

The Optimum Quantity of Money in a Situation of Information Asymmetries: Evidence from Cameroon

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ABSTRACT: This article is a macroeconomic assessment of the optimum quantity of money to inject into a developing economy in situation of information asymmetries. Starting from Tobin's "absolute liquidity rule", and under the hypothesis of a sub-optimal macroeconomic monetary equilibrium, a method of optimizing the money supply is proposed, based on a "monetary adjustment coefficient". It takes into account the effective growth rate, the potential growth rate and the current money supply. It appears, in the case of Cameroon, that the quantity of money in circulation is 30% lower than its optimal level compatible with the potential product, hence the need for an expansionary monetary policy, including monetary and credit easing measures. It is thus proposed to decision makers to introduce a monetary adjustment coefficient when elaborating monetary policy to be implemented in the country.

KEYWORDS: Monetary optimum, absolute liquidity, coefficient of monetary adjustment, Cameroon.

1. INTRODUCTION

"No development policy can be effective if public decision-makers do not control the quantity and the circulation of money within the economy" (Amin, 1973). This statement is crucial in the implementation of monetary policy in both industrialized and developing countries. Which optimal quantity of money should be injected into a developing economy in situation of asymmetric information, to ensure sustained growth and harmonious development? This is the question that this analysis seeks to answer, within evidence from Cameroon, a developing country of Central Africa. The question of monetary optimality, although old, is experiencing renewed interest today for at least two reasons. The first reason is due to the current difficulties faced by the decision-makers in truly controlling the money supply in circulation in the economy. It derives from the increasing complexity of financial assets and the increased diversification of means of payment due to financial innovation. The second reason is related to the changes in monetary policy, following the recent international financial and health crises, the effects of which have been transmitted to African economies with a very negative impact.

The revolutionary entry into force of unconventional monetary policy measures after the 2007-2008 financial and economic crisis (Stiglitz, 2013) and the rapid development of electronic money have increased the difficulty for central banks to control the quantity of money in circulation in the economy. These events logically lead to questioning the determination of the quantity of money necessary to satisfy the financial needs of all agents within an economy, taking into account the constraints of monetary policy. This is the case for both developed and developing countries. The former are facing the jolts of exit from the recent severe financial and health crises, including that of covid-19. The latter, hit by these same crises, are constantly seeking economic emergence, which requires a high level growth rate.

In the Economic and Monetary Community of Central Africa (CEMAC), to which Cameroon belongs, the current reflection focuses on the reform of the monetary system for substantial economic development. This brainstorming follows the direction given by the Heads of State of this sub-region, during the two extraordinary summits, respectively on November 22, 2019 and August 21, 2021. To this end, they instructed the CEMAC Commission to lead *"... an in-depth reflection on the conditions and the framework for a new monetary cooperation"*. Also, the higher desire of these leaders to carry out monetary reform explains the holding, in Libreville (Gabon), on November 17 and 18, 2022, of a high-level symposium on the theme: *"Money and development in Central Africa"*. However, the problem is how to determine the optimal quantity of money for a higher level of growth that promotes substantial economic development? This is the essential concern of this work, in the light of the Cameroonian economy, considered as a leader within the Community.

Indeed, the recognition of the influence of money on economic activity is a matter of a fairly broad consensus among economists. This is so with regard to its triple function of money as unit of account, intermediary of exchanges and store of values. However, determining the quantity of money necessary for the proper functioning of the economy remains an enigma. This issue

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worries both analysts and economic policy makers. For developed countries, monetary forecasts are not immune to the short-term and cyclical fluctuations of modern economies. For developing countries, information asymmetries due to the often approximate quality of statistical data and the informal nature of a large part of the economy make forecasting monetary aggregates become more uncertain.

The macroeconomic monetary optimum, firstly, refers to equilibrium between the supply and demand of money. This monetary equilibrium is said to be optimal when it effectively makes it possible to determine the best level of money supply to inject into an economy, taking into account all the related constraints. It is accomplished in case of equality between the global supply and the global demand for money. The optimal quantity of money then results either from a neo-classical market equilibrium or from a Keynesian equilibrium of the circuit. This “monetary satiety point” is necessarily compatible with meeting the financial needs of all economic agents within a nation.

Therefore, determining the optimal quantity of money in an economy presents a double interest both at the theoretical and the political level. At the theoretical level, it updates the debate on monetary equilibrium by inserting it into the modern framework of developing economies. At the political level, it helps to inform the monetary policy decisions of the central bank, with a view to rational use of monetary availability for strong growth, for substantial economic development. It is a necessary step to achieve macroeconomic policy objectives (economic growth, full employment, control of inflation, external balance). This operation constitutes a challenge for modern economies and particularly those of developing countries. Because the liquidity needs to be met take into account both consumer demand and public and private investment demand (aggregate demand).

