“Texto para discussão

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Understanding the dollar standard in order to improve ecological macroeconomic theory

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1 Introduction

The financial system instability is fundamentally derived from the flaws of the international monetary system that emerged from the collapse of the Bretton Woods system, i.e., the dollar standard. According Duncan (2005) the dollar standard has three inherent flaws. First, it allows certain countries to sustain large current account or capital and financial account surpluses over long periods, but it cause those countries to experience extraordinary economic boom-and-bust cycles that wreck their banks and undermine the fiscal health of their governments. Its second flaw is that this system has made well-being of the global economy dependent on a steady acceleration in the indebtedness of the United States, a state of affair that is obviously not sustainable. The third flaw is that it generates deflation at the consumer price level.

From 1973 up to the 2007 financial crises, the dollar standard made it possible for the banks to expand credit in the main economies worldwide. However, specifically in the US and European countries the essential fuel for credit expansion – i.e. money markets – stop running as usual becoming instead one of the main cause of the crisis (Milne, 2009). The bank system flaws became clearer in many countries, sparking popular movements favoring the creation of a new bank system, more attuned with social and environmental issues (Positive Money, 2016).

Besides the social problems caused by the financial and economic crisis themselves, world environmental problems (Mae, 2005; Steffen et al. 2015) have also been worsening by the dollar standard as it allowed for a credit over

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expansion which, in turn, stimulated a culture of consumerism and increased pressure over several ecosystems.

In this context, several initiatives are being developed to understand the functioning of the current economic system, as well as modify the way central banks create money and commercial banks expand credit (Positive Money, 2016; Yamaguchi, 2016) and also to develop a new macroeconomic structure, known as ecological macroeconomic (Jackson, 2009; Victor, 2008). These efforts deserve merits and it is imperative thing in new structures to solve the above mentioned problems.

In this sense, we believe that to solve the problems that emerge from the failures of the dollar standard we need to understand it initially, develop an analytical framework which takes into account its characteristics (Paiva Sobrinho & Romeiro, 2016), while incorporating knowledge from the sustainability of complex systems of flow (Ulanowicz et al., 2009), once the financial and economic system are a complex flow system (Goerner et al., 2009).

Aiming at contributing to the understanding of the current international monetary system, the standard dollar, we present a set of interconnected information that let you view its functioning, as well as understand its relationship with economic growth.

In section 2, we introduce the balance of payments along with some important relationships that introduce the currency boomerang process described in section 3. Understand this process it is essential to show the triggering of credit expansion through the inflow of international financial resources in the financial system of a country.

The latter is best viewed after considering how the money creation process in the primary dealer system (section 4) and as banks gets the cash to finance the loans they grant their customers (section 5). In this section, we present briefly the quantity theory of credit, which connects the credit offer with economic growth. More details about this theory are presented in Paiva Sobrinho and Romeiro (2016). In section 6, we conclude by presenting some considerations.

2 Balance of payments

Understanding the balance of payments is necessary for comprehend the dollar standard system and its flaws, because, the great credit explosion that occurred in almost all countries in the world is one of the consequences of global current account imbalance. We present a brief introduction to the main accounts of the balance of payments. For more information the reader should consult (IMF, 2004).

According to IMF the balance of payments is a statistical statement that systematically summarizes, for a specific time period, the economic transactions of an economy with the rest of the world. Transaction for the most part between residents and nonresidents, consist of those involving goods, services, and income; those involving financial claims on, and liabilities to, the rest of the world; and those classified as transfers, which involve offsetting entries to balance one-sided transactions.

Current account, capital and financial account, errors and omissions, overall balance all are components of the balance of payments (IMF, 2004). Transactions of goods and services between countries are registered in the current account; capital flows between countries are registered in the capital and financial accounts. Discrepancies between statistics are registered in the errors and omissions account. Overall balance is the sum of the balances of the current account, the capital account, the financial account, and net errors and omissions. Most of the time a positive overall balance is equal to the change in the country's reserve assets.

Reserve assets are those external assets that are readily available to and controlled by monetary authorities[3] for meeting balance of payments financing needs, for intervention in exchange markets to affect the currency exchange rate, and for other related purposes (such as maintaining confidence in the currency and the economy, and serving as a basis for foreign borrowing) (IMF, 2004). Table 1 shows the difference between reserve assets during the Bretton Woods system and the dollar standard.

