

# The Effectiveness of Governmental Monetary Policies on Economic Performance: Middle East Experiment

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## ABSTRACT

The current study was stimulated by the ongoing widespread debate about the effectiveness of monetary policy in improving economic performance. The study employed time series data obtained from the bulletins of the Central Bank of Jordan cover a period of 15 years from the third quarter of 2008 to the second quarter of 2023 with a total of 60 observations. The St. Louis methodology was adopted in order to verify the objectives of the study. The Granger test was also applied to verify the causal relationships and their direction between money supply and general price index from one side and real GDP from the other side. In order to create further evidence for the robustness of this relationship an additional tests-the VECM and FMOLS were conducted for predicting the study model. The results revealed that data were stationary at all levels. Moreover, the Granger test exposed unidirectional relationship between these variables (money supply, consumer price index) and real GDP, and therefore the null hypotheses of the study were rejected, and evidence was recognized; that the two variables were able to estimate the changes in RGDP. Further indication of the robustness on this relationship was obtained by the VECM and FMOLS tests that validated the prediction model of the study. The collective results of the study established an essential positive influence for money supply on RGDP in the Jordanian context.

**Keywords:** Money Supplies, Consumer Price Index, Real Gross Domestic Product, Monetary Policy

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## **INTRODUCTION**

Traditionally, the primary role of government and state officials is to develop strategies that are translated into policies and procedures aimed at stimulating the economy, maintaining fiscal solidity, controlling joblessness rates, inflationary levels, and achieve the stability of expenditures, which attains a privileged position for the economy and an appropriate exchange rate that mirrored the welfare of the community.

Generally, central banks in all countries are seen as the powerful financial arm that controls economic activities through their practices in controlling the total money supply in the market. These practices include setting interest rates and discount rates, reserve ratios for banks, deposit and lending interest rates and many other practices that govern open market operations. The Central Bank, such as in Jordan, closely monitors throughout the year, the activities for the broad of money, credit services, local money deposits, whether these deposits are governmental or corporate or individual deposits in addition to monitoring foreign cash deposits and money investments. This act by central bank is aimed to reassure the general level for the amount of money supply in market so as to intervene quickly in the event of any imperfection in the monetary policy that has been set for money activities in the market.

In the late eighties of the last century, Jordan began an economic reform program in order to revive and improve the Jordanian economy so that it becomes compatible with the new world order and the open market economy. Within this framework, the process of privatization of many different government institutions in all sectors had begun, making the market work more efficiently by granting greater flexibility and freedom in economic practices. The process of transformation and economic recovery had gained great support from all countries that have economic relations with Jordan, such as the United States of America, the European Union countries, Arab Gulf countries and East Asian countries such as China and Japan. Moreover, many international institutions had also provided economic support and assisted the Jordanian government to make this reform program a success. This support was witnessed in Jordan by the continuous funding from the World Bank, facilities from World Trade Organization and various funding from the European Union countries and the Arab Gulf countries.

In continuation of the economic transformation project, the financial sector and the trade sector were almost completely liberalized, and at the beginning of 1995 Jordan announced the liberalization of the Jordanian dinar and its convertibility to all visible and invisible economic practices (CJB, 1995). After 1995, the Jordanian financial authorities focused on the exchange rate of the dinar in order to maintain an acceptable rate that reflected the real value of the Jordanian currency. The process of maintaining the stability of the exchange rate began by linking the dinar to the basket of currencies with proper controls and appropriate reserves levels of these currencies, and in a later step in order to empower the exchange rate of the

dinar it was pegged to the US dollar, which gave more stability to the dinar and strong output values.

This fundamental change in the exchange rate of the Jordanian currency led to the emergence of some complications and effects on the general view of the monetary policy. On the one hand, there was criticism of this peg of the dinar with the US dollar, which in turn questioned the independence of the dinar and its liberalization to fluctuate with the rest of the global currencies independently from the dollar, but despite this criticism, this policy of pegging had achieved strong stability against many strong foreign currencies such as the Euro and the Pound Sterling. This pegging of the dinar with the dollar sustained a fair exchange rate for the Dinar, which led to the full opening of the Jordanian currency with foreign currencies at an appropriate exchange rate, that sustained a reasonable rate of inflation.

