

Endogenous money within sraffian framework and its implication for SME in Argentina

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Summary

This paper will show the endogenous channel of monetary policy under a Sraffian context. That is, assuming a distributive variable as exogenous. In this case we say that the interest rate is determined by constitutional features and is set exogenously by the central bank to the level that it wants.

In this scheme, banks have a central role. The possibility of extending credit without the need for prior deposits, makes them a key driver of economic growth. Since the loan amount is determined by the demand for credit rather than deposits, the concept of effective demand cannot be dissociated from the analysis.

The implications of monetary and fiscal policy should also not be ignored.

Introduction

In the XV, XVI and XVII century there were extensive discussions about the causes and consequences of price revolutions. The various theories at the time, agreed that the continuous flow of gold and silver, which came from the Americas, and the rapid expenditure of these "metals", mainly in wars, deteriorated the value of currency and generated devaluations. All this was considered the main cause of large price changes. (Joseph A. Schumpeter 1986).

However, the most satisfactory theoretical presentation, which has been accepted by most as the true discovery of the quantity theory, was Bodin's response to the "Paradoxes sur le des fait Monnoyes" by M. of Malestroict in 1566.

Bodin's explanation of the price revolution focused on increasing the gold and silver in circulation, the existence of monopolies which led to the "cannibalism" economy through the reduction of the flow of products, the expenses of kings and queens, and the depreciation of currency. Highlighting primarily the rise of precious metals in circulation as the root cause of this revolution.

Prior to the full development of the quantitative theory, one could say that there was already a theorem about the quantitative value of money, which is described below.

Assuming that there is a fixed amount of goods (Y) to be sold for a certain amount of gold (M), which is chosen as numeraire, and we also assume that consumers immediately spend all the money they receive. Where P is the price, we have:

$$M = P * Y$$

If an increase in gold production occurs ($\uparrow M$), it follows that the unit of gold will lose value, because of other things being equal to it (= Y). In other words, gold prices will increase since there is a fixed amount of goods to hand over with more units of gold.

That is, the cause of the drop in the value thereof is not an impairment of gold per se, on the contrary it is the increase in the amount of "coins". The important thing is that the amount of the drop in the value of gold is proportional to the increase in the amount of gold. Whereupon, as the purchasing power of the stock of gold remains constant, an increase in the amount of that stock inevitably leads to an increase in prices. The above equation compares a stock (currency) to another stock (goods), so ex post, it has to meet equality.

What was developed above is the most primitive idea of the quantity theory (QMT). Further developments sought to compare flow against another stream. That is, if the amount of money is multiplied by the speed of movement a monetary transaction flow is obtained, in turn taking into account that if the amount of goods are reproduced each day, the production flow is obtained. This is the path followed by Petty, Locke and Cantillon, and beyond the scope of this paper (Maybe History of Economic Analysis by Joseph A. Schumpeter 1986).

So the quantity theory is of money established causality coming from changes in the amount of money to changes in the price level. The latter being proportional to the variation of the first. In turn, if we added that there may be variations in relative prices that offset each other (thus absolute prices remain unchanged) and that money is neutral in the long run, you arrive at the quantity theory in its developed version.

Fisher's Version (1911, pg. 25) of the quantity theory:

$$M_s * V = P * Q$$

M_s is the stock of money, V is velocity, P is the general price level and Q is the product.

On the other hand the money demand equation, arising from the contributions of "the Cambridge group (Alfred Marshall, Pigou and Keynes)" is expressed by:

$$M_d = k * P * Y$$

Where k is the portion of income that agents want to keep as money.

Equating the two equations:

$$M_s = M_d$$

$$P * Y * 1 / V = k * P * Y$$

$$k = 1 / V$$

I.e., k is the inverse of the velocity of circulation. Thus, to obtain the expected results (variations in the amount of money involve price changes at the same rate) by the QMT, V must be constant over time and the product must be the full employment, i.e. it is fixed. Given these conditions, any variation in M_s generates variations in P . (De Lucchi 2012)

From the QTM to Monetarism:

In addition, two assumptions are relevant to obtain the results that the monetarist view proposes.

Monetarists like Milton Friedman (1963) claim that the Central Bank (CB) can control "high powered money", in other words the monetary base (MB). If we add that, by convention or by law, there are set ratios between the monetary base and all other forms of money, the CB could control the supply of money, thus it becomes exogenous.

In this view, the CB intervenes through open market operations (buying / selling government bonds for example) and the discount window to achieve their goal. While private banks ration credit to avoid their obligations becoming in excess of their legal or permitted reserve ratios. On the other hand, if the CB is not required to maintain a particular exchange rate with other currencies, the free play of supply and demand in the foreign exchange market determines the balance of the foreign market without intervention of CB¹.

The second key assumption is that the demand for money, defined as a portion of income, is stable. That is not influenced by interest rates or other factors.

Below an example to aid the understanding of the concept empirically is presented. Suppose that the CB decided to buy government bonds, and this generated an excess of the supply of money relative to income level (which is fixed). In other words, households, financial institutions and / or banks would find themselves with more money than they want to keep, and this would lead to a substitution effect between the spare cash and government bonds, increasing the demand of the latter and generating its price increases and interest rate decreases. This increase in value of

¹“The possibility that payments, whether among the same nationals or between different nationals, are effected in other currencies or through transfers between extraterritorial bank accounts has not, to my knowledge, been explicitly considered”. (Kaldor 1970)

bonds in turn would lead to increased spending, leading to increased income (thus, the demand for money increases) which would eliminate the excess supply of money.

