International Journal of Economics, Commerce and Management
United Kingdom Vol. II, Issue 5, 2014
http://ijecm.co.uk/ ISSN 2348 0386

TESTING THE RELATIONSHIP BETWEEN MONEY SUPPLY AND GDP IN BAHRAIN

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Abstract

This paper uses the Cointegration, Error Correction Model, and Granger Causality techniques to determine the relationship between the real money supply and real Gross Domestic Product (GDP) in Bahrain economy, and the direction of the causality between the two variables in both short and long run. The study covers the period 2000 to 2013. ADF test shows that the two series are integrated of order one I(1). The Cointegration test indicates the existence of long run equilibrium between real GDP and real money supply based on Engle-Granger two steps test. The Eerror term and F-test indicate unidirectional causality running from real GDP to real money supply in the short run as well as in the long run. This result is consistent with Keynesian theory, Real Business Cycle theory and several empirical studies in different countries. The study concludes that real money supply had neutral effect on the real GDP growth in Bahrain during the study period.

Keywords: Money, GDP, Cointegration, Causality, Bahrain

INTRODUCTION

The relationship between money supply and output has been receiving increasing attention than any other subject matter in the field of monetary economics in recent years, because of the importance of economic growth among the macroeconomic objectives of nations in both developed and developing.

There are debates between Keynesian and monetarists about the relationship direction between money supply and output. Monetarists argue that the changes in the amount of money lead to unexpected changes in nominal income because of the stability of money, where Friedman assumes that it is the most stable function. While the Keynesian assumes that the role of money supply is very limited because of the liquidity trap and the investment elasticity of interest is low, so the positive changes in income leads to raising money demand for transactions and raising the amount of money, and this means, the direction of causality comes from income to money and not the opposite.

Money supply and Gross Domestic Product (GDP) had variance changes in Bahrain economy during the period (2000-2013). Real money supply growth rate rose from 11.7% in 2000 to 21.6% in 2005, while it decreased to 10.9% in 2009 due to global financial crises, but it started again to rise to 16.5% in 2013. Following an exceptional decade of robust growth and increasing oil prices, Bahrain continued to record significant growth despite a number of challenges faced in recent years. Despite a severe global downturn since 2009, regional political challenges in 2011, and oil production dips in 2012, the economy has consistently posted positive growth throughout this period; where real GDP growth rate raised from 5.4% in 2000 to 7.9% in 2005, but it declined to 6% and 3.8% in 2009 and 2013 respectively (CBB, 2013). The changes in real GDP and money supply in the study period could indicate that there is a causality relationship between real GDP and money supply.

The study aims at testing the relationship between the narrow definition of money supply (M1) and the output expressed in real GDP in Bahrain during (2000-2013).

The examination of the causal relationship between money supply and economic growth in Bahrain is very important because it could help to identify which variable affects the other, and explaining the changes that occur in the future in both output and money supply. In addition, it could contribute to know the effectiveness of monetary policy that implemented in Bahrain during the study period.

The remainder of the study is organized as follows. Section two reviews the related literatures. Section three shows the study methodology. Section four presents data and empirical results, and section five is the concluding remarks.

LITERATURE REVIEW

Review of Economic Thought

The debates about the relationship between money and economic activity started since the mercantilists' era, where the mercantilists addressed the relationship between money and economic activity through the Quantity Theory of Money (QTM) that linking between the changes is the amount of money and the general prices level.

Tomas (1630) is considered the first writers who points out that the increasing in the amount of the precious metal would lead to an increase in domestic prices relative to prices of other countries. Other economists such as: John Locke (1691), David Hume (1752), David Ricardo (1880), and John Stuart Mill (1848) reformulate the relationship between money and prices in what is known the Traditional volume of Money, which confirms that the prices and money in circulation are changing at the same rate. The presence of this relationship in the traditional literature emphasize on the neutrality of money, that means the changes in money would not affect the real economic variables in the economy, but it would lead to relative changes in the price level, this would happen only if no money holding (Mill, 1848).

