

# An Econometric Analysis of the Nexus between Credit to the Private Sector, Inflation and Economic Growth: Case of Cameroon 1965 -2010

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## Abstract

This work is centered on bringing out the link between credit to the private sector, inflation and economic growth. When lending to the economy is insufficient, it poses a problem of slow growth and when credit to the economy is too high, it poses a problem of hyper-inflation. Using data from world development indicators, it employs a Vector auto regressive model involving a system of three equations, testing for the direction of causality amongst the variables using the VAR Granger causality block exogeneity Wald Tests. The results obtain shows that inflation has a positive and significant effect on growth, economic growth has a positive and significant effect on credit to the economy and credit to the economy has a negative and significant effect on inflation. Inflation granger causes economic growth, economic growth granger causes credit to the private sector and credit to the private sector granger causes inflation.

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*Index terms*— credit to the private sector, inflation, growth, monetary policy

## 1 Introduction

entral banks are of paramount importance in the development of the banking and financial system of a country. Their various tasks consist of : ensuring monetary emission thus setting interest rates; supervising the functioning of financial markets, ensuring the compliance to regulations associated to risks (solvency ratio) and to financial institutions (especially deposit banks) , acting as banker of last resort in the event of a systemic crisis.

According to the Annual Report of the BEAC (1992), in Cameroon, we can find out that the advances offered by the BEAC to commercial banks are not fully utilized (247,700,000,000FCFA uses against a ceiling of 310,400,000,000FCFA to June 30, 1992). This was confirmed by Fouda (2009) who revealed that despite the liberalization of the financial and banking sector in the early 1990s, banks keep holding excess liquidity, but sluggish credit is observed. Under the employment and growth strategy paper (EGSP), we noticed that from 2003 to 2008 (period of implementation of the poverty reduction strategy paper), the long term loans represent an average less than 3.5% of total loans. Yet the longterm credits are essential to the development of a sustainable growth in Cameroon.

Providing a level of credit to the economy that can be up to the growth and price stability objectives is a real task to CEMAC authorities. When the level credit to the economy is weak or insufficient to stimulate consumption and hence growth, it remains a problem, such as that of sub-inflation or suboptimal inflation. However, when they are too high, the risk of limiting the living standards of the population through inflation is very imminent. Research at the level of CEMAC have examined the impact of inflation on growth, for instance, Bikai and Kamgnia, 2011;Mantsie 2003;Engone, 2009). But to our knowledge, the joint and reciprocal influence of credit to the economy, inflation and growth which is nevertheless real in many developed and developing economies remains an unsolved problem in Cameroon. Showing that credit to the economy, inflation and growth are causal and mutually influential constitute a shade that is yet to be clarified within the context of Cameroon.

44 The objective of this study is to determine the links and potential effects existing between credit to the economy,  
45 inflation and economic growth in Cameroon. The significance of this study stems from the opportunities accruing  
46 from a high variability of three variables within an economic environment of positively stable fixed exchange rate  
47 regime.

48 The rest of our inquiry is structured around three sections, the first presents a review of the relevant literature,  
49 The second analysis the methodology and the econometric model, while the third section is devoted to results  
50 and conclusion.

## 51 2 II.

### 52 3 Literature Review a) Credit to the Economy and Inflation

53 The Modigliani (1986) -Miller (1991) theorem states that the equivalence of different funding sources dominated  
54 the literature in the late 1950s. During the particularly the information asymmetries and all their implications:  
55 there are many risk premiums, particularly in the external premium financing. He points out that the credit  
56 channel actually has two interlinked components: the channel that passes through the impact of changes in  
57 interest rates on the situation and the behavior of borrowers, and those interested in the impact of changes in  
58 interest rates on the behavior of lenders, particularly banks. He thus, stressed that the channel of credit rate is  
59 therefore generally not independent of the interest rate channel, and both play in the same direction to enhance  
60 the impact of monetary policy.

