Eurodollars in Motion: a monetary circuit analysis of the offshore dollar system

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Abstract: The U.S. dollar is the dominant currency in the international monetary system: a substantial share of global trade is invoiced in dollars, and roughly 90% of transactions in the global foreign exchange market involve the dollar on one side. A significant portion of the dollars that finance international trade and circulate in foreign exchange markets consists of offshore dollars. The aim of this paper is to explain the fundamental mechanisms of this offshore dollar market and its connections with global trade and international capital flows. To do so, we draw on Monetary Circuit Theory and use balance-sheet analysis to explain how dollars are created, circulated, and extinguished within the offshore system. We also examine the mechanisms through which offshore dollars can be converted into onshore dollars, and vice versa, as well as the interactions between the offshore dollar system and peripheral currencies.

Keywords: Eurodollars; International Banking; Monetary Circuit Theory; Currency Hierarchy; Post-Keynesian Economics.

JEL Classification: B50; E12; F30; G29.

Resumo: O dólar americano é a moeda dominante no sistema monetário internacional: uma parcela substancial do comércio global é faturada em dólares, e aproximadamente 90% das transações no mercado cambial global envolvem o dólar em uma das partes. Uma parcela significativa dos dólares que financiam o comércio internacional e circulam nos mercados cambiais consiste em dólares offshore. O objetivo deste artigo é explicar os mecanismos fundamentais desse mercado de dólares offshore e suas conexões com o comércio global e os fluxos internacionais de capital. Para tanto, recorremos à Teoria dos Circuitos Monetários e utilizamos a análise de balanços patrimoniais para explicar como os dólares são criados, circulados e extintos dentro do sistema offshore. Também examinamos os mecanismos pelos quais os dólares offshore podem ser convertidos em dólares onshore e vice-versa, bem como as interações entre o sistema de dólares offshore e as moedas periféricas.

Palavras-chave: Eurodólares; Sistema Bancário Internacional; Teoria dos Circuitos Monetários; Hierarquia Monetária; Economia Pós-Keynesiana**.**

Área: Área 6. Economia Monetária e Financeira e Dinâmica Inflacionária

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1 INTRODUCTION

The dollar is the world's leading currency. A considerable portion of global trade is invoiced in dollars (Boz et al., 2020). Furthermore, approximately 90% of transactions in the global foreign exchange market have the dollar at one end (Chaboud, Rime and Sushko, 2023). A considerable portion of these dollars that move international trade and circulate in the foreign exchange market are not located in the US, but in international financial centers such as London, Tokyo, Hong Kong and Singapore. These dollars that exist outside the US are called offshore dollars, although they are also known by their other name, Eurodollars.

Despite his importance, the offshore dollar system remains a blind spot of the post-Keynesian monetary theory (with very few exceptions). In particular, the Monetary Circuit Theory (MCT)has not paid sufficient attention to this phenomenon. While recently making enormous progress towards the understanding of the U.S. money markets, the MCT literature has yet to deal with money at the international level.

The aim of this paper is to fill this gap. After a brief discussion of recent advances of the MCT, and related works on the broader post-Keynesian monetary theory, we explore the dollar both at the onshore and the offshore levels. Using balance sheets, we show how dollars are created and circulated on both spheres, and how they move from one to another. We also explore the connections between the offshore dollar system and peripheral currencies. Finally, we present a synthetic monetary circuit that encompasses both the onshore and the offshore spheres, together with peripheral currencies.

2 MONETARY CIRCUIT THEORY, ENDOGENOUS MONEY AND CURRENCY HIERARCHY

The Monetary Circuit Theory (MCT) analyzes how a monetary production economy functions by examining how money is created, circulated across the main macroeconomic sectors, and ultimately destroyed. According to Alain Parguez (1975) and Augusto Graziani (1984), the Circuit begins when banks grant credit to firms, thereby endogenously generating money through what is referred to as "initial finance"[3]. Firms subsequently employ these funds to hire labor from households. Households, in turn, allocate part of their income to consumption while saving the remainder. The financial system intermediates these savings and channels them back to firms. Combined with the revenues generated

[3] According to Passarella (2024, p. 479), "initial finance is defined – by TMC theorists – as the flow of new credit supplied by the banks to firms at the beginning of the period, thus enabling them to start the production process. If firms are considered as one integrated and consolidated sector, initial finance must only cover the wage bill".

from the sale of goods, this process constitutes the "final finance" that closes the Circuit. The resulting monetary inflow enables firms to repay at least a portion of their original bank liabilities.

This foundational version of the Monetary Circuit Theory (MCT) has been applied to a wide range of topics[4]. For instance, Riccardo Bellofiore (2004) examines Karl Marx's labor theory of value, while Giorgio Lunghini and Giovanni Bianchi (2003) investigate questions related to income distribution. Likewise, Mohamed Bougrine and Mario Seccareccia (2002) employ the framework to analyze taxation, public expenditure, and the role of the state.

In recent years, the literature on Monetary Circuit Theory has increasingly attempted to incorporate financialization and the shadow banking system into the Circuit framework. One important contribution is provided by Michell (2017), who examines whether shadow banks are capable of creating money. After analyzing the role of shadow banking within a financialized economy, he concludes that these institutions remain dependent on conventional banks and therefore cannot independently generate money.

Likewise, Raffaele Canelli, Giuseppe Fontana, and Riccardo Realfonzo (2022) use the framework to investigate the nature and functions of shadow banks. Based on the activity-based classification developed by the Financial Stability Board, they divide the shadow banking system into five economic functions and employ an extended Circuit to demonstrate the continued relevance of the concepts of initial and final finance despite major changes in the financial system.

Earlier, Alberto Botta, Eugenio Caverzasi, and Daniele Tori (2015) had already proposed an expanded monetary circuit populated by different financial agents and instruments. Their approach suggests the coexistence of two interconnected circuits: one related to the real economy and another associated with financial activities. In a subsequent study, the same authors (2024) analyze the problem of profit realization in an extended Circuit composed of commercial and investment banks, hedge funds, money market funds, and special purpose vehicles. Finally, Kappes (2025) applies the Monetary Circuit Theory to examine the repurchase agreement market in the United States.

All these works broaden the scope of MCT by including several "new" types of financial agents and instruments. This brings welcome additions to the theory, such as the existence of two different circuits as proposed by Botta, Carvezasi and Tori (2015), and also reaffirms old tenets, as is done by Michell (2017) when showing that the shadow banking system needs the traditional banking system for the creation of new deposits.

[4] Refer also to Riccardo Bellofiore (2019) for an insightful discussion of Augusto Graziani's ideas.

There is still, however, an ample scope for new additions to the theory. The papers mentioned above, for instance, are all focused on the US money markets. A blind spot of the MCT, and of post-Keynesian endogenous money theory in general[5], refers to global banking and the offshore dollar system market. The aim of this paper is to fill this gap in the literature.