Despite of Locke (1691) and Hume (1752) thought the Quantity Theory of Money was correct in its simple formula, some of mercantilists believe that the domestic trade depends on the amount of money, and it is necessary to raise it in order to raise the employment of labor (John, 1705*).* In addition, they argue that the increasing in money supply reduces the cost of borrowing which increases sales and profits without increasing prices. This idea was completely conflicted with the Quantity Theory of Money. Cotillion (1755) points out the increasing of precious metals will lead to raise individuals' income that worked in this sector, and so rise the spending on the consumption goods, and this will lead to raising food prices and farmers' profits, while reducing real wages, which in turn lead to rising nominal wages, spending and then prices.

Fisher's (1911) exchange equation (MV=PT) is considered the famous classical mathematical formulas. It expresses the relationship between the amount of money and the general price level, where (M) is the amount of money, (V) is the money velocity, (P) is the general price level, and (T) is the volume of transactions. He assumes that output will be fixed at full employment, velocity of the money will be fixed too, and thus the equation shows only the relationship between the amount of money and the general price level, especially in the long run.

The neo-classical economists(Cambridge school),point out, the money supply affects both prices and output in the short run, but in the long the money supply only affects the general price level and not output. They reformulated the exchange equation to new equation called the equation of Cambridge. Which states that "the amount of nominal money demand and then money supply (at money market equilibrium) are proportional linked directly to the nominal per capita income or output"; this equation had the following formula: (Ms= Md= KY). Where (Md) is money demand, (Ms) Money supply, (K) is the liquidity preferences, and (Y) is nominal income (Pigou, 1917).

Keynes (1936) rejected the Quantity Theory of Money in the short run because their assumptions (Y was fixed at full employment and V was fixed) do not apply in uncertainty real world with high level of unemployment. Keynes argues that changing in money supply is not the only reason for changing in the general price level, but there is another variable affects the price level which is the employment of production factors. In the case of absence of full employment, the increasing in money supply will lead to increasing total spending, and then increased the total output. When the economy reaches to full employment, the increasing in money supply only leads to higher prices. Thus, the money supply is non-neutral when the economy operated at less than the full employment level, where there is indirect effect of money supply on economic activity, through the influence of money supply on interest rates, and then investment and output.

Monetarists (1963) stress on the importance of the money supply in determining nominal GDP and the price level. (Mohamed, 2005: 10). Where they adopt the Quantity Theory of Money, and they argue the changing in the amount of money lead to expected changes in nominal income, where the money supply directly affects the economic activity and then output in short run. Because monetarists believe that markets are stable and worked well, they argue that the economy is near or quickly approaching full employment; therefore in the long run, the economy will be at full employment output (Y_F), and so the Quantity Theory of Money in the long-run will show M and P are the only variables in this equation, which means changing money supply will only impact the price level and causes inflation. In addition the growth rate of money supply will equal the growth rate of price level (or inflation) in the long run. This conclusion explained Friedman's famous quote "*Inflation is always and everywhere a monetary phenomenon*." (Friedman, 1969).

The monetarist's points of view were different with the post-Keynesian's points of view for the effectiveness of money supply on the economic activity, and then output under the Rational Expectation Hypothesis, where: (Al-Mahdi, 2000: 120-126)

- Post-Keynesians argue that increasing the money supply affects both output and the general prices level, and there is different impact depending on individual's rational and irrational expectations. In the case of an anticipated increasing in money supply, and under rational expectations, people expect the possibility of a rise in the general prices level and also lead to increasing money supply that reduces interest rates, thereby raises investment and output. But the expectations of higher prices, lead to high wages rate, but at low rate (because of relative sticky wage rates), and lead to a reduction in total supply and then the low level of economic activity which will be less than the increasing in economic activity arising from the lower interest rate. The ultimate effect is increasing the level of economic activity. If the monetary policy is unexpected, it has the biggest impact on economic activity, where there are no expectations of rising prices, and therefore will not be a change in aggregate supply.
- The monetarists supposes a complete flexibility of both wages and prices, and hence there is no effect of money supply on the economic activity, this could be happen in the case of expected monetary policy, where the expected increasing in the money supply, lead to increasing the general price level in the future and increasing the level of economic activity. It also leads to workers' claim to raise their nominal wages (in order to maintain their real wages without reduction); and so production costs will increase; this could affect the economic activity to return to its previous situation, this means that the expected monetary policy has no impact on the economic activity (neutrality of money).
- In the case of unexpected monetary policy, it could be effective in influencing the economic activity. For example, implementing unexpected expansionary monetary policy