That is, if the money supply was the product of mining, the discovery of a new mine of gold or silver would lead to an excess supply of such goods, which can only be corrected by lowering the relative price of the commodity-money . But until this happens, some individuals will have an excess of gold or silver, because in this view the amount of the money commodity in circulation, and that which is maintained by the users of money is independent of demand. Ergo, only a change in prices will allow the system to return to an equilibrium. However, this return to equilibrium is the result of an illegitimate application of the quantity theory of money. It is implicitly considering the money supply as a supply of commodities (gold and silver) in an amount determined exogenously, for a period of time (Kaldor 1970)².

Exogenous Money

Speaking of exogenous money is to argue that there is not a relationship between the stock of money in the economy and the production process. The monetarists accept this vision to develop a theory where the central bank can directly control the monetary base through open market operations (OMO) and where it can indirectly regulate the total amount of currency.

In this exogenous view, M1 defined as the sum of deposits (DV) and currency in public hands (PM):

$$M1 = DV + MP$$

The monetary base (H) is equal to bank reserves (RB) plus MP.

$$H = RB + MP$$

Multiplying the monetary base (exogenous) by the bank multiplier (m) gives M1:

$$M1 = m * H \text{ with } m \geq 1 \text{ (1)}$$

To see clearly how the controls would operate in the monetary base, below the bank multiplier is derived, assuming that there is only electronic money, ie MP = 0 (Serrano and Summa 2012). This will clearly see an increase in the monetary base that generates a greater increase in the money supply through the multiplier.

Bank reserves are a portion (r) of the deposits (DV), thus:

$$RB = r * DV \text{ (2)}$$

$$r = RB / DV$$

² See: "Money and Inflation: A Taxonomy" by Matias Vernengo (2005)

On the other hand, we know that total bank reserves are equal to the reserve requirement (r_0) plus voluntary reserves (r_v).

$$r = r_0 + r_v$$

If banks can lend all their money, r_v is equal to zero.

$$r = r_0$$

$$r < 1$$

Replacing in (2) yields:

$$(1 / r_0) * RB = DV \quad (3)$$

As with the exogenous monetary base, control of the monetary base is accomplished as follows. The Central Bank issues the legal tender and affecting RB (a fraction of deposits) while banks generate the remaining money in the form of deposits. Knowing that $RB = H$ and $DV = M1$, replacing it in equation, (1) is obtained:

$$M1 = (1/r_0) * H$$

$$m = 1/r_0$$

Under the assumptions introduced (remember $MP = 0$), the central bank directly controls H through changes in reserves, plus the existence of a stable multiplier, any variation in the monetary base will have a multiplier effect on the demand deposits view, and hence on bank lending. Causality occurs at the following point: $\Delta H \rightarrow \Delta M1$.

For example, if the BC performs an open market operation, buying government bonds at the amount of \$ 1000, that amount is credited to a bank account, representing a liability to the bank. Assuming that the reserve requirement is 10%, there is a surplus of \$ 900 to the bank as credits granted to Bank B.

Bank A	
Assets	Liabilities
Reserves \$100	Deposits \$1000
Loanable Funds \$900	

Assuming that credit is given to Bank B:

Bank B

Assets	Liabilities
Reserves \$90	Deposits \$900
Loanable Funds \$810	

If we repeat this process, the result is an increase in the money supply, amplified by the multiplier effect on the monetary base. When all banks in the system have legal reserves equal to the deposits generated, the process of money creation ends.

An important point that is often cited as the transmission mechanism of monetary policy is the impact thereof on deposits of banks. Since deposits are the supply of loanable funds (net of reserve requirements), we conclude that they are the genesis of bank loans. That is, an expansionary (restrictive) monetary policy injects (drains) deposits into the system by increasing (decreasing) finally the bank credit.

The association between monetary policy and deposits lies in the concept of a multiplier of the money or the rebalancing of the portfolio of household assets (Piti Disyatat 2010).

The first (concept of a multiplier) runs through a change in reserves and its consequent impact on deposits, as was shown previously.

The second concept is the change that generates monetary policy on the relative yields of money and other assets held by households. Whereupon, to changes in yields, it affects the amount of deposits that agents want to keep.

The feature to note is that behind all of these mechanisms lies a financial Say's Law, where any increase in the monetary base, which in turn increases deposits and hence the supply of bank credit, has as its counterpart an increase in the demand for credit (De Lucchi 2012).

In other words, in the traditional view, money is considered to be a stock that can be increased or reduced, thanks to the Central Bank which will manage to impose their will on the banks or the agents to maintain or, change portfolios. That is, the first (private banks) will provide all the funds raised by the OMO, while the latter (the agents) wants to hold on to money to facilitate the exchange of goods which have already been produced.

In conclusion, a variation in deposits determines the variations in credit. In the traditional theory (Bernanke and Blinder, 1988, Kashyap and Stein, 1995; Stein, 1998; Walsh, 2003) the focus is on the money supply, given the capacity of BC to affect bank deposits through the bank multiplier.

Empirical difficulties of the exogenous theory

“The Federal Reserve has frequently been accused of money market myopia. This is a false charge usually made by economists affected in some degree by a peculiar myopia of their own.” (Alan R. Holmes 1969)

If monetary policy should focus on making the money supply or OMO as a control variable, it will find a lot of practical difficulties.

First, predictions about the money supply are very difficult to obtain, since there is a large accumulation of "noise"³ in the daily information and there are massive movements in bank credit accounts.

Second, information about the state of monetary aggregates is available ex post, usually with a delay, and monthly or annual predictions tend to be erratic.

Third, an increase in money supply, outside of a specified range does not necessarily mean easy money or a decline in a restrictive monetary policy (expansionary). On the contrary, the result of a policy conducted by the central bank must be judged taking the monetary aggregates into account, a proxy of bank credit and interest rates:

“Thus, in the real world of day-to-day open market operations-theoretical considerations aside- the use of money supply as a target would appear to be too mechanistic and, in the short run, too erratic to be of much use. The use of money market conditions- a blend of interest rates and reserve and credit measures- is a more realistic short-run guide, providing opportunities for trade-offs between interest rates and aggregates in the light of market psychology and expectations.” (Alan R. Holmes 1969)

As will be seen later, the banks' uncertainty about the solvency of borrowers, may restrict credit and financing to firms and individuals, and therefore any increase in loanable funds does not necessarily imply an increase in credit.

