were pretty much fixed. For details, see Van der Wee, Hogg and Hall (1987) and Eichengreen (2000).

(6) "Financial openness" refers to the elimination (or reduction) of barriers to the mobility of financial flows across national borders.

(7) In reality, there is some pressure from central countries and multilateral institutions advocating the adoption of floating exchange rate regimes and financial openness. Disobedience regarding these recommendations does not mean however sanctions by the International Monetary Fund (IMF), as it occurred in the BW period. The global financial crisis triggered by the US subprime market has even alleviated this pressure for financial openness. Indeed, multilateral institutions have admitted the necessity of capital controls in some of the so-called emerging countries (Blanchard; Dell'ariccia; Mauro, 2010).

Another important change occurred in the nature of the key currency, that has a fiduciary character in the current IMS. However, there is a feature of this system that remains unaltered after the end of the Bretton Woods Agreement: its hierarchical character. The dollar remains the key-currency and most national currencies do not fulfill traditional money functions internationally. It is precisely this distinction between the currencies that are used and those that are not used at the international level that determines the hierarchical character of the international monetary system.

This paper aims to analyze the current IMS, especially from the perspective of the currency hierarchy. Due to the impossibility of working with all countries and currencies of the world, the analysis focuses sometimes on three groups of countries: the central ones, the Latin American ones and the Asian ones. For each of these groups, some representative countries were chosen: United States, United Kingdom, Japan, Switzerland and the Eurozone – or Germany, when data for the euro area are not available (central countries); China, India, South Korea and Malaysia (Asian countries); Brazil, Argentina, Mexico and Chile (Latin American countries).

Besides this introduction, the paper has four sections: section 1 analyzes the functions of money internationally, their imbrications and contradictions; in section 2, the current configuration of the IMS is presented; section 3 proposes the main factors which determine the ability of a currency to be used at the international level; section 4 presents some final remarks.

1 Money functions at the international level

The three classical functions of money are: means of payment, unit of account and store of value. Internationally, several authors emphasized these three functions, but advocate the importance of establishing a distinction between the private and public uses of money (e.g., Cohen, 1971; Cooper, 1975; Krugman, 1991). They justify this decomposition claiming that the official demand (mainly from central banks) has generally different characteristics from that of private agents. Thus, the three functions of money are decomposed into six, in order to consider separately the private and public uses: means of payment/vehicle currency; currency of denomination; investing and financing currency; intervention currency; reference currency (anchor); reserve currency (Table 1).

Although the definition of the different functions of money is important from an analytical point of view, they are completely intertwined, making it

necessary to understand these inter-relationships. Imbrications are numerous, but Benassy-Quéré, Mojon and Schor (1998) explain the most important ones.

First of all, when a national currency is anchored in a foreign currency, it is absolutely necessary that the domestic monetary authorities have official reserves of this anchor-currency in order to intervene in the foreign exchange market for the maintenance of the parity. It is clear therefore that the three public uses of money at the international level – namely, intervention currency, reference currency and reserve currency – are completely intertwined.

Nevertheless, the anchoring of a currency has influence not only on public uses of money. The choice of a reference currency also influences its three private uses, since the stability of the exchange rate encourages agents to invoice commercial and financial transactions in the currency of reference, to use it as a vehicle currency and also to retain assets denominated in this currency.

Table 1
Money functions at the international level

Function	Private usage	Public usage
Means of payment	Means of payment/vehicle currency	Intervention currency
Unit of account	Price setting/invoice currency	Reference currency (anchor)
Reserve of value	Investment and finance currency	Reserve currency

Source: Cohen (1971).

When a currency achieves at the international level the status of vehicle currency, its foreign exchange market becomes larger and deeper, what – *ceteris paribus* – reduces the transaction costs of this currency measured by the bid-ask spreads (the difference between the market prices for the purchase and sale of the currency). If this spread becomes small, private investors have incentives for acquiring assets denominated in that currency, since its exchange for other currencies will not imply significant losses. For the same reason, the monetary authorities have an incentive to choose such currency as an instrument of foreign exchange market intervention.

However, the determination is not unidirectional. For instance, if a currency invoices most of the commercial and financial transactions of a certain country, its monetary authorities will have a strong incentive to link its national currency to this currency in order to protect the domestic economy from the adverse effects of excessive exchange rate fluctuations.

Moreover – still according to Benassy-Quéré, Mojon and Schor (1998) –, the existence of securities denominated in a certain currency –unit of account function – stimulates the expansion of its other private uses, that is, as a means of payment and a store of value.

It is therefore clear the existence of a large network of synergies between the three functions of money, either within their public or private uses, or in the relationship between these two spheres. Furthermore, as previously anticipated, this circuit has multidirectional influences, since one money function may at the same time stimulate and be stimulated by the other functions.

In addition to this web of complementarity between the functions of money, it is important to notice that there is also a character of contradiction between them. As discussed by Keynes (1936), the store of value function may overcome the others, especially in a context of high importance of the financial sphere. The author argues that hoarding money inhibits the exercise of its other functions, making it an inherently contradictory unity.

At the international level, this contradiction between the functions of money remains valid and the store of value function may be seen as more important than the other ones. The difference is that on the global scenario this contradiction interferes even in the selection of currencies by the international agents. It happens because the maintenance/valorization of the stock of wealth is normally the most important criteria for the selection of the currencies and usually this logic ends up overlapping the logics behind the other functions of money. This rationale is clear to private agents but has also been adopted – to some extent – by the public sector, which has been adapting gradually to the private logic of portfolio management (UN, 2009).

This preponderance of the store of value function, enhanced by the current environment of liberalized finance, makes the acquisition and ownership of different currencies subject to a great instability. As already mentioned, the currencies that have an international usage fulfill at this level the functions of means of payment, unit of account and store of value. Regarding the store of value function, there are two points of view that may be contemplated, according to the reference value which is considered.

Firstly, one may consider the ability of the currency to store its value intertemporally in relation to the purchasing power in the international arena; secondly, the ability to maintain its value in relation to the other currencies of the IMS. If a currency invoices most of the international transactions – thus being the key-currency of the system – the first aspect is more easily contemplated, since

the currency should be stable in relation to itself (which depends only on a moderate inflation rate). Hence, the logic underlying the choice of the store of value function coincides with the one referring to the other two functions. It is convenient to keep this currency in the portfolio, since it denominates the majority of the economic transactions, it is used for payments and it transfers value from the present to the future – at least the value regarding the international purchasing power[8].

Secondly, one may consider the ability of a currency to store its value in relation to the other currencies of the IMS. There, the contradictions between the functions of money clearly arise. Under this point of view, maintaining the value of the currency would mean the stability of its exchange rates.

In the case of the key-currency, if it is depreciating against other currencies, an agent who keeps a stock of this currency would not suffer losses from the perspective of the monetary functions of means of payment and unit of account. However, maintaining this stock shall imply losses when he incorporates in the analysis of the store of value function the perspective of the parity in relation to other currencies. This occurs because if the key-currency is depreciating against other currencies this stock implies an "opportunity cost". The store of value function (against other currencies) generates therefore a stimulus for the allocation of resources in the currencies that are appreciating, albeit from the perspective of the other monetary functions (means of payment and unit of account) the more convenient for this agent would be the maintenance of his wealth in the key-currency.

The reallocation of the portfolio brought to light the preponderance of the store of value function over the others. However, this reallocation, which follows the logic of the constant valorization of wealth, is not definitive; if there is any uncertainty regarding the international economy, agents would reallocate their resources in the key-currency because it is the receptacle for uncertainty and it has the higher liquidity premium at the global level[9]. In the current context of

(8) Determined by the prices of goods and services traded internationally, which are largely invoiced in the key-currency itself.

(9) Andrade and Prates (2013) and Kaltenbrunner (2015) applied the equation of the own rate of interest or total expected return, presented by Keynes (1936) in chapter 17 of the General Theory, to the international level. As these authors pointed out, international agents hold in their portfolio financial assets denominated in different currencies because they favorably estimate their total expected returns. Thus, this equation can be used to represent that behavior. In other words, the process of price determination of what it is named "currency assets" can be depicted through the variables (a, q, c and l) of this equation, which are attributes of assets denominated in a specific currency. Hence, assets denominated in the key-currency have the higher liquidity premium.

liberalized financial markets, the intervals between these two moments of portfolio reallocation (purchasing currency in appreciation and returning to the key-currency) are increasingly shorter. Inevitably, this dynamic contributes to the volatility of capital flows and the instability of international finances.

This paper proposes therefore that despite the imbrications between the different functions of money at the international level, there is also an important contradiction between the store of value function – from the perspective of the parity in relation to other currencies – and the other monetary functions. Alternatively, one could see the issue as a conflict between the two "faces" of the store of value function: one connected to the other monetary functions and the other isolated, as a goal in itself.

The contradiction between the store of value function and the other monetary functions also exists at the national level, as proposed by Keynes (1936). Internationally, however, another dimension of this store of value function arises, i.e., the one that puts this currency in relation to the other currencies of the world; once this currency has two reference values (on the one hand, goods and services denominated in this currency; on the other hand, the other national currencies), an additional contradiction arises: a contradiction that is related to the coexistence of different national currencies with floating exchange rates.

At the national level, the means of payment function can be overcome by the store of value function, interfering in the process of "money circulation". At the international level, the latter function not only diminishes the importance of the first function, but also states that this "store of value" can be held in a foreign currency (or in assets denominated in this foreign currency). The interference in the management and circulation of the national currency is therefore even greater.

2 The hierarchized character of the international monetary function

As already mentioned, the development of global exchanges without a proper global currency has been possible due to the international usage of national currencies. Yet, the benefits of using a currency come from its use by other market players, making it infeasible for all national currencies to be used worldwide. At the end, the underlying dynamic of the international usage of currencies determines that only a restrict group of currencies are able to fulfil the functions of money at the international level. This section aims to verify which currencies currently belong to this group.

There are no consolidated data for the six functions of money discussed in the previous section. Based on different databases, initially all currencies available are showed with the aim of providing an overview of the current international monetary system. After that, a smaller group of countries and currencies that are considered representative are presented.