leads to an increase in the aggregate demand, and in the absence of unexpected higher prices, nominal wages remain without changes, as well as the aggregate supply, it follows by an expansion in the level of economic activity combined with raising the general price level, and thus monetary policy would be effective (non-neutrality of money).

From the above we conclude that the impact of monetary policy on real output and employment under the hypothesis of rational expectations depend largely on the degree of expectations and the institutional structure, if sufficient information is available to the public about how the monetary policy is working, and if the institutions adjust their positions in light of the applied policy, the money supply will have no impact on both of real output and employment. But the monetary authorities can affect the output in the short run by adapting a way that making predictions not accurate enough.

Minsky (1977) argues that money is an endogenous variable, where the paper money supply determined by the banking system that based on the lending which depends on the volume of economic activity, the increasing in the amount of money leads to increasing the investment and also the amount of money again.

Real Business Cycle Theory (RBC), by Kydland and Prescott (1982) emphasize on the effect of GDP on Money supply .They attribute the changes in output growth lead to changes in money growth; due to two reasons. First, the developments in the real sectors of the economy affects the individuals financial decisions and the quantity of money demand, because of the financial system reacts to the changes in the money demand. The changes in output growth create changing in the growth of money supply; this means output causes money and not the opposite. Second, the expected rise in output leads to rise both of the demand for money and credit; and so policy makers will allow to increase the money supply to counter the increasing in money demand; and therefore the interest rate will not change (Jonsson, 2006:561).

Moore (1988) and Wary (1990) believe that the central bank in the modern economy does not control the amount of money and that money supply adjusts with the demand for credit. When firms borrow from private banks, it leads to lower banks' additional reserves and pushes private banks to central bank, which will increase the money supply to counter a surge in demand for credit to avoid the collapse of the banking system, and therefore the function of banks in the modern economy is to finance the business sector, and this demand is determined by money supply and not the monetary authorities. The increasing in investment expenditure (real capital or financial assets) requires a response of funding institutions to increase the demand for credit, this leads to an increase in money supply, which offset by a similar increase in money supply without affecting the interest rate, and this happened only if the central bank does not respond to the increase in demand. This means that the central bank controllers the

rate of interest but it does not control the amount of money, where the money supply by the central bank depends on the anticipated profit rates by private institutions, therefore, both the demand and supply of money depend on anticipated profit rates for the private sector. In this model money supply is endogenous variable, and so the monetary policy affects the real variables.(non-neutrality of money).

It is clear from the above; there are different point of views about the direction of the relationship between money supply and output.

Review of Empirical Studies

Friedman and Schwartz (1963) and Friedman and Meiselman (1963) studies were the first applied statistical studies. Friedman and Schwartz tried to measure the relationship between the amount of money and output, through studying the monetary history and the role of money in economic cycles in USA during the period (1867-1960). They argue that the sharp contraction that occurred during the Great Depression (1929-1933) was result of the high decline in money supply during the same period. While Friedman and Meiselman focus on the monetarist-Keynesian debates about the effectiveness of monetary and fiscal policies. They test the Keynesian assumption about the stability relation between income and consumption, and the monetarists' assumption about the stability of the money demand, they concluded that the monetarists' model that link between spending and amount of money shows better description to determine the total spending, and it is stronger than the Keynesian model.

In the of Brunner and Meltzer (1976) study, they argue that funding the increasing in government spending by raising the money supply will increase the total expenditure; and thereby increase the nominal income that lead initially to increase the real income and eventually to increase prices.