However, in a situation of informational asymmetry (Akerlof, 1970), all demands for money are neither visible nor timely in the official monetary circuit. The hidden behavior of borrowing agents induces, from the banking system, a rationing of monetary liquidity on the credit market (Stiglitz and Weiss, 1981). Consequently, the global money demand function is biased, monetary policy forecasts are erroneous and agents' expectations are no longer rational. In addition, if there is a wait-and-see behavior by banks in terms of credit supply, coupled with a restrictive monetary policy by the central bank, there are bottlenecks in the financing circuit of the economy. Consequently, the economy remains under liquid and does not achieve the desired optimal level of monetary equilibrium. Since the money supply is insufficient, it compromises the satisfaction of the monetary needs of economic agents. And the quantity of money in circulation then remains below its level compatible with the real potential product and consumption within the economy. Under these conditions, the opacity of the money market generates the hypothesis of a sub-optimal monetary supply. It is therefore necessary to inventory, at the same time, the monetary potentialities of the economy and the demand for liquidity of all the agents, to release from it an optimal money supply capable of satisfying their financing needs, in such a context of information asymmetries.

The search for the macroeconomic monetary optimum can take two methodological directions: the neo-classical market equilibrium or the neo-Keynesian equilibrium of the circuit. The first path leads to an equalization of the supply and demand for money within the economy. The second indicates a saturation of the liquidity demand of all economic agents by the financial system. It is therefore necessary to seek the level of money supply compatible with the state of the financial needs of the economy, under the assumption that the money supply leads to the full employment of the productive capacities (capital and work) of the economy. The rest of the article presents the literature (2), the methodology (3) and the finds and discussions (4).

2. LITERATURE

Theoretically, the monetary optimum is established by maximizing the money supply to be injected into the economy, under the economic, political and social constraints within the country. From a macroeconomic point of view, the optimal monetary equilibrium can be achieved through two models: the quantity theory of money [(Fischer, 1911), Pigou (1917) and Marshall (1922)] and the IS-LM model (Hicks, 1937). The monetary optimum refers to a market equilibrium which is set at the point of equalization of the supply and the demand for money. This is how the monetarist developments carried out in particular by Friedman (1963) militate in favor of a minimum quantity of money determined from the level of the Gross Domestic Product (GDP), the Balance of Payments and the state of public finances. This policy of “money supply growth standards” has been implemented in many countries, including those of the Economic and Monetary Community of Central Africa (CEMAC), since the financial liberalization of the early 1990s.

On the other hand, Keynesian and post-Keynesian analyses, based on the monetary equilibrium of the circuit, demonstrate that the monetary optimum can only be reached through the saturation of the for money demand aggregate. The optimum quantity of money is, therefore, the one that satisfies all the financing demands of the economic agents, with regard to the set of monetary needs that they express for the purposes of production and consumption. Money, considered in this integrationist analysis as an endogenous variable, is both a “consumer good” and a “production good”, as demonstrated by Tobin (1969), Clower (1969) and Patinkin (1972).

In the monetary prospecting model with random matching, the optimal quantity of money indicates the real supply of money (i.e. the purchasing power of the means of payment available within the economy) which maximizes social well-being (Kiyotaki and Wright, 1991, 1993). The optimal quantity of money to be injected into an economy is a subject of a coherent analysis by Friedman (1969) who identifies the determining factors and the consequences of the related monetary policies on the well-being of

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the individuals who hold this money. He therefore proposes that monetary policy should be adjusted to a growth rate of the quantity of money compatible with Paretian optimality and an interest rate close to zero.

In the theory of public finance, controlling the optimal quantity of money makes it possible to limit inflation during public levies in a monetary economy where money is mainly used as an intermediary for the exchanges that it helps to facilitate (Kimbrough, 1986). In a simple general model for computerizing the Ramsey-style optimal inflation tax, Mulligan and Sala-i-Martin (1997) show that this Friedman's rule of optimality depends on theoretical conditions on the form of the relevant equations relating measurable variables including, in particular, the nominal interest rate and the general level of prices. From a macroeconomic point of view, the monetary optimum is determined through classical market equilibrium or Keynesian circuit equilibrium.