2.1 Means of payment function – private usage

There are no specific statistics for the usage of currencies as a means of payment at the international level. Nevertheless, the analysis of the global foreign exchange markets provides an approximate idea of this usage, since the currencies mostly traded in these markets are very likely the most used as means of payment. The data published triennially by the Bank for International Settlements (BIS) are eloquent, indicating that almost all foreign exchange transactions involve the US dollar – in April 2016, the US currency share in the foreign exchange (Forex) turnover reached an average of 87.6% (table 2). There are no doubts that this share is so high because the US dollar is the most used currency for international payments (both for commercial and financial reasons), but also because it acts as a "vehicle currency" – or an intermediate currency – for the international transactions.

In a second level of importance in international monetary transactions, lies the euro. Since its creation, euro's share in the global Forex turnover was close to 40 percent, but it has decreased since 2010. The last data show that it has fallen to 31.3 percent. This declining use of the euro at the international level is most probably a consequence of the Eurozone crises. Although the height of the crisis is over, the region is still facing challenges (subdued growth, low inflation and high unemployment, impaired balance sheets and vulnerable financial systems in some countries) whose solution seems a long way off.

The yen is one step down in terms of global importance. Yet, its share has sharply decreased since 2010 due to the Japanese expansionist monetary policy (the so-called Abenomics). According to the ECB (2014), Bank of Japan's announcement to engage in large-scale asset purchases evoked a sell-off of the Japanese currency. The sterling pound ranks forth with a turnover share around 12 percent since 2010. The two following positions are occupied by the Australian dollar and the Canadian dollar, with Forex turnover shares above 5 percent in 2016. The Swiss franc is now ranked in the seventh position (share of 4.8 percent) while until 2010 it occupied the sixth one (and until 2007 the fifth one). Yet, the most important changed in the rank since 2010 has been the increase in the turnover share of the Chinese yuan from 0.9 to 4.0 percent in 2016.

After them, there are many other currencies which are also traded on global Forex markets, but with small importance (Table 2).

Table 2
Currency distribution on global foreign exchange market turnover
Net-net basis, percentage shares of average daily turnover in April of each year

Currency	1998	2001	2004	2007	2010	2013	2016
US dollar	86,8	89,9	88,0	85,6	84,9	87,0	87,6
Euro	...	37,9	37,4	37,0	39,1	33,4	31,3
Yen	21,7	23,5	20,8	17,2	19,0	23,0	21,6
Sterling pound	11,0	13,0	16,5	14,9	12,9	11,8	12,8
Australian dollar	3,0	4,3	6,0	6,6	7,6	8,6	6,9
Canadian dollar	3,5	4,5	4,2	4,3	5,3	4,6	5,1
Swiss franc	7,1	6,0	6,0	6,8	6,3	5,2	4,8
Chinese yuan	0,0	0,0	0,1	0,5	0,9	2,2	4,0
Mexican peso	0,5	0,8	1,1	1,3	1,3	2,5	2,2
Swedish krona	0,3	2,5	2,2	2,7	2,2	1,8	2,2
NZ dollar	0,2	0,6	1,1	1,9	1,6	2,0	2,1
Singapore dollar	1,1	1,1	0,9	1,2	1,4	1,4	1,8
HK dollar	1,0	2,2	1,8	2,7	2,4	1,4	1,7
Norwegian krone	0,2	1,5	1,4	2,1	1,3	1,4	1,7
Korean won	0,2	0,8	1,1	1,2	1,5	1,2	1,6
Turkish lira	...	0,0	0,1	0,2	0,7	1,3	1,4
Russian rouble	0,3	0,3	0,6	0,7	0,9	1,6	1,1
Indian rupee	0,1	0,2	0,3	0,7	1,0	1,0	1,1
South African rand	0,4	0,9	0,7	0,9	0,7	1,1	1,0
Brazilian real	0,2	0,5	0,3	0,4	0,7	1,1	1,0
Danish krone	0,3	1,2	0,9	0,8	0,6	0,8	0,8
Polish zloty	0,1	0,5	0,4	0,8	0,8	0,7	0,7
New Taiwan dollar	0,1	0,3	0,4	0,4	0,5	0,5	0,6
Malaysian ringgit	0,0	0,1	0,1	0,1	0,3	0,4	0,4
Thai baht	0,1	0,2	0,2	0,2	0,2	0,3	0,4
Hungarian forint	0,0	0,0	0,2	0,3	0,4	0,4	0,3
Czech koruna	0,3	0,2	0,2	0,2	0,2	0,4	0,3
Chilean peso	0,1	0,2	0,1	0,1	0,2	0,3	0,2
other currencies	0,2	6,9	6,9	8,2	5,4	2,5	3,3
Total	200,0	200,0	200,0	200,0	200,0	200,0	200,0

Note: Foreign exchange transactions involve two currencies, so the sum of the shares is 200%.
Source: Authors' elaboration based in BIS Reports (Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010, 2013 and 2016).

It is also interesting to analyze the operations in cross-border markets, i.e., the markets that are external to the country that issues the currency. The specific analysis of these operations provides an idea of the degree of

internationalization of the currencies. These data are shown in Table 3 and confirm the position of the US dollar as the most important international means of payment, the secondary place of the euro and the relative importance of some other currencies.

Table 3
Foreign exchange turnover – Cross border
US$ million – daily average (April)

Currency	2001	2004	2007	2010	2013	2016
US dollar	599,943	959,424	1,552,539	2,106,951	2,785,454	2,954,633
Euro	270,559	433,506	727,77	973,224	1,087,351	1,096,104
Yen	145,722	201,689	316,909	460,102	723,387	727,674
Sterling	82,918	170,484	262,436	302,851	337,795	406,394
Australian	26,259	55,591	121,524	186,486	286,581	242,639
Canadian	29,824	41,874	78,117	132,091	149,863	171,309
Swiss franc	41,754	70,494	125,884	165,516	171,59	169,685
Chinese yuan	64	796	4,196	13,076	62,895	108,194
Swedish	6,058	8,158	16,376	61,218	59,933	77,609
Mexican	5,783	13,12	23,677	32,519	82,695	77,486
NZ dollar	4,863	11,292	37,362	40,828	66,918	75,191
Norwegian	12	19,078	49,286	36,299	48,449	58,925
HK dollar	12,414	19,172	56,382	61,668	48,335	56,539
Singapore	586	2,784	5,237	34,839	46,791	56,322
Korean won	2,425	6,456	12,285	21,757	27,041	42,749
Turkish lira	705	2,684	10,746	15,038	44,359	42,459
South	4,229	10,333	22,458	17,647	37,5	29,622
Brazilian real	492	771	4,075	11,966	43,011	28,948
Danish krone	9,137	11,222	14,283	13,467	26,094	27,977
Indian rupee	160	692	5,119	12,672	22,876	25,160
Polish zloty	4,74	5,269	14,198	21,24	21,768	23,043
Russian	1,282	4,781	7,257	14,74	45,671	22,444
new Taiwan	724	1,28	2,135	7,538	11,511	17,311
Hungarian	35	2,803	5,729	10,988	12,8	9,725

Note 1: The total cross-border Forex exchange turnover refers to the sum of spot transactions,outright forwards and foreign exchange swaps.
Note 2: The countries are ordered according to the values of 2016.
Source: Authors' elaboration based in BIS Reports (Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010, 2013 and 2016).

Yet, even if the "top currencies" are the same all through this period, some specific currencies have gained importance. The Chinese yuan's increase is also the most impressive one regarding the cross-border turnover, having been multiplied by more than 150 in the last 15 years. As a consequence, Chinese yuan was upgraded from the tenth position in 2013 to the eight one in 2016 (Table 3). This same ascending trend took place in the customer initiated and institutional payments registered by the Swift (Society for Worldwide Interbank Financial Telecommunication): in 2015 the Chinese yuan was the fifth more used currency (Table 4). This trend, in turn, could be associated to the agreements signed by China with a dozen countries on currency swap agreements for the purpose of using the Chinese yuan as an invoicing and payment currency[10].

Actually, for the settlement of the international trade, Guttmann (2016) says that the Chinese yuan is already the second most used currency. The increase of its usage was unbelievably fast: from March 2010 to December 2013, the share of the Chinese exports that are settled in Chinese yuan went from nearly 0% to 25%[11].Since China is currently the most important country for the international trade it is evident that the rising share of the Chinese yuan for the settlement of the Chinese trade has a big impact over all international trade.

In addition to the volume of cross-border foreign exchange transactions in absolute numbers (Table 3), it is also important to check the ratio of the transactions made in the domestic and in foreign markets. Instead of working with all the currencies listed in the table 3, the choice is to present here only the currencies considered as the more representative for the central, the Latin American and the Asian countries – as anticipated in the Introduction of the paper. In order to avoid the influence of the speculative forward market operations, the Figure shows only the spot operations. Interestingly, for some countries the transactions involving their currencies occur predominantly in cross-border markets, while in others they are mostly made in the domestic markets, as shown in Figure 1.

In 2010, a clear pattern appears: central countries have more than 60% of the spot Forex transactions of their currencies in cross-border markets, while the peripheral countries have most of the turnover in local markets. The exception is

(10) For more details, see Isachsen (2012).

(11) Data provided by Erhart (2016).