The problem of the banking multiplier

The traditional view says that the CB can directly control the monetary base by OMO monetary aggregates and indirectly through compulsory reserves and / or reserve requirements. Indeed, given the demand for credit, a restrictive monetary policy may restrict bank lending. However, an expansionary policy may not have the expected effect (credit expansion), for two reasons: first, the Central Bank cannot force banks to lend more than they desire. Second, demand that banks consider reliable⁴ is not

³ In a statistical sense.

⁴ That at which banks are willing to lend because show loan repayment capacity.

affected by the policies of the CB (Wolfonson 1996; Serrano and Summa 2012). Thus, unless one assumes Say's Law in the financial market, with an attitude of private banks to pay all excess reserves, then the traditional causality holds only in the case of a restrictive policy.

In the example of increasing the amount of money through the multiplier, it was found that an increase in deposits (as a result of OMO) increases reservations and allows new credits to be extended. However, the logic of the multiplier is questionable given that in reality, first the banks grant the loans that create deposits and then go out and find the funds needed to maintain the required reserves, either through the "windows" of the CB or the interbank market. That is, the causality runs from loans to reserves. Or what is the same, from M1 to the monetary base.

“The idea of a regular injection of reserves-in some approaches at least-also suffers from a naive assumptions that the banking system only expands loans after the System (or market forces) have put reserves in the banking system. In the real world, banks extend credit, creating deposits in the process, and look for the reserves later.” (Alan R. Holmes 1969)

Assuming that a bank has provided loans for consumption but does not have sufficient deposits in the CB to meet the required reserves, there is no doubt that the bank will have to go out and get those missing funds, either through the discount window of the CB, borrowing from other banks or by selling assets, among others. Ultimately, if the bank in question cannot raise the funds to meet the minimum amount of reserves, the CB must provide the necessary reserves for keeping the payments system operating.

From the point of view of "bank multiplier", it recognizes that the CB can affect the total amount of reserves (binding + nonbinding) that a bank has, through an open market operation. However, the CB cannot determine the amount of loans the bank has to deliver, simply because this depends on the individual decisions of each private bank.

This means that if the CB injected more (less) reserves than the bank requires, the latter will be left with an excess (shortage) of reserves if it doesn't want to deliver (restrict) new loans. In the event of a surplus, the bank can find lucrative offers for these reserves in the interbank market, which will induce a short term low interest rate. The CB wanting to maintain a given interest rate will now find that this rate is

pressured downwards by the excess of reserves it has pumped into the system. The opposite can occur in cases where reserves are drained from the system.

This implies that if the CB wants to meet a target rate of short-term interest it has no choice but to provide the reserves that the banks demand, subtracting or shooting the surplus or shortage of them when necessary. Otherwise, the interest rate, considering the whole system, in an expansionary open market operation (contractionary), may be pressured towards zero (+ infinity), or towards its roof or its floor, in a system with an interest rate corridor.

This has an important implication. Open market operations are not used to setting the interest rate in the short term, but rather to adjusting the total amount of reserves that the economic system demands.

Ergo, monetarist causality is meaningless since, supposing that any change in reserves caused by an open market operation will generate changes in the money supply, and will mean accepting:

(A) Financial Say's Law to detect everything in excess of the reserves through new loans.

(B) The Fed is successful in imposing its policy (expansion of credit for example) to private banks. I.e. the latter always have a passive role and accepts the contractionary or expansionary policies imposed by the central bank.

(C) The money multiplier is stable.

The following sections will show how causality goes from credit to deposits, i.e. if the money supply is "credit-driven", the CB may have only partially succeeded in imposing its policy on private banks through an adequate regulatory system and that it will show up as the credit multiplier is logically untenable.

The origin of money-credit

Originally the people who owned large halls to safeguard gold and other commodities, were known as "goldsmiths". This feature allowed them to become the holders of gold from the rest of society. They just kept the gold in their "vaults" and issued a certificate stating the deposited amount that they were guarding.

Over time, depositors found it easier to make payments through these certificates instead of going, with each purchase, to withdraw the required amount of gold which would later be re-deposited by the seller.

That is, the money in this account serves as a medium of exchange to facilitate transactions. So far, the story does not seem very different from that of Robinson and Friday, or Friedman's helicopter.

However, the fundamental shift arises when the "goldsmiths" found it convenient to pay with money in their "vaults". They decided to issue notes to those who requested them (someone other than the depositor). This is how banks and financial institutions emerged as intermediaries between depositors and borrowers.

The "goldsmiths" realized that the notes issued by them could well exceed the amount of deposited gold, simply because the latter was rarely taken from the vaults.

This last fact has been a long and historic generator of debate and confusion.

The large number of "goldsmiths", now called banks, meant that there were as many varieties of bank notes as there were banks. Some notes being more acceptable than others, periodic crises arose in the payment system. Thus the need to focus the issue of notes from a single institution arose.

By 1929 the gold convertibility was abandoned in most countries and bank notes led to the current accounts and bank checks. This was a safer way to maintain and transfer money to the old system of notes.

Now banks are allowed to issue "promissory notes" and make loans. These loans could exceed the total amount of money deposited in bank accounts. Therefore it is appropriate to explain how this difference between loans and deposits is not a system imbalance, but instead, it is a natural feature, in a capitalist economy of production.

It should be noted that the disconnection of money with the production process in the traditional view does not reflect what actually happens in the economy⁵.

