

THE CAUSAL RELATIONSHIP BETWEEN MONETARY POLICY AND ECONOMIC GROWTH IN JORDAN DURING THE PERIOD 1978-2010

Thikraiat Soufan (Corresponding author)

Al Zaytoonah Private University of Jordan, Jordan

Abstract

This study aims to examine the causal relationship between gross domestic product and money supply in Jordan using the Granger methodology in order to determine the direction of the relationship between the two variables during the period 1978-2010. The study found that there is a causal relationship going from the money supply to gross domestic product, and not vice versa. Based on the outcome of causality tests, the changes in the money supply help explain the changes that occur in the gross domestic product, while not conducive to changes in GDP in the interpretation of changes in money supply.

Keywords: money supply, economic growth, the causal relationship, GDP, monetary policy, central bank.

1. Introduction

Developments in the world in the last century of the financial and economic crises affect the macroeconomic indicators, different ideas and contrasting monetary policies, which highlighted the importance of the role of monetary policy to influence the required rate of growth, hence this study was to shed light on the impact of monetary policy on economic growth in Jordan. My research is based on the assumption that there is a two-way causal relationship between money supply and GDP in Jordan, in the sense that at the time influenced the output with money supply (non-neutrality of money), the GDP impact on the money supply.

1.1 Research Methodology:

The study relied on primary sources such as references, periodicals and books that look at the subject of the study. Method of statistical descriptive analyzing the instruments of monetary policy and its evolution during the period (1992-2011). In addition to the use of causality Granger model to test the validity of the null hypotheses as following:

- 1 - Money supply does not cause Gross domestic product (GDP).
- 2 - Gross domestic product (GDP) does not cause the money supply.

1.2 Previous studies:

We can summarize some of the studies that have addressed the issue of causality between monetary policy and economic growth as follows:

The study of (Lee & Yang) in 2006 measured the causal relationship between money supply (M2, M1) and income expressed in per capita real income and differences in industrial output in the States by using monthly data during the period 1959 to 2001, The researchers concluded that there is a statistically significant relationship went from money supply to income, and the relationship of money supply by using the broad concept to the average per capita real GDP was more significantly in compared to using the narrow concept.

The study of (Gebregiorgis) in 2006, found a statistically significant relationship between the money supply as the independent variable and real GDP as the dependent variable, when testing the relationship to the Canadian economy in the short and long term, using quarterly data for the period 1959 to 2002, it is significant statistically relationship, but it is characterized by weakness.

The study of (Dalkir) in 2004, measured the causal relationship between money supply using the narrow and broad concepts and output in the United States by using monthly data during the period from 1962 to 1992, the results showed that the relationship between the two variables differed according to the concept used in the measurement of the money supply and on the time period, also the results showed the effectiveness of monetary policy in the U.S. economy among these periods, where it was more effective in the eighties and early nineties compared to the seventies, the different causal relationship was justified to the changes in monetary policy over time.

The study of (Akaddeer) in 2002, tested the relationship between money and GDP in the short and long term during the period from 1970 to 2001 in Qatar, and reached a one-way causal relationship between the two variables are moving from GDP to money supply in the short and long term, which due to the export

country's dependence on oil and gas, resulting an increase in the assets of the central bank's foreign exchange, thereby increasing the money supply.

The study of (Hafer & Ali) in 2001, tested the relationship between all of the money supply , the interest rate and output, to a sample of 20 countries from each of the EU member states and some of the least developed countries, the study found the role of money supply in the interpretation of the changes in the real output e compared to the interest rate for half of the countries.

Finally the study of (Holmes & Patricia) in 1992 ,tested the causal relationship between money supply and the monetary base and income using quarterly data for the period 1970 to 1988 has been reached that the monetary base has interpreted the changes in income ,also results showed weak statistically relationship (10%), and to the absence of a causal relationship from any direction between money supply in the narrow concept and income, also income contributed to in the interpretation of the changes in the money supply in the broad concept, but the money supply did not explain the changes in income, and that there is a two-way causal relationship between money supply and income, but the relationship of income to money in the broad concept is stronger if compared with the narrow concept.

2. The concept of monetary policy

The term of monetary policy in the economic literature appears during the nineteenth century, which also the start of the study for the monetary policy issues by economists of different persuasions and ideas. In the twentieth century the monetary policy and the study of different aspects have become an integral part of the general economic policy of the country.