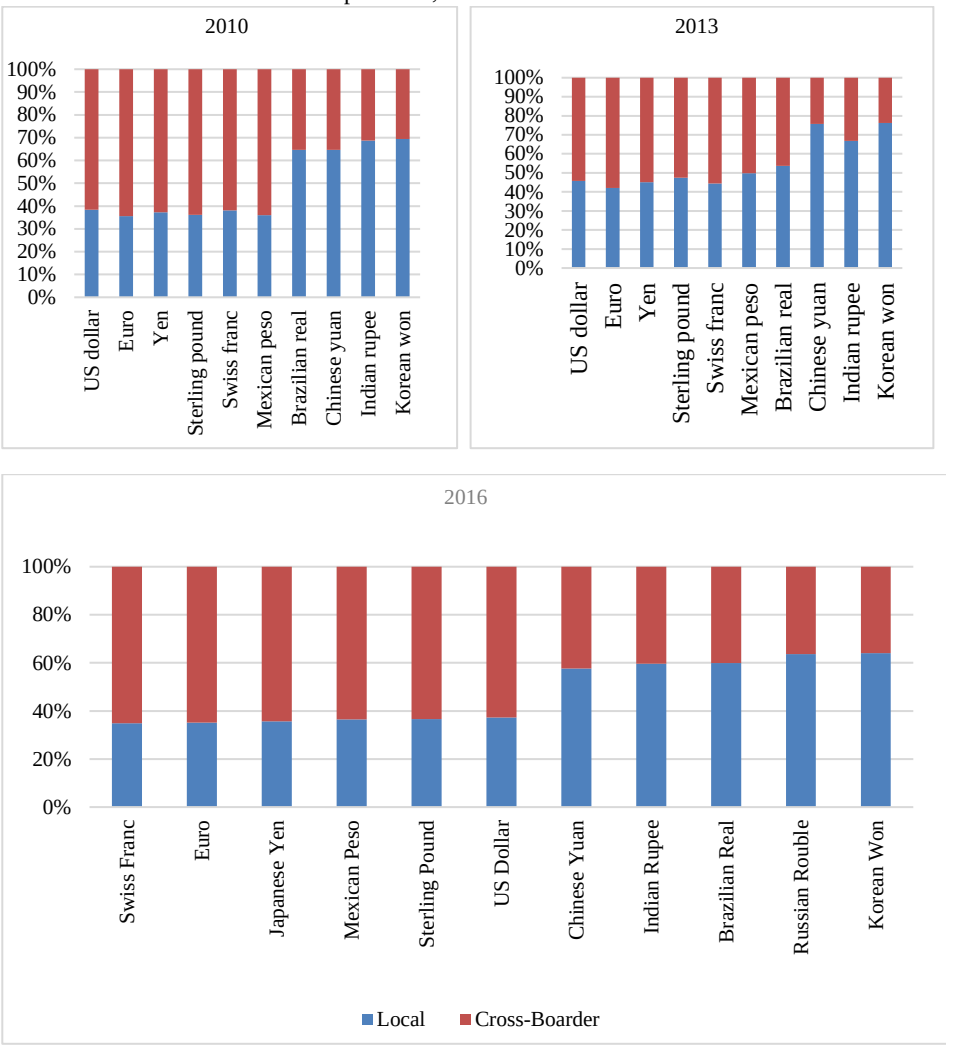
Mexico, because the economic integration (formal but also informal) with the United States inflates the exchange of Mexican pesos in US territory. The 2013 picture shows that Brazilian real has rapidly changed its shares, having almost half of its transactions being made cross-border; but even if this proportion is high, the absolute value of Brazilian currency being transacted cross-border is still low (Table 3). For peripheral Asian Countries, Figure 1 shows that while in 2013 they still have about 70 percent of their spot Forex turnover being made inside their national borders, in 2016 this percentage decreased to around 60 percent, the same level of the Brazilian currency.

Table 4
Customer initiated and institutional payments
Percentage based on value, Nov. 2015.

Currency	%
US Dollar	42,68
Euro	29,5
Sterling Pound	8,8
Yen	2,68
Chinese Yuan	2,28
Australian dollars	1,77
Canadian dollars	1,7
Swiss Franc	1,64
HK dollar	1,17
Thailand baht	0,98
Singaporian dollar	0,92
Swedish Krone	0,86
Norwegian Krona	0,76
Polish Zlot	0,5
Danish Krona	0,47
South African rand	0,43
Mexican Peso	0,34
NZ dollar	0,34
Turkish lira	0,25
Chilean peso	0,21

Source: SWIFT Watch.

Figure 1
Foreign exchange average turnover for spot operations in local and cross-border markets (%), April 2010, 2013 and 2016.



Source: Authors' elaboration based in BIS Reports (Foreign exchange and derivatives market activity 2010, 2013 and 2016).

The data presented in this section suggest the existence of three distinct situations: i) residents of a country make international operations in the national currency of this country; ii) residents make these operations in a foreign currency, but they are able to access cross-border Forex markets to purchase the currency

needed; and iii) the operations are performed in a foreign currency and the residents can only purchase this currency in the domestic markets, because their national currencies are not accepted in the cross-border markets. These three situations refer respectively to currencies that: i) are used as means of payment in the international level; ii) could not be used in that particular transaction as a means of payment, but fulfil the monetary functions in the international arena since they are offered and demanded in significant volumes in cross-border Forex markets; and iii) do not fulfil their functions at the international level and therefore are not – or almost not – traded in the cross-border markets.

2.2 Means of payment function – Public usage

Several researches (e.g. Calvo; Reinhart, 2000) stress that in many countries the monetary authorities intervene on foreign exchange markets to influence the process of determination of the exchange rate level or trend. Almost all interventions on the foreign exchange markets are done through the purchase and sell of US dollars as the most important bilateral exchange rate is the one against the key-currency (one exception is the group of European countries who aim at joining the Eurozone; in their case, the most important bilateral exchange rate is the one against the euro).

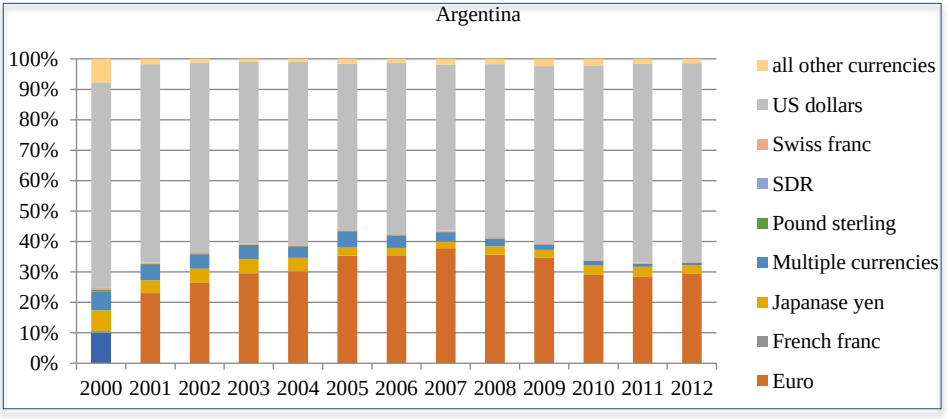
The means of payment and the unit of account functions for the public usage of money are completely intertwined, since the interventions on the forex markets by the monetary authorities of a country are made in the currency that they have as a reference for its exchange rate. Thus, the data concerning both functions will be shown in sub-section 2.4.

2.3 Unit of account function – private usage

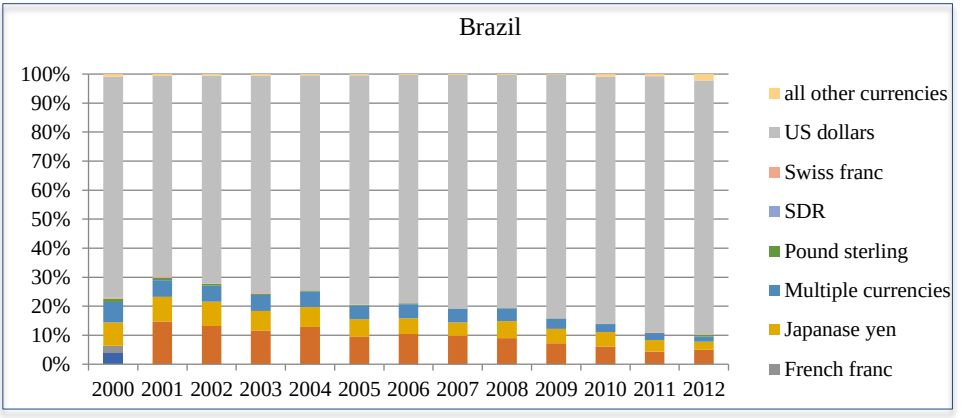
The previous sections showed that the payments in the international level are predominantly made in a few currencies. The same happens with the denomination of those operations – both the commercial and the financial ones. Regarding this function, there are also no aggregate data for the total global operations.

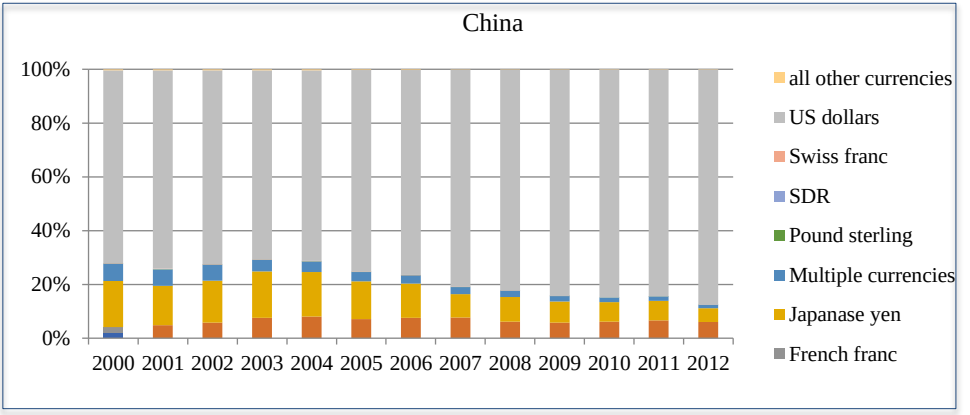
The World Bank has a databank with the currency composition of some peripheral countries' external debt[12]. Among the countries for which those data are available, three Latin American and three Asian countries were chosen. Figure 2 shows that the US dollar is the most used currency in the denomination of the peripheral countries' external debt. In Brazil, China and Malaysia about 90% of the external debt is denominated in the US currency and this share has been increasing for the last ten years. In Argentina, the end of the currency board regime – which determined a fixed parity for the exchange rate between the Argentinian peso and the US dollar – and the crisis of 2002 caused a decrease in the dollarized debt until 2007; data show however that this did not mean an increase in the debt denominated in local currency, but rather a growing share of the euro denominated debt, which now accounts for over a third of the total. Yet, from 2007 onwards, the share of the dollarized debt has been again increasing in Argentina. Due to regional reasons, India and Malaysia have a significant share of their debts denominated in yen, but the US dollar share is still predominant and growing. Mexico is the only country with a significant share of debts denominated in "all other currencies", but US dollar denominates half of its external debts.

