

Consequences of Monetary Depreciation on Houhehot Spending in Kinshasa (R.D.Congo) 2015-2017

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Abstract:

This work consisted in experimenting the theories on the currency while trying to work on the depreciation of congolese France vis-a-vis the foreign currency . This choice was moticated to enrich knowledge on the role that money play in the economy as heritage. And then try to apply social science theories and research methods in a specific context. It is a question of constituting a probability sample (simple random sample) of a set of household expenses for two periods. That of relative price stability on the market and that of the general increase in the exchange rate. After having established a correlation betweeen these two variables, we try to raise in percentage, of how muche the monetary depreciation influences the volume of expenditure of the househods. To do this, we will apply a paired sample test.

Keywords:

consequence; depreciation; monetary; expenditure; household

I. Introduction

As an economic phenomenon, monetary depreciation has been the subject of several scientific studies that should be reviewed in order to set an angle of attack on this subject in this work.

Wanting to raise the causes and consequences of inflation, Loumbi KABORE worked on the relationship between inflation and flow of food in the Lomé market in Togo. Having proceeded by an explanatory approach of these two phenomena, this researcher has been successful in the conclusion that following the loss of purchasing power of households caused by inflation, the sale of foodstuffs was decreasing function of the inflation rate. (L. KABORE, LOME 2016).

The author sought to establish a relationship between the depreciation of the Congolese franc and social tensions in the administration and public enterprises of the Democratic Republic of Congo. Through a descriptive and historical approach, he managed to demonstrate that strikes and public demonstrations often occur at periods of strong depreciation of the Congolese Franc against the US dollar. Following the results of his study, the author recommends the de-schooling of the Congolese economy through consistent monetary policies (K. LOMBE, UNILU 2015). Another study that caught our attention is that of LUHANGU KALOMBO. The latter sought to determine the influence of currency depreciation on women's contribution to household expenditure in the Kinshasa population. Having drawn a stratified sample of 500 households from different municipalities of the city with regard to the respective average standard of living, this researcher proceeded by a descriptive analysis of this situation by establishing a positive correlation between the two phenomena. He thus concluded that the more the Congolese currency depreciates, the more

women make efforts to contribute to household expenses by compensating for the loss of purchasing power experienced by the meagre salaries of the husbands. (L. KALOMBO, UNIKIN 2012).

As far as we are concerned, we return to the same subject in the Kinshasa context to try to see, in a descriptive approach, the consequences of the depreciation of the Congolese Franc on household spending in Kinshasa in general. The economic history of the country tells us that when Zaire was created as a currency, one Zaire was equivalent to two US dollars. The advent of the Congolese franc in 1998 reproduced the same experience in that, even if a Congolese franc was worth less than a dollar, the parity between this currency and the dollar was not so far away. When it appeared, one Congolese franc was equivalent to \$0.7 (J.C MASANGU 2014). But in less than 10 years, the Congolese currency depreciated to the point that the gap with the dollar had to be measured in terms of thousands of Congolese Francs to US dollars. This almost characterized economic instability is at the root of several social problems in Congolese households in general and Kinshasa in particular. Fuelled mainly by imports, the Congolese market sets prices in foreign currencies (more specifically in US dollars). Like any developing country, the economic dualism that characterizes the Congolese economy causes the confrontation between the industrial products of the modern economy and the agricultural products of the traditional economy. It is since the 1990s that the dollar has gained momentum as a reference currency on the Congolese market. Since then, the prices of goods and services have been set with reference to the parity between the Congolese franc and the US dollar. This reality is not without consequences on the functioning of the country's economy in general: foreign exchange reserves are generally insufficient, because of the marked imbalance in terms of trade, the Congolese franc is only losing value vis-à-vis the US dollar. This is called in economic jargon the depreciation of a currency against the foreign currency. This is one of the causes of several social tensions that the country has experienced in recent years. It will be recalled that between 2015 and 2017, the rate of the US dollar almost doubled and bringing with it an inflation rate higher than the forecasts of the central bank. But the salary envelope of the public administration has not changed. In view of this situation, we found it useful to focus our scientific curiosity on this subject to try to answer the following question: what is the impact of the depreciation of the Congolese Franc on the consumption expenditure of households in Kinshasa?