61 In addition, Cameroon is a member of CEMAC which is a segmentation of the franc area. All these countries  
62 have experienced a given period of excess liquidity of their banks. Thus, according to Fouda (2009), the fact that  
63 banks hold a certain volume of liquidity is theoretically justified by their liquidity insurance mission. But over  
64 the past fifteen years, liquidity holdings of the banks of the franc zone have been abundantly higher than what  
65 is necessary in fulfilling this mission and, paradoxically, the loans granted to the economy have been dropping.

66 According to Nubukpo (2003), since 1989, the monetary policy of the of Bank of West African States (BCEAO)  
67 is based on the increased use of market mechanisms, thus devoting to the option of a direct regulation of banking  
68 activity. A key role is granted to the interest rate which becomes the main instrument of monetary policy,  
69 particularly since the abandonment of the credit crunch that occurred in January 1994. He examined the impact  
70 of movements in interest rates of the BCEAO on growth and inflation between 1989 and 1999. He found out  
71 that interest rates negatively influence inflation and growth in the short run, but in the long run they positively  
72 influence growth and negatively influence inflation. Considering Boissieu (1990), we can talk of a relationship  
73 whose direction is to be determined between credit to the economy, inflation and growth.

74 The empirical evidence provided by Bullard (1995) tended to suggest that the strength of the relationship  
75 between liquid assets and inflation depends on the monetary measure used and the time horizon covered in  
76 the research. A broader set of factors offers surprising results whereas closer factors only lead to the balanced  
77 proportional theory, stipulated by the quantitative balance proportional relationship results. The extension of  
78 the sample size, especially when there is a series of monetary innovations, can lead to an important impact on  
79 the results.

### 80 4 b) Credit to the Economy and Economic Growth

81 The introduction of money in the new growth theories perpetuated a common divide between authors who  
82 believe that any monetary policy is doomed to failure and those who believe that, in the Keynesian tradition, an  
83 expansionary monetary policy can influence the level of activity. Modern literature on the subject date of work  
84 Tobin (1965) who showed that money is able to influence the level of economic activity by changing household  
85 portfolios. Money is considered as a financial asset. Given a certain level of wealth, the capital intensity of the  
86 economy (capital / head) depends on the distribution of this wealth between capital and money. In the event of a  
87 fall in the profitability of money due to inflation, economic agents will prefer to hold real assets in their portfolio,  
88 which will lead to a fall in investment and thus lower growth. Sidrauski (1967) is in a diametrically opposite  
89 opinion. He assumes that money enters the household utility function, because it provides a flow of services  
90 resulting from its detention. The results lead to the determination of the high neutrality of money. Money in  
91 this case would have no effect in the short-run on economic activity and in the long-run as well because it is not  
92 likely to influence the GDP growth level.

93 According to James (1970), money is a means of action. It is not just a "veil" or just a "medium of exchange"  
94 and a "standard of values", but a catalyst that promotes the growth of the economy, changes in the distribution  
95 of income and a "prime source of power." Beyond certain levels, the development of credit transactions leads to  
96 a rise in prices, without any positive effect on the level of economic activity. The monetary authorities must sit  
97 in order to determine the growth rate that is more consistent with the monetary equilibrium.

98 Peg (2003), of the Federal Reserve in St. Louis regresses changes in quarterly GDP growth in subsequent  
99 volumes to changes in interest rates on federal funds over the period 1962 -2002. He found out that a 1% increase  
100 in interest rates, leads to a reduction of 0.2% in the growth of quarterly activity within the next two years. On  
101 the other hand, a 1% decrease in interest rates on federal funds increases the growth of the real activity by only  
102 0.5% over the two years following the shock. We can observe an asymmetry in the response of the real economy  
103 to changes in monetary policy instruments, which apparently confirms the idea that the action of the central