Assuming that, given the aggregate demand, there are entrepreneurs who want to start or expand a production process, and they require access to new or existing

⁵*"Investment was the motive force, its effects spread through time and amplified by the "multiplier," and itself partly or largely a result of the "accelerator." Money, if it entered at all, played a purely passive role."* (Milton Friedman and Anna J. Schwartz 1963)

resources, and human labor. This access will be possible thanks to bank loans that will allow each employer to initiate (expand) the process through a loan, which will end once their product (the output) has been sold⁶.

It is in this production process where money is displayed and makes it possible to start production. Thus, to understand a modern monetary economy, one must accept the banking system as the mechanism through which production is started. This could be due to an initial debt between a bank and an entrepreneur who will begin production, which will then begin an income in a second step, and finally, it will then be distributed, allowing savings⁷. This point will be discussed further later in the paper.

There is not exogenous restriction (deposits) on the credit supply, but on the contrary, the credits are what determine the deposits. In other words, credit expansion increases the money supply (see Kaldor and Trevithick, 1981).

The central notion is that a capitalized banking system can provide all the demands for credit that exist, if it so desired. The only restrictions on the system come from capital requirements are the desire (influenced by perceptions of risk from each of the parties) of the lenders and borrowers to accept a loan, the relative cost of finding funding in the capital market as the bank takes into account the benefit to be received in the future, the interest rate which can be "loaded" to borrowers, and regulations on the purchase of assets or lending (Fulwiller Scott 2012).

As mentioned above, in the real world banks give credit regardless of the position of reserves. At a later period banks borrow the funds required by the monetary authority. Ultimately it is the Central Bank that must provide banks with the amount of money (reserves) that they require:

⁶“Industry and production, being dynamic concepts, cannot be explained by substitution effects designed for static behavior (that is, portfolio theory).” (Marc Lavoie 1994)

⁷ It cannot be attributed to the low level of savings as the primary cause of low investment and credit to small and medium enterprises.

“Bank managers generally neither know nor care about the aggregate level of reserves in the banking system. Bank lending decisions are affected by the price of reserves, not by reserve positions.” (Warren Mosler, 1994)

The process of money creation

“I am afraid the ordinary citizen will not like to be told that the banks can, and do, create and destroy money. The amount of finance in existence varies only with the action of the banks in increasing or decreasing deposits and bank purchases. We know how this is affected. Every loan, overdraft, or bank purchase creates a deposit, and every repayment of a loan, overdraft, or bank sale destroys a deposit.”(Reginald McKenna 1928)⁸

Imagine an economy where there is a large bank that has a monopoly on the loans and deposits of the entire system⁹. In addition, all agents have accounts at this bank, and all transactions occur through it (some agents have taken loans and other agents have made bank deposits).

Now imagine that one day an agent wants to buy a machine for their plant, but does not have enough money to do so. Therefore, the agent goes to the bank and applies for a loan of \$ 100,000. All he has to guarantee is his past credit history, current income and his factory. Any of these things could be a guarantee for the bank¹⁰.

Assuming the machine is the guarantee that will become the assets of the bank in the event that the employer is unable to repay the loan, if the bank thinks the agent is trustworthy, the loan is paid into a bank account. In this case, as we assumed earlier, the bank account is in the same bank that granted the loan:

Central Bank	
Assets	Liabilities

⁸Chairman of Midland Bank, one of the four major banking groups in the UK in most of the 20th century.

⁹Laureate John Hicks (1904-1989) called it monocentric monetary system.

¹⁰ This is what the bank called collateral. This could be a financial asset, government bonds or corporate bonds, or if the agent wants to buy a house, the guarantee could be the house itself. In other words, it's called collateral to guarantee repayment of a loan and the agent is solvent if they show sufficient ability to pay according to their obligations to the contract.

Credit to buy the machine = \$100,000	=	Deposit of the employer = \$100,000
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The bank credited the money into the account of the agent. Looking at the T-accounts of the central bank, we note that the deposit is an obligation for the bank, while the counterparty is a credit, that is part of its assets.

“For money creation to occur, all we need is the willingness of a bank to lend and a creditworthy borrower who is willing to borrow.” (Marc Lavoie, 1994)

Now we describe the movements of the employer. If in a subsequent period will buy the machine in its balance sheet the "central bank" would look like this:

Central Bank	
Assets	Liabilities
	Deposit of the employer = -100,000\$
	Deposit to the seller of the machine = +100,000\$

Summarizing Table 1 and 2 yields the joint operation of the bank for two periods:

Central Bank	
Assets	Liabilities
Credit to buy the machine = +100,000\$	Deposit to the seller of the machine = +100,000\$

Now if you go up one more time, one can assume that the seller of the machine took out a loan (\$ 100,000) to advance wages and build such a machine. Now, this agent has the money to repay the loan requested in the same bank. The new T-accounts is:

Central Bank	
Assets	Liabilities
Credit to buy the machine = -100,000\$	Deposit to the seller of the machine = -100,000\$

Summing up all the tables, we obtain:

Central Bank	
Assets	Liabilities
Loan to machine dealer = -100,000\$	Deposits = 0
Loan to machine purchaser = +100,000\$	

This reflects that there is no change to the stock of money in the bank and that the bank's balance sheet shows that the distributor of the machine owes less and the buyer of the machine owes more. This is the process by which a bank creates money through loans without deposit:

*“Banks lend by creating credit. They create the means of payment out of nothing.”
(Ralph M. Hawtrey, ex-secretary of the British treasury).*

Like the example of the great bank, if you take a group of banks, these are also not limited by the amount of deposits, the argument is still valid. It will now show, such as banks as a whole, that they are not limited by the existing amount of deposits or the monetary base.