Sims (1972) study was the first study applied the Granger causality approach, to determine the relationship between the amount of money and the output in USA. He finds that the amount of money helps in the interpretation of output and not the opposite, which means that there is causality direction from the amount of money to GDP, this result consistent with Friedman and the monetarists' point of view.

Williams and Gowl (1976) applied the Sims' model on the UK and they conclude that the direction of causality comes from the output to the amount of money (as opposed to the findings of the Sims).This is consistent with the Keynesian approach.

Friedman and Kutuner (1992) study for the period (1960-1990) of USA, they argue that the relationship between the amount of money and output becomes less strong with increasing time period, on the other hand, they find that the explanatory power of the interest rate has stronger impact than the amount of money in the interpretation of changes in output.

Rader (2010) tried to find out, whether the quantitative theory of money holds in the Czech Republic, and whether there is strong empirical relationship between money supply and output. He finds out there is indeed strong and mutual relationship between these two variables. However, the results do not clearly confirm or reject the validity of the Quantitative Theory of Money. Scatter gram analysis shows clear and positive relationship between money supply and output, no matter how much lagged the money supply variable. But Impulse-Response analysis shows negative reaction of real output to random shock in money supply.

Daniela and Mihail (2010) tried to study the relationship between money supply and GDP, in order to construct a function which would explicit this connection for Romania, depending on the data of money supply (M3) and of GDP over ten years through the ADF, They find out that both series are non-stationary, and when they apply the Engle-Granger cointegration method, they conclude that there is cointegration between two series.

For developing countries' studies, Abbas (1991) tests the causal relationship between money and output in some Asian countries, and he finds that there is mutual relationship between money and income in Pakistan, Malaysia and Thailand. While the study of Kalumia and Yourogou (1997) find strong causal relationship directed from money to income in five countries in West Africa, which means non-neutrality of money.

Tan and Baharumshah (1999) examine the causal relationship between money, output and prices in Malaysia; they find that money is non- neutral in the short run, which means there is unidirectional relationship from money to output and not the opposite. While in the study of Hussein and Abbas (2000) tested the causal relationship between money, income and prices in Pakistan, they find unidirectional relationship from income to money and not the opposite, which indicates that the real factors, but not nominal play effective role in the growth of national income in Pakistan.

Vector and Stephen (2000) explore whether a significant long run relationship exist between money and nominal GDP and between money and the price level in the Venezuelan economy. They apply time-series econometric techniques to annual data for the Venezuelan economy for (1950-1996). An important feature of their analysis is using unit roots test and cointegration with structural breaks. Certain characteristics of the Venezuelan experience suggest that structural breaks might be important. Since the economy depends heavily on oil revenue, oil price shocks have important influences on most macroeconomic variables. Also since the economy possesses large foreign debt, the world debt crisis that exploded in 1982 had pervasive effects on the Venezuelan economy. Radical changes in economic policy and political instability might have also significantly affected the movement of the macroeconomy. They find that long run relationship existed between narrow money (M1) and nominal GDP, the GDP deflator, and the CPI when one made allowances for one or two structural breaks.

Abdul-Raziq and others (2003) test the impact of real GDP, government spending, price level, and international reserve on the money supply in Qatar. They find significant relationship between real GDP and money supply; this means that the changes in GDP in Qatar help in explaining the changes in money supply and not the opposite

Hussein (2005) studies the causal relationship between money growth, inflation, currency devaluation and economic growth in Indonesia during the period (1954-2002) He find out that there is short run bi-directional causality between money supply growth and inflation and between currency devaluation and inflation. For the complete sample period, the causality running from inflation to narrow money supply growth was stronger than that from narrow money supply growth to inflation.

