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The Effectiveness of the 'Quantity Theory of money' in Explaining Inflation in the Gambian Economy

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ABSTRACT

This paper examined the effectiveness of the Quantity Theory of Money in explaining the rate of inflation in the Gambia utilizing annualized data covering the period 1985 – 2014, which were obtained from the World Bank Development Indicators. Ordinary Least Square (OLS) technique was used to estimate the variables. Inflation rate nowadays is one of the main concerns for governments. Having a low and stable inflation rate is beneficial for the whole economy. Quantity Theory of Money provides a direct explanation about the cause and consequences of inflation rate or price level. Inflation formed the dependent variable, whereas, money supply formed the independent variable. Statistical outcomes were interpreted based on a 5 percent level of significance. The regression results indicated that the money supply in the Gambia had a positive but insignificant effect on inflation for the period under reviewed. The study recommended that government should adopt measures that will revolve around supporting the youth and reduce the Gambia's dependent on agricultural sector and the huge informal sector. The policy makers should create legal systems that will improve the degree of unionization of the labor market. This will thereby increase gainful employment in the country. It also recommended that political leaders should put their support behind the effort to support and empowered the countries young and poor youth population.

Keywords: Money Supply, Inflation, Regression, Sampled period, The Gambia, Indicators

1. INTRODUCTION

1.1 Background

The Gambia is a small fragile country in West Africa. The country has a population of about 2.5 million and is one of the most densely populated countries in Africa. It heavily dependent on agriculture, tourism and foreign aid for her foreign currency needs. The Gambia's largest development partners include the International Monetary Fund (IMF), the European Union (UN), the African Development Bank and the United Nation agencies. The economy of the Gambia has experienced many ups and downs in economic growth in the recent years most especially during the COVID 19 pandemic.

Against background, the Gambia like many other countries, industrialized or developing countries, have among them one of the most fundamental objectives of the macroeconomic policy is to increase money supply with low inflation. Not surprising that there are considerable debate on inflation and money supply relationship. The government of the Gambia in the year 2016 proposed an increased in salaries of all civil and public servants across the country and this proposition came under serious attack, suggesting that it will not benefits the target group but only to increase their sufferings through inflations.

The Gambia faces her own share of social, political, economic and cultural problems which affected the well-being of the country's populace. Unemployment and poor earnings are one of the major issues that torment the lives of the youths and this has poses a serious risk to the Gambian society. Unemployment causes frustration, desperation, dejection and dependency on family members and friends who also have their own problems to tackle. In monetary economics, the Quantity Theory of money states that the general price level of goods and services is directly proportional to the amount of money in circulation, or money supply. In new classical macroeconomics, the quantity theory of money was still a doctrine of fundamental importance. However, Keynes thus accepts the Quantity Theory as accurate over the long-term but not over the short term. Keynes remarks that contrary to the contemporary thinking of the classical and neo-classical economists, velocity and output were not stable but highly variable and as such, the quantity of money in circulation was of little importance in driving prices up.

1.2 Problem Statement
Unemployment and poor earnings are one of the major issues that torment the lives of the Gambians especially the youths and this has poses a serious risk to the Gambian society. The Gambia is still positioned among the poorest nations on the planet with one of lowest salaries in the region. Hence, against this background, this paper seeks to examine the effect of money supply on inflation in the Gambia. This paper is examined by applying the OLS regression technique using SPSS.

1.3 Objective:
The aim of the study is to investigate the degree and the validity of the quantity theory of money in explaining the movement of the general price level of goods and services in relation to the amount of money in circulation, or money supply.
The objectives of the study are as follows:
1. To know what extent has the quantity theory of money is valid in explaining the movement of the general price level of goods and services in relation to the amount of money in circulation, or money supply in the Gambia.
2. To find out lessons learnt, specifically how the strategies can be implemented better, their impacts, or pros and cons.
3. To contribute to the study of inflation, to help develop an effective monetary and fiscal framework that The Gambia can use.

1.4 Organization of the Paper
The rest of the paper is organized as follows. The next chapter discussed the literature review on the relationship between the money supply and inflation and chapter three discusses the research methodology adopted and the econometric model and techniques used as well as the data source. Chapter four gives the presentation and analysis of the results, and conclusion and recommendation in chapter five. And Reference is given at the end of the last section of the paper with other appendixes.