The reports of the Central Bank of Jordan and some previous studies such as Maziad, (2009) had shown a linkage to the flexibility in the monetary policy set by the Central Bank of Jordan (CBJ) in terms of responding to the requirements of the local market to control interest rates, inflation and national product. The continuity for ensuring the effective monetary policy implemented by the government through the Central Bank required steadiness examination of this policy not only at the short-term level but also at the long- term level, since economic, political, social and even environmental events are constantly changing elements and thus monetary policies must suit these variables.

The originality of this study stemmed from the fact that it came to verify the effectiveness of the monetary policy applied by the government via the CBJ, and covered a sensitive period before, during and after the Corona pandemic. Therefore, this study mainly aimed to come up with transparent and reliable results on the fact that monetary policy succeeds in the continuity of economic growth, as the results that might be obtained could be different and show unexpected results or ascertain the previous results for the effectiveness of monetary policies that were applied.

Furthermore, the results of this study will be of great benefit to decision-makers in the government and to monetary policy implementers. Also, the study is likely to provide useful implications, especially for the financial sector on the effectiveness of the Central Bank in implementing various policies particularly the monetary policy. Additionally, the information obtained from the study is anticipated to add more to the literature on monetary policy in Jordan and emerging countries. Also, one of its great benefits is to deliver reliable information to the public about the effectiveness of policies that are implemented by government agencies. Besides, the results can deliver a basis for legislative authorities that can intervene at some point to amend legislation related to monetary policy.

The rest of the sections are as follows: The next section is for the literature of monetary policy and previous studies, the third section will be related to methodology and study instruments, the fourth section is for results and discussion, and the last section will be for the conclusions.

## **LITERATURE REVIEW**

### **Monetary Policy Concept**

The term monetary policy refers to the monetary procedures adopted by the financial authorities in the country in order to govern the amount of return that is paid for temporary borrowing or money supply. Traditionally, the monetary policy was used to control the money in the market as an effort to regulate inflationary levels or the rates of interest so as to control the increase in market prices and thus increase confidence in the value and stability of the national currency. Monetary policy is also referred to as controlling of money supply by issuing new money and offering it on the market or decreasing the money in the market by modifying the interest rates or getting rid of extra money in market. One of the long-term monetary policy objectives is also to contribute to the stability of GDP and achieve acceptable exchange rates between the currency of a particular country and other currencies.

Monetary authorities usually follow either an expansionary or a shrinkage monetary policy. The government relies on the expansionary policy when the financial authorities use their means to inspire the local state of the economy. Such expansion policies sustain interest level rate lesser than normal, and this policy is used in most cases to reduce unemployment rates in periods of economic recession. They may resort to increasing the money supply in the market to encourage borrowing at low interest rates which enables borrowers to establish or expand projects and raise the production rate of goods and services in the country. Nevertheless, with all these advantages of an expansionary policy the increase in the amount of money in market upsurges the risk for the possibility of collapse in exchange rate against other currencies.

In contrast, if the fiscal authorities pursue a contractionary monetary policy, they tend to raise the interest rates more than usual and reduce the supply of money in the market with the aim of slowing economic growth in the short run towards low inflation levels. Such a deflationary monetary policy could create several dilemmas, including rising for unemployment rates, a recession in the borrowing market, reducing consumption for consumers that cause a reduction in goods and services thus creating an economic recession (Yeyat et al., 2010).

Nowadays, after the increase in government's financial awareness, monetary policy makers have started to rely on a wider range of tools to formulate the monetary policy plans, including short term interest rates, long term rates of interest, more supply and more speed in money movement in the market, controlled currency conversion rates, enhancement for quality of credit, stocks and shares (debt and property in companies), adequate consumption and savings in the public and private sectors, encouragement of capital flows to the market specifically foreign investments, and finance derivatives such as, options, swaps and forward contracts.