2.1 Monetary optimum through market equilibrium

The monetary optimum by market equilibrium first assumes the existence of a money market. The optimal money supply to be injected into the economy is analyzed in the strict sense as the result of a simple equalization of the supply and demand for money on this market. In the broad sense, it refers to the balance of the entire monetary economy. In a market economy, monetary equilibrium is highlighted through three models: the quantity theory of money where equilibrium is reached by adjusting the general level of prices (Fisher, 1911); the IS-LM model with adjustment by the interest rate (Hicks, 1937) and the equilibrium model with rationing, by flow adjustment, assuming fixed prices and interest rates.

2.1.1. The monetary optimum through price adjustment

The monetary optimum by price adjustment assumes that the demand for money essentially responds to a transactional motive, where money is not demanded for itself, but for what it allows to acquire. It is then apprehended under its status of economic good, fulfilling the conditions of utility, scarcity and availability. In addition, money has the particularity of being the standard for measuring other goods. It is considered here as a simple facilitator of exchanges (Say, 1803). The value of money is therefore that of the goods it allows to acquire and its optimal quantity corresponds to the value of all the goods and services demanded in the economy. In this case, "*...the quantity of money which a country needs is determined by the sum of the exchanges which the wealth of this country and the activity of its industry necessarily entail*" (Say, 1803). This analysis logically reveals that, the more abundant the production and the intense consumption, the more developed will be the exchanges, which requires a larger quantity of money to be put into circulation.

This "dichotomous" approach separates the "real sphere" from the "monetary sphere" of the economy, under three assumptions: the monetary neutrality, the constancy of the velocity of circulation of money and the exogenous supply of money. It establishes a direct relationship between the quantity of money M in circulation and the general price level P and concludes that any supply of money only influences the price level. Under these conditions, considering T , the volume of transactions carried out during the period considered and V , the velocity of circulation of money, the optimal quantity of money is obtained by adjusting prices, with reference to the quantity theory of money according to Fisher's equation (1911):

$$MV = PT. \quad (1)$$

In this equation, MV represents the currency, and PT the quantity of goods purchased. Thus, for all the transactions carried out during a period, the total amount paid is equal to the total value of the goods and services purchased. Assuming that the velocity of circulation of money V and the level of transactions T are stable, any increase in the supply of money requires an increase at the same rate in the general level of prices, so that monetary equilibrium is maintained. It suffices, therefore, to play on the flexibility of prices to achieve monetary equilibrium, when the latter is broken. The optimal quantity of money here would therefore be that which makes it possible to carry out the number of transactions planned for the period. In this optimum, the supply of money M_o is equal to the demand for money M_d derived from the reformulation of equation (1) by the Cambridge School, with Marshall (1922) and Pigou (1917) in the form:

$$M_d = kPY \text{ or } M_d/P = kY \quad (2)$$

The global demand for money M_d is thus a function of the global quantity of goods and services, represented by the Gross Domestic Product (GDP) in volume Y , of the general level of P and of the fraction k of their income that economic agents wish to hold in liquid form. Monetary equilibrium is therefore achieved, once again, when the demand for real balances M_d/P corresponds to the preference for liquidity kY . A rise in the general level of prices reduces the value of real balances and brings the monetary optimum of the economy under consideration to a lower level. This situation explains the tendency of certain central banks to fight exclusively against inflation (dictatorship of the single objective). From this point of view, the optimal money supply is that which makes it possible to minimize inflation while maintaining GDP at an appreciable level. This is reflected in Taylor's (1993) optimal monetary policy rule, whereby the central bank's policy interest rate i depends on both the rate of inflation and the growth rate of production, such as:

$$i_t = r + P_t + 0.5(P_t - P^*) + 0.5(Y_t - Y^*) \quad (3)$$

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Where r represents the real interest rate, P_t the inflation rate for the current period and P^* the target inflation rate; Y_t and Y^* the current and potential growth rates respectively.

2.1.2. The optimal monetary approach through interest rates

Assuming that the general level of prices is constant, the IS-LM model (Hicks, 1937) establishes the monetary optimum at the point of equilibrium between the supply and the demand for money (M and L), by adjusting the interest rates. Graphically, the connection between the interest rate i and the global income Y leads to the optimal monetary equilibrium at the point of intersection between the IS curve (goods and services market) and the LM curve (the money market). But, if the interest rates defined by the monetary policy are not faithfully passed on to the bank credit market, the search for the monetary optimum is confronted with the rigidities of prices and interest rates; hence the optimal equilibrium approach with rationing.