2. LITERATURE REVIEW

2.1 Introduction
The Gambia is a small and fragile country in West Africa with a small economy that relies primarily on tourism, rain-dependent agriculture, and remittances. A free market oriented economy and currently one of the least performing economies in Africa and is vulnerable to external shocks.

The government of the Gambia in recent times did come with 50 percent salaries increase for all civil servants across the country. This policy of the government came under several attacks from across several disciplines. Some economists in the country did use the monetary economics theory; the quantity theory of money, to explain the effect of this government policy on the general price levels of goods and services in the economy. The quantity theory of money states that the general price level of goods and services is directly proportional to the amount of money in circulation, or money supply. They argued that since this salaries increased made by the government of the Gambia would resulted to increase in money supply or money in circulation and therefore, this policy of the government of the Gambia would only bring about inflation in the economy with all its vices.

However, since the early stage of post independence and until today's growth of Sub-Saharan African states were stimulated by the states themselves. The states had to maintain growing expenditure, in particular, investment expenditure in order to keep their domestic market expanding. The government of the Gambia increased salaries of the civil servants is increased expenditure and is intended to keep the domestic market of goods and services expanding, thus, would lead to increase GDP growth rates. GDP is the value of goods and services produce in an economy over given period of time.

2.2 The Quantity Theory of Money
In monetary economics, the quantity theory of money states that the general price level of goods and services is directly proportional to the amount of money in circulation, or money supply. In new classical macroeconomics the quantity theory of money was still a doctrine of fundamental importance.
The theory above is based on the following hypotheses:
1. The source of inflation is fundamentally derived from the growth rate of the money supply.
2. The supply of money is exogenous.
3. The demand for money, as reflected in its velocity, is a stable function of nominal income, interest rates, and so forth.
4. The mechanism for injecting money into the economy is not that important in the long run.
5. The real interest rate is determined by non-monetary factors: (productivity of capital, time preference).

The theory was challenged by Keynesian economics, but updated and revived by the monetarist school of economics. While mainstream economists agree that the quantity theory holds true in the long run, there is still disagreement about its applicability in the short run. Critics of the theory argue that money velocity is not stable and, in the short-run, prices are sticky, so the direct relationship between money supply and price level does not hold.

2.3 Criticism of the Quantity Theory of Money
Many economists challenged the theory and notably among them was John Maynard Keynes. He criticized the quantity theory of money in 'The General Theory of Employment, Interest and Money'. Keynes thus accepts the Quantity Theory as accurate over the long-term but not over the short term. Keynes remarks that contrary to contemporaneous thinking, velocity and output were not stable but highly variable and as such, the quantity of money was of little importance in driving prices.

Keynes had originally been a proponent of the theory, but he presented an alternative in the General Theory. Keynes argued that the price level was not strictly determined by the money supply. Changes in the money supply could have effects on real variables like output.

2.4 Empirical Evidence

Inflation can happen if the money supply grows faster than the economic output under otherwise normal economic circumstances. Inflation, or the rate at which the average price of goods or services increases over time, can also be affected by factors beyond the money supply. However, Keynes, New-Keynesians and other non-monetarist economists reject orthodox interpretations of the quantity theory. Their definitions of inflation focus more on actual price increases, with or without money supply considerations. According to Keynesian economists, inflation comes in two varieties: demand-pull and cost-push. Demand-pull inflation occurs when consumers demand goods, possibly because of the larger money supply, at a rate faster than production. Cost-push inflation occurs when the input prices for goods tend to rise, possibly because of a larger money supply, at a rate faster than consumer preferences change.

Empirically, the Phillips curve and the quantity theory of money are main frameworks used by economists to analyze inflation dynamics. The former is popular in analyzing inflation in advanced economies, due mainly to the fact that inflation in these countries is essentially due to high aggregate demand which boosts employment. The rise in employment in turn puts pressure on wages and hence on overall price. Durevall et al. (2012) state clearly that this analysis is less likely in countries that predominantly dependent on agricultural sector with huge informal sector, and a low degree of unionization of the labor market. In this set up, it is difficult to link the increase in aggregate demand to low unemployment and hence rise in wages. In addition, developing countries depict a strong negative relationship between business cycle and inflation. In general, an expansionary period is a result of positive shock from agricultural sector, which drives prices down.