Obaid (2007) tests the causality relationship between money supply (M3) and real GDP in Egypt during the period (1970-2006), by using Granger test. He concludes that there is no causality between the nominal money supply and nominal GDP during the study period, while when he used the real money supply and real GDP, he finds that there is mutual causality relationship between real money supply and real GDP in Egypt (non-neutral money), and thus the monetary policy is an effective policy on the real GDP in Egypt, the mutual causality relationship could help to forecast the GDP behavior within assumed volume of money supply by the economics policy making in Egypt

Finally, Ogunmuyiwa and Francis (2010) investigate the impact of money supply on economic growth in Nigeria between 1980 and 2006, by applying econometric technique OLS, causality test and ECM for time series data, the results reveal that although money supply is positively related to growth but the result is however insignificant in the case of GDP growth rates on the choice between contractionary and expansionary money supply.

It is clear from the previous studies, the relationship between money supply and output or income (expressed in different measures) is still controversy subject in the empirical studies (in both developed and developing countries), as well as theoretical framework, whether in the short run or long run.

METHODLOGY

The causality test relationship between the quantity of money supply and GDP requires three steps.

1- Identify the order of integration of the time series
2- Investigate the long run relationship between the two variables under study.
3- Determine the causality relationship between the study variables in short run as well as the long run.

Most of time series are non-stationary where the series' mean, variance and/or covariance depend on time. Thus the conventional regression techniques produce spurious regression

(Granger and Newbold, 1974). One of the most widely used tests is the Augmented Dickey-Fuller unit root test (ADF). (Dickey & Fuller, 1986, 1981, 1979).

The next step is to test for possibility long run relationship between the two series after establishing the stationary of the variables included in the model. Cointegration is a test of the existence of long run equilibrium of non-stationary series. (Granger,1987) (Granger & Newbold, 1974).

There are different methods to test for cointegration, for example Engel-Granger two steps test which carried out the same steps as ADF test, and Johansen(1988,1991), Johansen and Juselius (1990) cointegration test that uses the maximum like hood procedure. This method is preferable than Engle-Granger procedure, especially when model includes more than two variables (Gonzalo, 1994).

Vector Error Correction Model (VECM) will be utilized to estimate the speed of adjustment to the deviation in the long run equilibrium and to assess the direction of causality in both short and long run.

We can test the causality between the two variables in both short and long run by estimating the following two equation using (OLS) regression method:

$$\Delta GDP_t = a_0 + \sum_{i=1}^{k} a_i \Delta GDP_{t-j} + B_j \sum_{J=1}^{m} \Delta M1_{t-j} + g_1 e_{t-1} + v_t \qquad (1)$$

$$\Delta M_t = B_0 + \sum_{J=}^{k} B_j \Delta M1_{t-l} + a_i \sum_{i=1}^{m} \Delta GDP_{t-i} + g_2 e_{t-1} + \eta_t \qquad (2)$$

Where: (GDP) is real Gross Domestic Product, (M1) is Narrow definition of real money supply, (Δ) shows the 1st differences, (t) is time. (e_{t-1}) Error correction term

The short run causality is based on a standard F-test statistics to test jointly the significance of the coefficients of the explanatory variables in their first difference. The long run causality is based on a standard T-test of the lag value error correction term for one period. Negative and statistically significant values of the coefficients of the residuals of one lagged period indicate the existence of long run causality.