II. Review of Literature

At different times and in different contexts, several authors have defined money. According to MOUNIR SMIDA, money is an element of the physical heritage of an economy that allows the repayment of a debt and the settlement of a purchase. (MOUNIR SMIDA, University of Tunis, 2009). For BEZIADÉ M., money is any means of payment conventionally accepted in an economy for the delivery of goods or the settlement of debts. (BEZIADÉ M., *La monnaie et ses mécanismes*, Ed. La découverte, Paris 1992). One definition that caught our attention the most is that of AFLATION F. and PONCET P. According to these authors, money is the instrument of exchange that allows the immediate purchase of all goods, services and securities, without transaction costs or research costs and that retains the value between two exchanges. It is a social phenomenon because it is based on the confidence of agents in the system that produces it." (AFLATION F. and PONCET P., *Le monétarisme*, PUF, 1984). After these primary definitions of money, it is necessary to clarify this notion by defining it by its functions. Money can be defined by the functions it performs. It fulfils four essential functions: it is at the same time a unit of account, a means of payment, a store of value and an instrument of economic policy.

2.1. Money, Unit of Account

Money as a unit of measurement C_n is a numeraire good that allows the value of different goods to be expressed in a single unit. In the context of a barter economy, therefore absence of money, the value of a good is expressed in relation to other goods, we speak of relative prices, so if we have n goods, we have exchange ratio (relative prices). If among these n goods, one will play the role of money, thus ensuring the role of cash, the value of all goods will be expressed in relation to this currency, in this case we will have $n-1$ absolute price.

$$C_n^2 = \frac{n(n-1)}{2}$$

2.2 Money, Means of Payment

In this function, money appears as an intermediate good that makes it possible to dissociate the transactions of purchase and sale that are confused in the context of a barter system. It is an obligatory intermediary in exchanges, all goods are exchanged for money which, in turn, is exchanged for goods. R.CLOWER indicates that in a monetary economy, goods buy money and money buys goods, but goods do not buy goods. To ensure this role, the currency must be legal tender, it cannot be refused in payments. In a barter system, exchange can only take place if there is a double coincidence of needs, every agent must find not only someone who is willing to sell him the goods he seeks but also who accepts in exchange the goods that the agent has. As this double coincidence is likely to be exceptional, there will in fact be a blockage of the exchange. The introduction of money as an intermediary of exchanges thus makes it possible to split the barter operation in two and solve the problem of double coincidence.

2.3 Money as a Store of Value

Money makes it possible to build up a reserve of purchasing power from the moment when revenue and expenditure transactions are not synchronized. As soon as money is a medium of exchange, it is possible to keep it. Money makes it possible to spread purchases over time, it represents a link between the present and the future, it is a savings instrument. It should be noted that some assets may constitute a safer store of value than money. Nevertheless, the latter has the advantage of being the most liquid, it does not need to be transformed, it is used immediately in payments. But unlike other assets, the nominal return of money is zero, it is its quality of being liquid, without transaction costs, that makes economic agents hold it.

2.4 Money as an Instrument of Economic Policy

This function is relatively recent, it dates only from the beginning of the 20th century. Money is a powerful tool in the hands of public authorities because it can significantly influence economic activity. Monetary policy can serve the objectives of growth and price stability. (MONGI SMAILLI, ISG-TUNIS, 2012).

a. Money Supply Aggregates

Measuring the stock of money in an economy is equivalent to measuring the potential for immediate demand in the market for goods and services, that is, the total cash balances of resident non-financial agents at a given point in time. In concrete terms, measuring cash balances presupposes that we are able to share, in the assets of agents, what corresponds to a reserve of means of payment and what corresponds to a desire for sustainable savings. In other words, it is a question of distinguishing between monetary assets and financial assets. In an economy with poorly developed financial markets, this distinction is easy to make, whereas in an economy with highly developed financial markets, the rapid pace of financial innovation makes this distinction unclear: the transaction cost of moving from one asset to another has become very low. Currently, to measure the money supply, the monetary authorities of the

States have abandoned the institutional criterion (which refers to the institutions that manage the currency) to adopt a functional approach (it is the nature of the asset that is taken into account independently of the organization that creates or manages it). According to this second approach, the money supply represents all the means of immediate or deferred payments and financial assets, the conversion of which into currency does not involve a significant risk of capital loss, held by resident non-financial agents at a given time. To account for the money supply have constructed nested aggregates, from more to least liquid. There are four aggregates:

b. Money Supply in the Sense of M1 or Money Supply

$$M1 = MF + MS$$

MF = fiat money = notes and coins in circulation held by non-financial agents.

MS = scriptural money = demand deposits of non-financial agents with banks and the postal cheque centre (CCP).

c. Money Supply in the Sense of M2: Money Supply in the Strict Sense

$$M2 = M1 + QM$$

QM = quasi-money = liquid savings. For example, quasi-money includes term deposits, special savings accounts, and certificates of deposit

d. Money Supply in the Sense of M3: Broad Money Supply

$$M3 = M2 + EA$$

EA = assigned savings = $M3 - M2$. It is composed of housing savings, savings projects and investments and bond loans.

e. Money Supply in the Sense of M4

$$M4 = M3 + ATCN$$

ATCN = $M4 - M3$ = other negotiable debt securities which are composed of securities issued by the State to the public and commercial papers.