While not directly dialoguing with the international currency hierarchy literature, this paper employs concepts that are explored by authors of this tradition[6]. For instance, we fully adhere to their notion of the dollar as the key, hegemonic currency, with peripheral countries' currencies standing at the bottom of the hierarchy[7]. Therefore, our paper can also make a contribution towards this approach.

3. ONSHORE DOLLARS: A SIMPLE CASE OF ENDOGENOUS MONEY

Onshore dollars are created every time a bank grants a loan, purchases securities or discounts a receivable from a company. All these actions create an asset for the customer (the bank deposit), which is a liability for the bank. That creation occurs without the necessity to have bank reserves (or settlement balances).

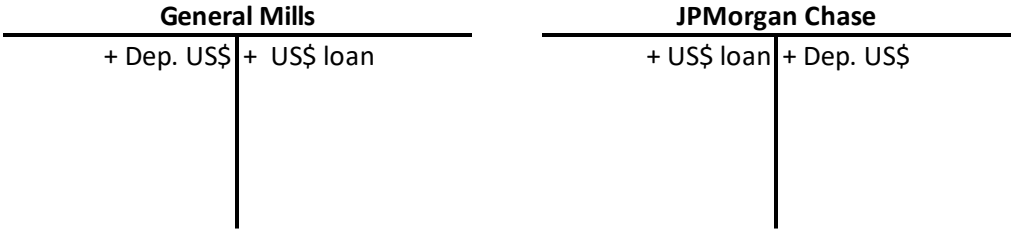
Figure 1 below illustrates the onshore dollar creation through a bank loan. The figure depicts the balance sheets of the bank (JPMorgan Chase) and of the customer (General Mills). In this, and all the other balance sheets presented in this paper, we follow the standard accounting convention of representing assets on the left side and liabilities on the right side. When needed, starting positions in assets and liabilities will be presented first. Furthermore, entries with a positive sign represent acquisitions of a given asset or liability, while entries with a negative sign represent reductions.

When JPMorgan Chase grants the loan to General Mills, both balance sheets expand. For the bank, the loan is an asset, since it is a claim on its customer, and the deposit is a liability, since it has the obligation to move this amount of dollars whenever General Mills wants to. The opposite happens for General Mills: the loan is a liability, since it is an obligation towards the bank, while the deposit is an asset. This is the standard endogenous money story: money, in the form of bank deposits, is created through loans; reserves, or settlement balances, if needed, will be looked for on a second stage. In the post-Keynesian school, a seminal work in this regard is Moore (1988). For an in-depth discussion, see Lavoie (2022, chap. 4). Central banks have taken a similar position, such as the Bank of England

[5] A notable exception is Bouguelli (2025).
[6] For a recent overview of this tradition, see De Paula, Fritz and Prates (2026).
[7] We will not, however, deal with the concept of "central" currencies, such as the Euro, the Sterling or the Yen

(McLeay, Radia and Thomas, 2014), the FED (Ihrig, Weinbach and Wolla, 2021) and the Bundesbank (2017).

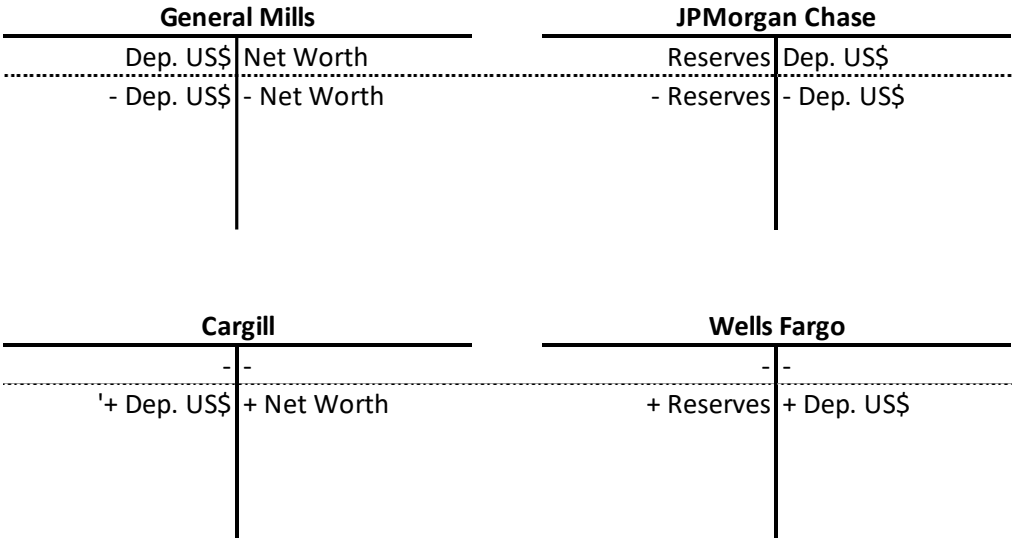
Figure 1 – Onshore dollars creation through a bank loan



Source: authors' own elaboration.

The reserves will be needed if General Mills uses its recently acquired funds to purchase inputs from its supplier, Cargill, which has an account on a different bank (for example, Wells Fargo). When General Mills buys corn from Cargill, it pays by sending its deposits, held at JPMorgan Chase, to Cargill's account, which is at Wells Fargo. That bank is, then, increasing its liabilities, since it has now more obligations towards its client. If that was the end of story, no bank would ever accept its clients to receive funds from another bank, since it would be only increasing its liabilities. This is not, however, all that happens. When banks' customers transfer money between their accounts, the deposits (liabilities for the banks) are moved, but so are the reserves, which are assets of the banks held at the Federal Reserve. Therefore, when General Mills transfers resources from its account at JPMorgan Chase to Cargill's account at Wells Fargo, both assets (reserves) and liabilities (deposits) move between the banks. This is illustrated in figure 2 below.

Figure 2 – Moving onshore dollars between different banks



Source: authors' own elaboration.