2.1.3. The optimal monetary approach through equilibrium with rationing

Assuming constant prices and the interest rate, the optimal monetary equilibrium can be obtained by adjusting, with rationing, the quantity of money needed to finance the economy. If the economic system is competitive, the monetary optimum can derive from a rationing of agents located on the "long side" of the market. Such a prospect is indeed possible when neither the interest rate nor the level of prices are sufficient to bring the monetary economy back into equilibrium. This is an adjustment made by the banking system, following a restrictive monetary policy. The classical equilibrium based on the hypothesis of an exogenous supply of money and perfect information therefore appears to be limited. It is then necessary to seek the monetary optimum by saturation of the endogenous demand for financing, in a situation of informational asymmetry. Apart from the equilibrium of the market, the monetary optimum can be considered through the equilibrium of the Keynesian circuit.

2.2 The monetary optimum through circuit equilibrium

The monetary optimum resulting from the equilibrium of the circuit corresponds to the quantity of money necessary to satisfy all the financing needs of the agents (producers and consumers) in an economy (Keynes, 1936). The optimal macroeconomic monetary equilibrium is then obtained by saturation of this overall demand for financing. It corresponds, in this case, to the quantity of money necessary to satisfy the various Keynesian motives for the demand for money, taking into account Tobin's rule of absolute liquidity (1969).

2.2.1. The saturation of the demand for financing

Unlike the liberal monetarist approach, which is based on the assumptions of a competitive market and exogenous money supply, the determination of the monetary optimum by saturation of the demand for financing requires an inventory of the financing needs of the economy. In this so-called endogenous approach, money is requested not only for transactional, precautionary and speculative reasons, but also for the financing reason or "financing motive". This refers to the need for a provisional advance of currency required to materialize the investment decisions of entrepreneurs.

For Keynes (1930, 1936) and his disciples, indeed, money is "the alpha and the omega", that is to say at the beginning and at the end of economic activity. Through the circuit theory, Keynes shows that the amount of money created by financial institutions and made available to businesses in the form of credit can influence the level of production and employment. Because, the company uses this currency to carry out its production plans by acquiring the capital and the work that it remunerates. According to the theory of the monetary economy of production, money is an endogenous factor of production. It is therefore both a production good before being a facilitator of market exchange. And, in this dual capacity, it undeniably influences the social well-being of all economic agents. The optimal quantity of money would therefore be, from the Keynesian point of view, the money supply compatible with the maximization of this social well-being. Monetary creation is then directed not only towards the financing of exchange, but also towards the financing needs of production (Artus, 2014; Kaldor, 1985; Taylor, 1995; Blanchard and Gali, 2007).

Through the mechanism of the credit divider, banks contribute to the optimization of the quantity of money, because of their liquidity-creating function in the process of financing the economy (Kashyap et alii., 2002). They stimulate a dynamic of monetary supply, in return for the investment and consumption credits they grant to businesses and households. The Keynesian theory of the circuit describes the cycle of this money offered from the evaluation of the demands for liquidity expressed by economic agents. It is then redistributed to households in the form of wages, part of which is consumed, the rest returning to the bank in the form of savings.

2.2.2 Consideration of Tobin's "Full Liquidity Rule".

As a consumption and production good, money necessarily influences the social well-being of those who hold it. Thus, the optimal quantity of money is that which maximizes the social welfare of economic agents according to the "Full Liquidity Rule" as tatted by Tobin (1969). According to this rule, money is a free good, which means a good that can be procured ad libitum for the private sector, in terms of real cash balances. This rule, has been since examined and recognized by Friedman (1969), Samuelson (1968, 1969), Clower (1969), Johnson (1971), then Levhari and Patinkin (1968). Using this rule therefore makes it possible to specify the optimal quantity of money demanded in an economy. To meet such a global money demand, monetary theory reveals the existence of an optimal supply of money whose validity is independent of the situation of the economy (steady state, regular state, non-regular

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state). Consequently, the optimal quantity of money in an economy is that which leads to the saturation of the overall demand for financing of this economy. It effectively takes into account the financing of consumption and production.

The definition of monetary optimality adopted here, therefore, derives from the basic proposition of the theory of value, according to which: welfare is maximum when a good that can be produced at zero marginal social cost does not bear an opportunity cost to the individuals who hold it. Thus, a good whose social cost of production is zero must be offered until full, i.e. until its demand is saturated. Money is a typical example of this kind of good, since its social cost of production is almost zero. The optimal social well-being it provides therefore requires that it be held at zero opportunity cost. Therefore, it must be offered until its marginal utility (or its marginal productivity) vanishes. The real quantity of money held by agents is therefore optimal only when money becomes a free good. The rule of money supply is therefore to provide economic agents with liquidity, so as to fully satisfy their desire for liquidity: we then say that “*the social optimum calls for full liquidity*”.