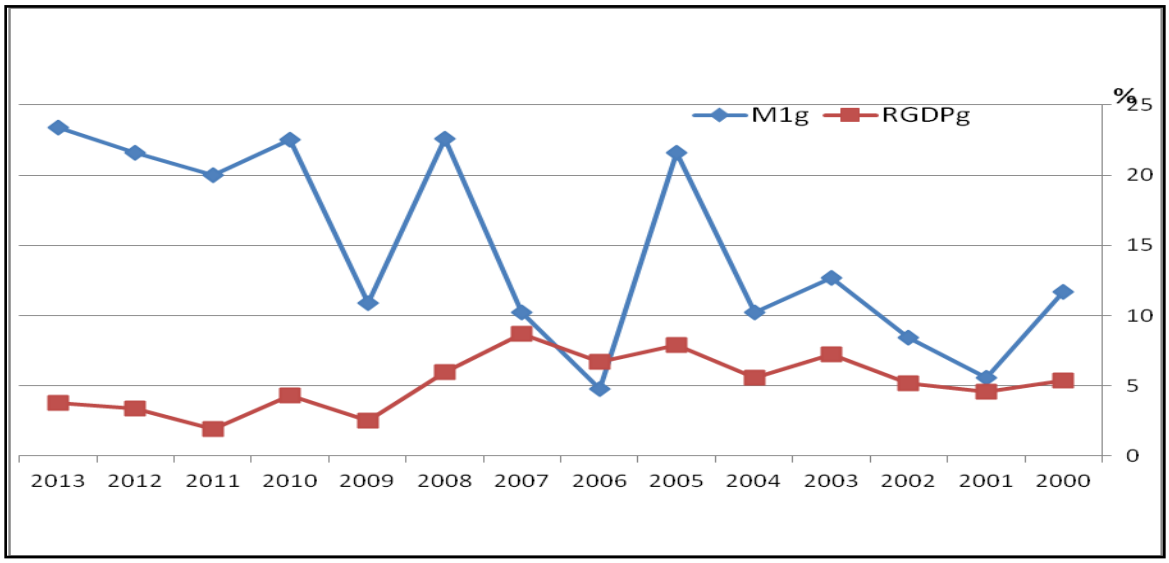
If both parameters (g_1,g_2) are statistically significant, this means there is a mutual causality relationship (from GDP_t to M_t) and (from M_t to GDP_t), while if (g_2) is only statistically significant, this means there is a causality relation in one direction (from GDP_t to M1), and this means that (GDP) leads (M1) to the equilibrium in the long run but not the opposite (Hussein and Abbas, 2000), (Abbas, K., 1991).

DATA AND EMPRICAL RESULTS

The main type of data that will be used for the study is time series data, which is limited to the period (2000-2013). The collected data are macro data for growth of the GDP, Quantity of money (M1) and inflation rate (CPI). The main source of data is the Central Bank of Bahrain statistical Bulletin (various issues). The variables used in this study are Log M 1 (log of money supply) and Log GDP (log of Gross Domestic Product).

The aim of this study is to identify the causality between the two variables, thus, all the data used are in BD millions and are measured in real terms (1999=100). Figure (1) shows the changes of the indicators used in the model. As seen Bahrain's real money supply and economic growth rates having stayed consistently at an average of 33% and 5% a year respectively.

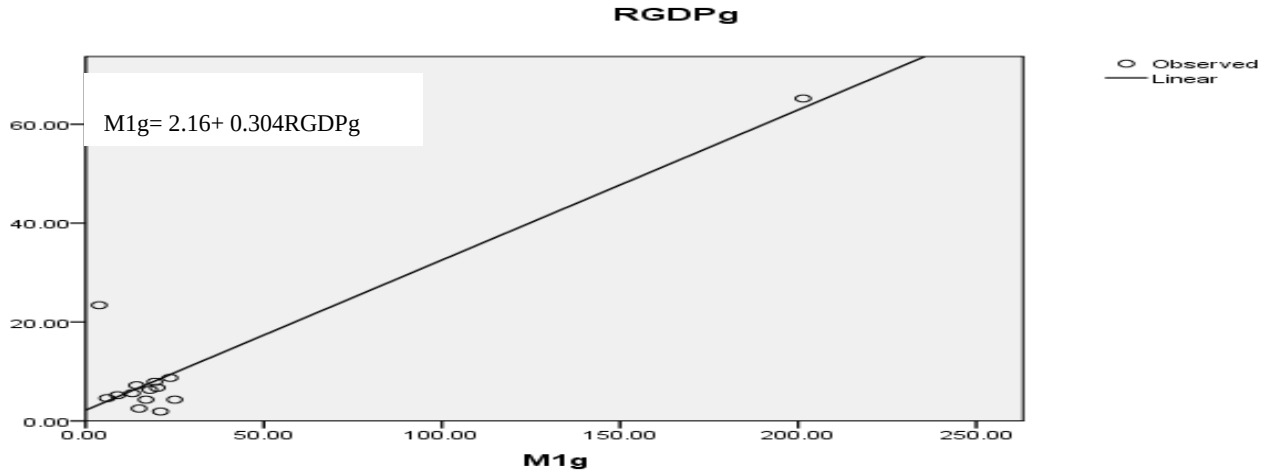
Figure(1) Real GDP and Real money supply growth rate in Bahrain (2000-2013)