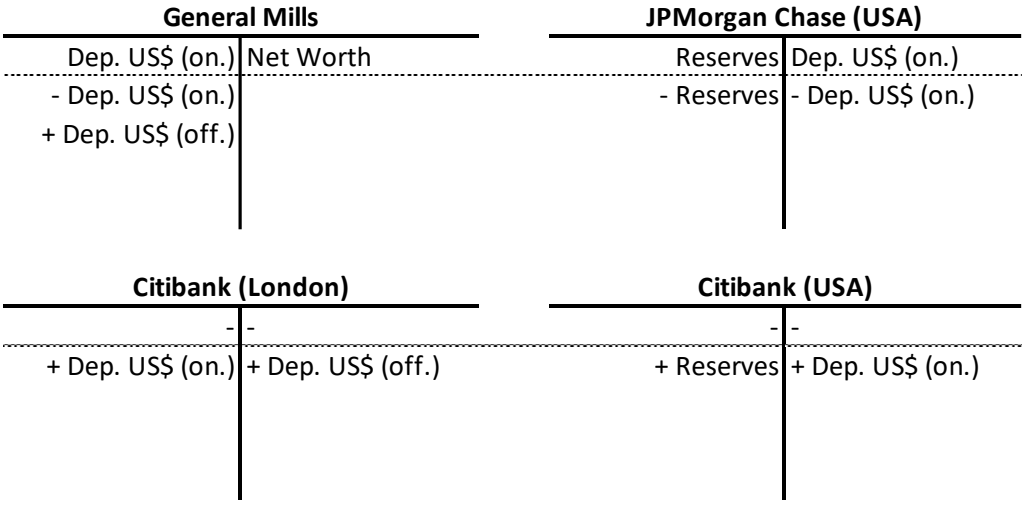
In figure 2, we made some simplifying assumptions to ease the reading of the balance sheets. For instance, we assume that General Mills does not have any liability towards another agent, thus having "Net Worth" on the right-hand side of its balance sheet, and that JPMorgan Chase has reserves[8]. If it didn't had enough reserves to settle its client's transaction, it could borrow reserves from the Fed, using the rediscount window, or from other banks in the Federal Funds market.

The simple story told above focuses on dollars created and moved inside the United States. However, dollars are also created and circulated outside the U.S., in the so-called offshore dollar system, or Eurodollars. This is the focus of the next section.

4. FROM THE ONSHORE TO THE OFFSHORE DOLLAR SYSTEM

Dollar-denominated bank deposits have been traded in financial centers outside the United States since at least the 1950s. Initially called Eurodollars, these financial assets emerged for a variety of reasons, many of them related to regulatory arbitrage (Schenk, 1998). Offshore dollars can be created in a variety of ways. One of them is when a company or person moves its dollar-denominated deposits from a U.S.-based bank to a branch in another country. In figure 3 below, we analyze what happens if General Mills decides to move its deposits from its account at JPMorgan Chase to an account at the London branch of Citibank.

Figure 3 – Transfer of onshore to offshore deposits



Source: authors' own elaboration.

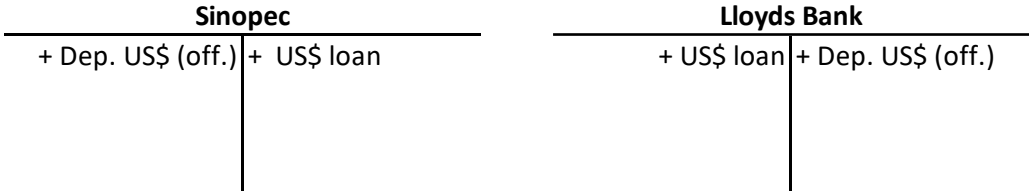
[8] These reserves are liabilities of the Federal Reserve, whose balance sheet is not shown in the figure.

The figure presents the opening stocks in the first row of each balance sheet. Both General Mills and JPMorgan Chase have the same starting positions as in figure 2: the company with deposits as assets, which are liabilities for the bank; and the latter has reserves on the asset side. The onshore deposits receive the "(on.)" at the end, to differentiate with the offshore deposits that will appear soon.

Several operations must occur for these deposits to move from the onshore account to the offshore account. First, the deposits move within the US, through a transfer of bank reserves from JPMorgan Chase to Citibank's headquarters in the U.S.. Citibank, in turn, credits a bank account for its London branch. Finally, Citibank in London credits General Mills' offshore account (+ Dep. US$ (off.), in the figure, where "off." stands for "offshore"). Note that, in practice, the dollars have not "left" the US: they simply moved from one agent to another.

Note also, that offshore dollars were created in direct connection with onshore dollars. Another way that offshore dollars are created is through the simple granting of loans by banks outside the US. As an example, suppose that Sinopec borrows dollars from Lloyds Bank in London.

Figure 4 – Creating offshore dollars through a bank loan



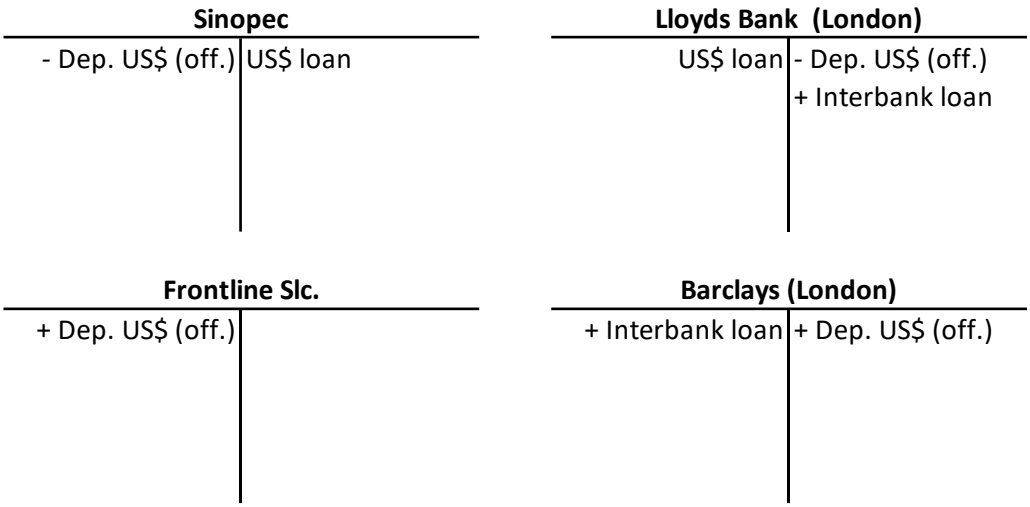
Source: authors' own elaboration.

In this case, the creation of offshore dollars is a direct consequence of the granting of the loan. Just as in the onshore system, the loan automatically creates deposits. Note that the bank incurs in several risks with this operation. Its dollar-denominated asset (the loan) takes a long time to mature, in addition to not having liquidity; its liabilities, on the other hand, have immediate liquidity. The borrower of funds will most likely need the money to make a payment, so these deposits will probably leave the bank. This creates the need for the bank to have some liquid assets denominated in dollars. One way to solve this problem is to go to the interbank market and obtain a loan.

Following the example above, let's say that Sinopec decides to use the proceeds from the loan to pay for the services of Frontline Slc., a Cyprus-based company that specializes in the maritime transportation of oil and petroleum products. Assume that Frontline Slc.'s bank account in London is at Barclays. In this case, we will have an offshore movement of dollars between the two London banks.