(3) Monetary authorities encompass the central bank (which subsumes other institutional units included in the central bank subsector, such as the currency board) and certain operations usually attributed to the central bank but sometimes carried out by other government institutions or commercial banks, such as government-owned commercial banks (IMF, 2004).

Duncan (2005) states the great difference between the reserve assets during the Bretton Woods system and the dollar standard is that gold could not be created by a government or by any other entity to finance a balance of payments deficit, whereas currency, deposits, equities, bonds, and money market instruments are all financial instruments that can be created, either by a government or by a private sector. He states also that it is not that such instruments be created specifically for the purpose of financing a balance of payments deficit. It is only necessary that such instruments exist and that those countries with a balance of payment surplus are willing to hold such financial instruments. Only when surplus countries acquire such instruments from deficit countries do those assets become reserve assets.

Table 1
Change in the composition of reserve assets after the end of the Bretton Woods agreement

During the Bretton Woods Agreement	During the dollar standard international monetary system
Predominantly Gold Foreign currencies Special drawing rights (SDRs) Reserve position in the IMF	Monetary gold Special drawing rights (SDRs) Reserve position in the IMF Other reserve assets: Currency and deposits Claims on monetary authorities Claims on other entities Securities Debt securities Short-term Long-term Equity and investment fund shares or units Of which: Securities under repo for cash collateral Financial derivatives Other claims

Fonte: IMF (2004).

The change of reserve asset composition allowed not only the U.S. but several other countries to finance their current account deficit with the sale of financial assets causing a global current account imbalance with countries with crescent current account deficits (U.S., the greatest in the world) and other with

crescent current account surplus (generally, U.S. trading partners, as Japan, China, Germany among others).

This global current account imbalance (IMF, 2011) generated an enormous flow of cash across countries worldwide, but more accentuated between U.S., Europe and Asia, and in less amount between formers with Latin America and Africa (Lund et al., 2013). One among other consequences from the global imbalance is the alteration in the way banks (except central banks) acquired cash for funding their loans, as will be show at section 5. Understanding this process is necessary for comprehend the credit explosion during dollar standard.

According the IMF (2004) a current account deficit can be settled with financial resources coming from capital and financial accounts and from reserve assets. The equation (1) summarizes this relationship.

$$CAB = - (NKA + RT) \quad (1)$$

Where

CAB = current account balance

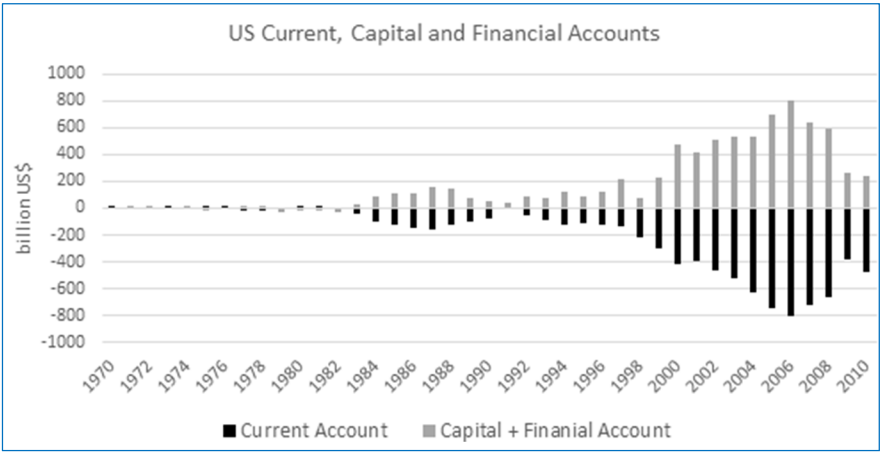
NKA = net capital and financial account (excluding reserve assets)

RT = reserve assets transactions

The Figure 1 shows the U.S. financed its current account deficit mostly through financial resources coming from capital and financial accounts. This was possible because the dollars sent by U.S. importers companies to pay the exporters firms in their countries trade partners were bought by their central banks which reinvested the dollars back into the U.S. economy for buying dollar denominated assets (government bonds, stocks, for example), increasing the acquisition of reserve assets. Duncan (2005) calls this process as 'currency boomerang', a common process during the dollar standard.