From the best mechanism that central banks introduced to control the economic is the usage of interest rate to expand or reduce the monetary base in marketplace, the currency involves the currency in the market and the reserves of banks for their deposits in Central Bank. However, Central Banks constantly tend to trail in monetary policy the open market operations by withholding rates and reserve requirements. Overall, governments or financial principals realizes a set of objectives by monetary policy performs, including the stability of prices in the market through a satisfactory inflation rate economically and socially, achieving monetary and economic stability by aligning the level of money supply to the level of economic activity, and balance of payments that gives better stability to the economic state. Furthermore, an appropriate monetary policy functions attains the desired level of community consumption that guides the production level through sustaining full employment of cash, reduction of unemployment rates and achieving of the best economic well-being (Friedman, 2001).

## **Central Bank of Jordan and Monetary Policy**

Jordan began planning to establish the Central Bank of Jordan in the late fifties of the last century. In 1959 the law of the Central Bank of Jordan was issued; since its establishment, the Central Bank of Jordan has sought to maintain monetary and financial stability in Jordan and thus achieved the desired economic level that achieves sustainable economic and social development. Moreover, from the beginning of its operations the Central Bank also has been working to achieve monetary stability in Jordan, whether through the stability of the exchange rate of the dinar or the stability of the general level of prices. Besides, it also pursued continuously to offer an attractive environment for various investments in Jordan by establishing an appropriate interest rate structure. The Central Bank was and still working unceasingly to adopt precautionary control policies, whether partial or total, aimed at achieving banking and financial stability.

According to the law of the central bank it is obligated with several tasks and duties including: setting the monetary policy in Jordan and working efficiently to implement it, maintaining and managing Jordan's reserves of gold and foreign currencies, issuing banknotes and coins, the continuous supervision over banks both public and private and any other entities that are classified as financial institutions, following up and supervising their banking business, organizing and developing the national payment system and regulating all credit activities in the Jordanian economy (Mishal & Abu-Dallo, 2014).

Through the historical review of the monetary policy in Jordan, we found that it passed through two periods of time, the first period was from the foundation of the central Bank of Jordan in 1964 up to 1989 the year that was regarded as the first year that the exchange rate of the Jordanian dinar started to decline after the disengagement between Jordan and the West Bank. The second period started after 1989 up to date. In the first period the government financial authorities particularly the ministry of finance was directly involved in formulating the monetary policies

in the market in addition to pursuing the requirements for preserving the desired volumes of reserves. In this period the central bank did not have a strong authority over market influence. Its role was only limited to maintaining the adequate liquidity for market based on the instructions for the ministry of finance. Also, the central bank was responsible for maintaining a certain level of credit and ceilings of interest rates (International Monetary Fund, 1995; Maziad, 2009).

Starting 1990 the Central Bank of Jordan began to practice the market business activities through the selling and acquiring of government bonds. After the significant decline in the exchange rate of the Jordanian dinar against other currencies the financial officials in the country moved into partnerships with the World Bank (WB) and the International Monetary Fund (IMF) and the Jordanian government launched the economic reform program through the economic a transformation project. The reform program obligated the Jordanian government to adopt new financial and monetary policies and procedures for serious financial interaction with market forces, as it has begun to discard the ceilings that was set previously for bank deposits and credit rates to commercial banks; moreover, the government in association with central bank liberalized the interest rates to realize open market operations that achieve efficient monetary policy.

At the beginning of 1993 the Central Bank established its own certificate of deposits (CDs) system aiming to maintain adequate exchange rate of the dinar in the market and its stability that enhances financial stability. The certificate of deposits system was used as a mean to control excess of liquidity in the market and more intervention in broad of money in market, after 1995 where the money supply (M2) was used by CBJ converted it to interest rates for the banking system, as this procedure was a prerequisite for linking the Jordanian dinar to the US dollar. Despite all these procedures, Poddar (2006) noted that the Central Bank of Jordan provided reasonable freedom in setting interest rates distributed between domestic interest rates and US Federal fund interest rates due to imperfect asset suitability.