The optimal quantity of money corresponds in this case to the level of money supply which makes it possible to fully satisfy all the needs for holding money by the agents of the concerned economy. However, the question of its determination does not arise in terms of the nominal supply of money, but rather in terms of the real supply. For, any nominal quantity of money can be transformed into a desired quantity of production. It's just necessary to make an appropriate adjustment to the general level of price P . Given the money supply M and the general price level, the real value of this money supply is measured by the ratio: M / P .

Therefore it is theoretically up to monetary policy to choose a rate of change in the money supply compatible with the golden rule of accumulation. This stipulates that money must be offered to satiety that is to say until the saturation of its transactional demand, because its cost of production is negligible (Solow, 1956). Indeed, provided that its offer corresponds to a refundable credit, the currency must be made available, in necessary and sufficient quantity, to all the agents who ask for it (Tobin, 1965), a conclusion supported by Stein (1977). At this optimum point, the effective per capita consumption c must correspond to the “net production” g of the economy, i.e.:

$$C = g \tag{4}$$

Therefore, the money supply becomes optimal when money is used as an alternative asset to productive capital, capable of satisfying the community's desire for wealth accumulation (Serra, 1982, p. 246).

Fisher et al. (1997) propose a general model for computing the Ramsey optimal inflation tax, showing that the Friedman equilibrium is not always optimal (or always non-optimal) on theoretical ground. This optimum depends on conditions related to the shape of relevant functions one of which is the relation between measurable variables such as the interest rate and the consumption elasticity of money demand. Feige et al.(2005) examine the optimum quantity of money in a society from the perspective of a utility function, using a theoretic model which focuses attention on the cost of transacting in different markets and on the storage cost of holding money. They find that socially optimal transactions patterns and inventory holdings can be induced by paying interest on money and bonds equal to the net rate of return on capital. The monetary optimum is shown to be instead one of zero inflation when targeting positive inflation, consistent with the Fisher price stability perception, the central bank must therefore hold reserves. Without ad hoc assumptions e.g. about price stickiness, the monetary optimum is where money's marginal cost of zero equals the marginal social benefit (Gillman & Nolan, 2008). Furthermore, Watanabe (2020) derives a money demand function that takes into account the costs of storing money. This function is then used to examine the consequences of the large-scale money injection conducted by the Bank of Japan since April 2013. He finds that the optimum quantity of money, measured by the ratio of M1 to nominal GDP, is 1.2. The findings imply that the Bank of Japan needs to reduce M1 by more than 30%, for example through measures that impose a penalty on holding money and also that the opportunity cost of holding money has been negative since the fourth quarter of 2014. Although there are many information asymmetries within the economy of the developing countries, such as Cameroon, policy makers must go further than pursuing a myopic fiscal objectives, such as short-run redistribution or public spending, to use an efficient monetary policy that that can realize the monetary optimality (Gaballo & Mengus, 2023).

3. METHODOLOGY

The methodology used is based on the theories for determining macroeconomic monetary equilibrium and the optimal quantity of money, based on Tobin's "Full Liquidity Rule" (1969). And, under the assumption of a sub-optimal money supply, due to information asymmetries, we introduce a “monetary adjustment coefficient” to correct this monetary imbalance. This model is compatible with the situation of the studied economy which is characterized by the existence of many informational asymmetries and the importance of the informal sector.

3.1 Monetary optimization model

From the BEAC monetary policy framework, we consider the money supply M and its three (3) counterparts which are: credit to the economy CE , credit to the public sector CG and net foreign assets AEN . As in the other countries of the CEMAC Zone, the accounting monetary balance is established in Cameroon as follows:

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$$M = CG + CE + AEN \quad (5)$$

Assuming that there is an excess global demand for money, due to informational asymmetries that make this equilibrium sub-optimal. The global money supply therefore does not fully satisfy the money demands of all economic agents (consumers, producers and the State). One of the main manifestations of this sub-optimality of the quantity of money available in the Cameroonian economy is the macroeconomic under-liquidity, the default (or delay) in the payment of numerous invoices and the shortage of monetary signs observed for several years in the country. The quantity of money available in the economy is therefore not enough for covering all the real transactions, even though the money supply of an economy must be used, at least, to cover the needs consumption and production. This amount of money must, at the very least, correspond to the level of the quantity of goods and services produced in a nation. It is therefore the equivalent of the volume of real transactions that led to the production of these goods and services, during a given period. Hence the need to develop a monetary adjustment model to satisfy this global demand for money necessary for an optimal equilibrium.