In resume the growing U.S. current account deficit functions as a pump, i.e., it puts dollars (liquidity) in the international system. More the US firms imports, more dollars are sent to foreign firms. On the contrary, less US firms imports, less dollars are sent to foreign firms.

Figure 1
Main accounts of the US balance of payment



Source: IMF International Financial Statistics.

3 Understanding currency boomerang

According Duncan (2012) after the collapse of Bretton Woods international monetary system the central banks of some countries began printing fiat money and using it to buy the currencies of other countries. He mentions that such intervention served to push up the value of the other currencies and depress the value of currency being created, making the products of the currency manipulating country more price competitive in the international marketplace.

The author explains exactly the way central banks create money and accumulate foreign exchange reserves (reserve assets) using China as study case. This process can also occur among other countries. We reproduce his words:

'In 2007, China's trade surplus with the United States was $259 billion. In other words, China sold the United States $259 billion more in goods and services than the United States sold to China that year. When Chinese companies sell their goods in the United States, they are paid in dollars. In 2007, those companies took their surplus of $259 billion back to China. Most of those companies wanted to convert their U.S. dollars into Chinese yuan. However, had they bought $259 billion worth of yuan in the foreign exchange market

without government intervention, the value of the yuan would have appreciated very sharply. The surge in the value of the currency would have made Chinese exports less competitive, which would have caused China's export growth and economic growth to slow.

A slowdown in growth was not part of the Chinese government's plan. Therefore, the government instructed the central bank, the People's Bank of China (PBOC), to buy all the dollars coming into China at a fixed exchange rate so that the yuan would not appreciate. The central bank created the equivalent of $259 billion worth of fiat yuan and used it to buy $259 billion at a fixed exchange rate so that the yuan would not appreciate. The Chinese companies who brought the dollars into China were able to convert their dollars into yuan and then do with their yuan whatever they pleased. The PBOC, meanwhile, ended up with an addition $259 billion.'

Taking into account the previous example presented by Duncan (2012), when People's Bank of China (PBOC) buys dollars they are creating yuan out of thin air. The process of money creation involves other institutions besides central bank (see section 4 for more details).

The recent-created yuans are sent to the bank account of Chinese exporters firms to do whatever they want. Generally the exporters firms, as well as, other firms and households, invest exceeding cash inside the Chinese financial system, for example for buying: stocks, real estate, lands, and 'commodities'. Other occasions they invest the exceeding cash in the money markets, via authorized financial institutions (pension funds, mutual funds, for example), for lending their exceeding cash for banks and other institutions for a short period of time. Investing in the money markets they are helping the banks to expand credit inside their country. How the credit expansion process occurs is explained in the next paragraphs. These characteristics are not exclusivity of Chinese economy, they occur in almost all countries around the world.

When PBOC use its acquired dollars to buy U.S. dollar denominated assets (government bonds, stocks, commercial papers, mortgage and asset backed securities, other financial assets), it is increasing its reserve assets and at the same time inserting cash inside the U.S. banking system helping the banks to expand credit and helping the U.S. to fund its current account deficit.

Concluding, the currency boomerang generally causes the credit expansion in both countries (the one with current account surplus and the other with current account deficit) in levels that causes economic booms followed by recession (Duncan, 2005). There is an exception regarding the currency boomerang process, that is, the credit expansion does not occur (or, it occur in levels inferior the ones preceding the economic crisis) in countries where households and firms are with excess of debt, such as those suffering the negative consequences of balance sheet recession (Paiva Sobrinho & Romeiro, 2016). According Koo (2015) balance sheet recession occurs only when a nationwide asset bubble financed by debt bursts'.

The way boomerang currency causes the credit expansion in several countries is better understood after considering the way money is created in the current financial system, as well as, one of main mechanism banks used to obtain cash in order for funding the loans they granted their clients.

4 Money creation process

Once central banks are key institutions in the currency boomerang process, it is important to understand how they create money. The following statement of the FED (1982) clarifies this issue:

> When you or I write a check there must be sufficient funds in our account to cover the check, but when the Federal Reserve writes a check there is no bank deposit on which that check is drawn. When the Federal Reserve writes a check, it is creating money.

In the dollar standard all central banks around the world create money in the same way; that is, every time central banks buy something (generally government debt, foreign currencies) they create out of thin air new currency or central bank reserves. Dollar, euro, real, yuan, yen, Swiss franc, other, all are of one type of money, debt-created fiat money, because the central banks create them when they buy some type of debt, mainly government debt (treasuries).

