International Journal of Economics and Financial Research
ISSN(e): 2411-9407, ISSN(p): 2413-8533
Vol. 5, Issue. 5, pp: 100-105, 2019
URL: https://arpgweb.com/journal/journal/5
DOI: https://doi.org/10.32861/ijefr.55.100.105

Academic Research Publishing Group

Original Research Open Access

The Determinants of Inflation in West Africa

Diabaté Nahoussé
Department of Economics, Alassane Ouattara University, Bouaké, Côte d'Ivoire

Abstract

The objective of this study is to identify the determinants of inflation in West Africa, mainly in the WAEMU zone, in order to contribute to improving the conduct of monetary policy. The equation of the exchange of the Quantitative Theory of the Currency and the generalized method of moments (MMG) in dynamic panel is used. Annual data concerning six countries in West Africa and range from 1991 to 2015. The results of the estimation show that in addition to the economic growth rate and the money supply, the devaluation has a significant effect on inflation. As we can see, inflation is not systematically a monetary phenomenon in West Africa. The authorities must therefore seek to determine the optimal threshold for the rate of increase of the money supply.

Keywords: Inflation; West Africa; WAEMU; Monetary policy; MMG.

1. Introduction

Inflation creates instability, unrest and anxiety as it distorts the economic decision-making process and is an obstruction to economic growth (Ftiti, 2010). But the questions about the causes of inflation are vast. Indeed, so-called monetarist economists, such as Friedman (1963), state that "inflation is always and everywhere a monetary phenomenon" in the sense that any increase in the quantity of money put into circulation is followed by a surge in prices. For monetarists, banks are considered influential players in rising prices. They see money as the sole cause of inflation. For these authors, banks participate in the process of inflation by the flow of additional purchasing power that they inject into the economy. And this through the credits they grant to economic agents. The assumptions of the monetarists are at the base of the various formulations of the quantitative theory of the currency given by Fisher in 1911 and the economists said of the school of Cambridge.

As for Keynesian approaches, inflation is a macroeconomic phenomenon. It comes from multiple reactions or interactions between variables of the economic circuit. In Keynesian theory, inflation is due to an imbalance between aggregate demand and the global supply of money. This is called inflation by demand. Another approach according to Keynesians considers that inflation can come from a growth of the remuneration of the factors of production higher than that of their productivity; we talk about inflation by costs. The New Phillips Keynesian Curves (NCPK) present current inflation as a linear function of expected inflation and output gap (Output Gap). The NCPK identifies three main determinants of inflation: the output gap, expected and / or delayed inflation, and supply shocks. Keynesians also commented on growth inflation. Their explanation is to consider that inflation is a more or less inescapable result of economic growth and wage increases that it generates. As a result, the risk of inflation only exists in a situation of full employment and is a consequence of economic overheating.

Among psychologists, one of the primary causes of inflation are expectations. For them, individuals are convinced that the process is cumulative and endless. They also consider mimetic contagions as determinants of inflation.

As for the regulationist theory, the economic and political institutions of a country can also be considered as influential factors of the price surge through what it calls the mode of regulation.

This theoretical divergence seems to be confirmed in the empirical work. Indeed, several studies have been conducted to shed light on the implementation of monetary policy. This empirical work has identified the determinants of inflation. Indeed, Musa and Yousif (2018) model the determinants of inflation in Sudan using the GMM method for the period 2000-2017 in order to contribute to the formulation of an effective policy to reduce the rate of inflation.

Their work shows that the increase in the money supplies and the reduction of the exchange rate lead to an increase in the rate of inflation. However, the increase in gross domestic product, the unemployment rate and government spending are leading to a fall in the inflation rate in Sudan. Sriyana (2018), analyzes the determinants of inflation in the Yogyakarta region of Indonesia in the short and long term. He finds that the determinants of inflation in Yogyakarta are the minimum wage, economic growth, and currency variables indicated by the exchange rate. It also confirms the non-neutrality of the wage on price variations. Kuje *et al.* (2017), examine the determinants of inflation in Nigeria from 1981 to 2010. The results of their study confirm that inflation is a monetary phenomenon in Nigeria. Eftekhari and Kiaee (2015), study the influencing factors of inflation for a panel of countries available in the World Bank database for 2008-2012. For this purpose, logistic logarithmic models with random effects and ordinal logistic are used for the analysis. The results of the two models show that monetary growth, GDP, oil prices and income levels of available countries are important determinants of expected inflation. Ochieng *et al.* (2016), analyze the determinants of inflation in Kenya's economy. The study concludes that real GDP growth, price fluctuations (changes in oil prices) and the inflation rate of the previous period (lagging inflation rate) are the ideal drivers of