N.B: the State has stopped issuing transferable treasury bills on the money market since 1999. These have been fully reimbursed since 2003. From now on, the $M4 - M3$ aggregate is limited to commercial paper. On the basis of these criteria, the Central Bank of Congo (BCC) considers the $M3$ aggregate to be the most representative aggregate of the money supply and is chosen as the intermediate objective of monetary policy.

2.5. Currency Depreciation

a. The Foreign Exchange Market

In general, it is on the foreign exchange market that we talk about currency depreciation. Indeed, even if, for pedagogical reasons, part of the macroeconomic analysis continues to assume an economy operating in autarky (an economy unrelated to the rest of the world or an economy in which net exports are not counted in aggregate demand), the reality of the modern world is that the growth of a strong economy is essentially a function of the expansion of its external market. It is for this reason that the Western powers use all means to control the countries of the South which constitute for them outlets for their products. Thus, economic transactions between different countries are done through the exchange rate mechanism, since each country has a different currency from the other (except those that have opted for monetary unions such as the European Union, ECOWAS, etc.). According to AMOS FILBERT, exchange consists of the exchange of a monetary unit for a given quantity of another currency, the strength of the real economy (production of goods and services of each economy) determining the respective weights of currencies in exchange. (A. FILBERT,

International Trade, Paris 2012). Thus, the price paid by one currency to obtain a given quantity of another currency is called the exchange rate. The aggregate foreign exchange transactions carried out by an economy during a given period constitute the foreign exchange market of that economy.

b. Definition of Currency Depreciation

HUGO MARRA defines the depreciation of a currency as the negative fluctuation of a currency against the foreign currency or the increase in the quantity of money that an economic agent must have at his disposal to obtain one unit of a foreign currency. (M. HOGO, Money in the economy, Brussels 2003). For MARIE PAULLA, currency depreciation is the loss of value of one currency against another, expressed in exchange rate of units of two currencies. It is consistent either with the economic policies deliberately put in place by the authorities of the country concerned for certain objectives (in particular the marketing of products on the external market), or with cyclical economic dysfunctions in the economy concerned. (M. PAULLA, Brussels, 1998).

c. Some Practical Cases of Currency Depreciation in the DRC.

According to MBUKU MALALA, the independent Democratic Republic of Congo has mainly experienced two cases of glaring currency depreciation from 1960 to date: the one following the creation of the Zaire currency in the early 1970s and the one that occurred after the launch of the Congolese Franc in 1998. Indeed, at its creation, one Zaire was equivalent to 2 US dollars. But since this exchange rate was not supported by the growth of the real economy, 20 years later, in the early 1990s, one Zaire was equivalent to \$0.0000008333. Conversely, we can say that a dollar cost 12000000fc. This author continues that at the exit of the Congolese Franc on June 30, 1998, a cost was 1.40 Congolese Franc. But to date one must have 1600 Congolese francs to have one dollar. Over time, both socially and economically, this situation has had very negative consequences that have been the subject of several analyses.

2.6. Empirical Discussion

Exchange rate fluctuation is a hot topic in all modern economies. Thus, several studies have been devoted to this subject. MARCEL HONEL has studied the Chinese influence in the cost of African economies. Before reaching the conclusion that about 50% of the industrial products flooding the African market are of Chinese origin, he was able to demonstrate that African importers were losing nearly 2% of their purchasing power as a result of the use of dollars, which is the most accepted currency in international transactions. (H.MARCEL, Chinese economic power in Africa, Brussels 2015). LOKONDO ZOUGOU, a Central African subject tried to demonstrate the need to make the dollar the national currency of Central Africa. Decrying the economic and social consequences of the political unrest in Central Africa, he said that external interventions for the stabilization of the country caused the free circulation of the dollar on the market. In doing so, the population lost confidence in the FCFA. In view of the marked price volatility in the market, he proposed that the country adopt the dollar as its currency. (L. ZOUGOU, Bangui 2014). But as can be seen, this author's conclusion is too hasty because the situation he is deploying is only cyclical. In the Congolese context, MANDANDI LUKUBO showed that in periods of strong currency depreciation, household spending tries to increase because they anticipate the continuous rise in prices on the market. Having proceeded by a simple linear regression relating the demand for rice and the exchange rate of the Congolese Franc, he was able to show that a unit increase in the exchange rate of the Congolese Franc against the dollar leads to a more than proportional average increase in the quantities demanded for rice on the market. But as we can see, this researcher only made his analysis in the very short term because, elementary economic analysis