Monetary policy represents one of the most important elements of economic policy system that can be used to achieve the economic goals of the community. Monetary policy depends primarily on the money supply and interest rates, which in turn affect the level of overall economic performance.

Kent believes that the monetary policy is a means by which followed cash management to control the money supply to achieve a specific economic goal. According to Prather that monetary policy includes the organization of the money supply through appropriate measures taken by the monetary authorities represented by the central bank, while according to Prof. Dr. Abdul Muttalib Abdul Hamid, the monetary policy is a set of rules, means and methods, procedures and measures undertaken by the monetary authority to influence the money supply in line with economic activity to achieve certain economic goals, during a certain period of time.

The power of the monetary authority represented by the Central Bank shows its ability to increase or decrease the volume of money in the banking system by relying on the various tools , methods and techniques of monetary policy which represented indirect and direct control of the monetary authorities, where is the control indirect effect the total cash reserves available to the banking system and thus influence the total volume of bank loans and investments, through the discount rate, required reserve and open market operations.

The direct control (quantitative and qualitative) has emerged during World War II and beyond, where the direct intervention of the monetary authorities in determining the volume of credit to influence certain sectors of the economy without affecting the rest of the sectors, including the means of the direct control of a set of actions that taken by monetary authorities for the purpose of promoting certain types of spending or productive investments and directing the flow of credit to them, and that the tools of direct monetary policy has a direct impact on the lender and the borrower at the same time, also influence qualitatively and quantitatively the level of demand loans, as well as at the level of ability of financial institutions to lend .

3. Economic growth theories

Theories of economic growth express the continuous increase in the gross domestic product, because of the interaction that occurs in a particular environment in a certain time period, where classical economists think that economic growth is done automatically without the need for state intervention in economic life and economic balance achieved always at full employment which has led them to believe in the neutrality of money so increase in the money supply appears on the monetary values are represented in the general level of prices , monetary wages and monetary income, as determined by the values of variables in real side of its independently of the monetary variables, and thus there are no channels of the impact of monetary between the monetary sector and the real sector In the classical model. The aim of monetary policy is to achieve monetary stability, with the exclusion of the impact of monetary policy on the real side of economic activity.

On the other hand, Keynesian theory is characterized by the difficulty of separating the real economy and the monetary economy, as was the case in conventional quantum theory, the Keynesian model has refused

to Sai law that supply creates demand for it with him, and the consequent rejection of the rule of permanent equilibrium at full employment. According to the analysis Keynesian not determined savings and consumption, according to the interest rate, but we find that they variables belonging to the level of income, and the interest rate is not determined by the intersection of savings with investment also confirmed it classic, but it is determined in light of a certain level of money supply favoring liquidity, and confirms Keynes that the rate of interest is monetary variable represents the cost of borrowing money for investment purposes, so the decline encouraged investors to increase their investment spending.

Chicago School believes that inflation is a monetary phenomenon mainly finds its origin in the growth of the quantity of money more quickly than production growth. It also believed that money is changing strategic fluctuations in economic activity and that the cyclical fluctuations in production are the result of the movements of the quantity of money and the impact of money supply in the long term be at the level of price in the short term will be its impact directly on the total expenditure and then on the national income, as seen monetary policy as a powerful and effective tool in achieving economic stability.

The theory of contemporary amount of money as formulated by Milton Friedman is represented interest in the relationship between the change in the quantity of money and the change in the price level, this means attention to monetary policy to combat inflation, and economic stability critical need to increase the money supply by a fixed and stable, consistent with the rate of economic growth, and that the role of the monetary authorities have limited the amount of money and control relevant work on a stable growth rate consistent with the growth rate of the economy, and that importance should be attached to the money supply, not demand them as Keynes as a variable changes happening on economic activity.

4. Monetary policy and economic growth in Jordan

4.1 Economic growth in Jordan.

Jordan in the recent years offset the lack in natural resources through the outstanding level in human resources, and by leading a policy of openness to the global markets. Jordan succeeded in economic policies by achieving fiscal and monetary stability and by creating a legislative investment environment, having been conducting many of privatization and structural reforms that contributed to accommodation for the private sector of the economy through supplement investments which contributed to raising the efficiency of the Jordanian economy and putting it in the path of growth and progress.