3.2. The introduction of a monetary optimization coefficient

The monetary optimization (or monetary adjustment coefficient) model is a method of determining the quantity of money that is effectively compatible with the set of financing needs of all agents within the economy. It makes it possible to reduce the gap, often significant, observed between the desirable quantity of money, resulting from all the financing needs of the economy and the quantity of money actually created by the financial system. Starting from accounting equation No. 5 of the demand for money in Cameroon:

$$Mt = CGt + CEt + AENt \quad (6)$$

A mathematical model à la Tobin is used, taking into account macroeconomic and real monetary variables such as the money supply $M2$, the potential (or desired) growth rates of GDP, TCp ; the effective growth rate of GDP TCe , the financing needs of the BFE economy. We introduce an adjustment coefficient as well which is established as follows. Literally, let Mt be the money supply for the current year, TCp the potential (or desired) growth rate and TCe the effective growth rate, we can evaluate this optimal quantity of money Qo by:

$$Qo = Mt * TCp/TCe \quad (7)$$

The TCp/TCe ratio is considered as a “money supply adjustment coefficient” or “coefficient of monetary optimality” to obtain the optimal quantity of money compatible with the potential product of the economy. The data comes from the monetary statistics of the Bank of Central African States (BEAC) and the African Development Indicators (ADI) of the World Bank, in the case of Cameroon. More precisely, the objective is to formulate and testing the optimal quantity of money in Cameroon.

4. RESULTS AND DISCUSSIONS

4.1 Result of the Monetary Optimization Model Test in Cameroon

Monetary optimality is consistent with the economic growth objective of the country concerned. The optimal quantity of money to be injected into the Cameroonian economy must be compatible with the highest GDP growth rate $TCp = 6.1\%$, expected by the public authorities in 2015, i.e. the highest of the last ten years. This desired growth rate was 6.1% in 2015, while the effective growth TCe only reached 5.9% , i.e. a growth gap of 0.2% . By applying the formula of equation (7) above, that is:

$$Qo = Mt * TCp/TCe$$

Considering that the broad money aggregate Mt is 3,076.02 billion CFA francs in 2013, the Cameroonian economy could only achieve an effective growth rate TCe of 4.7% . This falls at widely below the TCp target of 6.1% GDP growth projected by the Cameroonian Government for 2013. The application of this formula gives:

$$3,076,018,413,769 * (6.1 / 4.7) = 3,992,279,217,870 \text{ F.CFA.}$$

This operation reveals a gap or more precisely a monetary imbalance of 916,260,804,101 FCFA for that year, i.e. in relative terms, 29.78% of the quantity of money required. The money supply would therefore have had to grow by about 30% to achieve the GDP growth rate projected by the public authorities. Cameroon's money supply is therefore 30% lower than its optimal level, i.e. a level compatible with the implementation of all the production capacities available in the national economy.

4.2 Discussions

The above results show that there is an unsaturated excess demand for money in Cameroon. Therefore, any monetary equilibrium can only appear suboptimal. In this case, neither the financing needs of the producers nor those of the consumers are satisfied to the maximum level. The Accounting equality used by the BEAC hides many unmet financing needs in the economy. It therefore emerges from this analysis, that there is a low level of money supply not being enough for an optimal financing of the economic activities carried out by all the agents within the Cameroonian economy. However, the quantity of money available in the economy is that which should lead to the saturation of the transactional and productive demand for money. For, as a consumer good, money must