However, since Lloyds Bank does not have any liquid assets denominated in dollars, it must resort to an interbank loan with Barclays to settle the transaction.

Figure 5 – Movement of offshore deposits

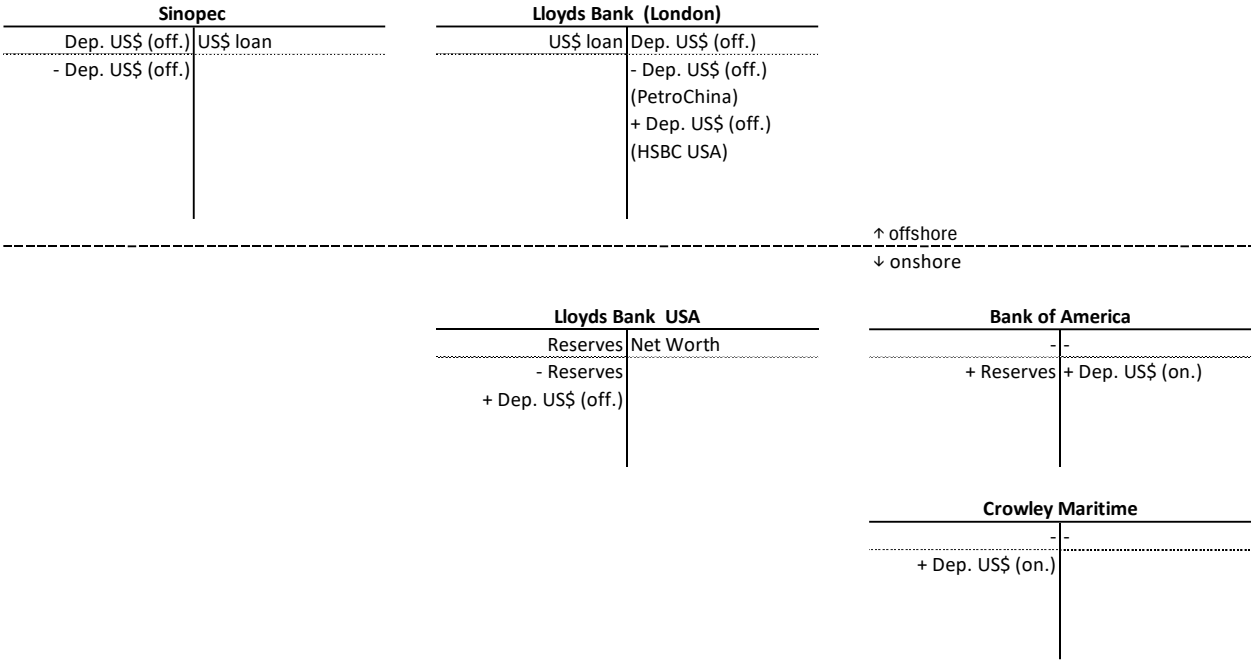


Source: authors' own elaboration.

It is important to note that there is no central bank for the offshore dollar system. Therefore, banks' reserves are also non-existent, so banks must find alternatives to settle the transfers of their clients' deposits. This can be done via the interbank market, as shown above, but banks have also developed more stable forms of deposits, such as time deposits, certificates of deposits and forward rates agreements. For an overview of these instruments, see Stigum and Crescenzi (2007, chapter 7).

The accounting becomes more complex if Sinopec wants to pay a U.S.-based supplier into a U.S. bank account. For this example, assume that Sinopec pays for services from Crowley Maritime, a Florida-based oil tanker company. The payment involves transferring dollars from Sinopec's account at Lloyds Bank in London to a Crowley Maritime account at Bank of America. However, because the dollars are leaving an offshore center, Lloyds Bank in London must use a correspondent bank in the U.S. that is a member of the Federal Reserve System. That bank is its U.S. subsidiary, Lloyds Bank USA.

Figure 6 - Transfer of offshore deposits to onshore



Source: authors' own elaboration.

In Figure 6, we divide the entries between the offshore and the onshore sides with a dashed line. The first line of each balance sheet shows the initial assets and liabilities. Sinopec and Lloyds Bank in London represent a direct connection with the story told in figure 4. Lloyds Bank USA has reserves at the FED (not shown in the figure), while, for simplicity, we don't represent any initial asset or liability for Bank of America and Crowley Maritime.

When Crowley Maritime receives its (onshore) dollars at Bank of America, that bank will demand the transfer of an asset to compensate for the increase in its liabilities. That asset is reserves, that Lloyds Bank USA sends to BoA. Lloyds Bank USA, then, receives the offshore dollars that once belonged to Sinopec, so that its assets have simply shifted from reserves to offshore dollars. Nothat the offshore dollars never "leave" that system, nor actually "enter" the USA, just like the onshore dollars had not "left" the USA when we discussed the example of figure 3.

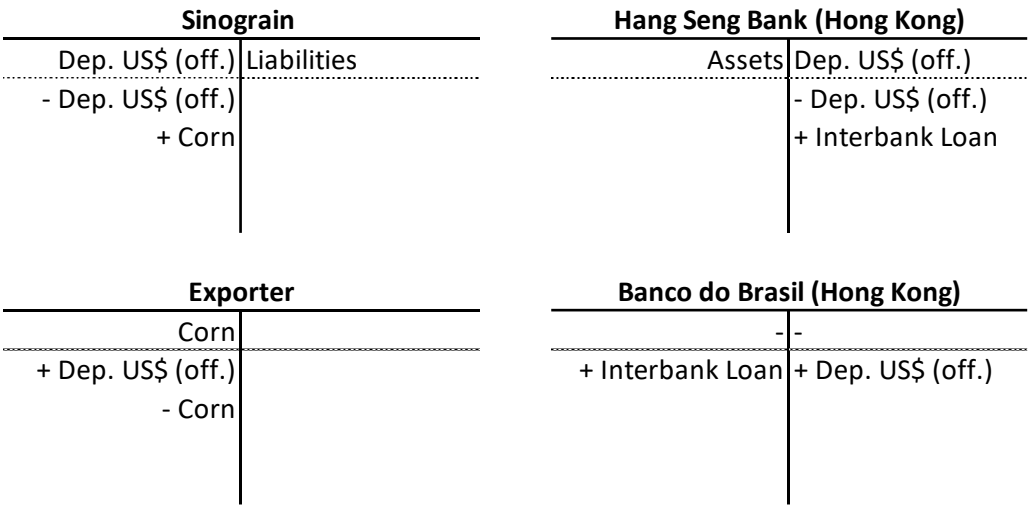
With the examples given from figures 3 to 6, we have analyzed the movement of dollars from the onshore to the offshore side, the creation and circulation of these dollars in the offshore system, and the movement from the offshore side to the onshore side. There is no exchange rate between onshore and offshore dollars. However, many participants in international trade have to worry about exchange rates because they are moving form their (peripheral) currencies to the (offshore) dollar system. This is the topic of the next subsection.