inflation in Kenya. Rahimov *et al.* (2016), assess the main determinants of inflation in Azerbaijan during the years 2003-2015. They use quarterly data on the Consumer Price Index (CPI), the trading partner CPI, the nominal effective exchange rate (NEER), the money supply (M2), the real gross domestic product (PNGD) and credits to the economy. VAR modeling is employed. The analysis of the impulse response and the decomposition of the variance suggests that inflation is mainly due to foreign inflation, fiscal policy, the exchange rate. On the other hand, they find that among the variables, inflation expectations, foreign inflation and monetary policy (credit variable) have a rapid effect on headline inflation, while the effect of the budget variable is relatively slower (two quarters). They also find that the appreciation of the exchange rate has a deflationary effect on domestic inflation. Bikai *et al.* (2016), identify the determinants of inflation in the CEMAC with a particular look at the money supply. Using a panel VAR model over the period from 1990 to 2014, they show that the money supply and imported inflation better explain the price evolution in the CEMAC than the price of oil or the output gap. Specifically, fluctuations in inflation are due to about 24% of money supply growth compared to about 6% for imported inflation. However, they observe a very strong inertia of inflation (64% on average), reflecting structural problems and particularly a slow adjustment of expectations of economic agents. Edward and Ramayah (2016), focus on the determinants of inflation in a few Southeast Asian economies, namely Singapore, Malaysia and Indonesia. The independent variables selected include money supply (M2), oil prices and the nominal exchange rate. This document uses the ordinary least squares method. Overall, the results show that money supply (M2) is a significant predictor of inflation in the three countries studied, in line with Milton Friedman's proposal. On the other hand, oil prices are only a significant predictor of inflation in Singapore and Indonesia. Lim and Sek (2015), examine the factors influencing inflation in two groups of countries (high inflation group and low inflation group) using annual data from 1970 to 2011. An error correction model based on Autoregressive Time Delayed Modeling (ARDL) was used to analyze the short- and long-term impact of each variable on inflation. The results indicate that GDP growth and imports of goods and services have a significant long-term impact on inflation in low-inflation countries. The results also indicate that money supply, domestic spending and GDP growth are the long-run determinants of inflation in high-inflation countries. In the short term, none of the variables influences inflation in high inflation countries. However, money supply, imports of goods and services, and GDP growth are significantly related to inflation in low inflation countries. Anfofum *et al.* (2015), examine the main determinants of inflation in Nigeria for the period 1986-2011. VAR modeling was used. The results show that fiscal deficits, the exchange rate, imports of goods and services, money supply and agricultural production have a long-term influence on the inflation rate in Nigeria. Only the loan rate influences inflation in the short and long term. According to their study, inflation in Nigeria is obviously influenced by fiscal and monetary policy. Ruzima and Veerachamy (2015), examine the influence of government spending, the import of goods and services, population growth, agricultural production and foreign direct investment on inflation. The time series for the period 1970-2013 were used. Ordinary least squares (OLS) is used to estimate the model. They find that agricultural production and the import of goods and services are the main factors of inflation in Rwanda. Population growth is statistically significant and negatively correlated with inflation. Ndilkodje (2015), analyzes the determinants of the consumer price index in the Democratic Republic of Congo. It is based on a methodology that progressively combines a unit root test, a cointegration test and the use of an error-correction vector model. He came to the conclusion that devaluation is a major factor of inflation.

Thus, placed at the heart of the economic debate, the control of inflation becomes a major concern of the authority responsible for economic policy, in general and monetary in particular. The monetary authorities of the Economic and Monetary Union of West African States (UEMOA) are not left behind. Indeed, the Central Bank of West African States (BCEAO) has also set itself the main objective of price stability.

Clearly, there is a multitude of studies examining the determinants of inflation. But this review of literature presents a weakness. There are few studies that have examined the determinants of inflation in WAEMU, taking into account the existence of a probable hysteresis effect on inflation. However, the study of Mukras and Momanyi (2016), concluded that the inflation rate of the previous period (lagged inflation rate) is an ideal factor influencing inflation, especially in Kenya. Our study tries to fill this gap by using dynamic panel modeling. Thus, the existence of a cumulative memory effect (past inflation influences that of today), leads us to the choice of a dynamic model. The purpose of this work is therefore both descriptive and normative. These are: (i) firstly, to determine the factors influencing inflation in WAEMU; (ii) secondly, to make available to the monetary authorities an additional decision-making tool that would enhance their transparency and credibility. To achieve these objectives, we organize this article as follows: the second section presents the methodology of the study, section 3 presents the results of the estimates and finally the conclusion and the recommendations are the subject of section 4.