Hillinger, Claude; Süssmuth, Bernd (2008) : - According to their paper, the Quantity Theory of Money (QTM) is valid and the New Keynesians are wrong! Their findings largely confirm the original Friedman position on monetary theory and policy: The QTM is a stable relationship and the best monetary policy is one of letting the money stock grow at a constant rate. Zhao, Hongjie (2021): - In their conclusion, quantity theory of money is useful to analyze price level and inflation. The relationship of money supply and price level can be observed in many countries. Policymakers may increase the money supply to try to push output above its normal level (Romer, 2012). However, the complexity of the current financial system and changes in the demand and supply of money make the theory weaker. Central banks are now focuses more on interest rate instead of money supply, which seems to be more effective.

3.0 METHODOLOGY, DATA ORGANIZATION AND ANALYSIS

3.1 Source of Data

This paper utilized data gathered entirely from secondary sources. The secondary data contributed towards the formation of background information. The secondary source of data was gotten from the WDI. Our model was estimated using the Ordinary Least Square (OLS) method. Since we are making use of annualized time-series data and the study cover a long sample period.

3.2 The model

The study used both descriptive and inferential statistical approaches. The statistical tool used to analyze data was Econometric views. In its modern form, the quantity theory builds upon the following definitional relationship.

$$MV_T = \sum_i (P_i * Q_i) = P^T Q \tag{1}$$

$$or \quad P^T = \frac{MV_T}{Q} \quad or \quad TlogP = LogV + \delta_1 logm - \delta_2 logQ \tag{2}$$

In monetary economics, the velocity of circulation and output in the economy are expected to be constant in the short-run and that the Quantity Theory of money states that the general price level of goods and services is directly proportional to the amount of money in circulation, or money supply.

Therefore; $logP^T = (LogV - logQ) + \delta_1 logm$ (3)

Or $\quad logP^T = A + \delta_1 logM$ (4)

Where:

P^T is the inflation for the economy during the period;

M is the total amount of money in circulation on average in an economy during the period, say a year; and

$A = (LogV - logQ)$ is the constant.

δ_1 is the parameters of $log\ M$ in the model.

The evaluation question to tackle is: how far the quantity theory of money explains the movement of the general price level of goods and services in relation to the amount of money in circulation, or money supply? The simple hypotheses embedded in that question can be restated as follows:

$H_0: \delta_i = 0;$ in other words, the quantity theory of money gives no explanation to the movement of general prices of goods and services in the Gambia;

$H_1: \delta_i \neq 0;$ in other words, the quantity theory of money gives explanation to the movement of general prices of goods and services in the Gambia.

Where, H_0 and H_1 are the null hypothesis and alternative hypothesis, respectively.

In the case, answering this question requires three steps:

1. Transform the quantity theory to linear equation and perform OLS.
2. Confront the theory with data to find out the presence of autocorrelation.
3. Test the parameters estimated for validity and finally do prediction.

4.: ANALYSES AND PRESENTATION OF RESULTS

4.1 Analyses and Presentation

The researcher investigated the degree and the validity of the quantity theory of money in explaining the movement of the general price level of goods and services in relation to the amount of money in circulation, or money supply. After applying OLS to the observations we obtained the following:

$$P_i^T = 0.382 \quad + \quad 0.33M \qquad \ldots\ldots \qquad\qquad (5)$$
$$\qquad (0.268) \quad (0.223)$$
$$d = 1.004 \qquad \rho \cong 0.498 \qquad r^2 = 0.072$$

The value of the $R^2 = 0.072$ is very low and that indicated that money supply is not a variable that best explained inflation in the Gambia. The Durbin Watson statistic (DW Stat. =1.004) by "rule of thumb" has presented a serious suspicion of auto-regression; we therefore, required transformation and applied the OLS again.