The stages of economic growth in Jordan as follows:

4.1.1 The stage of the economic boom period (1978-1982).

This stage is characterized by the average growth rate of GDP in the amount of 14.2% and the average size of the investment reach a rate of 37.5% as a percentage of gross domestic product for the period, also investment focus on the private sector building and construction which generates the income and employment, also adopted the economic growth for this period on external funding, and was financing the construction of the private sector through workers' remittances, while the infrastructure and key projects set up by the state have been funded through the aid received by the government of oil-producing countries, which amounted of GDP average 15.2 % for the period 1978-1982.

4.1.2 The stage of the economic slowdown for the period (1983-1987).

This period saw a decline in oil prices, which led to a decline in workers' remittances of Jordanians and Arab aids, which led to a deficit in the current account of 5.2% of GDP, and this in turn led to a decline in the average size of investment to a rate of 25.3 % of GDP for this stage, but in contrast the average fiscal deficit to 3.9% as a percentage of GDP for this period to be the result of a decline in the average rate of GDP growth would amount to 1.4% for the period 1983-1987.

4.1.3 The stage of the economic crisis for the period (1988-1991).

This stage came a result of the economic crisis that occurred on the impact of the collapse of the dinar exchange rate in 1988 and the Gulf War in 1990, which led to the decline in the rate of GDP growth to negative growth rate of 2% for the period 1988-1991, and due to the increasing fiscal deficit and increasing debt service ratio to 45.4% of exports in 1989, which led to government borrowing to meet this deficit, also led to the high rate of inflation to a rate of 13.5% in 1988, and the decline in investment to 22.7% as a percentage of GDP for the same year, and ultimately fell in GDP that increased by 21% as a result of the recession period in the Jordanian economy in 1989.

The result of the economic crisis in 1988 was the adoption of a comprehensive program of economic reform and structural cooperation with the International Monetary Fund and the World Bank to promote economic growth were to start applying the first program in 1989 to cover the period 1989-1993, by using

a concretionary monetary policy to reduce the inflation effects in the program of debugging Economy as well as promote the development of foreign reserves as a tool to maintain the stability of the dinar exchange rate and peg to the dollar and reduce the margin between the official exchange rate and the free exchange rate to cover all economic transactions visible and invisible since February 1990, in addition to promoting national exports to cancel the requirement to provide bank guarantee for Exports of goods Jordanian origin, as the central bank cut its minimum ratio of cash margins charged by banks on the import of raw materials used in the domestic industry.

4.1.4 The stage of economic recovery for the period (1992-1995).

Jordanian economy continued on the road to real economic growth despite the crisis the Arabian Gulf that have hindered the continuous application program debugging economy ,because of carrying the Jordanian economy additional burdens and losses as a result the economic blockade and international sanctions imposed on Iraq that stopped the aid and workers' remittances of Jordanians in the Gulf, so that characterized this period increase the average size of investments to 34% for the period 1992-1995, resulting in a higher average economic growth rate to 7.5% for the same period, due to the return of 300 thousand Jordanian workers from the Gulf after the Gulf War with the savings to Jordan, along with results of the application of another program to correct covering the period 1992-1998, which represented an increase of average economic growth rate to 5.5% for the period 1992-1998 which is higher than the growth rate of the goal of the program to achieve 4.3% for the period 1992-1998.

4.1.5 The stage of the economic slowdown for the period 1996-1999.

economic reform policies Succeeded for the period 1992-1998 in achieving its short-term goals and of achieving financial and monetary stability with the end of 1998, to control inflation to a rate of 4.4% annually in 1998, in addition to controlling the budget deficit within the limits of 5% in 1997 and 8.5% in 1998, also a decline in the expenses growth to become positive as a result to debt rearrangement during 2002 -2003.

In 1998 Jordan was affected in declining the global oil prices which has led to the interruption of financial assistance to Jordan, by contrast, that has been the development of local revenue by issuing a new law of Customs which was to unite all fees and taxes collected on goods imported and re-exported. On the other hand reflection negatively on the size of Jordan trade with Arab countries exporting oil, also weak competitiveness of the industry of Jordan and its dependence on the domestic market and the high cost because of the small size of the production so that decreased total commodity exports and services, including 4.5 percent for 1998 when compared with 1997, thus the above factors may have influenced negatively on the level of economic activity to achieve average annual growth rate of 2.9% of GDP for the period 1996-1999, which called for the adoption of the correct program for the period 1999-2001.