2. Methodological Approach

2.1. Basic Model

The starting point of our modeling is the exchange equation of the Quantitative Theory of Money (TQM). It is an economic theory based on the causal relationship between the general level of prices and the amount of money in circulation. It has been developed by different authors. Classics and neoclassicals consider that money is neutral. Keynesians say the currency is active and can be used to improve economic performance. Monetarists argue that money is also active but that its use is especially harmful for the economy.

The principle of this equation is to reconcile, by the equal registrants, a flow of monetary payments and a flow of trade in goods and services. The TQM assigns a preponderant role to the amount of money in circulation in explaining inflation. It is as follows:

$$M * V = P * T \quad (1)$$

With:

M: The average amount of money in circulation during the year in the community

V: The velocity of currency circulation

P: The general price level

T: The overall volume of transactions, production, in other words real GDP

The quantitative theory of money adds the following assumptions:

- Fisher assumes that T is exogenous because it is determined by the goods market from the available factors of production, V is exogenous because it is determined by the technology and payment patterns of agents, M is exogenous because it is controlled by monetary authorities.
- GDP growth is determined in the long term by the growth factors of demography, capital accumulation and technical progress.

According to the monetarists, the speed of circulation of the currency V is constant, the level of production is supposed constant also because of the situation of full employment of the factors of production in the economy. From these two hypotheses, any increase in the quantity of money M causes a rise in prices. All this leads monetarists to think that inflation is only a purely monetary phenomenon.

The currency would therefore have no effect on the level of production of an economy (classical dichotomy). By making the logarithmic derivative of equation 1 with respect to time, we obtain equation 2:

$$\frac{\Delta M}{M} + \frac{\Delta V}{V} = \frac{\Delta P}{P} + \frac{\Delta T}{T} \quad (2)$$

With:

$\frac{\Delta M}{M}$: The growth rate of the money supply

$\frac{\Delta V}{V}$: The rate of growth of the velocity of currency V. Like monetarists, we assume that the velocity of currency circulation is constant, which renders its derivative null: $\frac{\Delta V}{V} = 0$

$\frac{\Delta P}{P}$: The price change or the price growth rate or the rate of inflation.

$\frac{\Delta T}{T}$: The real GDP growth rate. Since the level of production is assumed to be constant due to the full employment situation of factors of production in the economy, we have: $\frac{\Delta T}{T} = 0$. We obtain the direct relationship between inflation and monetary growth, which is the central proposition of the TQM: the rate of growth of the money supply is fully reflected in the rates of price growth. Equation 3 presents this relationship.

$$\frac{\Delta P}{P} = f(\frac{\Delta M}{M}) \quad (3)$$

Moreover, based on the literature review, we can choose the main determinants of the inflation function. These factors are linked to demand and supply to cover both demand-side inflation and rising costs, while having as their basic theoretical model the quantitative theory of money. Thus, as determinants of inflation, we retain the monetary (Musa and Yousif, 2018; Sriyana, 2018), the gross domestic product (Eftekhari and Kiaee, 2015; Kuje *et al.*, 2017), imported inflation (Bikai *et al.*, 2016), employment (Phillips, 1958). In addition, the existence of a cumulative memory effect (past inflation influences that of today), that is to say the consideration of a probable hysteresis effect at the level of inflation, leads us to the choice of a dynamic model. Also, to take into account the effect of the exchange rate (Musa and Yousif, 2018; Sriyana, 2018), we integrated the decision that modifies the exchange rate by fixing it at 100 Francs CFA for a French franc in 1994. It is measured by a variable dummy marked by 0 for the years before 1995 and by 1 for the years from 1995 to 2015. Equation 4 presents the final form of the inflation function:

$$INF_{i,t} = \beta_0 + \beta_1 INF_{i,t-1} + \beta_2 MG_{i,t} + \beta_3 IMPINF_{i,t} + \beta_4 EPR_{i,t} + \beta_5 DEV_{i,t} + \varepsilon_{i,t} \quad (4)$$

Table 1 gives some brief descriptions and notations for these variables that will be used in the data analysis.