Table 4.1: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.281	0.103		2.725	0.011
	M*	0.175	0.141	0.229	1.244	0.224

a. Dependent Variable: $\widehat{P}*$

The above regression equation (5) indicates incident of a first-order auto-regression at significant at the 5% level. Using the estimate $\hat{\rho} = 0.498$ we obtain the transformed variables and apply1ing OLS to the transformed data we obtained

$$\widehat{P}_1^* = 0.281 + 10.175M_t^* \qquad \ldots.. \qquad\qquad (6)$$
$$\qquad (0.103) \quad 1\,(0.141)$$
$$d = 2.124 \quad 1 \qquad\qquad r^2 = 0.052$$

where $\widehat{P}_1^*$ is the transformed inflation for the economy during the periods under review;
          M_t^* is the transformed the total annual amount of money in circulation on average in an economy during the p1eriods under review.

We observed that with1 the appropriate transformations the value of $DW\ Stat.$ comes close to the 'crucial' value of 2 (which corresponds to zero auto-correlation). The Durbin Watson statistic ($DW\ Stat. = 2.124$) now closer to 2, by "rule of thumb" has not presented a serious suspicion of auto-regression.

After transformed the variables, the coefficients of the independent variable (M_t^* = transformed total amount of money in circulation on average in an economy during the period) that were regressed on the dependent variable (Inflation). The established regression equation (4.2) stated above investigated the impact of money supply on inflation in the Gambia.

The equation (4.2) indicates that the money supply has a positive and non-significant effect on inflation in the Gambia for the period under review. This is described by the positive coefficient value 0.175 of our independent variable – money supply with a corresponding t-statistic value of 1.244 which is less than the theoretical t-statistics value of 1.96 critical value (i.e. 1.244 < 1.96) at 5% significant level. This means that money supply has no effect on inflation in the Gambia, in other words, it is statistically insignificant for money supply to explain the inflation in the Gambia.

Table 4.2: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	0.178	1.000	0.178	1.546	0.224
	Residual	3.223	28.000	0.115		
	Total	3.401	29.000			

a. Dependent Variable: P^*
b. Predictor: (Constant), M_t^*
Source: Own computation from the WDI data aided by SPSS.

The F-statistic is used to check the overall significance of the model. The F-statistic of our estimated model is 1.546, which is less than the theoretical F-statistics value of 4.20 (i.e. 1.546 < 4.20) at 5% significant level. This means that the model is not significant, that is, growth in money supply is not a good reason to explain the reason for inflation in the Gambia. Also the probability of the significance is 0.224. Since the probability of the significance is more than 0.05, it is concluded that the independent variable – money supply has insignificant effects on the inflation in the Gambia over the period under consideration.

4.2 Discussion of the Results

The Gambia is a poor and small West African country with a very narrow economic base and the economy traditionally relies on tourism and rain-dependent agriculture. The Gambia's natural resources are underdeveloped and are in the hands of foreigners. Its exports are predominantly in the form of few agricultural products such as groundnuts, cotton, etc. Indeed, this study found that, the effect of money supply on inflation in the Gambia was positive but insignificant. This study affirmed the views of the Keynesians and other non-monetarist economists who rejected the orthodox interpretations of the quantity theory. This finding largely rejects the original Friedman position on monetary theory and policy: The QTM is a stable relationship and the best monetary policy is one of letting the money stock grow at a constant rate.

This theory is popular in analyzing inflation in advanced economies, due mainly to the fact that inflation in these countries is essentially due to high aggregate demand which boosts employment. The rise in employment in turn puts pressure on wages and hence on overall price. Durevall et al. (2012) state clearly that this analysis is less likely in countries that predominantly dependent on agricultural sector with huge informal sector, and a low degree of unionization of the labor market. The Gambia is predominantly dependent on agricultural sector with huge informal sector, and a low degree of unionization of the labor market. Finally, this research found positive but insignificant relationship between the money supply and inflation in the Gambia. The research also found that a unit change in the money supply even though brought about an increase in inflation by 17.5% of money supply in the Gambia; still, this increase is insignificant.

5. RECOMMENDATIONS AND CONCLUSION

From the theoretical points of view, according to the Classicals and the Neoclassicals, postulate that the Quantity Theory of Money provides a direct explanation about the cause and consequences of inflation rate or price level. However, Keynes, New-Keynesians and other non-monetarist economists reject orthodox interpretations of the quantity theory. Their definitions of inflation focus more on actual price increases, with or without money supply considerations. Inflation rate nowadays is one of the main concerns for governments. Having a low and stable inflation rate is beneficial for the whole economy.