4.1.6 The stage of moderate growth for the period (2000-2007).

The moderate growth rate reached 4.4% for the period 2000-2002 cause of the impact of using expansionary monetary policy and was adapted to local and international economic conditions by achieving reform program for 1999-2001 improvement in the performance of trade of exports and services to an average of 42.5% for the period 1999-2001, and decreased the deficit in the including trade balance by 5.7% compared with the previous stage to reach an average of 27.7% as a percentage of GDP for the period 1999-2001.

Also been reached in the month of July 2002 an agreement with the IMF on a a new program of economic reform begins in 2002 and extends until 2004, and includes fiscal policy aims to provide the conditions for economic growth and contribute to the positive impact on people's living standards and maintain exchange rate stability and an appropriate level of foreign exchange reserves, in addition to continuing to work to reduce the public debt as a percentage of GDP.

Jordan had positive results at the end of this program and reached an average growth rate of real GDP of 8.3% for the period of application of the program, continued Jordan in growth rate of GDP stood at 8.2% in 2007, and through the implementation of investment quality and quantity in the areas of local development, and the development of programs aims to empower citizens and provide appropriate opportunities, especially youth and women, as well as encouraging and promoting private investment.

4.1.7 The stage of the global financial crisis (2008-2010).

Signs of the global financial crisis were to emerge in September 2008 in the United States and moved quickly to the most advanced economies and then spread globally, and implications of the crisis came on countries varying in intensity and speed of impact, according to the degree of openness of their economies

in general on the global economy with its components that were different, and exposure economy ,for Jordanian global financial crisis and consequent recession in the economies of most developed and developing countries over the past 2008, 2009 and 2010, where had begun a growth rate of Jordan GDP reached to 7.2% and 5.5% and 2.3% for the years 2008, 2009 and 2010 respectively .

4.2 Monetary policy in Jordan.

Indicators can be expressed in monetary policy in Jordan through the following indicators:

4.2.1 The ratio of money supply to GDP.

The money supply in its narrow approach represents cash in circulation among the public, in addition to current deposits in Jordanian Dinars for the private sector (resident) and NBFIs and public institutions, plus demand deposits of other banking institutions in Jordanian Dinars at the Central Bank only.

The money supply in its broad approach is defined as money supply in its narrow approach ,in addition to cash equivalents, which includes demand deposits in foreign currency deposits, savings whether its in Jordanian dinars or foreign currency in the banking system of the private sector (resident), financial institutions and public institutions (the central bank, 2005).

The change in the money supply affect in making economic cycles and impact directly on the efficiency of the national economy, and then welfare of individuals, so increase in the money supply lead to a recovery in the financial markets due to expectations of economic units to a better future, due to the low rate of interest rate , which leads to increased investment then increasing in the aggregate demand then gross domestic product and income through investment spending multiplier process, resulting in lower unemployment rates.

There are four points of influence in the money supply, where the central bank's most influential as a governmental entity independent monitoring of the banking system and controlling the monetary policy, which followed by commercial banks as financial institutions and intermediate accept deposits from individuals and institutions and then lend, to be followed by a group of depositors of individuals and institutions commercial reserve deposits with banks, and finally a group of borrowers from individuals and institutions who borrow directly from banks, deposit or through the issuance of bonds sold directly in the financial markets, so the decisions of banks with reserves of its money in the treasury and preferences of individuals to retain its liquidity are all factors affect the volume of deposits in commercial banks and the money supply.

The index value of the ratio money supply to GDP is greater than the rate of growth in GDP since 1978 and up to 2004, reflecting the size of the local liquidity, which increasing throughout the period of the study from 29% in 1978 to 200% in 2010, indicating an improvement in the financial depth of the Jordanian economy, Table (1).

4.2.2 Real interest rate levels.

The interest rate represents the amount of cash received by the lender or the opportunity cost to keep money liquid, where the interest rate prevailing at the individual level indicator of the households of the trade-off between the purchasing power of the current and the purchasing power of the future, because the interest rate is a price for credit and its role as the rest of prices in the distribution of funds between different uses in the present and the future (the central bank, special number).

The interest rate as one of the monetary indicators show that the increase in the interest rate on deposits lead to increased opportunity cost to hold additional reserves liquid, resulting in a low percentage of reserves to demand deposits, so the relationship inversely low proportion of reserves to demand deposits and interest rate.