In almost all countries the creation of money (currency) by central banks occurs inside a system called primary dealer system (PDS) which was created in the U.S. in 1960 and adopted worldwide with exception a few countries such as Costa Rica, Chile, Latvia, Mauritius, Saudi Arabia; Germany adopts a quasi-PDS (World Bank 2010).

The PDS is formed by a number of financial enterprises called 'primary dealers', which operate directly with a country government and its central bank. The government is represented in the PDS by its financial minister, central bank and regulatory agencies McConnachie (1996). The government issues bonds that are acquired by the 'primary dealers' which, in turn, can resell them to the central bank when they see fit. The money is created when the central bank buys the bonds.

As the U.S. is the country of the where sits the central bank that issues the most used currency in the international transactions, it is interesting note the list of the financial institutions that have operated as 'primary dealers' with the US government and the FED:

- JP Morgan Inc. 1960-2010;
- JP Morgan LCC 2010-present
- Merrill Lynch Government Sec. Inc. 1960-2009;
- Merrill Lynch, Pierce, Fenner & Smith Incorporated 2010-2014;
- Goldman Sachs 1974-2014; Morgan Stanley 1978-2014;
- Barclays Capital 1998-2014;
- HSBC Securities (USA) Inc. 1999-2014;
- BNP Paribas Securities Corp. 2000-2014;
- Deutsch Banc Securities Inc. 2002-2014;
- Mizuho Securities USA Inc. 2002-2014;
- Citigroup Global Markets Inc. 2003-2014;
- UBS Securities LLC. 2003-2014;

Under the dollar standard the growth of US governmental deficit has reached levels that would be impossible during the Bretton Woods monetary pattern as there had not enough gold to cover it. Under the dollar standard otherwise there is no limits to do that through bond emissions. The primary dealers benefit directly as they are the first to by the bonds and can easily resells them to the central banks (primary market) and other financial institutions (secondary market).

As it can be seen in the table 2, some of the financial institutions operating as primary dealers in the US, play the same role in other countries as well, forming a complex network which has reveal itself as highly problematic during the 2007 financial crisis. Many of them have been rescued by the FED, as shown by Bloomberg (2011) database.

Table 2
Partial list of financial institutions acting as primary dealers in 2014

	Austria	Belgium	Brazil	Greece	Irland	Italy	Japan	Portugal	Spain	United Kingdom	USA
JP Morgan	X	X		X	X	X			X	X	X
Goldman Sachs	X			X	X	X	X	X	X	X	X
Merrill Lynch Int.	X			X	X	X	X			X	X
Banco Santander	X	X	X					X	X	X	
Citigroup	X	X	X	X	X	X		X	X	X	X
Barclays Bank	X	X		X	X	X		X	X	X	X
BNP Paribas	X	X		X	X	X	X	X		X	X
Credit Agricole	X	X	X	X	X	X		X	X	X	X
Deutsche Bank	X	X		X	X	X		X	X	X	X
Morgan Stanley	X	X		X	X	X	X	X	X	X	X
HSBC	X	X		X	X	X		X	X	X	X
Societe Generale	X	X		X	X	X		X	X	X	
Nomura Int.	X	X		X	X	X	X	X	X	X	X

Sources: Federal Reserve System, Brazilian Central Bank, European Union, Bank of Japan.

The primary dealers have also been expanding credit to families, firms and governments through a system known as 'shadow banking' (Luttrell et al. 2012), which has been the responsible as well for the great credit expansion during the dollar standard period. McConnachie (1996) warns about the risks of the PDS:

> Primary dealers hope to make money by being given an oligopoly as intermediaries between the authorities and the market; and there is a danger of collusion, particularly if only a few firms wish to be and are accepted as primary dealers. A cartel could: (a) force the price at auction down against the authorities by forming a bidding ring, with the intention of resell later at higher prices; and, (b) take too high a cut on their intermediation, so depressing demand from end-investors.

According to him it is not easy for authorities to identify the primary dealers bad practices. The Valukas report (2011) clearly shows the dishonest practices of some of them, as the Lehman Brothers. The transferences of financial resources among such institutions take place mainly through SWIFT (Society for Worldwide Interbank Financial Telecommunication), created in the seventies. The SWIFT can be a coercion force as it can suspend the countries from the system (Bloomberg, 2012; 2014). So, for a new macroeconomic structure is essential to have alternatives to SWIFT. For example, the Ripple can be considered an alternative (Finovate, 2014).