Figure 2
Currency composition of the external long-term public and publicly-guaranteed debt



(12) Krugman (1991) associates the unit of account function, private usage, to the denomination of international trade and international loans; and the store of value function, private use, to the assets that compose the portfolio of international agents. The choice here is therefore to present the data regarding the external debts in this section that concerns the unit of account function – private usage. It is anyway important to stress again that the monetary functions are all imbricated, as seen in section 1, so these data concern also the unit of account function – public usage and even the store of value usage.


Brazil
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
all other currencies
US dollars
Swiss franc
SDR
Pound sterling
Multiple currencies
Japanese yen
French franc


China
100%
80%
60%
40%
20%
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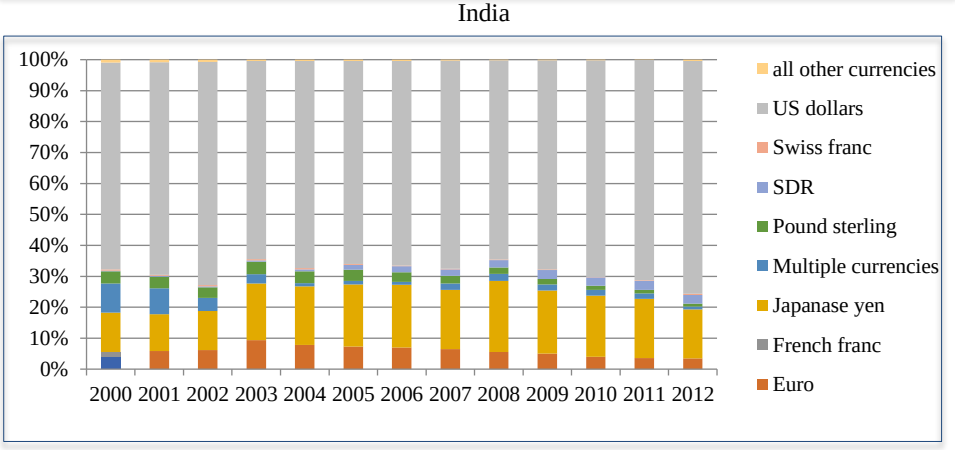
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
all other currencies
US dollars
Swiss franc
SDR
Pound sterling
Multiple currencies
Japanese yen
French franc


India
100%
90%
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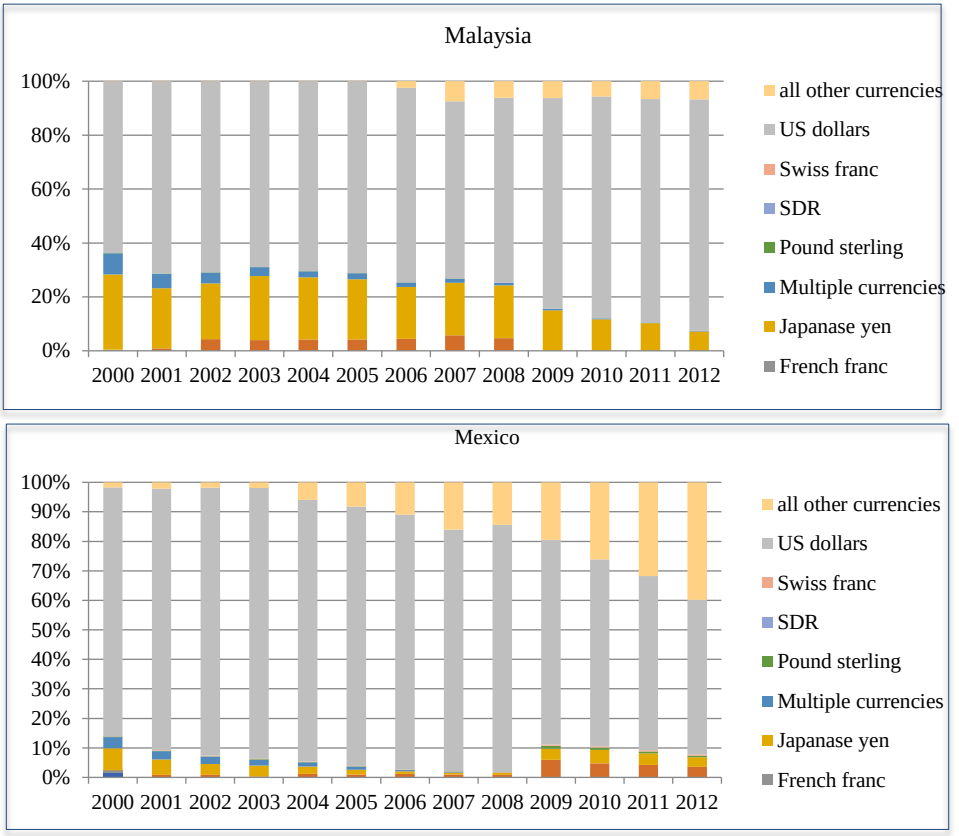
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
all other currencies
US dollars
Swiss franc
SDR
Pound sterling
Multiple currencies
Japanese yen
French franc
Euro



Source: Authors' elaboration based on data from the World Bank.

For the commercial operations, there are no precise data, but estimations show that the invoicing of the international trade is also absolutely concentrated. Guttmann and Plihon (2011) indicate that the US dollar's share is between 40 and 45% and the euro's share is within the range of 15 and 20% of the total.

According to Goldberg and Tille (2005), there are two main reasons to explain why the exports are mainly denominated in U.S. dollars. Firstly, exports are made to the United States. Secondly, exports of homogeneous goods have high price-demand elasticity. Therefore, if one country's exports are denominated in its own currency, a tiny change in its exchange rate will cause the international demand for their goods to vary greatly. This stimulates a collective behavior by producers to denominate their goods in a common currency, the "vehicle currency" – and this currency is almost always the dollar. Indeed, the prices of commodities traded in international exchanges are quoted in dollars.

Once again, the currencies of the "triad" are the most commonly used to internationally fulfil the monetary function of unit of account, with the sterling pound and the Swiss franc occupying a minor place.

It is obvious that the peripheral countries, if they were able to denominate – even partially – their international trade and their foreign debt in domestic currency, they would do it, reducing the problem of currency mismatch and making easier for the domestic agents the economic calculation and the ability to honor their commitments. If they do not do it, it is because their currencies are not recognized internationally as units of account, revealing once again the hierarchical character of the IMS[13].

2.4 Unit of account function – public usage

The dismantling of the Bretton Woods system in 1973 meant the end of the compulsory fixed exchange rate regime. Nevertheless, in the current IMS, countries are allowed to pursue the stability for their exchange rates. Since the 1970s therefore, many countries have alternated different exchange rate regimes, with moments of greater flexibility and moments of more rigid parities. Few countries, however, completely neglect the changes of their exchange rates as the effects of excessive exchange rate variability are harmful to the domestic economy. Thus, many national monetary authorities keep attention on exchange rate movements, electing an international currency as a rigid anchor or simply as a reference to avoid excessive exchange rate volatility.

According to the Annual Report on Exchange Arrangements 2014, an annual publication of the IMF (IMF, 2014), only 29 over 191 countries (15.2%) have free floating regimes; 149 countries (78%) have exchange rate regimes that contain some kind of exchange control (currency board, conventional peg, stabilized arrangement, crawling peg, crawl-like arrangements, pegged exchange rate with horizontal bands, other managed arrangement and floating[14]); and 13 countries have no national currencies[15] (Table 5).

(13) It is worth to mention that according to Eichengreen, Hausmann and Panizza (2003) and Eichengreen and Hausmann (2005) the incapacity of these countries of denominating their external debt in their own currency is determined by an "original sin" associated to economies of scale and network externalities that resulted in the use of few currencies in the international level for the fulfilment of this monetary function.

(14) The IMF has even changed its categorization in order to distinguish the "free floating" regime from the "floating" one. This second category is normally named "dirty floating", because the monetary authorities eventually intervene in the exchange rate market without publicly announced their targets.

(15) Eight countries are dollarized and three use the euro as their currencies, even if they are not part of the Eurozone.

Given that the current international monetary system does not establish a global rule for exchange rate regimes – as in Bretton Woods – governments must elect the currency in relation to which there must be some kind of control for the exchange rate movements. Once again, the currencies elected are almost exclusively the US dollar and the euro. Table 5 shows that 43 countries explicitly declare the US dollar as their reference currency and 26 countries announce the euro as the most important currency for their exchange rate regimes.

Table 5
Exchange rate arrangements, 2014

Exchange rate arrangement	US dollar	Euro	Composite	Other	Monetary aggregate target	Inflation targeting framework	Other
No separate legal tender	8	3	-	2	-	-	-
Currency board	8	3	-	1	-	-	-
Conventional peg	15	18	5	5	-	-	1
Stabilized arrangement	7	1	2	-	7	-	4
Crawling peg	1	-	1	-	-	-	-
Crawl-like arrangement	2	1	-	-	3	3	6
Pegged exchange rate within horizontal bands	-	-	1	-	-	-	-
Other managed arrangement	2	-	3	-	4	1	8
Floating	-	-	-	-	11	21	4
Free floating	-	-	-	-	-	9	20
Total	43	26	12	8	25	34	43

Source: Annual Report on Exchange Arrangement 2014, IMF.

Many other countries do not explicitly declare their reference currency, but it is not difficult to see that the exchange rate against the US dollar and the euro are the most important ones. Cartapanis (2009) estimates that among the countries with any kind of exchange rate management about two thirds have the US dollar as their reference currency and about one third have the euro. Goldberg (2010) proposes that the US dollar is the reference currency for 104 over 207 analyzed countries.