5. PERIPHERAL CURRENCIES AND THE FOREIGN EXCHANGE MARKET

To begin our study of this market, let us take the case of a corn producer in Brazil as an example. He exports his production to Sinograin, a Chinese state-owned food processing company. The transaction is settled in offshore dollars in Hong Kong. As starting positions, the example assumes that Sinograin has offshore dollars and "liabilities" in general, which do not interfere in our story; Hang Seng Bank has "assets", which are also unimportant to the transactions to be described, and the offshore dollar deposits as liabilities; and the Brazilian exporter has corn.

Sinograin then transfers the dollars from its account at Hang Seng Bank to the exporter's offshore account at the Banco do Brasil's branch in Hong Kong. In the example, we assume that the banks settle the transfer through an interbank loan, in the same way as in Figure 5. There are several alternatives to this option, such as Hang Seng Bank crediting a Banco do Brasil account in its own books or via the transfer of some highly liquid security, for instance.

Figure 7 – A corn export from Brazil to China via Hong Kong

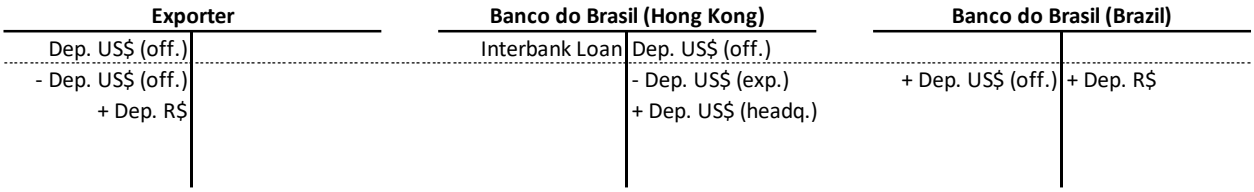


Source: authors' own elaboration.

It is natural to assume that the exporter wants to transfer at least part of these resources to Brazil. After all, his operations take place in Brazilian territory: salaries, part of the inputs and taxes are paid in reais. Thus, the exporter must find an agent who wants to obtain this deposit in dollars that he keeps in a bank abroad, giving in exchange a deposit in reais in a bank in Brazil. In the example presented here, this agent is an obvious choice: Banco do Brasil itself. The exporter probably chose the Banco do Brasil branch in Hong Kong to receive his resources precisely because he is a client of this bank within Brazilian territory. Thus, the offshore dollars are moved within the balance sheet of the Banco do Brasil branch in Hong Kong: there is a simple change of ownership, from the exporter to the headquarters' account. The

latter, in turn, expanded its accounting balance: on the assets side, it acquired the offshore dollars; on the liabilities side, it issued deposits in reais.

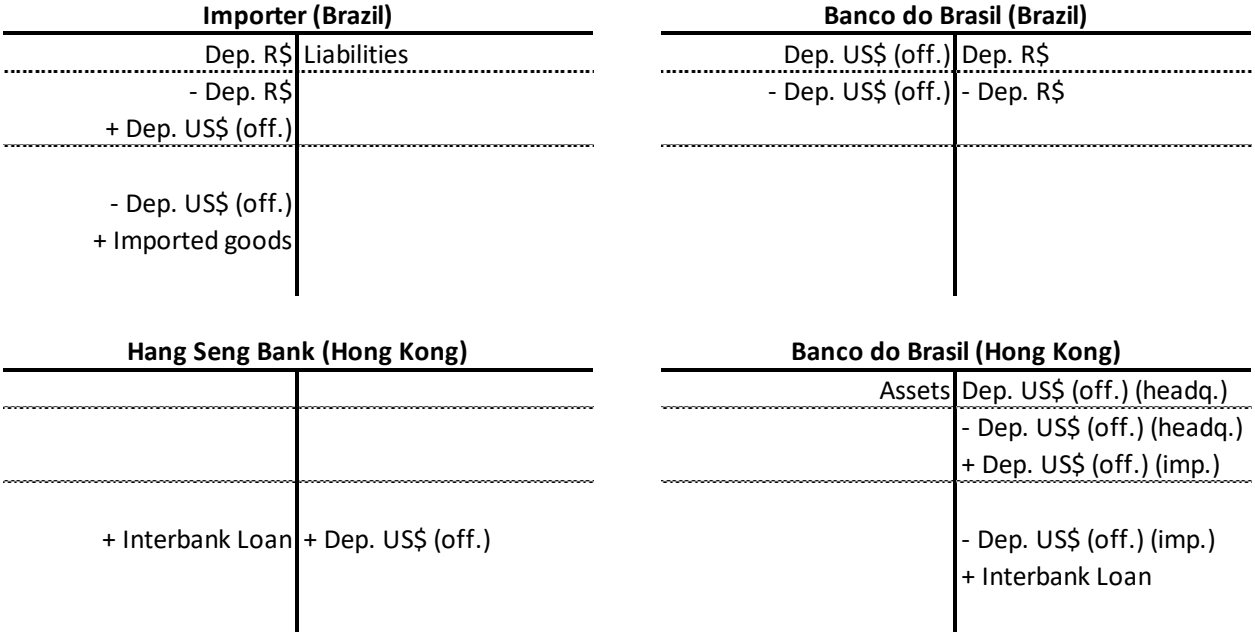
Figure 8 – The exporter exchanges his dollars for reais



Source: authors' own elaboration.

In Figure 9, we present a transaction in the opposite direction. A Brazilian importer wants to acquire Chinese goods to resell in Brazil. To do so, he uses its deposits in reais to acquire offshore dollars, using Banco do Brasil. The head office of the latter then writes off its deposits in reais and also its offshore dollars in its Hong Kong branch. The latter, in turn, simply rearranges its liabilities, exchanging dollars from the head office account to the importer's account (all changes shown in the second row of the balance sheets). Finally, the importer uses the offshore dollars to acquire the goods, transferring funds to Hang Seng Bank, the bank of his Chinese supplier (the supplier's balance sheet is not shown in the figure). The transaction between the banks in Hong Kong is settled with an interbank loan, but it could be done with any of the options discussed before. It could even involve writing off the interbank loan done in figure 7.

Figure 9 – An import from China to Brazil via Hong Kong



Source: authors' own elaboration.

We could present several examples of alternative behaviors of the importer. For example, he could take out a loan in reais and use these funds to acquire dollars through an agent other than his bank. He could also take out a loan directly in Hong Kong, a case that would be similar to what was described in figures 4 and 5.