As mentioned above, the financial institutions acting as primary dealers can also expand, through their branches, the credit towards the others economy sectors. As these institutions control the stock of more liquid assets in the

financial market, as the US bonds and other government securities, they can influence a country credit expansion policy. Once primary dealers have access the stock of government treasuries they can sell these financial assets via sale and repurchase agreement (repo) for other institutions inside U.S. and abroad. The cash obtained from selling the mentioned assets for foreign institutions as well other is used to fund their banking activities.

As shown by Duncan (2005), in the countries where bigger influxes of financial resources exist the economic growth is stimulated as well as formation of economic "bubbles" followed by economic crisis. This phenomenon has been described by Werner (1997). So, the primary dealers and the central bank are the key institutions for dollar creation as well as other currencies. They are also the main dealers in the bond markets for the financial institutions of other countries, bearing the responsibility in the so called process of "boomerang currency" and in the credit expansion in many countries (Luttrell et al., 2012).

5 How banks (except central banks) expand credit

It is important understand the way banks obtain cash for fund their activities because this is one of greatest flaw in their business model (Milne, 2009). In order to solve the environmental and social problems it is essential to create new financial institutions that can grant credit without the flaws that will be shown.

Mcleay; Radia e Thomas (2014) explains how the banks extend credit:

> Commercial banks create money, in the form of bank deposits, by making new loans. When a bank makes a loan, for example to someone taking out a mortgage to buy a house, it does not typically do so by giving them thousands of pounds worth of banknotes. Instead, it credits their bank account with a bank deposit of the size of the mortgage. At that moment, new money is created. For this reason, some economists have referred to bank deposits as 'fountain pen money', created at the stroke of bankers' pens when they approve loans.

Werner presents empirical evidence confirming the veracity of this process (Werner, 2014; 2015).

The banks can expand credit in quantities several times higher than the amount of currency issued by the central bank. The banks can settle most of their transactions in an intra-day clearing (Ryan-Collins et al. 2011) reducing

the need for central bank reserves. This means the banks can reduce, i.e., they continue depending of cash to settle some of their activities.

That means in order to 'lend money' the banks do not need to have available cash in their balance sheet. They extend the credit to their customers simply inserting a digital number in their customer account and try to obtain the cash for fund the loan in one of the four ways: retail funds (cash deposited by their clients), interbank market, money markets ad central bank (Milne, 2009). The author shows that several commercial banks from U.S. and Europe adopted the practice to commercialize their client loans in the money markets through securitization in order to obtain cash. He mentions also that after 1970s banks from several countries (mainly the ones with current account deficit) turned more dependent from short-term wholesale markets[4] (money markets) and less dependent of retail funding[5].

Table 3 shows (in percentage) the retail funding dependence of banking sector in several countries in two dates (1970 and 2007). It is evident that countries with current account deficit (U.K., France, Italy, Australia, and Canada) became less dependent of retail funding and more dependent from money markets to obtain cash to fund their activities. At contrary, the countries with current account surplus became more dependent of retail funding.

According Milne, this behavior is a consequence of global current account imbalances. With the increase of global current account imbalances the flow of money across border increased in proportions without precedent in the human history and altered the way banks from certain countries to overpass some key constraints for lending contributing to the enormous expansion of credit in several countries.

One of the most important key constraints on banking lending is funding, that is, fund the loan (Beau, 2014); in other words, keep enough money on deposit in the bank throughout the life of the loan.

(4) In this context, short-term wholesale funding means the banks obtain cash to fund its activities selling 'something' to the participants of money markets through the practice of sale and repurchase agreement (repo). Money markets More detail see Milne (2009) and Beau (2014).

(5) Retail funding refers to the various types of deposits that households and small companies keep with a bank (Beau, 2014). In other words, the banks use the cash deposited by their clients to fund its activities.

Table 3
Dependence of certain countries over retail funding market

Country	1970	2007	Current account status in 2007
United Kingdom	100%	50%	Deficit
France	102%	76%	Deficit
Italy	110%	61%	Deficit
Australia	136%	77%	Deficit
Canada	177%	112%	Deficit
Germany	87%	126%	Surplus
Japan	126%	143%	Surplus

Source: adapted from Milne (2009).