Table (2) shows that the interest rate on deposits in Jordan has risen in the eighties, compared with the seventies, and in 1988 interest rates are determined by the forces of supply and demand which has contributed to narrowing the gap between interest rates and inflation rates and help the financial sector in attracting financial savings, which has been converted to loans to various sectors to invest in several projects. The interest rates on deposits, despite falling since 1999, tend to be high and the stimulating local savings and attracting the movement of capital from foreign in compared to other Arab countries.

4.2.3 Credit facilities.

The credit facilities are a source of income for banks, because of the benefits charged by these facilities, and the banks obtain funds from depositors and are turning to med- term loans and long-term loans to borrowers who need funding for a period of time so it is considered one of indicators of financial depth.

The interest rates affect on banks' profits that meet the margin between the interest rates payable and receivable and dissemination of new technologies to enter the foreign financial institutions as well as local

financial institutions and create an atmosphere of competition that lead to raising the efficiency of financial institutions.

The size of the credit facilities Influenced by the financial and administrative policy of the Bank's in the granting of loans that are available to the requirement of security more than unsecured loans, the ability of banks to obtain sufficient information and comprehensive, where banks policy since the fifties attends to provide short-term loans rather than long-term, on the other hand the size of the facilities affected by monetary policy that affect the money supply which affects the interest rate and thus the size of investment then the size of GDP through tools that include open market operations and the issuance or sale of government bonds to the public, and the proportion of required reserve on deposits of commercial banks to keep them in the central bank, and the discount rate which is the interest rate that commercial banks pay it when borrow from the Central Bank.

Liberalize the interest rate on the deposit in 1988 impact on savings rates, the higher the interest rate on savings deposits managed banks attract more domestic liquidity , capital inflows, and affects the interest rate on banks' profits, which verify the margin between the interest rates payable and receivable. In 1990 has been liberalized interest rates on lending, where the interest rate on lending as the cost of public institutions when borrowing to finance their investments, the lower the interest rate on lending leads to activate the business of economic, where the interest rate on borrowing began to decline, reaching 8.26% in 2004.

The decision to establish the company contributed Jordan Loan Guarantee to increase the size of the facilities through sector to support small and medium-sized enterprises by providing guarantees to commercial banks. Limited investment banks in the field of facilities on loans evolved investments in the field of credit facilities to include the following:

1) direct credit facilities.

Borrowers are provided with the necessary funds to facilitate their activities, that the borrower undertakes to pay and benefits of those funds and their expenses and commissions in exchange for credit guarantees for Bank (Awwawdeh,1998).

Direct facilities banks licensed grow by 9.96% for the period 1985-2010, and attributed the low figure with the passage of time due to the role of the central bank in determining this ratio in accordance with the interests of the banking system

Direct credit facilities include three main types are:

A - Loans and advances: the bank is to give the borrower a sum of money for a legal religion in accordance with the rules, credit guarantees and a timetable (Awwawdeh,1998).

B - Discounted Bills: The Bills are a personalized advance to the customer against his pledge to pay a certain amount to the bank after a limited period, and this is usually known as the discount banking, and may be promissory notes in the form of discount business as a result of a business process between two parties (Awwawdeh,1998).

C -Indebted deposit is defined as an agreement between the bank and the client on the client to withdraw the money that allows him to drag Bank, to be calculated indebted to a ceiling agreed upon during a certain period of time (Awwawdeh,1998).

2) Indirect credit facilities.

Credit facilities do not result in a cash payment directly to the client, and indirect facilities include three types as follows (Shatti, 1996):

A - Documentary Credits: bank undertakes to pay a certain sum of money to the borrower for the provision of certain documents; you can use this type of facility in financing foreign trade sector, in return for guaranteeing the source right to meet the value of his goods because of the commitment is irrevocable by the Bank of the importer.

B - Guarantees: bails is defined as a written undertaking issued by the bank in return for the borrower undertakes to pay a sum not exceeding a certain limit to a third party account for a particular loan by a specific date.

C - Credit cards: defined as the cards issued by the bank to its customers allowing them to either withdraw cash or pay off a credit for goods and services in return for guaranteeing versions of this card, in addition to meeting the commission on the issuance and interest on cash withdrawals, and electronic transactions law was adopted in 2001.