Inflation formed the dependent variable, whereas, money supply formed the independent variable. Statistical outcomes were interpreted based on a 5 percent level of significance. The regression results indicated that the money supply in the Gambia had a positive but insignificant effect on inflation for the period under reviewed. The study recommended that government should adopt measures that will be revolved around supporting the youth population in acquiring capital thereby reducing the Gambia's dependent on agricultural sector and the huge informal sector. They (the policy makers) should create legal systems that will improve the degree of unionization of the labor market as well. This will thereby increase gainful employment in the country. It also recommended that political leaders should put their support behind the effort to support and empowered the countries young and poor youth population.

REFERENCE

1. Alain Kabundi (2012) "Dynamics of Inflation in Uganda" Working Paper Series No. 152 African development Bank, Tunis, Tunisia.
2. Atif Batarseh (2021) "The nature of the relationship between the Money Supply and Inflation in the Jordanian economy". Bank and Bank Systems, 16(2), 38-46.
3. Hongjie Zhao (2021) "Is there a Stable Relationship between Money Supply and Price Level? Arguments on Quantity Theory of Money" Granite Journal: a Postgraduate Interdisciplinary Journal: Volume 5, Issue 1 Page 13-18.
4. John R. Moroney (2002) "Money Growth, Output Growth, and Inflation: Estimation of a modern Quantity Theory of Money".
5. Hillinger, Claude; Süssmuth, Bernd (2008): The Quantity Theory of Money is Valid. The New Keynesians are Wrong!, Munich Discussion Paper, No. 2008-22, Ludwig-Maximilians - Universität München, Volkswirtschaftliche Fakultät, München.
6. Davoodi, H.R., Dixit, S., and Pintor, G. (2012) "Monetary Transmission Mechanism in the East African Community: Implications for Monetary Union," forthcoming IMF Working Paper
7. Diouf, M.A. 2007. "Modeling Inflation for Mali." IMF Working Paper WP/07/295.
8. Durevall, D. and Ndung'u, N. (2001) "A Dynamic Model of Inflation of Kenya, 1974-96." *Journal of African Economies* 10(1): 92-125.
9. Durevall, D., Loening, J.L., and Birru, Y.A. (2012) "Inflation Dynamics and Food Prices in Ethiopia," Mimeo
10. Kwiatowski, D., P.C.B. Phillips, P. Schmidt, and Shin, Y. (1992) "Testing the Null Hypothesis of Stationarity Against the Alternative of a Unit Root: How Sure Are We That Economic Time Series Have a Unit Root?" *Journal of Econometrics* 54:159–178.
11. Loening, J.L (2011) "Middle East and North Africa Countries' Vulnerability to Commodity Price Increases," Mimeo
12. Nachega, J-C (2001) "Financial Liberalization, Money Demand, and Inflation in Uganda," IMF Working Paper 01/118.

APPENDIX

Year	Broad money growth (annual %)	Inflation rate
1985	51.34291436	18.31988
1986	7.273788675	56.5602
1987	24.62995211	23.5292
1988	14.74689256	11.6906
1989	20.7996144	8.27502
1990	8.381284388	12.1678
1991	25.70288128	8.6423
1992	13.80830533	9.4865
1993	12.7627587	6.6438
1994	-3.78715993	1.7102
1995	14.2193703	6.98097
1996	5.778647313	1.0995
1997	22.9677926	2.7812
1998	10.21032376	1.11419
1999	12.10143491	3.8124
2000	34.82622594	0.84497
2001	19.41937599	4.4926
2002	35.2810923	8.6091
2003	42.74422031	17.0329
2004	22.45065283	14.2067
2005	8.049780081	4.8386
2006	26.64556384	2.0565
2007	6.778352406	5.3691
2008	18.15583817	4.44365
2009	14.82617462	4.56158
2010	17.84068215	5.0489
2011	11.19842799	4.7965
2012	7.267276412	4.2545
2013	14.6116061	5.6997
2014	9.004270626	5.9474