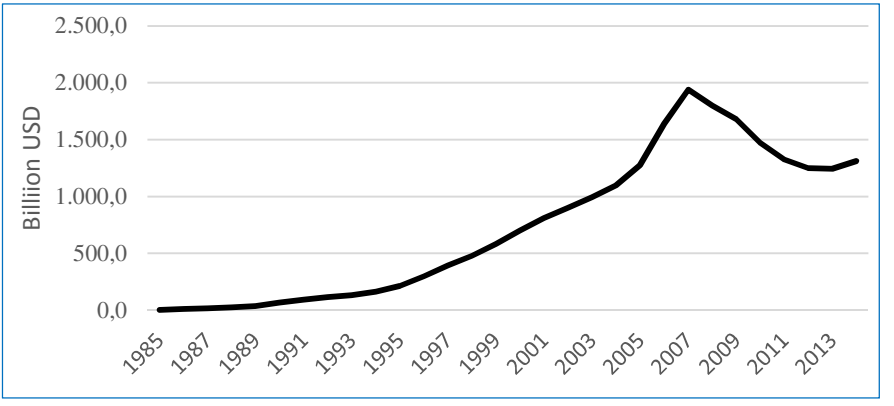
Milne (2009) points out wholesale funders are skeptical about the ability of bank management to manage their business and avoid major problems; consequently wholesale funding is usually only available for short maturities of up to about three months and is more expensive than retail funding and increases the risk of bank instability. This is why banks turned to the new structured credit instruments – that is, loans packaged into securities. In other words, banks were using their own loans as collateral for funding. The banks created pools of loans and bundled them up inside tradable mortgage- or asset-backed securities. Doing that they reduced the costs to acquire the funds using the sale and repurchase agreement (repo). In order to obtain cash to fund their activities the banks sold their mortgage or asset-backed securities to wholesale funders and repurchase them with a slightly high cost after a short period of time. Milne states the owner of these securities (wholesale funder) had a legal claim to the interest and principal payments due on the underlying loan pool. In this way, banks could attract and keep wholesale funds by selling or lending these loan-backed securities.

Figure 2 and 3 show, respectively, the growth of the practice of securitization in U.S. and Europe. The expansion phase occurred almost exponentially from 1980s to 2008 followed by decline after 2008 partly due the reasons mentioned above.

As pointed out by Milne (2009), meanwhile the banker's clients had kept paying the interest as well as the principal of their debts, both the mortgage and asset-backed securities were liquid in the money markets. The problem was

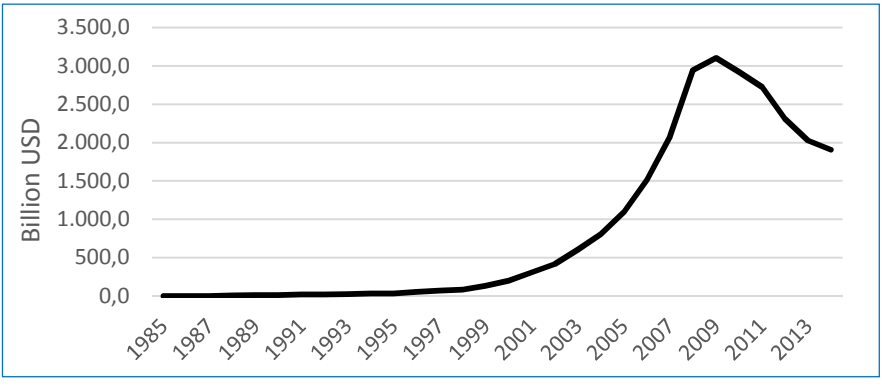
the following: with increasing consumption patterns, high level of debt and limited income most clients or became unable to pay the debt interests or paid them delayed. This affected negatively the value of mortgage and asset-backed securities provoking a negative reaction on the wholesale funders against the mentioned securities. Consequently, banks had no longer access for funding causing a series of negative consequences for the worldwide economy (Milne, 2009).

Figure 2
US asset-backed securities outstanding



Source: SIFMA.

Figure 3
Europe securitization outstanding



Source: SIFMA.