Actually, many countries seek exchange rate stability with respect to the main economic partners. In many cases they are the United States, the Eurozone, or even countries whose exchange rate is pegged to the dollar or the euro, reinforcing this trend. The euro is therefore the anchor for some European countries outside the Eurozone (especially those who want to join the monetary union in the future) and for some former French colonies in Africa; and anchoring in the dollar is a more widespread policy, including many countries in Latin America, Asia, the Middle East and Africa.

In spite of the divergence concerning the precise data, it is clear that the unit of account function, in its public dimension, is fulfilled at the international level mainly by the US dollar and in a second level of importance by the euro.

2.5 Store of value function – private usage

Finally, it is important to analyze the store of value function. In which currency the international private agents choose to allocate their wealth? In which currencies are they investing? International investors often seek to diversify their portfolios with respect to the assets acquired and preserved, the markets in which they operate and also the national currencies of their transactions. One would therefore expect a more fragmented participation of the various national currencies in the international fulfilment of this function. Nevertheless, in practice, only a few currencies have been used for this function, similarly to what have been seen for the other monetary functions.

Financial globalization has opened multiple possibilities for private agents to choose the allocation of their wealth, since it has facilitated investments abroad and in markets infrequently accessed in the past. In an attempt to understand what are the currencies that currently play the role of store of value at the international level (in its private dimension), the option here is to analyze two international markets, namely the banking and the bonds markets.

2.5.1 International banking market

Banks are increasingly operating internationally, having often important cross-border operations and, even at the local level, a share of their assets and liabilities are denominated in foreign currencies. Table 6 shows the currency composition of bank positions abroad. The majority of cross-border bank assets and liabilities is denominated in US dollar or euro. At a second level, the table shows a reasonable share in yen, sterling pound and Swiss franc.

Table 6
Banks – Cross-border assets and liabilities, in foreign currencies (%)
April 2010 and 2013

Currency	Assets		Liabilities	
	2010	2013	2010	2013
US dollar	57.8	58.7	63.5	60.7
Euro	20.7	19.5	18.6	18.4
Yen	5.1	3.1	3.3	4.9
Sterling pound	3.3	5.1	4.9	3.9
Swiss franc	2.3	2.4	1.7	2.3
Other currencies	10.7	11.2	8	9.7
Total	100	100	100	100

Note: the reference to the definition of "foreign currency" is the country of location of the bank in question.
Source: Authors' elaboration based in BIS Reports (Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010 and 2013).

Even locally, the banks have a share of their positions denominated in foreign currencies. Excluding assets and liabilities denominated in national currency and considering only the banking positions denominated in foreign currency, the US dollar is once again the most used currency (Table 7). Besides the dollar, the euro, the Swiss franc, the yen and the sterling pound denominate local assets and liabilities. It is important to notice that the shares in euro, yen, sterling pound and Swiss franc have lightly decreased from 2010 to 2013. This decline was compensated by a considerable increase in the US dollar share.

Table 7
Banks – Local assets and liabilities, in foreign currencies (%)
April 2010 and 2013

Currency	Assets		Liabilities	
	2010	2013	2010	2013
US dollar	49.2	56.4	52.8	58.5
Euro	27.4	24.8	23.4	21.5
Yen	4.8	3.3	3.6	2.2
Sterling pound	4.3	3.2	4.0	2.8
Swiss franc	7.0	4.7	3.2	2.2
Other currencies	7.5	7.6	13.1	12.8
Total	100	100	100	100

Note: the "non identified" assets and liabilities are not considered.
Source: Authors' elaboration, based in BIS Reports (Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010 and 2013).

2.5.2 International bond market

Money market

For the Money market instruments (notably, commercial papers), the data show that the euro and the US dollar are the most used, followed by the sterling pound and one level below by the yen and some other currencies (Table 8).

Table 8
Money Market instruments

Currency	2010	2013
US dollar	37.2	37.6
Euro	41.3	36.1
Sterling pound	13.7	18.6
Yen	2.3	1.5
Australian dollar	1.0	1.0
Swiss franc	1.6	0.9
HK dollar	1.0	0.6
Swedish krona	0.3	0.6
NZ dollar	0.2	0.2
Singapoure dollar	0.2	0.2
Norwegian krone	0.1	0.2
Canadian dollar	0.2	0.1
Danish krone	0.1	0.1
South african rand	0.02	0.03
Russian rouble	0.1	0.0
Czech koruna	0.00	0.02
Polish zloty	0.3	0.02
Other currencies	0.3	2.2
Total	100	100

Source: Authors' elaboration based in BIS Reports (Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010 and 2013).

It is clear again the decline in the share of euro – a relative loss that is more important than the one verified for the bank assets and liabilities. The data indicates that the euro still has a huge participation in the total money market instruments (36.1%), but it has been surpassed by the US dollar in recent years. This loss was completely due to a decline of the commercial papers in euro,

whose share has declined from 46.9% in 2010 to 33.4% in 2013 (Table 9). In this market the counterpart of this loss has not been an increase in the dollar share, but rather in the sterling pound share; considering only the commercial papers, the sterling pound share has gone from 14.9% in 2010 to 21.6% in 2013 (Table 9).

Table 9
Money Market instruments

Currency	Commercial papers		Other instruments	
	2010	2013	2010	2013
US dollar	31.7	39.7	44.2	34.9
Euro	46.9	33.4	34.1	39.5
Sterling pound	14.9	21.6	12.3	14.8
Swiss franc	2.2	0.9	0.9	0.9
Yen	1.1	0.3	4	2.9
Canadian dollar	0.3	0.2	0.1	0
Other currencies	3	3.9	4.4	6.9
Total	100	100	100	100

Source: Authors' elaboration based in BIS Reports (Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010 and 2013).

Capital markets

For the international bonds and notes, the situation is different, since the euro occupies the first place with 45.2% of the total in 2013, an increasing share compared to 2010. The US dollar comes after, with 35.8% of the total and a declining share. It is worth mentioning that the greater share of the Euro in this money function is due to the issues of bonds and note by residents in the Eurozone, who prefer these classes of securities (with longer terms) in comparison to money market instruments. The sterling pound also emerges as an important currency in the denomination of such securities, followed by the yen, Swiss franc, Canadian dollar and Australian dollar. The rest of the currencies have a small – albeit increasing – share in the capital market.

Table 10
International Bonds and notes

Currency	2010	2013
Euro	44.0	45.2
US dollar	39.2	35.8
Sterling pound	7.8	9.5
Yen	2.8	2.2
Swiss franc	1.5	1.6
Canadian dollar	1.3	1.2
Other currencies	4.7	5.7
Total	100	100

Source: Authors' elaboration based in BIS Reports (Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010 and 2013).

Derivatives market

At the international derivatives market, the same currencies occupy the first places either in foreign exchange or in interest rate derivatives[16]. Table 11 shows that almost the totality of the foreign exchange derivatives stock involves the U.S. dollar. In decreasing order of importance, the data show euro, yen, sterling pound, Swiss franc, Canadian dollar and Swedish krona.

Table11
Derivatives – Foreign Exchange

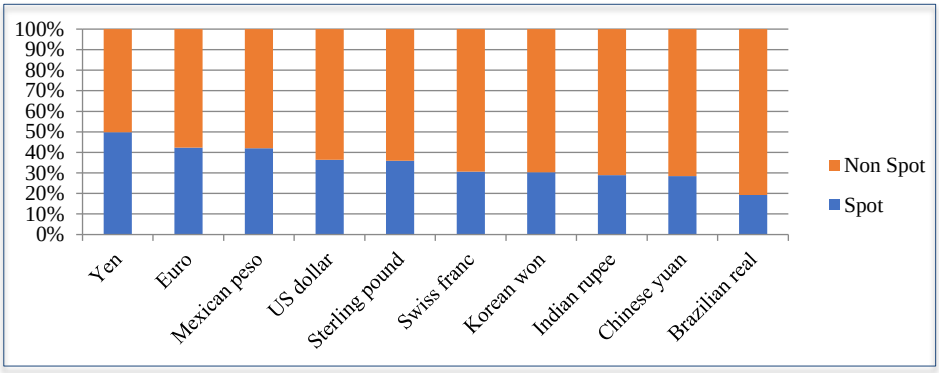
Currency	2010	2013
US dollar	88.0	87.9
Euro	38.8	33.4
Yen	23.0	20.8
Sterling pound	12.8	11.5
Swiss franc	7.4	5.7
Canadian dólar	4.3	4.5
Swedish krona	2.7	1.9
Other currencies	22.9	34.2
Total	200	200

Source: Authors' elaboration based in BIS Reports (Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010 and 2013).

(16) In the case of this class of derivative, the euro occupied this first place in the ranking from its launch to 2013 (49 percent in comparison to 28 percent of the US dollar). Yet, in 2016 they changed positions: the US dollar´s share increased to 51 percent and the euro´s one decreased to 24 percent (BIS Reports - Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010, 2013 and 2016).

Yet, differently from the other markets, the share of the "other currencies" is representative and increasing. Hence, the data concerning the foreign exchange derivative markets suggest that the participation of currencies issued by peripheral countries has been increasing. Effectively, as Figure 3 shows, their participation is much more important for the forward markets (non spot operations) than for the spot ones.

Figure 3
International forex markets: non spot vs. spot operations (average, April 2013)



Source: Authors' elaboration based in BIS Reports (Foreign exchange and derivatives market activity 2001, 2004, 2007, 2010 and 2013).

The findings about banks, money markets, capital and derivatives markets make clear which currencies are chosen by private agents to the international fulfilment of the store of value function: US dollar and euro are the most used currencies; yen and sterling pound alternate in the third and fourth positions; Swiss franc systematically presents a considerable extent; Australian dollar, Canadian dollar and Swedish krona also have reasonable participation in some markets, although quite minor. The non spot operations involving the peripheral currencies might be seen as speculative operations rather than operations in which theses currencies fulfil the store of value function.