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104 banks is slower in restoring According Boissieu (1990), it is to integrate the imperfections of the credit and capital  
105 markets, and economies from a recession than pushing them to overheat under an expansionary regime. The  
106 weak response of the economy to decreasing interest rate results from the fact that growth is first and foremost a  
107 Tallman and Chandra (1996) in the case of Australia, examined two systems of VAR variables (set of monetary  
108 factors and production), three systems variables (including inflation), four systems (including the interest rate)  
109 and five systems (including exchange rates). The authors found out that sets of monetary factors did not contain  
110 any important information to explain subsequent changes related to output growth or inflation. Goldsmith (1969)  
111 conducted a study using a multiple regression model to show the effect of domestic credit on the growth rate of  
112 GDP per capita. He concluded that domestic credit and the per capita GDP growth are positively correlated.  
113 De Regorio and Guidotti (1995) conducted a study on 100 countries for the period from 1960 to 1985 and  
114 the same study of 12 countries of Latin America for the period 1950 to 1985. They used a regression model to  
115 show the effect of credit on per capita GDP growth. Using domestic credit to the private sector as a percentage  
116 of GDP as an exogenous variable, they carried out the same study for 100 countries, and revealed that credits  
117 permitted an increase in the rate of economic growth for 12 countries in Latin America. The Credit granted to  
118 the domestic private sector was significant and negatively related to economic growth, due to liberalization within  
119 an environment poorly regulated by the government. Acaravci et al (2007) in Turkey conducted a study covering  
120 the period 1970 to 1992 using a dynamic time series model to determine whether there is a causal relationship  
121 between GDP growth and domestic credit granted by the banking sector. The result showed that in Turkey  
122 there is a one-way relationship between credits granted by the banking sector and economic growth, there was  
123 also an absence of a long-term relationship between these two variables. The Granger causality test showed that  
124 domestic credit granted by the banking sector led to economic growth in Turkey.

## 125 5 c) Inflation and Growth

126 The classical economists believe that in the short run, monetary impulses exert only limited effects on economic  
127 activity. According to them, household savings and investments of firms are not very responsive to changes in  
128 the interest rates. Thus, the proponents of this view believe that money is a veil, in other words, it is neutral.

129 However, according to the monetarists, monetary policy has an active role in economic growth. From their  
130 point of view, a restrictive monetary policy leads to lower relative prices of monetary, financial and real assets.  
131 This results to a change in aggregate demand which is consumption and investment, as well as cumulated real  
132 stocks. Thus Friedman (1968), considers that short-term variations in the quantity of money can have temporary  
133 real effects due to the initial price rigidity. But in the long run, under the assumption of price flexibility and labor  
134 markets, changes in the money supply have an effect on the general price level. Production and employment are  
135 not affected. Mantsie (2003), determined within the framework of CEMAC area, the effect of inflation nuisance  
136 on growth. He found out that there is an inflation rate below 4.75% in the CEMAC area. In the same vein,  
137 other authors such as Fisher [1993] working on panel data for 13 non-OPEC countries and for the period 1961  
138 1988, Barro [1995] working on data in longitudinal sections of 100 countries and three decades found an impact  
139 on the annual per capita growth respectively of -0.13% and -0.024% and of a 1% increase in inflation beyond the  
140 threshold potential.

## 141 6 III.

## 142 7 Methodology

143 The data used in this work are from a secondary source, originating from the annual publication of the World  
144 Bank, more specifically from the CD-ROM (WBI-2011). The study covers the period from 1965 to 2010. This  
145 choice is justified by the need to integrate the various evolutions in money and credit policies within the CEMAC  
146 area with a specificity accorded to the Cameroonian economy.

## 147 8 a) Variables i. The rate of inflation

148 In order to measure inflation, we use the example of Claus (1997) and Blix (1995) cited by Ngonne (2003),  
149 which is the GDP deflator. When searching the target level of inflation in the CEMAC zone for the latter,  
150 the relationship between the observed inflation measured by the GDP deflator, on one hand, economic growth  
151 and money supply, on the other hand. It provides information about the macro-economic stability and has a  
152 permanent effect on economic growth. Inflation as measured by the annual growth rate of the GDP implicit  
153 deflator shows the rate of price change in the economy as a whole. The implicit GDP deflator is the annual  
154 percentage change in GDP.