Due to the high level of indebtedness of household and private sector from the most important economies in the world, U.S. and Europe (Koo, 2015), the bank sector does not have good collateral to commercialize in the money markets (Gordon, 2012). Consequently, the credit expansion is lower than before the crisis and the economic growth of countries like U.S., European countries, as well as, from the Asian economies do not perform well as before the crisis (Koo, 2015). The relationship between credit expansion and economic growth (measured by the Gross Domestic Product – GDP) was pointed out by (Werner, 1997; Duncan, 2012). Both authors presented the Quantity Theory of Credit (QTC), since its predecessor the Quantity Theory of Money (QTM) did not perform well in the current international monetary system, the dollar standard. The differences between the QTC proposals are treated in (Paiva Sobrinho; Romeiro, 2016).

During economic crisis the government should become the debtor in order to allocate the money into activities that promote economic growth. This is a traditional Keynesian remedy to solve economic crisis. This recommendation can fix the problem temporarily and as pointed out by Koo (2009) the government fiscal stimulus is necessary until the firms (non-financial and financial) deleverage, i.e., reduce their levels of debt. Once these firms, especially non-financial ones, reduce their indebtedness level, Koo argues they can acquire new loans and the credit expansion can occur without the intervention of fiscal stimulus policies.

The problem with this idea is simple. Most economists do not consider other types of credit, as well as, other types of money. The Quantity Theory of Credit (QTC) proposed by the mentioned authors only considers one type of credit: the one where a cash deficit institution (for example, a non-financial corporation) assigns a contract with a cash surplus credit institution (commercial bank) in which the former is obligated to pay the principal plus positive interest rates during a fixed period of time.

This is only one type of credit. The QTC does not consider, for example, other types of credit that does not depend of the current financial institutions (like commercial banks). One example of other type of credit is the mutual credit clearing system (Paiva Sobrinho, 2016). This system has been used in Switzerland since 1934 helping small and medium enterprises to

improve their business and avoiding the negative consequences of financial crises. Stodder and Lietaer (2012) analyzed the role of this system in the Swiss economic system and found it serves as a counter-cyclical measure in economic downtown and it contributes to increase the economic resilience of the mentioned economy.

Relying on a single type of credit, as well as, a single type of money makes an economic system vulnerable to negative consequences arising out of the current international monetary system failures. This leads to the deterioration of the social, economic and environmental problems and unless it is the main objective, it is necessary to urgently consider new solutions. If we do not try new structures we are subject the negative consequences of the flaws of the current international monetary system, the dollar standard.

6 Conclusion

In this article we present the main elements that allow understand the functioning of the current international monetary system, dollar standard. We show how changes in the composition of reserve assets after the end of the Bretton Woods system allowed the current account imbalance, as well as the triggering of the credit expansion that caused worldwide economic growth periods followed by economic recessions. This process is well described in Duncan (2005). The solutions proposed by various authors to remedy the negative consequences of the crises, as already mentioned, are palliative because it keeps the same structure that caused the problem. To solve the problems of this 21st century, whether environmental, social and economic it is necessary to go beyond these palliative measures.

Recent advances from the sustainability of complex flow systems (Ulanowicz et al. 2009) show us that the sustainability of a system depends on a balance between resilience and efficiency. Either the system has or high resilience or high efficiency it turns unsustainable. The economic and financial system is a complex flow system (Goerner et al., 2009; Ulanowicz et al., 2009; Lietaer et al.; 2009; Lietaer et al., 2010), where the flow of money, goods, and services occurs. The flow of cash, credit in the current international monetary system, dollar standard, is strongly dependent of only one type of money (fiat money) and one type of credit. Besides this system is highly efficient it presents

low level of resilience (Lietaer et al., 2012). As seen in the most recent US financial crisis, unless the Federal Reserve System bailout (Bloomberg, 2011) the financial firms they had not survived.

Humanity faces serious challenges in several domains environmental (climate change, biodiversity loss, among others), social (reduce social inequality), economic (increase decent work, for example) and to solve them requires money and credit.

It is necessary a new economic structure where the money creation and credit expansion will never more be only in the hands of financial institutions such as the primary dealers. It is necessary new types of money that will be created not every time the central bank buys something. In this sense, the proposal of Positive Money (2016) should be taken into consideration since it is complemented with the insertion of other types of money (backed by time, cryptocurrencies, for example) and other types of credit such as mutual credit clearing (Paiva Sobrinho, 2016). Concluding, these new types of money and credit must be considered to the improvement of an economic system.

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