2.6 Store of value function – public usage

Public actors also use assets denominated in foreign currencies as a store of value. Accumulating international reserves, for instance, is primarily a matter of transferring value from the present to the future. These reserves serve to finance balance of payments deficits and to allow interventions in the foreign exchange markets. Moreover, after the currency crisis of the 1990s and beginning

of the 2000s, emerging economies have begun to pursue a defensive strategy of pre-emptive accumulation of foreign reserves with two non-exclusive goals: to protect the country against adverse external shocks, mainly capital flows reversals (the so-called "precautionary demand" for reserves); and/or to establish a competitive level of exchange rates under export-based growth policies (Aizenman; Lee; Rhee, 2004; Carvalho, 2010).

A small share of these reserves is invested in gold and special drawing rights (SDR) – the IMF accounting currency. Indeed, Table 12 shows that in the case of this function the main currency is the US dollar, whose share in the total stock remains above 60%, despite the decline in recent years. The euro is the second most used currency, representing a quarter of the official exchange reserves in the second quarter of 2014. Due to regional reasons or to the degree of economic integration with the United Kingdom or Japan, assets denominated in the sterling pound and the yen are also kept as reserves by some monetary authorities. The other national currencies have an increasing share in this stock of reserves, notably after 2008. Even if the concentration is still extremely high, some national authorities are diversifying the currency denomination of their reserves and information from the media indicate that the Chinese yuan has been progressively searched for this purpose[17].

Therefore, although the public logic is theoretically different from the private one, regarding the constitution of the portfolio that will transfer value from the present to the future, the currencies chosen are basically the same.

Table 12
Composition of official foreign exchange reserves

	1996	1998	2000	2002	2004	2006	2008	2010	2012	2013	2014	2015	2016.II
US dollar	62,0	69,3	71,1	66,5	65,5	65,1	63,8	61,8	61,2	61,0	63,3	64,2	63,4
Euro	-	-	18,3	23,7	24,7	25,0	26,2	26,0	24,2	24,1	21,9	19,7	20,2
Sterling pound	2,7	2,7	2,8	2,9	3,5	4,5	4,2	3,9	4,0	3,9	3,8	4,9	4,7
Yen	6,7	6,2	6,1	4,9	4,3	3,5	3,5	3,7	4,0	3,9	3,9	4,0	4,5
Swiss Franc	0,3	0,3	0,3	0,4	0,2	0,2	0,1	0,1	0,3	0,3	0,3	0,3	0,3
Deutsche mark	14,7	13,8	-	-	-	-	-	-	-	-	-	-	-
French Franc	1,8	1,6	-	-	-	-	-	-	-	-	-	-	-
Netherlands guilder	0,2	0,3	-	-	-	-	-	-	-	-	-	-	-
ECUs	7,1	1,3	-	-	-	-	-	-	-	-	-	-	-
Other currencies	4,5	4,5	1,5	1,6	1,9	1,8	2,2	4,4	6,3	6,8	6,8	6,9	6,9

Source: Cofer.

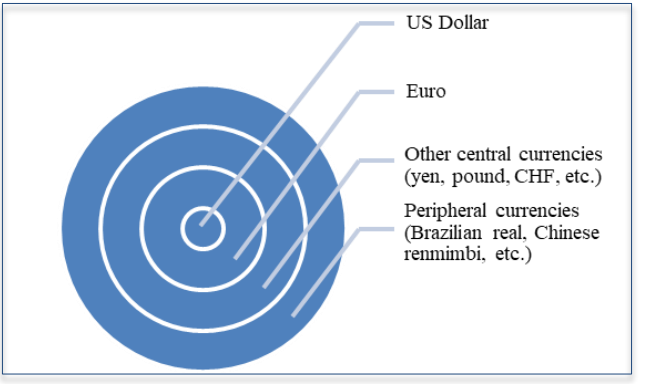
(17) According to Trevisan (2012), Chile, Nigeria and Malaysia have a small but increasing share of their official reserves composed by Chinese yuan. In June 2017, the European Central Bank has bought Chinese yuan to compose its official reserves. The shares are still modest, but the fact is quite symptomatic of the internationalization of the Chinese currency.

2.7 The currency hierarchy

The data shown along the last section reveal that not all currencies are used internationally and that even among those who are, their relative importance is quite heterogeneous. Despite recent changes in the IMS, mainly the creation of the euro and the ascension of the so-called "emerging countries", the US dollar remains the most widely used currency in the international sphere (especially in the functions of means of payment; unit of account, public use; and store of value, public use). The euro comes in a second place, with growing importance from its creation until the outbreak of the Eurozone crisis, especially in the private fulfilment of the store of value and unit of account functions. At a third level of importance, there are the yen, the sterling pound and – slightly below – the Swiss franc, the Canadian dollar and the Australian dollar, which fulfil some monetary functions at the international scene, albeit in a less relevant manner. Besides these, other currencies may eventually have an international usage, but it is still marginal.

Andrade and Prates (2013), Kaltenbrunner (2015) and Paula et al (2016), among others, propose that, precisely because of the ability or inability to fulfil the functions of money internationally, the different national currencies can be ordered, exposing the hierarchical character of the IMS[18]. Based on the evidence seen above, the paper proposes that the current IMS presents the hierarchy shown in Figure 4.

Figure 4
The hierarchy of the current International Monetary System



Source: Author's elaboration.

(18) While these authors adopt the concept of currency hierarchy, Cohen (1998) proposes the concept of monetary pyramid to classify the different types of currencies. Yet, in Cohen´s pyramid, currencies are distinguished according to their degree of monetary internationalisation as well as of currency substitution (use of a foreign currency inside the national borders).

According to this classification there are four main positions in the current IMS: i) in the center, the US dollar, the key-currency of the system; ii) below, the euro, which differs from the other currencies that have a consolidated international usage, but without reaching the status of the dollar; iii) in a third place, the other central currencies, which also fulfil the monetary functions at the international level, but in a less relevant manner; and iv) finally, the group that is named here as peripheral currencies, namely those who do not fulfil the monetary functions at the international level in a consolidated manner.

3 Currency internationalization determinants

In a national economy, the currency is imposed by the state, according to the logic of *fiat money*. Having sovereignty over the national territory, the State issues the currency, determines its acceptance and the rules of its course by law, makes payments and collects fees, fines and taxes in that currency. Nevertheless, for international transactions no currency is explicitly imposed, even because there is not a supranational state with such power. Thus, the various national currencies are – at least potentially – capable of international use.

Section 2 showed however that only a few currencies fulfill monetary functions internationally, configuring a hierarchical IMS. Although this hierarchy is clear, the reasons behind the selection of the currencies that are used for global transactions are not obvious and different approaches are found in the literature to explain this determination[19]. De Conti et al. (2013) aim to contribute to these discussion, proposing three main reasons that explain why some national currencies are used at the international level and others not. The reasons proposed are: 1) the dimension and integration of this country's economy; 2) the geopolitical power of the country; 3) the political will of the national government to internationalize its currency.

3.1 Dimension of the national economy and integration with the world economy

It is a consensus among researchers that the dimension of the national economy of the issuer of a particular currency is important to determine its

(19) Although there is no consensus, there are many authors that – directly or indirectly – address the issue, such as Aglietta and Deusy-Fournier (1994); Aristovnik and Cec (2009); Belluzzo (1997); Benassy-Quéré and Deusy-Fournier (1994); Berthaud (2009); Bordo, Meissner and Redish (2005); Bourguinat (1995); Cohen (1998, 2000, 2009); Eichengreen and Hausmann (2005); Guillaumin and Plihon (2008); Hayek (1976/1990); Herr (2006); Krugman (1991); Lake, Duttagupta and Goyal (2009); Lindert (1969); Miotti, Plihon and Quenan (2002); Prates (2002).

international usage. It could not be otherwise, since the amount of money an economy uses is related to its size and, in general, the larger the economy, more transactions will be made with the rest of the world.

Indeed, the usefulness of a currency is closely related to: i) the network economy: the larger the network of actors in the market that use a certain currency, the greater the incentive for new actors to also use it in face of the facilities of exchange and the reduction of uncertainty; ii) economies of scale: the greater are the exchanges performed in a certain currency, the lower are the transaction costs.

Table 13 shows that in general countries whose currencies play an international role have a huge gross domestic product (GDP). USA GDP represents 22.4% of world's GDP, and this is surely one of the main factors that explain the role played by the dollar as the key-currency of the IMS. The sum of the GDPs of the countries that compose the Eurozone reaches a value that is comparable to the United States, explaining the use of the European currency internationally and, also, the difference in its importance in comparison to the European national currencies that the euro came to replace. The euro has behind it the German, French, Italian, Spanish economies, among others, and it certainly accentuates its international usage. Japan and the UK also have relatively large GDPs, contributing to the international usage of their currencies.

Table 13
GDP – % of World's GDP

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
United States	31.3	32.5	32.3	30.1	28.5	28.1	27.5	25.5	23.6	24.4	23.2	21.7	22.2	22.4
Eurozone	19.1	19.4	20.4	22.4	22.8	21.8	21.4	21.8	21.9	21.1	18.9	18.4	16.8	17.1
China	3.6	4.0	4.3	4.3	4.5	4.9	5.5	6.2	7.3	8.6	9.2	10.2	11.5	12.7
Japan	14.4	12.7	11.7	11.3	10.8	9.8	8.6	7.7	7.8	8.5	8.5	8.3	8.2	6.6
Un. Kingdom	4.5	4.5	4.8	4.9	5.2	5.0	4.9	5.0	4.3	3.8	3.6	3.5	3.4	3.4
Brazil	2.0	1.7	1.5	1.4	1.5	1.9	2.2	2.4	2.7	2.7	3.3	3.5	3.1	3.0
India	1.4	1.5	1.5	1.6	1.7	1.8	1.9	2.2	2.0	2.3	2.6	2.6	2.6	2.5
Korea	1.7	1.6	1.8	1.8	1.8	1.9	2.0	2.0	1.6	1.5	1.7	1.7	1.7	1.7
Mexico	2.1	2.2	2.2	1.9	1.8	1.9	1.9	1.8	1.8	1.5	1.6	1.6	1.6	1.7
Switzerland	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9
Argentina	1.0	1.0	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.8	0.8	0.8
Malaysia	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4
Chile	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4

Source: World Economic Outlook Database, IMF. Authors' elaboration.