155 ii. The growth rate In order to consider growth, we use the natural log of real GDP as Fischer (1993) and Sarel  
156 (1996) cited by Mantsie (2003) when determining a threshold at which inflation is harmful to the economy. We  
157 also drew inspiration from Nubukpo (2003) who measured the impact of key interest rate on inflation and growth  
158 in the UEMOA area, and used the GDP deflator and the natural log of real GDP respectively to account for  
159 inflation and growth. The gross domestic product (GDP) at market prices is the sum total of gross value added  
160 by all resident producers in the economy plus (+) any product taxes and minus (-) any subsidies not included



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218 lending rates are too high in Cameroon leading to an increase in the cost of production. This is then transmitted  
219 to higher prices in the market.

## 220 12 c) Estimation of Model

221 The objective of the study is not being able to identify in their diversity, all the variables that influence inflation  
222 and growth, but to highlight the combined effects of credit, inflation and growth. That is why our exogenous  
223 variables are variables whose short-term variation is important.

224 These results are interpreted taking into account that each variable in turn is a dependent variable. When  
225 growth is a dependent variable, it is positively and significantly (at 5%), influenced by the growth rate with a lag  
226 period of 1. the inflation rate both at lag period of 1 and 2 influence GDP positively and significantly at 5% and  
227 1% respectively . So in Cameroon, current growth is significantly influenced by passed growth. The coefficient  
228 of inflation rate at lag 1 and 2 have positive signs showing that a short-term rise in inflation is challenging for  
229 growth because when prices rise in the short term, producers make profits on their stocks. But as stocks run  
230 out, they are forced to integrate different production costs in new stocks. Credits on the other hand have an  
231 insignificant effect on growth in the short term. The reason may be the non-significance of the same amount of  
232 credits and the low profitability of some investments due to poor monitoring of the implementation and finance  
233 of projects.

234 Furthermore, credit to the private sector is influenced positively and significantly at 5% by the GDP at a lag  
235 period of 2. This show the results of the previous companies are a key factor for future funding. The inflation  
236 rate meanwhile, has no significant effect on credit. If the effect of the change in the inflation rate is transmitted  
237 to interest rates, inflation could have an effect on supply.

238 About inflation as the dependent variable, it is found that growth has no effect on it. This is a satisfactory  
239 outcome to the extent to boost growth will have a significant impact on inflation; it will still increase lending to  
240 the economy. It is well noticed that there are still many opportunities available in terms of financing loans to  
241 run towards the objectives of growth and hence welfare of the people. Passed credits negatively and significantly  
242 affects inflation, since most loans are short term loans with high interest rates in Cameroon. Inflation lagged one  
243 period has a negative and significant effect on the current inflation rate. This result is satisfactory to the extent  
244 that past inflation increase current inflation in the short term. This is advantageous because in this case it is  
245 sure to increase funding in order to seek growth, stable framework, in order to increase growth in the long run.  
246 This is possibly the reason why Cameroon operates a fixed exchange rate regime with some western currencies.

247 The coefficients of determination are 0.32, 0.19 and 0.43 respectively for the variables growth, credit to the  
248 economy and inflation. They are all relatively small, but they do not have great importance for the objective of  
249 this exercise is to check the combined effects of the three variables. It was necessary for sacrificing the presence  
250 of other explanatory variables such as exchange rate, interest rate and many others.

251 For model appropriateness, autocorrelation is absent as shown by the Langrange-multiplier test. Both at lag  
252 1 and 2, the probabilities of 0.28 and 0.23 are all greater than the critical test statistics of 1%, 5% and 10%. Our  
253 VAR model equally satisfies stability condition since using the Eigen value stability test, all the eigenvalues lie  
254 inside the unit circle.

255 V.

## 256 13 Conclusion

257 Our study aimed at determining the joint effects of the credit to the economy, inflation and growth in Cameroon.  
258 We opted for two objectives stated as follows: To determine whether the three variables granger causes each  
259 other in Cameroon, and to determine the reciprocal joint effects of these three variables in Cameroon.