Source: Central Bank of Bahrain, Annual Reports, Different Issues

A significant positive and robust relationship between economic growth rate and real money supply growth rate is observed during the study period, as can be observed from figure (2). The correlation coefficient between the economic growth and real money supply growth rate calculated on the basis of the CBB data is 0,68 during (2000-2013) period, which may prove the existence of essential and positive linear relation between these variables.

Figure (2) Relationship between real money supply and real GDP growth rate in Bahrain during (2000-2013)



Unit Roots Testing

Table (1) shows the results of the ADF unit root tests for levels and first differences of GDP and M1 series. The t-values on the level obtained from ADF test are Cleary less than the critical values and therefore we accept the null hypothesis of a unit root for both GDP and M1 series at 5% significant level. Thus GDP and M1 are non- stationary time series at their levels. In addition table (1) shows that the same test applied to the first differences of the two series. The results show that the calculated t-values are greater than the critical values at 5% significant level, this means rejection the null hypothesis that the series have unit roots in their first differences , which means that the two variables are stationary at their first differences, and so the two variables are integrated of order one I(1).

Table (1) ADF Unit root tests for level and first differences*

Variables	Level		First difference	
	Intercept	Intercept & Trends	Intercept	Intercept & Trends
GDP	1.84	2.56	3.64	3.95
M1	1.61	2.43	4.25	3.61
Critical values at 5%	3.03	3.67	3.03	3.67
Critical values at 10%	2.65	3.28	2.65	3.28

**Number of lags is determined according to Akaike Information* Criterion(AIC) (Akaike, 1974)

Cointgration Test

Having established the stationary of the two times series under consideration, the next step is to test for cointegration. Although the individual time series tends to deviate from equilibrium in the

short run, they may have long run equilibrium. Table (2) shows the results of Engle and Granger two steps test for cointegration for the following two equation using (OLS) method:

$\text{Log GDP}_t = \alpha + \beta \text{ Log M1} + \varepsilon_t$ (3)

$\text{Log M1} = \alpha + \beta \text{ Log GDP}_t + \mu_t$ (4)

The results represent the outcome of regression of the two equations and the ADF test which applied on the residuals obtained from the two regressions. The results imply that the residuals are free of unit roots which means that residuals are stationary and cointegrated of degree zero I(0), this means there exists cointegration between GDP and M1; thus there is an equilibrium relation between the two variables in the long run, and thus there could be a causality relationship at least in one direction between the two variables.(Granger,1988).

Table (2) Engle and Granger two-step cointegration test

Regression equation Variables	**GDP**	**M1**
A	2.143 (0.837)	1.561 (1.43)
GDP		0.301 (4.321)*
M1	1.721 (4.321)*	
ADF statistics for residuals	4.321	4.073

*99% critical values for ADF statistics= 3.694& ** Values in brackets are T- ratio

Following the Granger representation theorem, the Error Correction Model is added to test the short run adjustment towards long run equilibrium (Engle and Granger, 1987), as well as to test for causality between variables. The result of VECM estimates are shown in table (3). The value of error terms (g_1,g_2) indicates the speed of adjustment of any disequilibrium towards long run equilibrium, where (g_1) suggests that about 73% of disequilibrium in the long run equilibrium in GDP is corrected after one year. The significant error term in GDP equation provides more evidence for the existence of cointegration between GDP and M1 as well. This result could indicate the existence of unidirectional causality running from GDP to M1.