3) Leasing:

The Bank financed purchase the asset then lease it he borrower with giving him the right to own the asset, whether individual or institution against specified payments in accordance with the specific conditions ,so

the Arab bank in Jordan established for rental devices and mechanisms in 1996 to fund this type of credit facilities (Husseini, 1999).

The size of the credit facilities granted by banks licensed to the private sector as one of the indicators that reflect the role and importance of the banks in financing private sector activity. The evolution of the volume of credit facilities granted to the private sector by licensed banks in Jordan from 308.8 million dinars in 1978 to 11.7804 billion dinars in 2010, has doubled the size of the credit facilities provided to the private sector, that nearly thirty-eight times

Also the ratio of the volume of credit facilities directed to the private sector by banks licensed to GDP, which is considered one of the indicators that reflect the financial depth and shows us the size of the role of banks in financing the private sector during the study period (1978 -1020), in addition to the gradual rise of almost 15% in 1978 to 118% in 2010, to reflect this rate the importance of banks and their role in financing the activities of the private sector

In 1979, a high rate of growth in the volume of credit facilities granted to the private sector by licensed banks which is 47%, then the rate of growth of credit to the private sector starts to decline, and then to rise gradually in the first half of the nineties, and then resumed growth rate to decline out of the second half of the nineties to continue the rise and fall until 2004 and then begins to decline due to the global financial crisis.

5. Econometrics analysis

5.1 Stationary Test

To test for the presence of unit root in the time series, study relied on test Dickey - Fuller expanded each of the natural logarithm of the GDP data and the natural logarithm of the data of money supply broad sense at current prices (ln (M2)) during the period from 1976 to 2010, as shown in the table 4

Tests showed stability at the level of the first difference of the data used to stable when the first difference of the variables, where the calculated values of the test greater than the table values when 1% level of significance, so we accept the alternative hypothesis that the variables are stable at the first difference.

5.2 Granger causality test

Granger test determines the causal relationship which is based on the dynamic relationship between the time series, using Granger causality test make sure whether there is a feedback relationship or correlation between gross domestic product and money supply.

Granger test assumes that appropriate information for the relevant variables, and includes testing the following equations:

$$GDP_t = \sum_{i=1}^n a_i M_{t-i} + \sum_{j=1}^n B_j GDP_{t-j} + U_{1t}$$

$$M_t = \sum_{i=1}^n \lambda_i M_{t-i} + \sum_{j=1}^n \delta_j GDP_{t-j} + U_{2t}$$

The below table show that there is a causal relationship between money supply and real GDP but in one direction so that changes in the money supply have effects on economic growth and not vice versa, where tests showed causal there was no effect of changes in real GDP on money supply real.

5.3 Descriptive analysis of the variables of the study

Table (6) shows descriptive statistics for the variables of the study, the table shows that the monetary data and the variable GDP does not far from the normal distribution using the test (Jarque-Bera), and to accept the null hypothesis that the data follow a normal distribution

As shown us from the results of the sprain values and through review of mean and median values, we find its close, so this indicating the absence of sharp fluctuations in the fluctuation of these variables.

6. Recommendations

The results of the study indicated that changes in the quantity of money supply helps explain changes in the gross domestic product, it can help the economic decision-maker to use monetary policy tools to influence the gross domestic product (GDP) and then on economic activity as a whole.

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Table 1, The ratio of money supply to GDP as a monetary policy indicator in Jordan

Financial Depth(%)	GDP Growth(%)	MS2*	GDP *	Year
28.92	15.0	606.7	2098.1	1978
30.50	20.8	773.1	2534.6	1979
34.95	11.2	984.8	2818.6	1980
35.73	17.2	1179.9	3302.2	1981
39.71	7.0	1403.3	3534.2	1982
46.74	2.2-	1615.2	3455.8	1983
48.77	4.3	1757.7	3604.1	1984
53.47	2.7-	1874.8	3506.5	1985
56.02	5.5	2072.4	3699.5	1986
62.67	2.3	2372.2	3785.5	1987
68.91	1.5	2646.8	3840.8	1988
86.65	10.7-	2971.1	3428.7	1989
91.32	0.3-	3122.6	3419.3	1990
107	1.6	3717.5	3474.3	1991
105.54	14.4	4193	3972.9	1992
107.97	4.5	4481.8	4151	1993
111.1	5.0	4841.5	4358.1	1994
111.5	6.2	5159.8	4627.7	1995
109.56	2.1	5175.3	4723.5	1996
114.26	3.3	5576.6	4880.5	1997
119.86	3.0	6026.3	5027.6	1998
130.23	3.1	6747.6	5181.4	1999
137.84	4.1	7434.7	5393.7	2000
139.02	4.9	7866.1	5658.1	2001
141.96	4.8	8419.1	5930.6	2002
153.32	4.1	9465.7	6173.8	2003
142,4	5,8	10571.4	6649.2	2004
143,3	11,0	12364,0	7379,6	2005
155,0	8,1	14109,7	7976,9	2006
163,5	8,2	15606,8	8629,0	2007
168,7	7,2	18304,2	9253,3	2008
187,5	5,5	20013,3	9760,0	2009
200,4	2,3	22306,7	9985,4	2010