Note that in Figures 7 to 9, one currency was exchanged for another. There is an exchange rate that measures the relationship between the value in dollars and the value in Brazilian reais. This exchange rate is set by the bank when it makes its offer to buy or sell dollars to its client, taking the form of a spread in relation to the exchange rate in the interbank, or interdealer, market. In this market, large banks exchange currencies among themselves. The main type of agent in this case is the dealer.

Like the international banking system, the foreign exchange market has onshore and offshore segments. The onshore segment encompasses those markets located in the monetary area of one of the currencies being traded; for example, the foreign exchange market for the Brazilian real is basically onshore, since most transactions occur within Brazil (Prates, 2015). The offshore segment comprises transactions in financial centers outside the monetary area of both currencies. For example, an exchange of dollars for yen occurring in London, Singapore or Hong Kong is an offshore transaction. Chaboud, Rime and Sushko (2023) point out that, in April 2022, the global foreign exchange market moved, on average, the equivalent of $2.11 trillion dollars per day. In addition, they point out that 74% of transactions occurred in four major financial centers: London, New York, Singapore and Hong Kong.

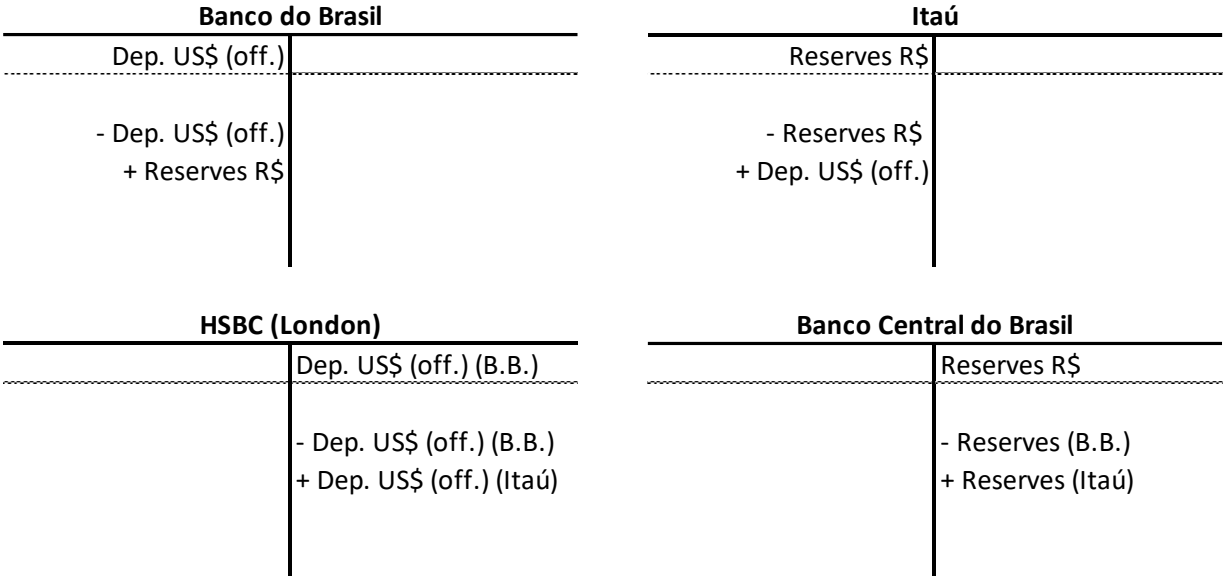
Dealers are key institutions in both the onshore and offshore segments. In general, dealers are large banks that are always willing to buy and sell foreign exchange, applying a spread between the purchase price and the sale price[9]. Dealers transact large volumes of foreign exchange between themselves in the so-called inter-dealer, or interbank, market.

The basic operation of this market is shown in Figure 10. In this example, we analyze the interbank market in Brazil, in which banks exchange reais (in bank reserves deposited at the Banco Central do Brasil, the Brazilian central bank) for dollars (which can be either dollar deposits in the United States, thus constituting onshore dollars, or offshore dollars in some international financial center). In the example, Banco do Brasil has offshore dollars deposited at HSBC in London, while Itaú has bank reserves in reais. These items appear in the first line of the balance sheets in Figure 10. An exchange then occurs: Banco do Brasil transfers the dollars to Itaú, while Itaú transfers the bank reserves to Banco do

[9] The global foreign exchange market has been changing rapidly, from a place dominated by large banks acting as dealers to an electronic, fragmented market in which so-called High Frequency Trading firms, also known as Principal Trading Firms, have proliferated. However, despite these changes, the inter-dealer market, which is the one in which dealers trade currencies among themselves, is still fundamental to the price discovery process (Chaboud, Rime and Sushko, 2023).

Brasil. Corresponding entries appear in the balance sheets of HSBC and Banco Central do Brasil: both simply rearrange their liabilities between one bank and the other.

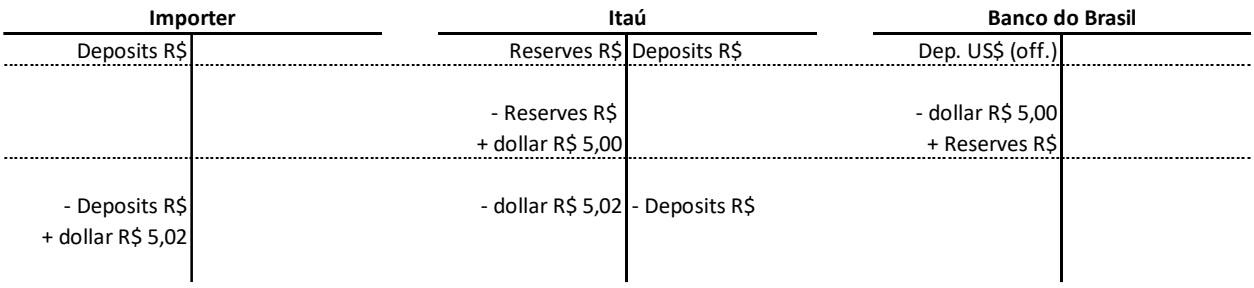
Figure 10 – The interbank foreign exchange market



Source: authors' own elaboration.