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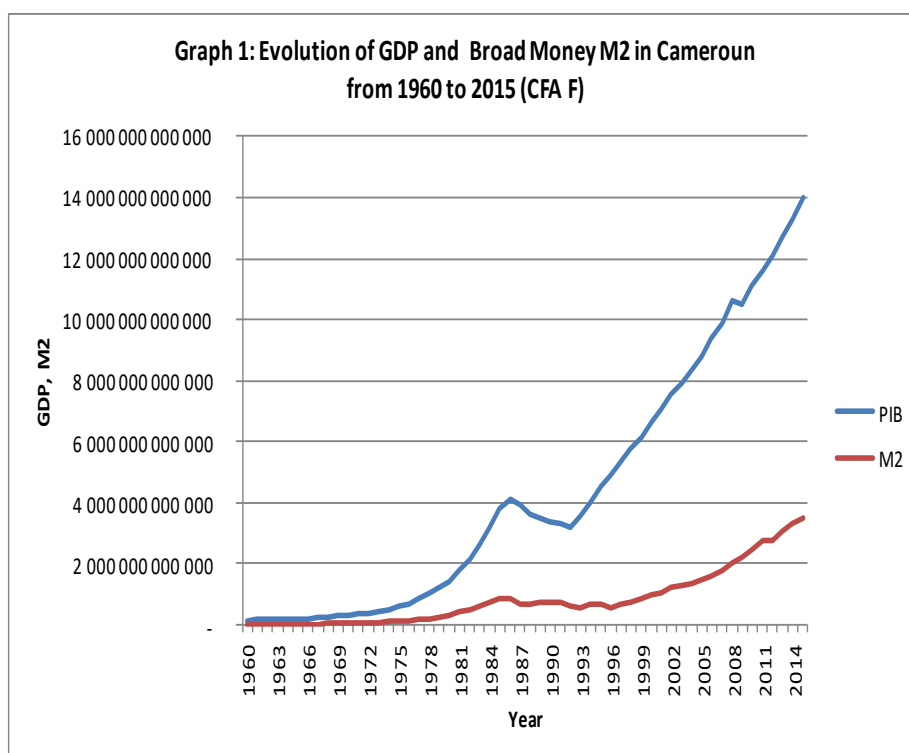
satisfy all its demands relating to the motives of transaction, precaution and speculation. And, as a production good, it must be used to satisfy the need for a provisional liquidity advance to stimulate the dynamics of investment in companies. The financial system must, autonomously, be able to generate enough money supply to achieve these financing objectives, and monetary policy must ensure this mechanism. But, this seems not to be the case in Cameroonian economy. Macroeconomic under-liquidity resulting from insufficient monetary creation is one of the consequences of monetary sub-optimality. It is chronically observed in the Cameroonian economy, thereby also explaining the lack of growth observed.

4.2.1. A high social cost of producing money

The golden rule of “Full Liquidity” is based on the assumption that the social cost of producing money is almost zero. However, in the African countries of the Franc Zone (ECOWAS, CEMAC), money is produced and issued at a high social cost, linked to the considerable limitation of national monetary sovereignty (mechanism of the operating account, management of central bank, etc.). This limitation of monetary sovereignty makes it difficult to realize the saturation of the transactional demand for money in Cameroon. The current monetary programming in the area appears to be a perfectible framework for optimal financing of the economies of CEMAC countries in general and Cameroon in particular. Indeed, like in most of the developing country, this economy is in a phase of increasing returns and should continue to refinance itself abundantly, in particular with the domestic monetary system, under the monetary impulse of the Central Bank. Failure to implement such a mechanism leads either to a monetary disequilibrium or to a sub-optimal monetary equilibrium, with rationing of economic agents, which negatively affects economic growth and development.

4.2.2 A sub-optimal monetary balance in Cameroon

In the case of Cameroon, facts and analysis reveal that productive capital and transaction cash are not sufficiently available. The marginal utility and the marginal productivity of money therefore remain positive (Friedman, 1969). In this case, the actual quantity of money held by individuals is below its socially optimal level. The requirement of “absolute liquidity” defined by Tobin is therefore not satisfied in this economy. The discrepancy observed in the long term, between the M2 money supply in circulation in Cameroon and the realized GDP is an edifying illustration of this by the Graph N° 1 above.



Sources: Author, based on data from the World Bank (WDI, 2016)

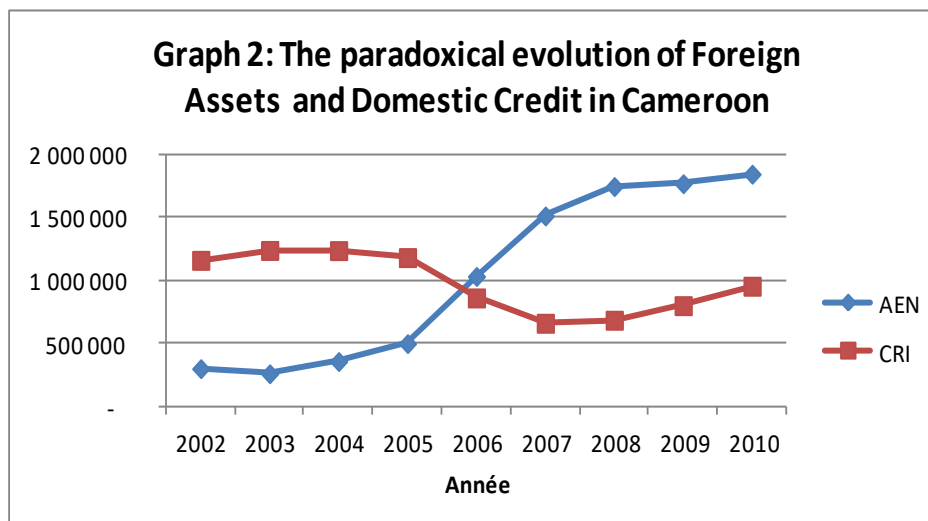
This graph N°1 is revealing of an increasingly growing gap between the money supply M2 and the quantity of wealth produced in Cameroon, which reinforces the idea of a non-optimal quantity of money in circulation in the economy. This should be remedied by correcting the conceptual shortcomings of the financial system, revising the monetary policy strategies and outdated managerial practices of the Central Bank. It is a question of adjusting the supply of money to its socially optimal level, responding both to the maximization of its marginal utility for consumers, and to the maximization of its marginal productivity for producers.