In addition from table (3) we could determine the causality in short run between the variables using F-test for the explanatory variables in VECM. The results shows the F-stat is very high (6.12) in M1 regression equation compared with the value F-stat in GDP equation (1.23), this indicates the existence of short run causality from GDP to M1 and not the opposite.

Table (3) Estimates for VECM

Regression Equation Variables	ΔGDP	$\Delta M1$
Constant	0.63 (1.45)	0.46 (1.12)
g_1	-0.73(2.23)*	
g_2		-0.35 (1.57)
ΔGDP_{t-1}	0.12 (1.96)*	1.08 (2.43)*
ΔGDP_{t-2}	0.1 (1.23)	1.69 (1.75)
$\Delta M1_{t-1}$	0.06 (0.83)	0.4 (2.14)*
$\Delta M1_{t-2}$	0.2 (0.14)	0.13 (0.61)
F-stat	1.23	6.12
Prob. (f-stat)	0.456	0.006

*significant at 5%, values in brackets are t-ratio

Granger Causality Test

The Granger causality test helps in determining the direction of causality between the two variables included in the model. Since the two series are integrated of order one I(1), the Granger causality is applied using the first differences of two variables involved in equations (1) and (2), and excluding the error correction term (e_{t-1}) from the two equations. Table (4) shows the Granger causality, where the null hypothesis of GDP equation is (Δ GDP does not Granger cause ΔM), and the null hypothesis of M1 equation is (ΔM does not Granger cause ΔGDP). As shown in table (4) the first null hypothesis is rejected which means that GDP growth Granger causes M1, however, the second null hypothesis is accepted implying the M1 does not Granger cause GDP. The results confirm the existence of unidirectional causality from real GDP to real money supply that obtained from VECM results.

Table (4) Pairwise Granger Causality Test

Null hypothesis	F-Stat	Probability
Δ ***GDP*** **does not Granger cause** Δ ***M***	6.63	0.015
Δ ***M*** **does not Granger cause** Δ ***GDP***	0.453	0.611

*Number of lags=2

From the above results, we conclude that all tests show a long run equilibrium relationship between the two series in Bahrain during the period (2000-2013), and there is unidirectional causality from real GDP to real money supply in the short run as well as the long run. This result

is consistent with both the Keynesian theory and the Real Business Cycle Theory. So we can say, the changes in the money supply do not help in explaining the changes in output, while the changes in output helps to explain the changes in the amount of money in both short and long run; and thus the Bahraini monetary policy had no significant effect on the GDP growth rate in during the study period.

CONCLUSION AND REMARKS

The study aims at determining the causality relationship between real money supply and real GDP in Bahrain during the period (2000-2013). ADF test results shows the two series were non-stationary at their levels, but they were stationary at their first differences, this means the time series of GDP and M1 were integrated of order one I(1). Engle and Granger two steps and the ADF test shows that the residuals are free of unit roots which means that residuals are stationary and cointegrated of degree zero I(0), this means there are cointegration between GDP and M1, and so there is an equilibrium relationship between the two variables in the long run; and thus there is a causality relationship at least in one direction between the two variables. The Granger causality test shows that there is unidirectional causality from real GDP growth to real money supply growth in the short run as well as the long run. We conclude that the changes in money supply de not help to explain the changes in GDP in Bahrain during the study period, while the changes in GDP obviously explain the changes in money supply. The study recommends the following:

- Monetary authorities could achieve the economic growth goal by providing cash balances without leading to inflation, this could be happen if CBB controls the demand for money and directing the money supply to meet the needs of the demand for cash balances, This will be done under the complete independence of the authority of the Central Bank in making decision far away for government intervention.
- Studying of the structure of interest rates in the future due to the call to raise interest rates on the dollar after reducing it several times after the events of September 11-2001, and taking into account the impact of restructuring the interest rate on investment levels and the requirements of the development process and also the short run financial flows and exchange rates.
- Coordinating between the CBB as a responsible and independent institution for implementation the objectives of monetary policy and the other government agencies that responsible for formulating and implementing fiscal policy, trade policy and exchange rate policy in order to achieve the objectives of Bahrain economic vision 2030.

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