informs us that inflation caused by the rise in the exchange rate negatively impacts the purchasing power of households. KALUNGA MATUSILA also conducted an interesting analysis about the behavior of the local currency against the dollar and the social of households. Having considered what the consequences of the use of foreign currency would have on daily household expenditures, he proceeded by descriptive analysis and concluded that expenditures requiring the use of dollars as currency (e.g. foreign travel, transfers abroad, etc.), caused about 10% of households' purchasing power to be lost. This situation is due to the fact that as the exchange rate increases, the additional Congolese francs needed to buy dollars constitute an expense for the household insofar as it leads to the foregone of other daily expenses made in local currency. But we find that the claims made by this author on this subject can be the subject of much criticism. The least we say is that the methodological approach followed is not sufficient to reach credible conclusions. We also found it useful to talk about LUKOMBO LUABEYA who tried to establish a relationship between the evolution of the exchange rate and the price of transport in Kinshasa. Having noted that the average price of transport often varies following the increase in the price per litre at the pump following the depreciation of the Congolese franc against the dollar, he wondered what the impact of the increase in the price of transport would be on the social life of the people of Kinshasa. Following a compliance test of the average of a sample of a few households on the Kinshasa population, it concluded that the difference noticed between the average daily consumption expenditure of the Kinshasa household during a period of monetary depreciation and the average average daily consumption expenditure in normal times by all households was significant at 5%. As far as we are concerned, we opt for a Khi2 test to show the order of which the depreciation of the Congolese franc explains the variation in the social comfort of Kinshasa households.

III. Research Results

This is the essential part of the research whose primary task is to give the results of the study after analysis of the data collected.

3.1 Brief Overview of the Use of Foreign Currency on the Kinshasa Market

It was since the early 1990s that, following the hyperinflation experienced by the country's economy (the Zairean economy at the time), the dollar began to be legal tender in the economy of the DR-Congo. Indeed, the marked crisis of this economy has spread to all sectors of national life to the point that most products, even everyday consumer products, are imported from abroad. As everyone can see, most of the food products that ensure the lives of Kinshasa come from abroad: from rice from Pakistan to fish from Zimbabwe commonly called Mpodi, see corn flour from Angola (Lufu) to onions from Turkey, the diet of the average Congolese is mainly imported from abroad. The scarcity of these products in the economy of DR-Congo causes not only the permanent increase in their prices on the market, but also and above all the demand for foreign currency by importers who buy them from abroad. The instability of prices on the market accentuates the lack of confidence in the national currency, savers and importers resort to the US dollar (the most used foreign currency on the international market), to take advantage of one of the roles of the currency which is to serve as a store of value.

Thus, all households follow the evolution of the exchange rate on the market on a day-to-day basis to make rational decisions on their spending choices. On the market, it is with reference to the dollar that prices are set in Congolese francs. It is common to hear a trader say: "the exchange rate has gone up, so I have to raise prices". In other words, since the national currency has depreciated, the trader adjusts his prices to this depreciation. It is the cost

of this price adjustment by traders following the depreciation of the Congolese franc that we try to determine in this article following the analysis of the data we present below.

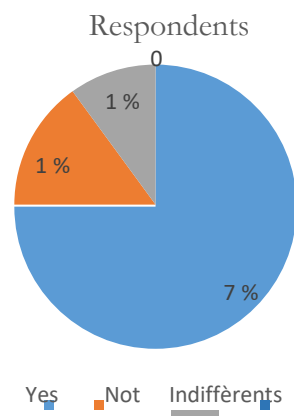
3.2 Study Data

As announced in the introduction, we conducted a sample survey of 100 households randomly selected from the population of Kinshasa to collect data from this study. At first glance, this sample can be considered unrepresentative in view of the large population of Kinshasa households numbering in the millions. But our sample being the average Kinshasa, we did not find it useful to expand the sample too much being convinced that this population has more or less the same characteristics. Thus, the following few questions made up the questionnaire we sent to respondents:

Question 1 :

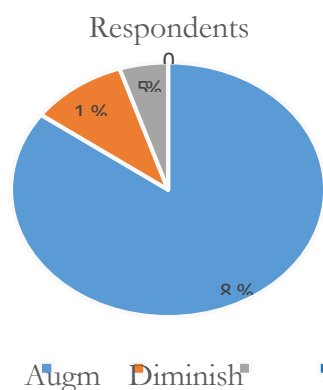
Do you think that the pricing of goods and services on the Kinshasa market follows the evolution of the exchange rate of the US dollar against the Congolese franc?