The money supply in its broad approach in million JD.

R.GDP in base year 1994. Source: central bank ,

Table 2, The Real interest rate levels as a monetary policy indicator in Jordan

Average	Time	Saving	Demand	Year
4.17	5.5	5	2	1978
4.17	5.5	5	2	1979
4.33	6	5	2	1980
4.33	6	5	2	1981
5	6	5	4	1982
6.08	8	6.25	4	1983
6.42	8.5	6.75	4	1984
6.42	8.5	6.75	4	1985
5.42	7.5	5.75	3	1986
5.42	7.5	5.75	3	1987
5.03	8.23	5.18	1.69	1990
4.79	7.82	5	1.54	1991
4.23	6.95	2.01	0.74	1992
4.30	6.87	5.14	0.88	1993
4.48	7.33	4.96	1.15	1994
4.67	7.97	5.01	1.04	1995
5.09	8.85	5.22	1.19	1996
5	8.91	4.79	1.27	1997
4.75	8.33	4.56	1.35	1998
4.51	7.89	4.19	1.46	1999
3.84	6.55	3.76	1.2	2000
3.05	5.19	2.91	1.06	2001
2.24	3.97	1.84	0.91	2002
1.38	2.75	88.	0.5	2003
1.2	2.48	72.	0.41	2004
1,61	3,52	0,83	0,47	2005
2,33	5,13	0,99	0,87	2006
2,53	5,56	1,10	0,94	2007
2,57	5,66	1,04	1,01	2008
1,91	4,23	0,84	0,67	2009
1,54	3,40	0,77	0,44	2010

Source: central bank ,

Table 3: CREDIT FACILITIES EXTENDED BY THE LICENCED BANKS IN JORDAN

Growth	CREDIT FACILITIES	Year
	1531.7	1985
5.8-	1442.7	1986
4.9	1513.1	1987
8	1634	1988
5.8	1729.3	1989
7.8	1863.5	1990
5.5	1965.1	1991
12.9	2218.3	1992
23.6	2741.2	1993
18.5	3248.4	1994
14.1	3705.5	1995
5.8	3920.1	1996
1.5	3979.7	1997
7.7	4285.3	1998
4.2	4466	1999
1.8	4546.5	2000
3.7	4714.7	2001
3.2	4866.7	2002
2.2	4972.5	2003
19.4	5934.8	2004
30.5	7744.3	2005
26.1	9761.9	2006
15.7	11295.6	2007
15.5	13044.3	2008
2.1	13317.2	2009
8.5	14451.4	2010

CREDIT FACILITIES in MILLON JD

Source: central bank

Table 4: Augmented Dickey-Fuller test

Variable	Level			First difference		
	ADF	Critical values 1%	Critical values %5	ADF	Critical values 1%	Critical values %5
ln(GDP)	5.38	2.63	1.95	2.09	2.64	1.95
ln(M2)	8.79	2.63	1.95	2.03	2.64	1.95

Table 5: Granger causality test

Prob.	F-Statistic	Obs	Null Hypothesis:
0.0220	4.38795	33	LN2 does not Granger Cause LNGDP
0.1190	2.29861		LNGDP does not Granger Cause LN2

Table 6: Descriptive analysis

LN2	LNGDP	
8.219445	8.393187	Mean
8.407780	8.331129	Median
9.904152	9.208879	Maximum
5.941223	7.432129	Minimum
1.040116	0.447610	Std. Dev.
-0.431826	-0.033528	Skewness
2.459541	2.661406	Kurtosis
1.513736	0.173749	Jarque-Bera
0.469133	0.916792	Probability
35	35	Observations