260 We drew some lessons: firstly, inflation causes growth rate which in turn causes the credit to the economy,  
261 which in turn causes inflation. Secondly growth is driven upward by the lagged growth and the lagged rate of  
262 inflation. Credit to the economy is stimulated to increase by an earlier growth. The inflation rate is driven down  
263 by the short term loans and past inflation rates. In a stable economy, short-term variations can be preserved  
264 for the benefit of the expected structural changes. The Cameroon fixed exchange rate regime has the advantage  
265 of easing economic stability thus permitting to seize the opportunities offered by funding policies or funding  
266 requirements. It is hence obvious that a less restrictive monetary policy in an environment where monetary  
267 authorities are independent (which would allow more effective action and policy control of the currency ) will be  
268 a good complement to the fiscal policy for achieving internal balance (full employment equilibrium) and external  
269 balance (balance between import and export). It is important to decide on the contribution to the development  
270 of various monetary policy instruments that have evolved within the CEMAC sub region. <sup>1</sup>

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Figure 1: Figure 1 :

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Dependent variables	TPIBR	TINFL	CE
Independent variables			
CE	+	+	? ±
TINFL	? ±	? ±	+
TPIBR	? ±	? ±	+

Source: Author, based on a literature review IV.

Figure 2: Table 2 :

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29. Sims C.A. : « A Simple Model for the Determination Lag Length: 1 (Automatic -based on SIC, max

L2D. 1	19.8856	11.482 9	0.27946	2.21
	10.9456			
2	11.6439			0.23414

ce Augmented Dickey-Fuller test statistic LD. .1933099 H0: no autocorrelation at lag order .14585 1.33

Augmented Dickey-Fuller test statistic Test critical values: 1% level 5% level Test critical values: 1% level  
10% level .0649404 Eigenvalue stability condition \*MacKinnon (1996) one-sided p-values. L2D. .0382486

Y \*MacKinnon (1996) one-sided p-values. Null Hypothesis: D(CE) has a unit root Null Hypothesis: D(TI

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( 26. Null Hypothesis: TPIBR has a unit root Exogenous: Constant, Linear Trend Lag Length: 4 (Autom

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271 [Gregorio] , De Gregorio , Jose , PabloE . *Guidotti Financial Development and Economic growth*

272 [Friedman and Le Rôle De La Politique Monétaire ()] , M Friedman , Le Rôle De La Politique Monétaire .  
273 *American economic review* 1968. LVIII.

274 [Sims et al. ()] , C Sims , Macroeconomics , Reality , *Econometrica* . 1980. 48 p. .

275 [Beac and Statistiques ()] , Etudes Beac , Statistiques . 1992. 301. (juil. -sept)

276 [Banque Mondiale, World Development Indicator ()] , *Banque Mondiale, World Development Indicator* 2007.

277 [Tobin et al. (1965)] , J Tobin , Economic Money , Growth . *Econometrica* October. 1965. 33 p. .

278 [Acaravci and Ozturk ()] ‘Acaravci « Finance -Growth Nexus: Evidence from Turkey’. S Acaravci , K Ozturk ,  
279 AI . *International Research Journal of Finance and Economics* 1450-2887. 2007. (11) p. .

280 [Adf Test At Level Form Null Hypothesis: TPIBR has a unit root Exogenous: Constant Lag Length: 4 (Automatic -based on SIC  
281 *Adf Test At Level Form Null Hypothesis: TPIBR has a unit root Exogenous: Constant Lag Length: 4*  
282 *(Automatic -based on SIC, maxlag=9) t-Statistic Prob,*

283 [Aiyagari and Gertler ()] S R Aiyagari , M Gertler . *The Backing of Government Bonds and Monetarism*, 1985.  
284 16. (juillet)

285 [Nubukpo ()] *efficacité de la politique monétaire de la banque des Etats de l’Afrique de l’Ouest depuis la*  
286 *libéralisation de*, K Nubukpo . 1989. 2003.

287 [Mckinnon ()] *et Shaw « Money and Capital in economic development », The brooking institution*, R I Mckinnon  
288 . 1973. Washington D.C.

289 [Shaw ()] *Financial deepening in economic development*, E S Shaw . 1973. New York: Oxford university Press.