To this question, of the 100 households interviewed, 75 or 75% recognized that the fixing of prices on the Kinshasa market depends on the evolution of the exchange rate of the dollar against the Congolese franc. 15% believe the opposite and 10% expressed indifference.



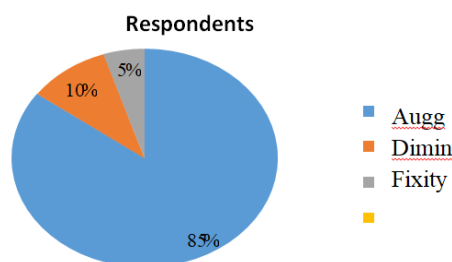
Question 2 :

Do you think that the exchange rate of the dollar against the Congolese franc causes the increase, decrease or fixity of prices on the market? On this question, 85% of respondents or 85 people said that the exchange rate is the basis for the increase in prices in the market, 10% or 10 people thought the opposite while 5% remained indifferent.



Question 3 :

Do you think that the increase in prices caused by the increase in the exchange rate increases decreases or has no impact on your daily consumption costs? 92% of respondents, or about 92 out of 100 households, said they used to downgrade their consumer spending during the period of overheating of the foreign exchange market, 5% or 5 people said they were not in the habit of lowering their consumer spending as a result of the positive price change due to the increase in the exchange rate and 3% expressed their indifference.



Question 4 :

On average, how many Congolese francs can you estimate your daily consumption expenditure in times of inflation caused by the rise in the exchange rate?

Table 1. Breakdown of data on average household expenditure during periods of exchange rate increases. (The figures in this table are in thousands of Congolese francs)

4	6	9	12	4	6	15	10	12	6	15	15	6	17	4	12	6	9	4	6
10	12	4	4	10	12	12	15	11	17	4	14	4	6	13	9	10	9	10	16
15	12	12	9	10	12	15	12	11	11	11	13	12	15	9	9	10	14	9	10
12	15	12	15	12	9	9	16	15	9	12	9	15	9	6	6	15	6	10	10
6	12	6	12	15	16	10	13	11	12	13	12	15	12	12	12	11	15	10	15

Source: Central Bank of Congo, data from the public sector treasury plan

Question 5 :

On average, how many Congolese francs can you estimate your daily consumption expenditure in times of relative price stability?

Table 2. Breakdown of data on average household expenditure in periods of exchange rate stability. (The figures in this table are in thousands of Congolese francs)

7	9	12	15	7	9	18	13	15	19	18	19	23	20	7	15	9	12	7	9
13	15	7	7	13	15	15	14	19	15	15		7	9	23	12	23	12	13	19
18	15	23	12	13	15	15	19	19	20	20	23	19	18	12	12	13	19	12	13
15	18	15	18	15	12	12	19	18	12	15	12	18	12	9	6	18	9	13	13
9	15	9	15	18	19	13	20	20	15	20	15	18	15	20	15	19	18	13	18

Source: Central Bank of Congo, data from the public sector treasury plan

3.3 Brief Description of the Method Used to Test the Assumptions and Visualization of the Data

a. Brief Description of the Method

To test the hypotheses of this study, we decided to compare the average daily expenditure level of households over two periods: a period of price stability and a period of exchange rate increase. To achieve this, the sample size being quite large (n = 100) and given the other characteristics of these data as listed below we opted for a test on matched samples.

As detailed below, the test on matched samples is performed to attest to the effect of a given phenomenon on any statistical population. For our case, it is a question of seeing if the rise in the exchange rate has a negative effect on the social comfort of the Kinshasa population and determining what this comfort is. Thus, it is on the average of differences in data series of two periods that we will apply a z-test (given that the sample size is much greater than 30) to find the P-value that will be confronted with the threshold $\alpha = 5\%$.

b. Visualization of the Distribution

Before proceeding to the hypothesis test, we remind you that the z-test is applicable under the following conditions:

- the variable studied must follow a normal distribution;
- the variable studied must be quantitative;
- The sample size must be greater than 30.