In the following example, there is a student who needs to move to start college and his parents have opened a bank account. Because the student needs extra money to settle on campus, his parents requested a loan from Bank of Argentina at a total of \$ 1000, and the money is credited to the bank account of parents in the bank.

\$ 1000 is then transferred through an electronic transaction, from the account of his parents at the Bank of Argentina to their child's account at the Bank of Students.

The Bank of Argentina has no reserves at the time of making the loan. Looking at the chart below, you can see in the second row -1000 reserves because that is the amount the bank should receive once given the credit. Because the central bank must ensure the functioning of the payment system, it is required to make an overdraft to these banks with a net balance below zero.

Through this transaction, the Bank of Argentina can make the transfer to the Student Bank. The only obligation of the Bank of Argentina is to cancel the overdraft at the end of the day. Therefore, the bank can go to the interbank market and borrow the amount needed. It is now in the third row (Book + \$ 1000 on the asset side and + \$ 1,000 loans in the liabilities side)¹¹.

¹¹ We are assuming that the Bank has no other place to put the excess money, thus increasing reserves by 100%. That is, the bank with a portion of the money could pay off the debt or obtain some kind of financial asset.

Bank of Argentina		Parents		Student Bank	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
Credit+1000	Deposit +1000	Deposit in Bank of Argentina +1000	Credit +1000	Reserves+1000	Deposit+1000
Reserves -1000	Deposit -1000	Deposit in Bank of Argentina -1000			
Reserves +1000	Interbank lending +1000	Deposit in Student's Bank +1000			

The result for the Bank of Argentina in its account is: + \$ 1000 Credit and Loan interbank + \$ 1000.

Provided that the individual banks do not have enough deposits at the central bank to meet reserve requirements, they will have to borrow the necessary amount from other banks or the discount window.

The question is whether banks can do this indefinitely. It is pertinent to note that a bank like the one described above, wants to make profits, this means that the bank wants to increase profits on the assets rather than increasing their liability. Given this, the bank will find the cheapest money that it can find. Obviously the cheapest way to make a loan is with its own funds, such as deposits, because their cost is lower than the loans in the interbank market.

This leads us to see the benefits of banks as a reference point in the supply of credit as long as there is demand for credit:

“Finally and most importantly, increases in bank loans are made at the initiative of bank borrowers, not the bank themselves.” (Basil Moore 1988)

The basic idea is that the credit-money is the result of a bank loan to a borrower who demands a certain amount of money to expand their factory, to start a business, to advance wages to start a production process, to buy machinery, or for any other economic activity.

Some readers may be skeptical about the process of money creation described above, since it seems that there is no limit to it. The reality is that there are no restrictions on a bank to create money through the mechanism described above. That is, providing a loan requires two agents who wish to participate in the transaction. On the one hand the borrower, who may not be willing to take a loan if he does not want to pay interest or acquire debt. In addition, the borrower could look ahead and may decide not to

spend / invest because of the possible risk of bankruptcy or they may observe a fall in aggregate demand that will prevent them from selling their products. In other words, if borrowers perceive that the risks are too great, this may limit the demand for loans.

Furthermore, private banks also carry risks. In this case, if they think the economy is going into recession, and there are few creditworthy customers (many customers can not repay their loans), they may be reluctant to increase the supply of credit (Wolfonson 1996).

That is, the "fear"¹² of the bank to lend to people who cannot repay them, limits the creation of money. The "fear" to become insolvent (net assets / equity of the bank negative) is what works as a brake.

On the other hand, if nobody is willing to borrow (demand), although the bank has an abundance of low cost funds, there will be no lending.

It should be noted that solvency, to determine the potential demand for credit is defined in each bank. In other words, there may be different considerations for each bank and these may change over time. Thus, there is no universal rule for determining demand "solvency" to which indeed you will be awarded credits. In other words, the creditworthiness of each customer is under the consideration of each private bank individually and does not follow a rule.

"We have seen that loans made to individuals or corporations, and hence money creation, depend on trust." (W.J. Baumol, A.S Blinder, M. Lavoie and M. Seccareccia 2010)

Summarizing the process described:

Flow:

Credit (money creation) → Use of credit to pay salaries or to purchase machinery → wage expenditure.

-Portion of salary saved → Bank Deposit

Reflux:

Portion of wage-worn real → Buy (gain of the borrower) → Loan Repayment = destruction of money

-Purchase of equipment (gain of a borrower) → pay wages (repeat the process described above)

¹² Do not consider only the fear factor as the only restriction. Financial speculation and devaluation expectations can also slow long-term loans.

If the banks at some point in this process were to hold funds beyond the required or desired level, they do not necessarily respond by granting new loans, but may invest the excess money in assets that yield interest or cancel out debts to the CB or other institutions.

The question is: From where do the initial funds to start the process of flow arise? This is where the CB and the Interbank market come into the equation. The bank that wants to make a loan can find the funds wherever it is convenient, whether by an overdraft from the CB, the sale of government securities, by borrowing from other banks, etc. But it is important to note that it is not a necessary condition that the bank will seek funds before granting credit. Thus, if we want to understand the system of bank credit it is necessary to explain two key points. One refers to how the bank determines to whom it gives credit, while the second refers to the search (ex post) for the funds to "give" the credit.

The concept behind the first point is the need for existence of a cash payment to which the bank considers the issue credit beneficial as it ensures that it will recover the amount delivered plus interest. Without an effective demand that excess funds banks as reserves, deposits, among others, and ceteris paribus, nothing will ensure that there is anyone wanting to apply for a loan (someone willing to incur a debt) or someone willing to give a loan.

At the same time added that the bank is monitoring the level of aggregate demand for goods and services throughout the economy. That is, if it considers that the investment firm faces a demand that contracts will not want to make the loan even if the company is solvent. That is, the bank also takes into account these other factors when deciding whether to expand or contract its credit line.