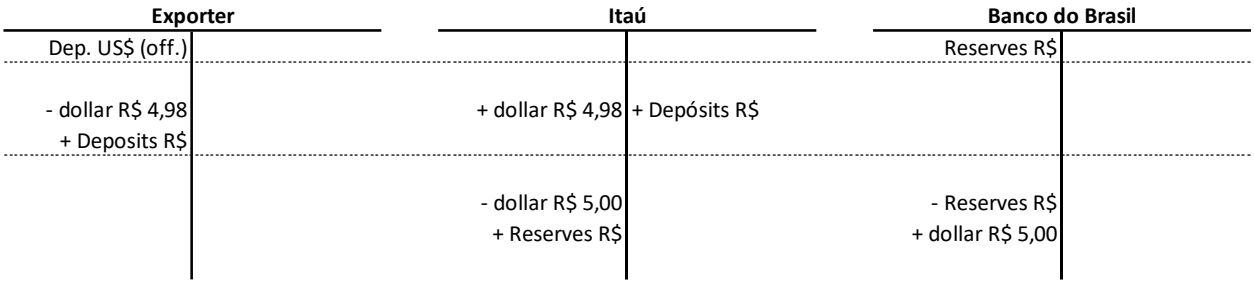
The existence of the interbank foreign exchange market opens up the possibility of arbitrage gains for banks when trading foreign exchange with their customers. Suppose the dollar is trading at R$5.00 on the interbank market. Imagine that an importer who wants to obtain dollars contacts Itaú to obtain it. Itaú can then buy these dollars from Banco do Brasil on the interbank market, as shown in Figure 7, and pass them on to its customer, charging a spread for this. Let's say, for example, that Itaú sells the dollars to the importer at R$5.02. In this case, Itaú profited 2 cents for each dollar sold to its customer. This operation is illustrated in Figure 11 (the profit does not appear on the balance sheet).

Figure 11 – Spread on sale of dollars



Source: authors' own elaboration.

Figure 12 – Spread on purchase of dollars



Source: authors' own elaboration.

This spread is also charged when a bank's customers come to Itaú to sell their dollars. Imagine that the customer who comes to Itaú is an exporter who is offering his dollars. Itaú will then look at the interbank market price to know at what price he can sell these dollars. The price he offers to his customer will obviously be lower (for example, R$4.98), to guarantee his profit in the interbank market. This process is shown in Figure 12. These two examples make clear the importance of the interbank market in pricing the dollar for the rest of the economy.

Finally, we will use the balance sheets to understand the basic functioning of one of the most important type of capital flows: the carry trade. These operations are characterized by taking out a loan in a currency with a low interest rate and then investing the loan proceeds in a currency with a higher interest rate. In general, the carry trade is done by taking out resources in an advanced economy and investing the resources in a peripheral economy.

The carry trade operation is illustrated in Figure 13. The foreign investor (which may be an investment fund, a bank, or even a non-financial company) takes out a loan in dollars at an interest rate of 2% per year, thereby receiving bank deposits denominated in dollars. In the example, this is done offshore, using Lloyds Bank in London (first row of the figure). The investor then "sends" these dollars to Brazil. In practical terms, there is no sending, but rather an exchange, since the investor must find an agent in Brazil willing to exchange Brazilian reais for the dollars newly obtained with the loan. In the example, this agent is Banco do Brasil bank, which issues bank deposits denominated in reais to the foreign investor in exchange for the offshore dollars (second row of the figure). The foreign investor then uses his reais to acquire a financial security that yields 12% per year. This security was issued by the "counterparty in Brazil", which can be a company, a bank or any other agent (third row). When the bond matures, the counterparty must return the deposits in reais to the investor, plus the interest rate of 12%, which is illustrated in the fourth row of the figure. The deposit entry is now "+ Dep. R$ (1+12%)", to make it clear that the value of this deposit is greater than the previous one.

Figure 13 – A carry trade operation

	Foreign investor		Lloyds Bank (London)		Banco do Brasil		Counterparty in Brazil	
1	+ Dep. US$ (off.)	+ loan US$ 2%	+ loan US$ 2%	+ Dep. US$ (off.)				
2	- Dep. US$ (off.) + Dep. R$			- Dep. US$ invest. + Dep. US$ (B.B)	+ Dep. US$ (off.)	+ Dep. R$		
3	- Dep. R$ + Sec. R$ 12%					- Dep. R$ invest. + Dep. R$ cntrprt.	+ Dep. R$	+ Sec. R$ 12%
4	- Sec. R$ 12% + Dep. R$ (1+12%)					- D. cnt. (1+12%) + D. inv. (1+12%)	- Dp. R$ (1 + 12%)	- Sec. R$ 12%
5	- Dep. R$ (1+12%) + Dep. US$ (1+12%)*(Δe)			- D.B.B. US$ (1+12%)*(Δe) +D.inv. US$ (1+12%)*(Δe)	- Dep. US$ (1+12%)*(Δe)	- Dep. R$ (1+12%)		

Source: authors' own elaboration.

Finally, the investor will send the funds back to the offshore system, as shown in last line. For the investor, this is a simple exchange of assets: instead of deposits in reais, he now has deposits in dollars. This exchange of currencies involves an exchange rate (represented by Δe in the figure), which can generate either a loss or a gain for the investor. Assuming that the exchange rate remains the same throughout the process, the investor will then have obtained an asset that yielded a rate of 12%; to do so, he contracted a liability that costs a rate of 2%; there is a gain of 10% in this transaction. If the exchange rate has varied, this return may be higher or lower. For Banco do Brasil, there is a decrease in its balance sheet, since both the liabilities (deposits in reais) and the assets (offshore dollars) are reduced. Finally, for Lloyds, there is only a rearrangement in its liabilities[10].

6. AN INTERNATIONAL MONETARY CIRCUIT

Against the backdrop given in the previous sections, we propose a monetary circuit as depicted in the figure below. It shows two subcircuits: one for the U.S economy, and another for a "peripheral" economy. This last circuit can be regarded as a single country, being analyzed against the U.S economy and the offshore dollar system; or it can be interpreted as an aggregation of the rest of the world, which is the studied *vis a vis* the America economy and the offshore system.

In both the "U.S. circuit" and the "peripheral circuit", we have the basic monetary circuit represented in the seminal works discussed in section 2. In both cases, banks extend credits to firms (the "initial finance"), which use the money to pay in advance for the labor force of the households, or workers. These, by their turn, save a part of their wages, which goes to the financial market, and expend the rest as consumption. Firms are able to close the circuit with the proceeds from both households' consumption and the "funding" given by financial markets.

Outside both circuits, we have the offshore banks. They have a connection with the U.S. banks, since onshore dollars and offshore dollars can be exchanged, as discussed in sections 3 and 4. Moreover, they can give both *cross-border lending* and *offshore lending*. This terminology is used by the BIS when computing the international banking statistics. According to McCauley, McGuire and Wooldridge (2021), the international banking system has three segments. The first is the so-called cross-border in the currency of the lender; in this, for example, a bank headquartered in New York lends US dollars to a German

[10] Note that in Figure 13, the "counterparty in Brazil" had to obtain reais through sources not shown in the figure to cover the interest payments. These reais could have come, for example, from revenues from the sale of its products, if the counterparty is a company. Similarly, Banco do Brasil needed more dollars than it had at the beginning. These dollars could have come, for example, from its foreign exchange transactions during the period between the investor's purchase of the bond and its maturity. We have not included either the counterparty's source of reais or Banco do Brasil's source of dollars to keep the figures as simple as possible, but we would like to warn the reader that other transactions, not shown in the figures, are necessary for the full closure of this transaction.