Since the last two conditions are previously checked, we first check the first one and then apply the test. Indeed, the verification of the normality of a distribution is done either by informal tests (graphic observation), or by formal tests (JB, STUDENT, and others ...), under the conditions of their respective realizations. In this work, the graphical representation of the distribution was sufficient for us to attest to the normality of the distribution. Thus, we visualized the data of our study by the Boxplot or mustache box and the probability density of each of the two series. It is on the **R** software that we applied the plot command which gives us the following results:

1. Boxplot or Mustache Box for the Period of Exchange Rate Stability (PS)

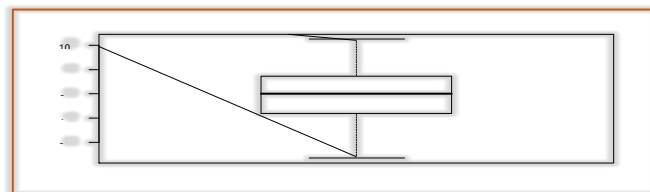


Figure 1. PS Series Boxplot or Mustache Box

Source: Our investigation into R software

Note: the Boxplot indicates the normal distribution if the small rectangle inside is roughly divided by 2. That is, the small bar that divides this rectangle corresponds to the midpoint of the graduation to the left of the large rectangle that surrounds the small one that is in the middle. Queux extending on two sides (lower and upper) of the small rectangle indicate possible outliers. In the case of space, our distribution has no outliers. This is due to the homogeneity of the population studied. There would be outliers, we would find points at the end of these queux. This box thus confirms the shape of the distribution of PS.

2. Probability Density for the Period of Exchange Rate Stability (PS) density.default(x = PS)

N = 120 Bandwidth = 0.4481

According to THIERRY ANCELL, an exactly normal distribution is only an ideal. It is rather the trend of distribution that matters. (A. THIERRY, La Bio statistique, Paris 2014). The shape of this probability density curve is not exactly normal but follows a trend of a normal distribution. Finally, the probability density clearly shows the shape of the PS distribution. The same exercise on PHT data yields the results as shown in the graphs below.

3. Box Plot or Mustache Box for the Period of Exchange Rate Rise (PTH)

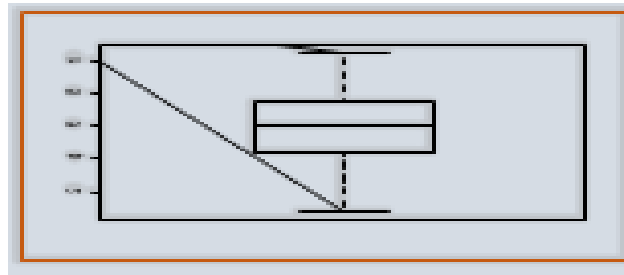


Figure 2. SP Probability Density
Source: Our investigation into R software

4. Probability Density for the Period of Exchange Rate Rise (PHT) density.default (x = PHT)

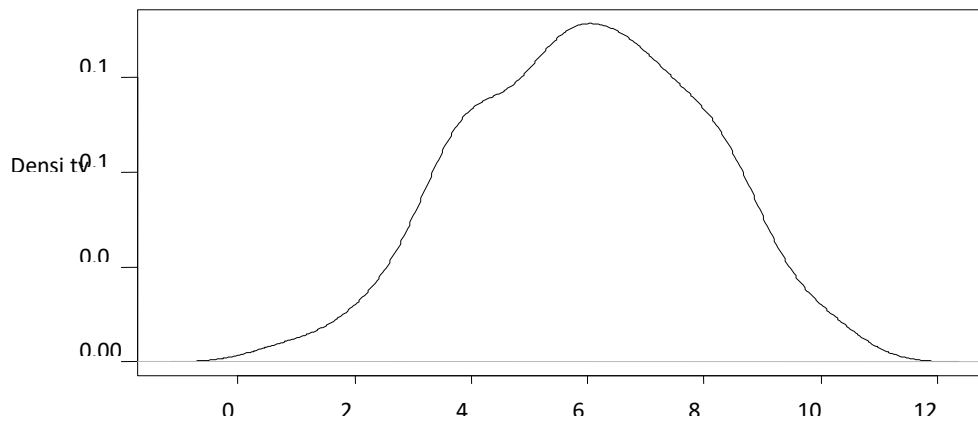


Figure 3. PHT Frequency Boxplot
Source: Our survey based on the R software survey

N = 120 Bandwidth = 0.6238

3.4 Data Presentation and Analysis

This is the essential part of my research. It is a question of applying all the methodological approach announced above to arrive at the results of the study that will make it possible to answer the research question. Thus, in this point, it is a question of: Organize the data collected to output the characteristic values (parameters) that will be the subject of the analyzes; Analyze study data by a student's test on matched samples; Discuss results of analyzes; Show the real implication of these results in the context of the study; And finally, to make a self-criticism on the methodological approach used to arrive at our results to open a field to further research. Each of these items as listed is the subject of a section.

a. Presentation of Data

Table 3. Distribution of Data on Average Household Expenditure during Periods of Rising Exchange Rates

X_i	f_i	$X_i f_i$	$\bar{X} - X_i$	$(\bar{X} - X_i)^2$	$f_i(\bar{X} - X_i)^2$
5	8	40	5	25	200
6	10	60	4	16	160
7	12	84	3	9	108
8	13	117	-2	2	52
10	14	140	0	0	0
12	13	156	-2	4	52
13	12	156	-3	9	108
14	10	140	-4	16	160
15	8	120	-5	25	200
Σ	100	1013	0	110	1040

Source: Our calculations using E. Views 7.