In conclusion, the CB can not affect (at least directly) the decisions of a private portfolio through open market operations.

Seeking funds for a loan

From an endogenous vision, the amount of money in existence arises from the relationship between the non-bank private sector and the banking sector, based on the desire to hold money and loans.

The central bank sets a discount rate and provides reserves to commercial banks when they require them. That is, the CB determines the price at which it provides reserves (which are the makers of quantities or "quantity-takers"), while the banks set a markup over the rate which results in the rate at which they grant loans. This mark-up is determined by the preferences of bank liquidity, market power and their attitude toward risk (P. Arestis and M. Sawyer 2006).

Credits are created according to their application and deposits arise as result of the process of money creation. Finally, when the loan is repaid, money is destroyed and that remaining in existence depends on the amount of private money the bank wishes to keep. This implies that, so far, money is a waste, that is, the monetary base is fully endogenous. Soon we will see how it's really not entirely endogenous nor totally exogenous, given the existence of autonomous factors.

If each bank does not have funds to lend, they can use the CB to request an overdraft rather than selling assets (eg. government bonds). Or rather, it is not necessary to sell government bonds or other assets, or have them “exante” to obtain the necessary funds to grant credit.

This may also apply to the firms or households that receive an overdraft from a bank, because they do not have sufficient funds to make a purchase or investment.

That is, focusing on the financial system, commercial banks are indebted to the CB every time they performs an overdraft, and they try to reduce that debt whenever possible. The overdraft system that allows banks to obtain the required funds is similar to bank overdraft made to families or employers. The procedure is the same, regardless of whether the economy is open or closed.

The balance sheet of the CB in an economy with a system of overdrafts that can be seen as follows:

Assets	Liabilities
Overdrafts to banks	Bank Reserves
	Currency in Circulation

We saw in the previous example that the Bank Reserves can also be purchased through the system of overdrafts. Once credit has been granted and deposits have been created, the bank seeks out the necessary reserves for such deposits.

The required reserves are set according to a proportion of the amount of deposits of a previous period. That is, the bank for a specified period of time has X amount of deposits for which he needs a piece Y of reserves.

For precautionary reasons or because of uncertainty, the bank may want to keep a surplus Z thereof, so as to resist unexpected shocks payments. Excess reserves above the amount Y involve a cost to the bank as they generally do not receive any interest and they get less than the market. The size of Z depends on the expected stream of

payments, constitutional features of the payment system and the expected cost of overdrafts (Disyatat 2008).

What is important is that the surplus Z is inelastic to variations in the interest rate. If one observes the variations thereof, one can see that even with the possibility of obtaining an interest deposit that amounts in the market, the surplus is maintained and shows small variations (Borio, C. and P. Disyatat 2009). This is because there are a costs for banks that want to have a quantity of reserves at all times, y in exact proportion to deposits X.

Only in a perfect theoretical system, without transaction costs, with perfect rationality, could a bank play with the required reserves every day .

So far, the money in this economy is a waste, understood as the portion held by the private surplus once the debts are canceled. And from the previous example we can observe a correlation between central bank assets and the monetary base.

However, if you add some items to the sheet, considering an open economy with government, this correlation ceases to exist:

Assets	Liabilities
	Currency in Circulation
International Reserves	Bank Reserves
Overdrafts to banks	
Overdraft to governments	Government deposits

Adding a third component (Government Deposits) to the obligations of the central bank, there is no direct association between assets and base money, simply because government deposits are not part of the database.

Thus there are two independent factors which affect the level of reserves and are not in the control of the CB. On the one hand, as stated, government deposits arise for example from an overdraft asked for by the CB to pay wages to public employees or social programs. These deposits in the CB are then transferred to a private bank. I.e. deposits are added to the balance of a commercial bank and therefore this will require more reserves.

On the other hand, there are deposits held by the public. A higher cost also increases the demand for the reserves of private banks.

Ergo, the CB cannot control the money supply perfectly, as monetarist theory points out, simply because the autonomous factors affecting reserves cannot be perfectly predicted and / or controlled by the monetary authority.

At the same time the monetary base is not completely endogenous because there are autonomous factors (government deposits and families) affecting it.

Therefore, the demand for reserves is highly inelastic to the interest rate. It is an obligation of the bank to meet required reserves and it is a obligation of the CB to be a supplier of reserves, through open market operations, and of the funds that the banks request. In other words, the OMA is primarily intended to ensure the day to day funds of the banking system and they are not used to set a specified interest rate.

It is appropriate now to explain how the CB determines the rate of short-term interest, which is the price paid by banks for a specified amount of reserves.

Controlling the rate of the short term

It is known that the interest rate on any given day may rise or fall according to whether the banking system has a shortage or excess reserves. If for some reason the banks has few reservations they can exert a bid to raise the rate for the short term, while if they encounter too much, they can go out and get rid of them and push the rate down. Without the intervention of the CB, short-term rates can skyrocket to infinity (zero) or hit a ceiling and floor which has been fixed when the "corridor / channel" in which they operate was determined.

At the end of each day, the price of stocks is called the "overnight" interest rate. If Fed is willing to buy or sell the necessary reservations, then it can control the market interest rate for the entire system.

Once fixed, the interest rate, and if the notices of BC interventions to keep the "overnight" rate are credible, then the volatility of this rate will be reduced and operations will occur near the target set. If there is greater uncertainty or delays in the BC intervention, volatility will be higher.

The point is that the CB can set the interest rate where it wants, because it can affect the system's total reserves and more importantly, if the commitment of the CB is credible, it can set interest rates without the need for OMA:

"Simply by announcing their intentions, central Banks can move rates without needing to undertake any operations because the threat to adjust liquidity as needed to achieve the rate is enough to make markets coordinate on the new rate. (Disyatat 2008)"

That is, an interest rate policy is simply a commitment from the CB to keep the target announced. And if the announcement is credible, the same instruments (OMO) are not needed to achieve this purpose.