The exceptions to the standard are China, the second largest GDP in the world, but still having a currency that is not widely used at the international level,

although its share in the global foreign exchange market turnover has increased at an unprecedented rate since 2010, which means that its private usage as means of payment in international level has gained relevance recently; and Switzerland, which, despite not having a very large GDP, issues a currency with international usage. The following analysis will help to explain these exceptions.

Indeed, having a large GDP is not enough for a country to issue an international currency. Some countries may have a large GDP, but be economically isolated from the rest of the world, so that their currencies are used only at the domestic level. It is necessary therefore to also examine the degree of economic integration of the countries with the rest of the world both in the commercial and financial dimensions.

Nevertheless, the analysis of this economic integration should not be done (as usually) based on the degree of trade and financial openness of the various countries, since the relevant aspect to the current study is not how much each national economy is integrated with the world, but rather, the volumes of resources the world gets or sends to this economy. If an economy is highly integrated with the world, but it is small, the probability that its currency acquires an international use is smaller than that of an economy with low commercial and financial openness, but with important dimensions. What matters therefore is the total value of transactions carried on by the country with the rest of the world, i.e, the dimension of its "transactional network" (Helleiner, 2008).

In Table 14 the trade and services flows of selected countries show a pattern very similar to that seen for the GDPs. The Eurozone has a very large flow of commerce, but it includes exports and imports internal to their own monetary zone, not interfering thus in the use of the currency for countries other than the participants of the monetary union. Still, the percentage of the Eurozone foreign trade is relevant, and especially in transactions with Eastern Europe and the former African colonies, the euro is widely used. The United States also have very significant foreign trade relations, "exporting" somehow the use of the dollar, along with their products (as seen in section 2). Japan and the UK have smaller trade currents, but still significant, and especially in regional orbits, this encourages the use of their national currencies. China and Switzerland are again the exceptions, but nonetheless the proposition by Flandreau and Jobst (2009, p. 662) that "currency and trade are complementary" seems true.

Table 14
Trade and services flows – US$ billion

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
Euroarea	3947	4543	5382	6122	4918	5518	6513	6321	6524
USA	3286	3676	4008	4388	3545	4192	4786	4960	5020
China	1416	1738	2203	2638	2301	3072	3799	4145	4490
Japan	1276	1394	1521	1763	1315	1658	1898	1926	1786
UK	1264	1448	1555	1602	1247	1399	1594	1597	1602
Korea	649	761	889	1043	835	1060	1339	1370	1365
India	336	418	519	685	589	787	999	1024	1028
Switzerland	372	411	485	582	526	629	791	752	835
Mexico	475	546	597	645	505	642	747	789	815
Brazil	230	276	342	449	355	478	597	587	607
Malaysia	292	330	373	409	331	421	482	495	490
Argentina	82	95	119	150	116	150	188	179	185
Chile	87	111	131	147	115	151	181	181	180

Note: “Trade and services flows” were calculated as the sum of goods and services exports and imports.
Source: Balance of payments statistics, IMF – Authors’ elaboration.

With regard to financial flows (Table 15), the pattern is the same and the comments made above are equally valid. The only relevant difference concerns the positioning of China, serving as a new clue to understand why the yuan is a currency with no wide international usage: despite the dimension of the Chinese economy and the importance of its foreign trade, its economy is still relatively closed and highly regulated from the financial point of view; and it helps also to explain why this international usage of the yuan is increasing, since Chinese financial integration with the world, albeit controlled, is also increasing. Switzerland, meanwhile, despite the small size of its economy, has a relatively large financial power, especially in light of the core role that the Swiss banking system occupies in the world economy.

There are two other important factors associated to the international financial integration and the size of the national economy that are also important in determining the use of a currency on a global scale, namely, the size and the depth of the domestic financial market. In fact, for a currency to acquire international use, it is necessary for the financial market of the country to be able to orderly absorb and provide capital flows. The largest financial markets in the

world – based on the stock of financial assets (stocks, bonds – public and private – and bank deposits) – are the United States, the Eurozone, Japan and the UK.

Table 15
Financial flows

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
Euroarea	3363	4356	5177	1463	3170	1675	1902	1898	2371
USA	1859	3456	3756	2277	2002	2349	1552	2351	2009
China	275	398	470	406	359	705	827	736	933
Japan	583	502	727	651	595	697	614	691	735
UK	2749	2261	4148	3404	1653	1036	695	838	672
Switzerland	270	285	727	682	309	176	191	188	209
Brazil	54	90	160	93	131	226	196	156	198
Mexico	69	34	107	75	100	140	89	147	146
Korea	64	118	183	105	83	103	103	126	128
India	39	71	128	103	72	142	120	139	111
Chile	19	28	50	46	43	58	61	80	62
Malaysia	18	38	55	56	38	56	54	59	44
Argentina	14	32	33	41	16	34	41	27	24

Note: "Financial flows" were calculated as the sums of assets and liabilities operations concerningthe "direct investments", "portfolio investments" and "other investments".
Source: International Financial Statistics, IMF. Authors' elaboration.

Table 16 shows the financial depth of the countries, calculated as the stock of debts and equities over the GDP of each country (or region). We notice that the countries with deepest financial markets are the advanced ones. Among the analyzed regions, Latin America is the one that has the lowest result.

Table 16
Financial depth – Debt and equities, as a percentage of GDP – 2012, 2nd quarter

Countries/Regions	GDP
Advaced economies (average)	408
China	226
Other emerging Asia	151
India	148
Latin America	126

Fonte: McKinsey Global Institute (MGI, 2013).

Hence, the financial hegemony of the United States in the current IMS is certainly a central element in explaining the status of the dollar as the key-currency of this system (Strange, 1986). This hegemony, in turn, is associated with the very dimension of the US economy, its integration with the world economy and the geopolitical power of the United States (see next subsection). Attempts to build a large and deep financial market without these other aspects (or prerequisites) can be counterproductive.

Therefore, the dimension of the national economy and its integration with the rest of the world seem to actually interfere in the international usage of currencies, although the exceptions of China and Switzerland. China has a large and highly integrated economy with the rest of the world (at least from a commercial standpoint), but its currency is still not expressively used at the international level; as it will be discussed further, this is a result, at least in part, of political choices. Switzerland, in contrast, does not have a large economy, but its currency fulfill some functions internationally due to the role of the Swiss banking system, historically seem as a safe place and one of the most important tax havens in the world.

3.2 Geopolitical power

Another aspect highlighted by some authors as one of the determinants of the international use of currencies is the power countries hold in the world political scene, linked to their insertion into the international capitalism (Brunhoff, 2005; Herr, 2006, Aglietta and Deussy-Fournier, 1994; Helleiner, 2008). Strange (1986) defines power as "the ability of a person or a group of people to influence the state of affairs so that their preferences take precedence over the preferences of others".

Geopolitical relations are relations of power and there is a clear hierarchy, since some countries are unable – to paraphrase Strange – to put their preferences above the preferences of others. Regarding to monetary issues, the most powerful countries can impose on others the use of their currencies, although, unlike what happens at the national level, at the international level it is made implicitly. The geopolitical power can stimulate the use of certain currency in two ways: directly, mainly through the confidence of the agents on a currency issued by a powerful state; or indirectly, namely through the effects of this geopolitical power over important economic variables (the transactions network of the country, the characteristics of its financial market etc.).

Lindert (1969) suggests that these geopolitical influences can occur in bilateral relations between the countries, but also by the strength of the most powerful nations on multilateral institutions. The paradigmatic case is that of the Bretton Woods Agreement, which expanded and consolidated the hegemony of the US dollar in the IMS. The author shows that it was common in the last century, for instance, that creditor nations exert influence not only on the composition of the international reserves of the debtor nations, but also on those of the official institutions.

The geopolitical power of each country is not something measurable, but there are no doubts about which are the most powerful countries internationally. Table 17 presents some international political groups that only express this common sense.

Table 17
Participation on Multilateral Institutions or groups

G7	UN Security	NATO	OECD	G20
USA	USA	USA	USA	USA
UK	UK	UK	UK	UK
Germany	China	Germany	Germany	Germany
Japan			Japan	Japan
			Switzerland	Switzerland
			S. Korea	S. Korea
			Mexico	Mexico
			Chile	China
				India
				Brazil
				Argentina

Source: Authors' elaboration.

Another indication of the geopolitical power of countries can be given by the voting power of the countries in the IMF Board of Governors, the highest decision-making authority of the institution. This voting power is determined by each member country's quota[20] that is denominated in Special Drawing Rights (SDRs), the IMF's unit of account. Due to their resilience during the contagion-effect of the global financial crisis and their leadership in the double-speed

(20) The current quota formula is a weighted average of GDP (weight of 50 percent), openness (30 percent), economic variability (15 percent), and international reserves (5 percent) (www.imf.org).

recovery in its aftermath, the so-called emerging countries pleaded to increase their quotas. In 2010, the most important IMF quote reform (the 14th General Review of Quotas) since its establishment was agreed, giving more voting power to these countries. Yet, the US Congress approved it only in December 2015, with a five-year delay. Table 18 depict IMF voting power of selected countries before and just after the reform (2010 and 2016, respectively). With exception of China, it clearly reveals the supremacy of the central over the peripheral countries in both moments. Indeed, the achievements of this recent reform in terms of a rupture with the pre-crisis status quo are limited, given the US retains its veto power[21]. On the other hand, it could be seen as symbolically significant since the increased prominence of emerging countries in the IMF was mostly achieved at the expense of European countries. Yet, the table also bright to light the asymmetry among emerging countries: China voting power, besides being the highest in this group in 2010, was the one that grew most with the reform, achieving 6.8 percent in 2016, only after to the United States. It is also worth mentioning another expression of this asymmetry: the inclusion of the yuan in the SDR's basket in 2015.

Table 18
IMF Voting Power: selected countries (percent of the total)

Country		2010	2016
Central countries	USA	16.8	16.8
	Japan	6.2	6.2
	Germany	5.8	5.4
	France	4.3	4.1
	UK	4.3	4.3
	Switzerland	1.4	1.2
Latin american countries	Brazil	1.7	2.3
	Mexico	1.5	1.9
	Argentina	0.9	0.7
	Chile	0.4	0.4
Asian countries	China	3.8	6.2
	India	2.3	2.7
	South Korea	1.4	1.8
	Malaysia	0.7	0.8

Source: IMF.