Essentially only needing the mean as the centrality parameter and the standard deviation as the dispersion parameter, we calculate them as follows:

- $\bar{X} = \frac{\Sigma f_i x_i}{N} = \frac{1013}{100} = 10,13 = 10$
- $\sigma^2 = \frac{\Sigma f_i (\bar{X} - X_i)^2}{N} = \frac{1040}{100} = 10,4$
- $\sigma = \sqrt{\sigma^2} = \sqrt{10,4} = 3,2$

Source: Microeconomics Course

Table 4. Distribution of Data on Average Household Expenditure during Periods of Exchange Rate Increases

X_i	f_i	$X_i f_i$	$\bar{X} - X_i$	$(\bar{X} - X_i)^2$	$f_i(\bar{X} - X_i)^2$
13	7	91	-5,4	29,16	204,12
12	9	108	-4,4	19,36	174,24
11	12	132	-3,4	11,56	138,72
10	10	100	-2,4	5,76	57,6
8	16	128	-0,4	0,16	2,56
6	14	84	1,6	2,56	35,84

5	12	60	2,6	6,76	81,12
4	9	36	3,6	12,96	116,64
3	7	21	4,6	21,16	148,12
Σ	100	760		109,44	958,96

Source: Our calculations using E. Views 7.

- $\bar{X} = \frac{\Sigma f_i x_i}{N} = \frac{760}{100} = 7,6 = 7,6$
- $\sigma^2 = \frac{\Sigma f_i (\bar{X} - X_i)^2}{N} = \frac{958,96}{100} = 9,6$
- $\sigma = \sqrt{\sigma^2} = \sqrt{9,6} = 3,1$

Source: Courtof Mathematical Statistics

One of the conditions for applying the matched sample test is the homoscedasticity of variances. We find that at 1 hundredth loan, the variances of two series are the same. This encourages us to move on to the next step where we calculate the differences on which we will apply the test statistic.

Table 5: Distribution of Data on Differences from Two Previous Series Previous.

D_i	f_i	$f_i D_i$	$D_i - \bar{D}$	$(D_i - \bar{D})^2$	$f_i (D_i - \bar{D})^2$
-8	7	-56	10	100	700
-6	9	-54	8	64	72
-4	12	-48	6	36	72
-2	10	-20	4	16	160
2	16	32	0	0	0
6	14	84	-4	16	224
8	12	96	-6	36	432
10	9	90	-8	64	576
12	7	84	-10	100	700
Σ	100	208			2936

Source: Our calculations using E. Views 7.

- $\bar{D} = \frac{\Sigma f_i D_i}{N} = \frac{208}{100} = 2,08 = 2$
- $\sigma^2 = \frac{\Sigma f_i (\bar{D} - D_i)^2}{N} = \frac{2936}{100} = 29,36$
- $\sigma = \sqrt{\sigma^2} = \sqrt{29,36} = 5,42$

Source: Courtof Mathematical Statistics

b. Analyze Data

has. Hypothesis Testing

As a reminder, we start from the following assumptions:

- H_0 : The rise in the exchange rate of the dollar against the Congolese franc has no effect on the social comfort of Kinshasa. Otherwise, the difference in average daily expenditure averages between two periods is not statistically significant.
- H_1 : The rise in the exchange rate of the dollar against the Congolese franc has a negative effect on the social comfort of the people of Kinshasa.

$$T = \frac{\bar{D} - \frac{2}{5,42} - \frac{2}{5,42} - \frac{4}{5,42}}{\frac{\sigma}{\sqrt{N}} \sqrt{1002}} = 0,738$$

The test statistic is 0.738. Any statistical test consists of calculating the probability of wrongly rejecting the null hypothesis (H_0). At this level, we use table to compare the calculated value to the table value to make the decision. As can be seen, the value in study follows Student's law. With $n=100$ and at the standard threshold of 5% the table of student's law gives 1.9719. In principle, if $T_{cal} > T_{table}$ we reject the null hypothesis. It can be seen that $0,738 < 1,9719$. As a result, the average daily expenditure of Kinshasa households during periods of exchange rate increases is different from the average daily expenditure of Kinshasa households during periods of exchange rate stability. We therefore reject the null hypothesis (H_0). There we did a bilateral test. But when asked whether households spend more than in times of rising exchange rates than in times of stability, we need to make a one-sided test. The difference with the first is that here we indicate the meaning of the difference. At that time, the threshold value of the probability of being wrong if one rejected the null hypothesis will be. At this threshold and the sample size equal to 100, the statistical table of Student's Law gives 2.3451. It can be seen that the $T_{cal} < T_{table}$. This suggests that in times of rising exchange rates, households spend more daily than in periods of exchange rate stability. As the basic income remains unchanged, households are forced to forego certain current expenses that determine their social comfort at a given proportion. The conclusion is therefore that the rise in the exchange rate lowers the social comfort of households. $\frac{\alpha}{2} = \frac{0,05}{2} 0,025 <$