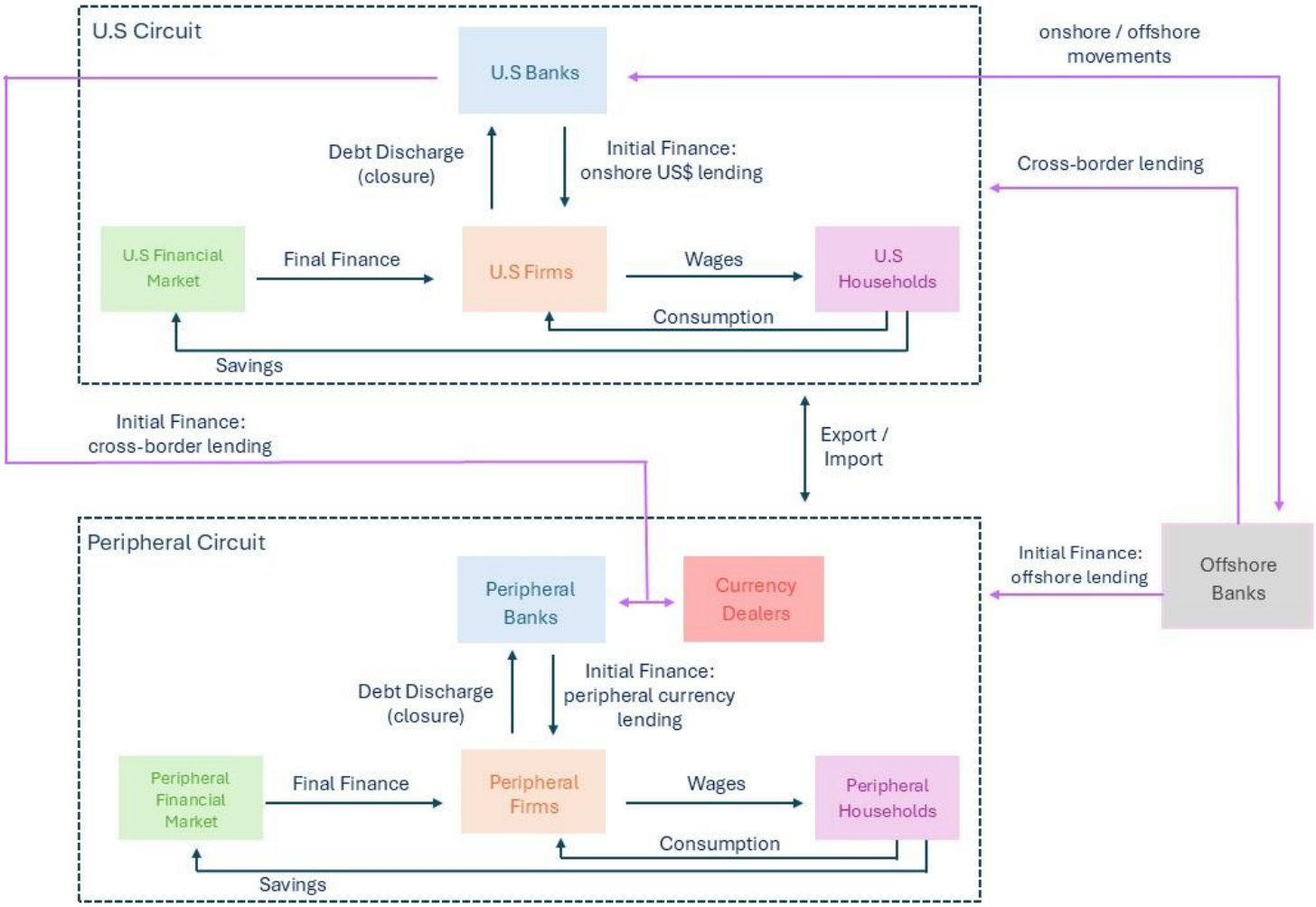
company. The second segment comprises cross-border transactions in the currency of the borrower; for example, a bank headquartered in London may lend US dollars to a company headquartered in New York. In these two segments, the loan is denominated in a currency foreign to one of the parties, but not to the other. In the third segment, called offshore, the currency is foreign to both parties. For example, a bank headquartered in London may lend US dollars to a company headquartered in Brazil. In the figure, we merge both types of cross-border lending into a single category, while retaining the offshore lending.

Both the cross-border and the offshore lending are sources of initial finance at the international level: globalized firms can get loans not only in their home countries but also with U.S. and offshore banks. Firms from peripheral countries, however, need another agent in order to transform dollars into the domestic currency: the dealers (which can be banks, as discussed in section 5).

The final finance at the international level is more complicated. The firms need to obtain foreign currency, and it can be obtained via exports or with a currency dealer. These agents play an important role in this regard, since the currency they obtain with an exporter will facilitate the final finance of an importer.

One last aspect to be highlighted is that, even at the international level, banks are still the source of endogenous money. Firms need credit to obtain financial resources with which they undertake the production process. At the global level, this credit can be obtained from many different sources. Therefore, banks are still a central actor in the monetary circuit. Furthermore, when currencies are exchanged between countries, banks are the correspondents of the movements at the international level, a role that demands more attention from MCT scholars.

Figure 14 – An international monetary circuit



Source: authors' own elaboration.

7. FINAL REMARKS

In this paper, we contributed to the Monetary Circuit Theory by showing how it can be used to analyze money at the international level. We analyzed how dollars are created and circulated in both the onshore and offshore systems, as well as how they can move from one sphere to the other. We also analyzed the interaction of the offshore dollar system with peripheral currencies. This contact occurs basically through trade flows (exports and imports) and capital flows, exemplified here by carry trade operations. In this interaction between dollars and other currencies, the figure of the dealer emerges, an important agent in the global foreign exchange market that facilitate the exchange of currencies.

Our paper is an initial proposal for the study of the monetary circuit at the international level. Many avenues of research are open with this first effort. One aspect that demands more scrutiny is the nature of the final finance at the international level. Another element is the inclusion of an offshore *financial* system, to which surplus agents can send their savings. A deeper discussion of the peripheral circuit is also a promising line of inquiry, with possible differentiation between peripheral countries. For instance, the circuit in an emerging economy with a relatively well developed financial system such as Brazil is very different from a small economy in, say, Central America. A sub-Saharan country, dependent of a single commodity for the bulk of its exports (for instance, oil or cocoa) obviously behaves very differently from a big economy such as China or India. The interplay between the questions raised in this paper with the concepts of the international currency hierarchy literature is also a necessary step in the research agenda we are putting forward.

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