290 [Goldsmith ()] *Financial Structure and Development*, Raymond W Goldsmith . 1969. New Haven, CT: Yale  
291 University Press.

292 [Modigliani and Life Cycle ()] *Individual Thrift, and the Wealth of Nations», AmericanEconomic Review*, F  
293 Modigliani , Life Cycle . 1986. 76 p. .

294 [Blix and Underlying ()] ‘Inflation: A Common Trend Approach’. M Blix , Underlying . *Sveriges Rikbank*  
295 *Arbetsrapport*, 1995. p. 23.

296 [Woodford and Price (1995)] ‘Level Determinacy Without Control of a Monetary Aggregate’. M Woodford , Price  
297 . *Carnegie-Rochester Conference Series on Public Policy* 1995. December. 43.

298 [ClausI ()] ‘Measure of Underlying Inflation in the United States’. ClausI . *Bank of Canada-Working Paper*,  
299 1997. p. .

300 [Miller ()] ‘Monetary Dynamics: An Application of Co-integration and EC Modeling’. S M Miller . *Journal of*  
301 *Money, Credit and Banking* 1991. 23 p. .

302 [Sarel (1996)] ‘Nonlinear effects of inflation on economic growth’. M Sarel . *Staff Papers. IMF* 1996. March. 43  
303 (1) .

304 [JamesE ()] *Problèmes monétaires d’aujourd’hui*, JamesE . 1970. Paris. 2.

305 [Piger ()] *Pushing On A String », Monetary Trends*, J Piger . 2003. Federal Reserve of St Louis, March. p. 1.

306 [Sidrauski (1967)] ‘Rational choice and patterners of growth a Monetary Economy’. M Sidrauski . *American*  
307 *Economic Review* 1967. May. 54 p. .

308 [Kahn and Knight ()] ‘Stabilization Programs in Developing Countries: A Formal Framework’. M Kahn , M  
309 Knight . *Macroeconomic Models for Adjustment in Developing Countries*, M Kahn, P Montiel, N Haque (ed.)  
310 (IMF, Washington D.C.) 1991. p. .

311 [Tallman and Chandra ()] *The Information Content of Financial Aggregates in Australia*, Reserve Bank of  
312 *Australia*, E W Tallman , N Chandra . 1996. (Research Discussion Paper No. 9606)

313 [Fischer ()] ‘The Role of Macroeconomic Factors in Growth’. S: « Fischer . *Journal of Monetary Economics* 1993.  
314 32 p. .

315 [Woodford (1997)] M Woodford . *Doing Without Money : Controlling Inflation*, 1997. September. 6 p. 188.  
316 (NBER Working Paper)

317 [Leeper ()] ‘« Equilibria under ’Active’ and ’Passive’ Monetary Policies’. E Leeper . *Journal of Monetary*  
318 *Economics* 1991. p. 27.

319 [Barro ()] ‘« Inflation and Economic Growth’. R Barro . *Bank of England Quarterly Bulletin* 1995. 35 p. .

320 [Boissieu ()] « *Politique monétaire* », *chapitre 46 de l’Encyclopédie économique, op. cit*, C Boissieu . 1990. de. p.  
321 .

322 [Keating ()] ‘« The Long-Run Relationship between Inflation and Output in Postwar Economies’. J , J W Keating  
323 . *Journal of Monetary Economics* 1995. 36 p. .

## 13 CONCLUSION

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- 324 [Bikai and Kamgna ()] ‘«Effets de seuils de l’inflation sur l’activité économique en CEMAC’. J L Bikai , Y S  
325 Kamgna . *Journées Internationales du Risque* 2011. p. .
- 326 [Mantsie ()] «*inflation et croissance dans les pays de la CEMAC*, R W Mantsie . 2003.
- 327 [Engone ()] «*la cible d’inflation en zone CEMAC*, S Engone . 2009.
- 328 [Fouda ()] «*la surliquidité des banques en zone franc : comment expliquer le paradoxe de la CEMAC ?* », in  
329 *revue africaine de l’intégration*, O J Fouda . 2009.