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4.2.3 Obstacles to optimal monetary policy in Cameroon

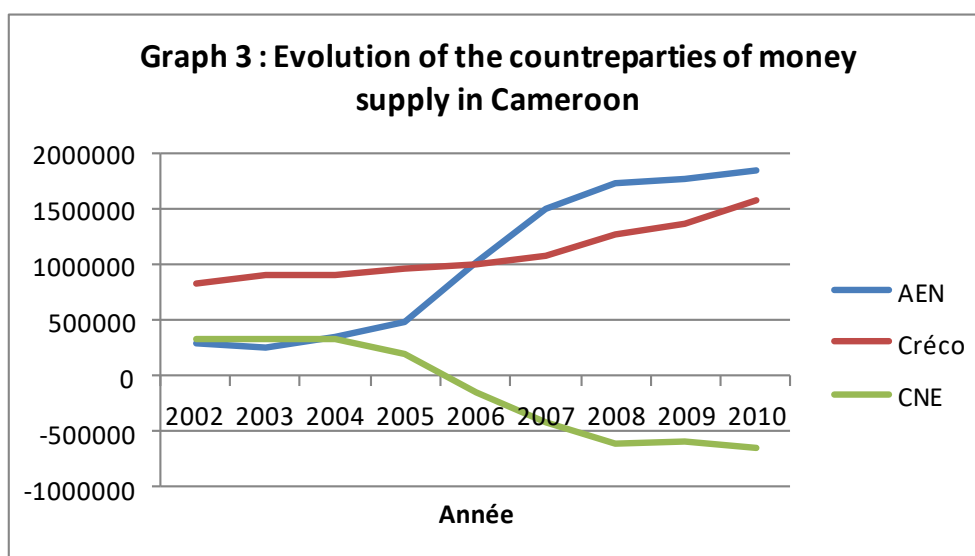
Two pitfalls hinder the optimization of the money supply by monetary policy: institutional rigidities and opportunistic monetary leaks leading to the non-satisfaction of the financing motive.

First, institutional rigidities on Net Foreign Assets seriously limit monetary policy sovereignty. With regard to Cameroon's net foreign assets, they are kept in the French Treasury within the framework of monetary cooperation, where there the principle of the operating account is applied. Why are the external reserves kept in an unpaid account abrought in an “operating account” when the credit to the economy, supposed to give an impetus to growth, remains insufficient? The following graph presents a recent paradoxical evolution of NEA and domestic credit (CRI).



Sources: Author, based on data from the Beac

Secondly, opportunistic monetary leakages they lead to the non-saturation of the demand for money in the Cameroonian economy. Thus, the money demand for the settlement of many real transactions having already taken place remains unsaturated.



Sources: Author, based on Beac data.

5. CONCLUSION

The objective of this work was to develop a specific model for determining the optimal amount of money to inject into a developing economy, in situation of asymmetric information, for a high level of growth, projected by decision-makers. Using a methodology based on the construction of a “monetary adjustment coefficient” (ratio between the potential growth rate and the effective growth rate), the evidence is made from Cameroon. The findings show a fairly considerable gap, of 30%, between the money supply, corresponding to the growth rate actually achieved, and the optimal quantity of money needed to achieve the desired growth rate. This optimal quantity of money appeared necessary for the saturation of the global demand for financing from economic agents. It

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corresponds to the potential growth rate. This finding is close to the conception of the optimal quantity of money as presented in the "Full Liquidity Rule" stated by Tobin (1969) and the theory of endogenous money supply as revealed by the Keynesian principle of the divider of credit. It is therefore important for the monetary authorities to take monetary policy measures to remove bottlenecks in the monetary circuit, in order to improve the institutional framework for the functioning of the central bank BEAC, specifically in Cameroon. The introduction of a "monetary adjustment coefficient" appears to be necessary in the formulation and the implementation of the BEAC's monetary policy. Similarly, the loosening of monetary policy and the use of unconventional instruments (quantitative easing, credit easing) are important for an efficient implementation of development policies in Cameroon.

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