Table-1. Description, Symbols and Measures of Determinants

Symbols	Represent	Description	Source
GDP	Real GDP Growth rate	Economic growth; Annual changes in gross domestic product at constant prices in each country.	BCEAO (2018)
MG	Growth rate of money supply	Annual changes in the quantity of money and quasi-money in each country.	BCEAO (2018)
$IMPINF$	Imported inflation	Domestic prices rise as a result of higher imports. We use as proxy for imported inflation, the index of consumer prices in France.	World Bank (WDI, 2018)
EPR	Employment-population ratio	The proportion of the population aged 15 and over who has a job in each country.	World Bank (WDI, 2018)
DEV	Devaluation of the CFA	Change in the parity of the CFA franc in 1994. It is measured by 0 for the years before 1995 and by 1 for the years from 1995 to 2015.	Variable «Dummy» chosen by the author

Source: Author

These are annual data, with a study period from 1991 to 2015. Guinea-Bissau was not taken into account due to the lack of data available in some years. Indeed, Guinea-Bissau joined UEMOA in May 1997.

2.2. Estimation Method

The estimation method chosen is the generalized moments method (MMG) in dynamic panel, introduced by (Areliano and Bover, 1995; Arellano and Bond, 1991). Unlike dynamic panel MMGs, standard econometric techniques such as OLS do not provide unbiased estimates because of the presence of the delayed dependent variable to the right of the equation. It follows from biased estimates. The generalized moments method (MMG) is based on the orthogonality conditions between the lagged variables and the error term both in the first and the first difference. The generalized moments method has very specific advantages, namely the nature of the data panel and the solutions it provides. Indeed, the dynamic panel MMG method makes it possible to provide solutions to the problems of simultaneity bias, inverse causality and omitted variables. Also, this method makes it possible both to control the individual and temporal specific effects and to overcome the endogeneity biases of the variables, especially when there are one or more delays of the dependent variable as an explanatory variable. In case of endogeneity, estimates are made using instruments. An instrument for an endogenous variable is a variable that is not correlated to errors but correlates with the endogenous explanatory variable in question. Thus, it gives an efficient estimation of the model contrary to the Ordinary Methods.

There are two variants of the dynamic panel MMG estimator (Sargan, 1958): The first difference MMG estimator of Arellano and Bond (1991) and the MMG system estimator of Blundel and Bond (1998). In order to estimate our model, we use the "Diff MMG" generalized moments method from Arellano and Bond (1991). This estimator is based on the first difference of the variables and thus eliminates the country-specific effects while taking as instruments appropriate levels of lagged values (in level) for all potentially endogenous variables.

Autocorrelation tests of the first difference errors are proposed by Arellano and Bond (1991) to verify the validity of these moment conditions. In addition, the Sargan (1958) and Hansen (1982) over-identification tests make it possible to check the exogeneity of the instruments and to validate them.

After the methodological approach, we present the different results of the tests and the final estimation of the model.

3. Results

3.1. Descriptive Statistics

Table 2 summarizes the results of descriptive statistics for raw variables prior to modeling. The standard deviations of the different variables are small; a logarithmic transformation is not necessary.

Table-2. Descriptive statistics on variables

Variables	Average	Standard deviation	Minimum	Maximum
INF	3,606	6,725	-7,796	39,163
MG	2,806	0,443	1,904	3,851
IMPINF	1,595	0,776	0,038	3,217
GDP	3,847	3,571	-13,723	16,247
EPR	64,669	7,312	44,671	81,702

Source: Author based on data from the BCEAO (2018) and WDI (2018)

3.2. Presentation of Test Results

Table 3 presents the results of the interindividual dependency test of Pesaran and Smith (1995). It clearly indicates that there is a strong cross-sectional dependence between the different variables of our model because the p-values are less than 5%; we therefore reject the null hypothesis.

Table-3. Interindividual dependency test of Pesaran and Smith (1995)

Variables	*CD-test*	*P-value*	*Corr.*
INF	*25,36*	*0,000****	*0,935*
MG	*3,75*	*0,005***	*0,187*
IMPINF	*7,31*	*0,000****	*0,332*
GDP	*5,24*	*0,000****	*0,431*
EPR	*-4,63*	*0,001****	*-0,275*

Note: ***; ** * significant at the 1%, 5% and 10% thresholds respectively
Source: Author based on data from the BCEAO (2018) and WDI (2018)

Table 4 presents the results of unit root tests. The inflation rate and real GDP growth rate, temperature and precipitation variations are stationary in level. On the other hand, we find that the growth rate of money supply and imported inflation are stationary in first difference.