(21) The U.S. share is expected to be reduced to 16.5% after full implementation of the reforms, but for some important issues to be approved it is necessary to have 85% of the votes, which means the U.S. has kept its veto popwer. Voting shares are being updated as countries pay their quotas, then some small changes in comparison with the current shares are likely (www.imf.org).

The geopolitical power has a strong relationship with the military power of different countries. Although national governments do not hold – as occurs nationwide – the "monopoly of force" in the international sphere, this military power undoubtedly impact on the relationship between countries. The rankings on this national military power are not exactly coincident, but almost always put the United States as the first and China as the second or third. Taking into account basically the size of the army (men, weapons and vehicles) and dominated technologies (among other criteria), a specialist consultancy established for the year 2014 the ranking shown in Table 19.

Table 19
Military Power, 2014

Ranking	Country
1st	USA
2nd	Russia
3rd	China
4th	India
5th	UK
6th	France
7th	Germany
9th	South Korea
10th	Japan
14th	Brazil
27th	Switzerland
33rd	Mexico
38th	Malaysia
55th	Argentina
58th	Chile

Source: Global Fire Power

The United States continue to be unquestionably the most influential country in the international political scene. The nations that compose the Eurozone – notably Germany and France – are also major players in the international geopolitical decisions, but there is a crucial issue that must be highlighted: the Eurozone does not have a central government, reducing the strength of the euro. Although the ECB is the unique responsible for the "governance" of the euro, there can be conflicts between this institution and the national governments of member countries due to the lack of a centralized

coordination. There is not a European treasure, neither a European state. While in the United States there is "a homogeneous piloting" of the dollar, because the Fed is somehow coordinated with the American treasury and other regulatory institutions, "the euro does not emerge from a State, but an unfinished federal building; political legitimacy stems from a treaty and not an exercise of national sovereignty "(Cartapanis, 2009, p. 9)[22].

Japan and the UK have also a great geopolitical importance. Switzerland, for historical reasons, enjoys prestige and privileges in this area. Due to the importance of its economy, China has also been gaining a great power, both in bilateral relations – including those with the United States[23] – and in multilateral institutions. The other peripheral countries have also an increasing importance in the international discussions and forums – especially when they act collectively – but their geopolitical power is far below from that of central countries and, more recently, of China.

Finally, initiatives seeking to establish bilateral trade lines or credit denominated in peripheral currencies and the creation of new international financial institutions (IFIs) by emerging economies[24] also indicate that the geopolitical power influences the determination of the currencies used at the international level, since they are restricted to the peripheral countries themselves[25]. Yet, it has become increasingly evident that most of the new IFIs are actually dependent on China and mostly reflect China's power, rather than the diversified power of emerging economies as a bloc. Such differentiation is also now crystal clear with the formal ascension of the Chinese currency into the SDR basket.

3.3 Political will

One aspect neglected by most authors, but mentioned by Berthaud (2009) and Cohen (2000), concerns what is named in De Conti (2011) as "political will". A country which meets the conditions discussed above for the internationalization

(22) This issue is crucial to understand the current crises in the eurozone and its troubles to face the crises. For details, see Farhi (2014).

(23) One evidence is the ongoing effort of the USA to convince the Chinese monetary authorities to allow the appreciation of the yuan against the dollar, without success.

(24) The New Development Bank (NDB) and the Contingent Reserve Agreement (CRA) under the BRICS (Brazil, Russia, India, China and South Africa), and the Asian Infrastructure Investment Bank (AIIB), led by China and formed by 57 (prospective founding members).

(25) China, for instance, being a "regional leader", can already make a part of their trade with neighbor countries – and even some Latin American countries – in their own national currency, but cannot do the same with the central countries.

of its currency may interfere in this process through public policies designed for this purpose. Facing the possibility of seeing their money being used internationally, a government should choose one of the following possible actions: trying to speed/boost the international use of its currency; adopt a neutral stance; or intervene to prevent its currency to be used internationally.

The countries that have a major geopolitical power (and especially the hegemon country) can somehow enforce the use of their currencies by other countries or multilateral institutions. Although this imposition is not explicit, as the one that occurs within national spaces, the means of persuasion at the international level are numerous.

The case of the dollar is eloquent, since the United States has adopted a strategy of encouraging the international use of its currency since the early twentieth century, when a "National Monetary Commission" was established in Washington to discuss, among other issues, ways to strengthen the international role of the dollar (Flandreau and Jobst, 2009). Yet, during the interwar years this strategy was not pursued continuously as in some moments the American government chose for a non-internationalist position (Block, 1977). In the post-World War II, expanding the use of the dollar was the result of high growth rates of US trade and investments abroad, but also to the financial assistance conceded to several countries and especially the enactment of the BW Agreement, which formally placed the dollar in the center of the IMS. It is always important to remind that the US radically denied Keynes' proposal concerning the creation of a supranational currency (the Bancor). A few decades later, in 1979, facing an international distrust about the value of US currency, Paul Volcker, the chairman of the Fed at the time, put in place a policy to re-create a "strong dollar", restoring (and even enhancing) the role of the dollar as the key-currency of the system. It is therefore clear that the US government has acted to stimulate and maintain the international usage of the dollar. According to Cartapanis (2009, p. 8):

> There is a real monetary diplomacy in the United States; the dollar's role is very clearly perceived as an important element of geopolitical power and strategic influence in Washington; especially when economic and political interests come together.

In 1960, the British government also acted in favor of the re-emergence of London as an international financial center, helping to strengthen the international usage of the sterling pound[26].

(26) For details, see Strange (1986) e Helleiner (1994).

Yet in the Eurozone the official stance of the monetary authorities is neutral with respect to the internationalization of the euro. According to the ECB, the international usage of currencies is a process that must be pulled by demand, i.e, essentially determined by the initiative of markets, without being neither encouraged nor discouraged by public actors[27] (Aubin et al, 2007; Pouvelle, 2006; Cartapanis, 2009). Similar stance has been historically adopted by the Japanese government, since it has not encouraged the international use of its currency, fearing the negative effects of an excessive degree of internationalization of the yen[28] (Cohen, 1998); however, the Japanese monetary authorities do not create obstacles to this process.

China, on the other extreme, still has a policy of restrictions on its financial account and rigorous exchange rate control that prevents its currency to acquire a relevant use in the international arena. Although China has a large economy, an important international trade and an increasingly central role in the political world – as discussed in the previous two subsections – the yuan is inconvertible and this is a political choice. Any future prognosis is based only on assumptions, but it seems likely that once these self-imposed barriers are reduced by the Chinese authorities, the yuan will tend to be used internationally more significantly, due to the economic and political weight that the country acquired[29]. It is already quite clear that the Chinese government has plans for the near future that indicate this direction (Stevens, 2009), as stressed in section 2 and 3. According to Erhard (2016), "encouraging the international use of the Chinese currency, the renminbi or as it often referred to 'the renminbi internationalisation' became a priority objective of the Chinese economic policy after the crisis.

It worth mentioning that the effects of this "political will" depend on the geopolitical power of each country. A few countries are able to stimulate its currency to be used worldwide; others countries can only exert this kind of influence at the regional level; finally, there are some countries that are not able to stimulate the international usage of its currency – not even in the regional sphere. For these last countries, any kind of political will aiming to

(27) At least that's the official rhetoric.

(28) For instance: the need for financial openness and less control of the national monetary authorities over the circulation of the national currency.

(29) The Chinese macroeconomic policy is not practiced with an exclusive regard at the issue of the internationalization of currencies. The priorities are others and these so-called "barriers" are a byproduct of the existing policies.

internationalize its currency is absolutely vain and may even cause serious instabilities in the national economy.

4 Final remarks

This paper analyzed the current configuration of the international monetary system, with the primary purpose to reveal and explain its hierarchical character. The data have shown that the national currencies have different roles at the international level, since some of them are able to fulfil the classic functions of money, whilst others – the majority – are not able. This ability may be used as the criterion for dividing the currencies into two groups: the central currencies, which are widely used in the international scenario; and the peripheral currencies, which are not used outside the national borders of their country of issue.

In the current IMS, the US dollar is the key-currency, being the most used currency in the international arena for almost all functions of money – as seen in section 2. On a second stage, the euro is also very used, especially regarding to some of the monetary functions (e.g. store of value, private usage). One step further there are the other central currencies, which are also used at the international scenario, but less significantly; stand out among them the Japanese yen, the sterling pound, the Swiss franc and, on a lower level, the Canadian dollar and the Australian dollar. Finally, there has a huge group of peripheral currencies that fulfil their functions nationally, but not internationally – at least not in a relevant way. The examples studied in this paper were the Argentinian peso, the Brazilian real, the Chilean peso, the Mexican peso, the Chinese yuan, the South Korean won, the Indian rupee and the Malaysian ringgit.

The configuration that has just been outlined describes a picture of the current IMS, but the features and the hierarchy of this system are not static. It is true that the transformations require a long term perspective, especially in light of the inertia and path dependence that characterize the positioning of currencies in this system – mainly depending on the conventions that are established and take time to change. In the long term the position of currencies in the IMS hierarchy may vary, due to changes in the determinants of the international use of currencies.

The findings of this paper have shown that: i) the US dollar has kept its role as the key-currency of the IMS, in spite of the crisis originated in the American subprime markets; ii) although the euro's role as the second most used currency in the world is still not threatened, its importance has diminished in the

last year as a consequence of the eurozone crisis; iii) the Chinese yuan's importance in the IMS is increasing in a relatively high and sustained pace; although its role is still not comparable to the one played by the central currencies, the evolution of the indicators presented here suggest that the Chinese currency will change its status in a near future. Indeed, the recent inclusion of the yuan in the SDR's basket could be seen as the most important change in the post-crisis international monetary landscape and could be interpreted as the acknowledgment – from the Internationl Monetary Fund, hence from the whole international community – of China's monetary power.

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