On the other hand, the CB directly influences supply and demand for bank reserves, but cannot control the demand for them, as this depends partly on external factors beyond their control and partly on the private decisions of individual banks. These will pay for demanding a reserve price, which depends on the CB, which seeks to maintain the rate at a certain level and its response mechanisms at that level of deviations. In other words, the interest rate paid by banks is the result of supply and market demand influenced by the operations of BC.

Thus, as there is no link between reserves and loans, the banking multiplier is an uninformative construction. In other words, in the endogenous view is that there is no direct correspondence between monetary amounts and interest rates (Disyatat 2008).

Risk Aversion

Risk aversion and expected return influence of the location of wealth among different assets. Changes in demand for these assets affect their price and therefore their performance. For example, if a bank is a large amount of deposits, it may decide to reduce the rate paid by them and decrease the amount of the deposits.

Since the main bank's assets are relatively illiquid loans, aversion to risk and return, also affect their willingness to lend.

The relevant point is whether the CB can affect the credit rationing or not through their operations.

To simplify the exposition of the idea, the following equation is written:

$$il = ir + u$$

Where il is the interest rate of a loan, ir is the rediscount rate set by the CB and u is the mark-up.

While it is true that an increase in ir is going to move to il which increases the risk of loan default, due primarily to the possible inability of a firm to repay the loan at a higher rate, and second movement of the portfolio Credit to projects with higher rates of return, but more risk.

Should there be an increase in ir , one would expect an increase in the cost of credit, if the bank has the ability to do so. This increase is also a cost to the policyholder credit, for example an employer who wants to buy machinery. The employer has the ability to move prices by raising the credit costs, if it has sufficient market power to determine them. Whereupon, the investment project, given sufficient demand, can be carried out

if the bank makes the loan, albeit at a higher cost.¹³ This is not so for smaller firms because they are generally price takers and they cannot always move prices when there are increases in costs.

In conclusion, variations in the cost of obtaining funds may affect the supply of credit given the mark-up. Since banks operate in a relatively competitive market they cannot respond by increasing the interest on credit with every increase in their costs because they may lose market position. Thus increases in borrowing costs may reduce the expected return on future loans, therefore placing the funds in other assets could be more lucrative than granting a loan.

Thus, finally, it is a private decision of the bank to grant credit or not when it sees fit, with a rise in costs. Even if, for example, it notes that the proposed investment is not secure because there is low demand, it may refuse to grant new loans at a higher rate. It may also refuse to provide credit to small firms or to projects with high returns but high risk. (See Kregel 1994)

Credit constraints

Even if we accept that a restrictive monetary policy may restrict credit, banks are able to access the interbank market and obtain the necessary funds. Knowing that banks create deposits which are the means of payment for transactions of the non-bank private sector, the system as a whole cannot be quantitatively limited in funds to finance loans. All that is needed is an interbank market that works well enough to avoid the system's natural desynchronization between loans and deposits between banks.

The capital market intermediation is essential for the proper functioning of a credit-driven economy. That is, in a financial transaction between private non-banks, it is indeed necessary that the creditor or purchaser has the means of payment before making a purchase or a loan to the debtor. But bank loans or interbank loans contain within themselves the means of payment, as seen in the example of the purchase of machinery which automatically generates a credit deposit.

In other words, there is not only a quantitative restriction but also qualitative restriction of a well functioning bank.

But during the implementation of a restrictive policy, it increases the cost to find liquidity. Thus, if the bank cannot offset the increased costs by increasing the lending rates it will have a disincentive to extend new loans and their performance will be decreased.

¹³ Although it is not the subject of this work, this can lead to an increase in the price level of a sector or the level of inflation if the credit is more expensive for all sectors by an increase in costs rather than an excess supply of money in the monetarist sense.

This lack of quantitative restriction mentioned is clearer if we define the concepts of savings and financing.

From the perspective of national accounts, with 3-sectors (government, private sector, the rest of the world) we have:

$$(S - I) = (G - T) + (X - M) \quad (1)$$

(I = investment, G = public consumption, X = exports M = imports, T = taxes, S = private saving)

However, private sector saving can be decomposed into household savings (Sf) and saving employers (Se), which can be defined:

$$S = S_f + S_e$$

We defined household savings, as the portion of disposable income not spent on consumption and business savings as retained earnings.

Traditional theory says that given the equation (1), the public sector deficit takes resources to the private sector or what is the same, a saving of a sector is the des-saving of another.

This need not be so if we understand the concepts of real wealth, financial wealth and savings.

First, the private sector can generate real wealth without government intervention. For example, a rancher wants to raise their heads won from 10 to 20 and does not need government spending to do so. In this situation, the government is not useless, however what he can do is to monetize the real wealth that was just created to facilitate the accumulation of wealth. That is, providing the necessary financial assets through regulation of the banking system and the CB.

However, an industry or manufacturing employer needs credit to start production and once they sell their product they will have their own wealth.

The relevant point is that the saving of sectors is an ex post result. I.e. either family savings or business saving arise once the production process has occurred. In the previous example, only after the employer has requested credit to expand production, wages ahead and sold the product, does he make a profit which he may decide not to distribute and thus this becomes part of his savings. So too the family, once he has paid their salaries, may decide not to spend all their income net of taxes, which would be then become savings.

In other words, every investment decision (flow) or government spending is generating a flow of savings, which if maintained over time, and is transformed into a stock

savings. The same will depend on the decisions of individual families, employers and governments. In other words, focusing on the private sector, investment generates savings and the spending of one is the income of another, and is part of this income that is not spent and is saved.