Table-4. Summary Table of IPS and CIPS Unit Root Tests

Variables	Level variables			Difference 1st			Degree of integration
	IPS		CIPS	IPS		CIPS	
	Coef.	p-value	Coef.	Coef.	p-value	Coef.	
INF	7,193	0,000	-6,989***	-7,510	0,000	-7,408***	I(0)
MG	0,027	0,582	-1,603	-5,016	0,000	-5,526***	I(1)
GDP	-4,002	0,002	-5,344***	-6,986	0,000	-6,129***	I(0)
IMPINF	-4,381	0,009	-7,182	-5,464	0,000	-5,751***	I(0)
EPR	-0,257	0,343	1,874	-5,017	0,000	-6,381***	I(1)

Note: ***; ** * significant at the 1%, 5% and 10% thresholds respectively
Source: Author based on data from the BCEAO (2018) and WDI (2018)

The result of the autocorrelation test gives us a probability greater than 5% (Prob> z = 0.0734). We can't reject the null hypothesis. The test result is shown in Table 5.

Table-5. Result of the autocorrelation test error of Arellano and Bond (1991).

Order	Z	Prob > z
1	-0,194	0,103

Source: Author based on data from the BCEAO (2018) and WDI (2018)

There is no autocorrelation between the variables and the error term. As for the normality test for Jarque and Bera (1980) residues, with a probability lower than the 5% threshold (Prob> chi2 = 0.000), we reject H0. We conclude that the residues do not follow a normal distribution.

3.3. Result of the Model Estimation

The estimation was done in one step and we used the "robust" option to free ourselves from the detrimental effects on the estimators due to the presence of autocorrelation of errors and / or heteroscedasticity in the panel. The estimated model is globally significant at the 1% level. The Arellano-Bond first order difference autocorrelation test confirms the validity of the moment conditions and therefore of the estimator (Table 6).

Table-6. Results of model estimation

Dependent variable: Inflation rate	coefficients	Standard error	z-stat	p-value
Inflation (-1)	2,93*	0,54	1,38	0,10
M2 money supply growth rate	-5,72***	0,99	-4,01	0,00
Real GDP growth rate	0,83	0,20	1,62	0,11
Imported Inflation	2,25***	0,10	10,82	0,00
Employment	-0,28	0,09	-0,80	0,40
Devaluation	0,64***	6,00	4,95	0,00
Constant	-5,21	12,93	-0,35	0,66
Number of observations	161	--		
Overall significance	--			0,0000
AR(1)	--		-0,19	0,10

Note: ***; ** * significant at the 1%, 5% and 10% thresholds respectively
Source: Author based on data from the BCEAO (2018) and WDI (2018)

4. Discussion

The results of the estimation show that within WAEMU, the determinants of inflation are the growth rate of the money supply, imported inflation and devaluation. At the 1% threshold, the growth rate of money supply has a negative and significant effect on inflation within WAEMU. Indeed, an increase in the growth rate of the money supply leads to a fall in inflation of 5.72%. This can be explained by the fact that a significant proportion of the increase in the money supply, below a certain threshold, contributes to increasing the possibilities of production and therefore of supply. In fact, faced with a financing gap, any additional increase in the money supply comes as a response to the financing needs of the WAEMU economies. And this increase in supply has a downward effect on the prices of goods and services. In addition, it is possible that beyond a threshold any additional increase will lead to higher prices. Our result shows that inflation is not systematically a monetary phenomenon in WAEMU. Moreover, our study contradicts those of some authors who find a positive relationship and significant between money supply and inflation (Bikai *et al.*, 2016; Kuje *et al.*, 2017; Lim and Sek, 2015; Musa and Yousif, 2018; Sriyana, 2018).

Imported inflation has a positive and significant effect on inflation. Indeed, an increase in imported inflation induces an increase in domestic inflation of 2.25% in WAEMU. In fact, imported products account for about 34% of goods and services in the UEMOA consumer basket. In addition, a significant number of local products consumed by households have significant import content. Given this weight, price developments in supplier countries, particularly in France, the Union's main trading partner, affect the level of inflation in the zone. Moreover, the linkage of the FCFA first to the French franc and then to the euro requires long-term convergence of inflation in WAEMU and France. This result is in line with those of Bikai *et al.* (2016) and Rahimov *et al.* (2016) who finds a positive effect of imported inflation on domestic inflation.