3.5 Discussion

All of the above, it is necessary to consider closely the analysis of the data by the comparative approach as described above, we have come to reject the null hypothesis. In this case, this means that the difference in average household daily consumption expenditure is statistically significant. More specifically, in times of rising exchange rates, households spend more daily than in times of exchange rate stability. But like any statistical inference procedure, these results are questionable. To the extent that, the matched sample test we used only described the situation without clearly outlining the magnitude or impact of the exchange rate fluctuation on the social comfort of Kinshasa households. Several implications can be drawn from the results of our study. From this multitude, we can dwell on the economic and social implications.

IV. Conclusion

Finally, to experiment our little knowledge on economic theories (especially on money in the economy) and on research methods in the social sciences, we have chosen in this research, to focus our scientific curiosity on the depreciation of the Congolese Franc against the US dollar and its consequences on the social life of Kinshasa households. The reader may

retain that the depreciation of a currency is the negative fluctuation of a currency against the foreign currency or the increase in the quantity of money that an economic agent must have at his disposal to obtain a unit of a foreign currency. An explanatory approach to the social comfort variable by the variation of the exchange rate would be more appropriate to answer this question, which remains unanswered. Another questionable element of these results is the sample size that we have adapted to our working conditions. Indeed, the standards of statistical inference would require that the sample be at least 30% of the population under study. Given the homogeneous nature of the Kinshasa population, we were satisfied with 100 households to make our analyses. While this may be tolerated in some cases, it must be recognized that this approach has the effect of reducing information. But never mind, the results of this study have all their credibility insofar as they were obtained following a known classical methodological approach.

The economic implications being multiple in this research, we have limited ourselves to quoting and explaining the most traditional according to classical economic analysis: the reduction in aggregate demand due to the erosion of the purchasing power of households and therefore the reduction of overall supply; the decrease in savings, thus reducing overall investment; to name a few. Indeed, macro-dynamics (economic growth) indicates that savings finance investment. As the latter diversifies the economy and increases national wealth, its effects spread to several aspects of economic activity. In particular, the broadening of the tax base that feeds public revenues allowing the public authorities to finance their actions and public infrastructure. The latter generate private investment and increase economic activity. As can be seen, a virtuous circle of growth is created by the health of household purchasing power. But the fluctuation of the exchange rate negatively impacting this purchasing power, in the long term, it is the opposite that happens. The social implications flow from the economic implications. The main social implication that can be drawn from these results is the one highlighted above: the decrease in the social comfort of households in all its diversity. Indeed, primary needs (food, housing, health care, clothing, schooling...); luxury needs (average transport, leisure, etc.); the standard of living of the average Kinshasite is very low. Several studies have shown this in the past and there is no need to return to it. Until proven otherwise, these results are only valid in the context of Kinshasa. Although spread over a period of at least three years, this study focused only on the fluctuation of the exchange rate in the market as a determinant of the purchasing power of Kinshasa households. However, basic economic analysis indicates that several other cyclical factors can explain the variation in the purchasing power of households over time and space. But for logistical reasons and the means to be studied, this analysis has been done and now everything else being equal. Future studies may extend this analysis to other factors that have not been taken into account. After applying the student's T-test to matched samples, we came to the conclusion that the difference in the average level of household consumption between the two study periods is statistically significant.

In particular, we suggest to the political monetary authorities as well as the Congolese government the following:

- Multiply efforts on the recovery of the economy through the agricultural sector;
- To continue to ensure the improvement of the business climate, with a view to the appreciation of the national currency on the foreign exchange market and consequently to the reduction of the inflation rate;
- Strengthened the decision recently launched on the new exchange regulations, which are full of measures to enhance the national currency in order to succeed in the project of de-dollarization of the economy on which the government and the Central Bank have embarked.

Before concluding this conclusion, we would like to emphasize here that we do not claim to have emptied all aspects of the issues related to our problem. Limited in time, space and scope of the subjects covered, this study, which is not intended to be exploratory, leaves the door wide open for other research that can replicate or broaden it. So we invite all interested people to get involved.

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