Therefore, it is not necessary to have a stock of savings to start the process described, but it is only needed to have a banking sector with easier access to interbank loans and/or central bank overdrafts, i.e., funding is needed.

This means that savings can be zero for each sector and for the whole economy and investment they can be positive. Expressed in equation (1) if we have:

$$(S-I) = 0 \quad (X-M) = 0 \quad \text{and} \quad (G-T) = 0$$

This simply means that given the definition of saving used, each sector consumes as much as it earns.

While there is bank financing the lack or inadequacy of savings is a fallacious argument to justify the lack of credit.

Central Bank of Argentina in a bi-monetary economy

“la cantidad de dinero crece de acuerdo a la demanda transaccional y, en nuestro país, todavía hay mucho que avanzar para remonetizar nuestra economía” (Mercedes Marco del Pont, <http://www.elperiodico.com.ar/2011/03/18/marco-del-pont-salio-al-cruce-de-las-criticas/>)

The concern here is to summarize the actions of the Argentine Central Bank for post-convertibility. The previously developed theory is applicable to the Argentine case if we are referring to the legal tender, i.e. the “peso”, because dollars are not produced by the “money’s house”.

In Argentina, a reserve interbank market (overnight) has a benchmark interest rate called the “call”. Since 2002, the CB has been issuing debt, Nobacs and Lebacs and its influence on the market has been increasing. The object of its speech is to control the basic interest rate, although this is not formally recognized as a policy instrument by the Bank. That is, if the CB sets interest rates for their titles, it inevitably becomes “quantity taker”, in other words, the amounts become endogenous.

If the CB calls for tenders or sets an auction for trading securities in the primary market, fixes interest rates and then delivers the demanded quantities of bills and notes, the CB may declare the bidding or surpass the amounts claimed. This is how the amounts become endogenous and are led by demand (De Lucchi 2012).

A secondary market was added to this primary market, which was established in 2004. The latter refers to a transfer market where the repurchase BC performs using its letters and notes. This also has another tool to control liquidity.

With all these tools the CB has fixed (though not explicitly advertised) interest rates (rate "call") for the interbank reserve market with a roof and floor and can thus control bank liquidity.

Conclusions and Policy Considerations

For a manufacturing company that produces goods, the preferred form of expansion is through retained earnings. But if he needs to take a debt to resolve investment, there arises a problem to be solved by the firm. This refers to the temporal mismatch between the revenue stream to receive new investments in the future and the income reflux to cancel out obligations.

Financial markets generally avoid making long-term loans to small firms, such claims are aimed at short-term bank loans. This may force the firm into a forced sale if it has enough income to meet the debt or if there is sufficient funding. Even the ratio between assets and liabilities may be increased due to a decrease at first, to address the short-term debt (Steindl 1945).

The following considerations should be taken into account when making any policy to increase lending to SMEs.

First, it is important to have a local bank state that not only aims to make a financial gain but also, and primarily, has aims for higher growth and increased employment. I.e. granting loans to companies which private banks are unwilling to fund. Since higher growth and employment imply a higher performance (by increasing deposits and the consequent reduction in the costs of obtaining loan funds), the search for the first should be the goal of the CB and a state banking system, so that eventually more credits will be geared towards production. Secondly if the solvency of employers who have received or will receive a credit is affected by the decline in private or international demand (as at present), the government can increase spending (and here is one of the reasons for the Central Bank to fund the treasury, as permitted by the charter of the monetary authority recently amended) to compensate for falling demand and decrease the likelihood of default by borrowers. Implicitly, this measure of demand stimulus is a signal to the private credit providers to avoid contracting the money supply.

In other words, since a greater supply of credit will not be converted into new loans if there is no demand, it is a necessary condition: a stable level and / or increasing demand for goods and services to ensure that projects are viable and productive in the long-term solvent and therefore the return of long-term loans are secured.

Third, it could provide facilities or prioritize the supply of credit to those SMEs that aim to replace imports to avoid a worsening current account and thus relax the external gap that is always lurking in Argentina (Diamand, 1973) . Given the high dependence on imports of intermediate goods and the capital of Argentina's economy, we must bear in mind that a higher credit flow in pesos can lead to a greater demand for dollars in order to buy supplies or imported capital equipment, making it necessary to assess the impact on the trade balance will have on credit growth. A strong policy of import substitution implies that any increase in spending (either SMEs or state) and credit have a greater impact on domestic demand and a low impact on external demand (imports).

However, this structural problem of Argentina's economy cannot be an excuse for not lending productively, nor should it serve as an argument to make adjustments to the contractionary, as accompanied with a proper policy of import substitution (which in part will be performed by SMEs if they can realize their investment projects) most of the credit (or deficit) will be spent internally, increasing domestic demand and employment levels.

That is, there are two ways to increase spending at home and to maintain a level of activity appropriate to the goals of employment and growth

“One way is for government to spend. The other is for banks to lend. Leaving aside short-term adjustments like increased net exports or financial innovation, that's basically all there is. Governments and banks are the two entities with the power to create something from nothing.” (James K. Galbraith, 2012)

Given a framework of global crisis should not be self-imposed, a trade-off between these two alternatives is needed. By contrast, the two tools should work collaboratively to achieve the objectives of economic policy. However, if you had to choose one or the other, it is important to note that a good banking and financial system, properly regulated so as not to counter the state policy for growth and development (which requires a central bank that not only pursues inflation targeting), can provide the necessary resources to the economy and therefore demand that the government deficit be reduced as it is pumping money through the banking system. Simultaneously if the credits increase the GDP by their impact on aggregate demand, the debt / GDP ratio will decrease further in pesos.

Given the practical difficulties of increasing the productive credit to SMEs with the current banking system, creating an alternative banking system coordinated by the state with the main objective of providing long-term credit and fixed-rate low-cost private schools that can participate or not according to their will can be considered.

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