We note a positive effect of the devaluation on inflation in WAEMU. Indeed, the devaluation encouraged imports of goods and services from France. In addition, another explanation would be the monetary policy of the

EURO zone to which the CFA franc is directly pegged. Our result is consistent with those of Ndilkodje (2015) in the Democratic Republic of Congo. Indeed, these authors have identified devaluation as major factors influencing inflation in the Democratic Republic of Congo.

5. Conclusion

The objective of our study was to analyze the determinants of inflation in the WAEMU zone. The estimation method chosen is the generalized moments method (MMG) in dynamic panel of Arellano and Bond (1991) and Areliano and Bover (1995). The estimation was done in one step and we used the "robust" option to free ourselves from the detrimental effects on the estimators due to the presence of autocorrelation of errors or heteroscedasticity in the panel. Empirically, we have been able to identify the factors that influence inflation in the WAEMU economies.

The results of the estimation show that in addition to the economic growth rate and the money supply, the devaluation has a significant effect on inflation. As we can see, inflation is not systematically a monetary phenomenon in WAEMU. Moreover, our study contradicts those of some authors (Bikai *et al*., 2016; Kuje *et al*., 2017; Lim and Sek, 2015; Musa and Yousif, 2018; Sriyana, 2018).

The authorities must therefore seek to determine the optimal threshold for the rate of increase of the money supply.

References

Anfofum, A. A., Afang, H. A. and Moses, G. D. (2015). Analysis of the main determinants of inflation in Nigeria. *Research Journal of Finance and Accounting,* 6(2): 144-55.

Areliano, M. and Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics,* 68(1): 29-51.

Arellano, M. and Bond, S. (1991). Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. *The Review of Economic Studies,* 58(2): 277-97.

Bikai, J. L., Batoumen, M. H. and Fossouo, A. L. (2016). *Déterminants de l'inflation dans la CEMAC : le rôle de la monnaie.* BEAC: Yaoundé.

Edward, T. and Ramayah, M. (2016). The Determinants of Inflation: An ASEAN Perspective. *Taylor's Business Review,* 6: 49-72.

Eftekhari, M. S. and Kiaee, H. (2015). Determinants of inflation in selected countries. *Journal of Money and Economy,* 10(2): 113-43.

Friedman, M. (1963). *Inflation: Causes and consequences.* Council for Economic Education: Bombay.

Ftiti, Z. (2010). The macroeconomic performance of the inflation targeting policy: An approach based on the evolutionary co-spectral analysis (extension for the case of a multivariate process). *Economic Modelling,* 27(1): 468-76.

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica,* 50(4): 1029-54.

Jarque, C. M. and Bera, A. K. (1980). Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics Letters,* 6(3): 255-59.

Kuje, S. O., Musa, A. M. and Ukeme, G. O. (2017). Macroeconomic variables: Road map forempirical analysis of the determinant of inflation in Nigeria. *Imperial Journal of Interdisciplinary Research,*, 3(11): 277-84.

Lim, Y. C. and Sek, K. S. (2015). An examination on the determinants of inflation. *Journal of Economics, Business and Management,* 3(7): 678-82.

Mukras, M. and Momanyi, G. (2016). The determinants of inflation in the Kenyan economy. *International Journal of Economics,* 1(1): 46-60.

Musa, A. M. and Yousif, F. M. (2018). Modeling the determinants of inflation in sudan using generalized method of moments for the period 2000-2017. *International Journal of Information Research and Review,* 05(2): 5154-65.

Ndilkodje, B. (2015). *Les determinants de l'inflation en republique du Congo.* Union Européenne: Editions Universitaires Europeennes.

Ochieng, O., M, S. M. and Gedion, M. (2016). The determinants of inflation in the Kenyan economy. *International Journal of Economics,* 1(1): 46-60.

Pesaran, M. H. and Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics,* 68(1): 79-113.

Phillips, A. W. (1958). The relation between unemployment and the rate of change of money wage rates in the United Kingdom, 1861-1957. *Economica,* 25(100): 283-99.

Rahimov, V., Adigozalov, S. and Mammadov, F. (2016). *Determinants of inflation in Azerbaijan.* Central Bank of the Republic of Azerbaijan: Bakou.

Ruzima, M. and Veerachamy, P. (2015). A study on determinants of inflation in Rwanda from 1970-2013. *Int. Journal of Management and Development Studies,* 4(4): 390-401.

Sargan, J. D. (1958). The estimation of economic relationships using instrumental variables. *Econometrica,* 26(3): 393-415.

Sriyana, J. (2018). Determinants of inflation in the local economy. *Etikonomi,* 17(1): 1-10.