It is worth mentioning that the monetary policy in the second period that witnessed the global financial crisis in 2009 led the Central Bank of Jordan to adopt more flexible monetary policy with the banking sector to qualify the government and private sector to overcome this crisis despite of its difficulties with the least losses in currency exchange rates mainly losses in the real estate investment sector. However, after overcoming of this global financial crisis, the Central Bank embraced an expansion monetary procedure by decreasing of interest rates and reserves requirements for banks operating in Jordan that steered commercial banks to expand the lending base at low interest rates to support the Jordanian investment environment for providing the essential liquidity for everyone whether at the level of individuals or companies.

In 2012, a new challenge emerged to the Central Bank of Jordan, namely the start of the Syrian crisis in the region and Jordan was enforced to receive a very large number of Syrian refugees. This situation prompted the Central Bank to fully review the framework in which monetary policy operates in order to adapt to this emergency event. Due to this crisis, Jordan was enforced to provide greater liquidity

in the market as a respond to the increasing demands for energy, water and food so as to overcome this crisis, although Jordan endured external borrowing by several billions and the presence of a fixed exchange rate for the Jordanian dinar against other currencies, this is the result of the successful linking of the Jordanian dinar with the US dollar (Central Bank of Jordan, 2016).

The monetary policy suffering did not stop at the presence of great requirements on the Jordanian government due to the displacement of people from Iraq and Syria since 2011, but the suffering of the Jordanian banking sector continued after the entrance of the Corona pandemic after 2019 for three consecutive years. During these years, many countries not just Jordan faced several pressures on the level of money supply (World Bank, 2020; IMF, 2020; Durrani et al., 2020; Smith, 2020; Krugman, 2020; Rogoff, 2020).

As response to Corona situation in Jordan the Central Bank of Jordan was forced to make several procedures such as cut its monetary policy by a total of 225 points, in addition to that the Central Bank of Jordan reduced the reserve ratio of banks at the Central Bank from 7% to 5% because the Central Bank's expectations viewed this reduction will increase market liquidity by about 550 million Jordanian dinars (Obeidat et al. 2021). Furthermore, a continual monitoring for inflation levels was also considered as one of the major focuses for central bank in this condition; another problem that faced Jordanian government and obligated quick intervention is the unemployment issue, where many of people lost their jobs and a huge number of projects in the private sector stopped, which led the government to develop emergency monetary policy plans and recovery policies to support the unemployed individuals and support projects (CBJ, 2021).

## **Previous Literature**

The historical debate continues about the ability of monetary policies to advance the economic level of the state, since the arrival of Quantity Theory of Money (QTM) before the thirties of the last century that claimed a little upsurge in the money supply causes an inflationary state since the gross product and the money supply are fixed factors and therefore there will be no effect for money supply on the gross product. On the other hand, the theory of Liquidity Preference (LPT) offered by Keynes criticized the quantitative theory of money after explaining that an increase in the money supply would lower interest rates and thus stimulate the economy and raise GDP if the economic conditions for an effective market were available (Keynes, 1936).

After the emergence of monetary theory in 1950, the argument continued about the role of monetary policy in stimulating GDP, economic proponents of this theory asserted that there is a positive and effective impact for monetary policy on GDP in the short term but ruled out the existence of this effect in the long run as (Friedman and Schwartz, 1963) and (Friedman and Meiselman, 1963) claimed. Although Keynesian theory advocated its focusing on fiscal policy factors, studies on the usefulness of monetary policies proved the success of using the money supply in

raising GDP, for example, (Friedman, 1968) asserted that increasing the money supply at fixed annual rates from 2% to 5% can make the economy more stable. On the contrary Ando and Modigliani (1965) pointed out that the Keynesian policy proponents criticized the monetary policy by that, increasing the money supply will lead to more consumption and more Savings and thus reduction in investment opportunities, leading to a decline in GDP.

The state's intervention in the private sector and the role of its fiscal and monetary policies in the political economy is still the focus of research for many researchers and economists, especially with regard to the impact of monetary policy on the aesthetic GDP. For more than ten decades this controversial issue has continued to be about ascertaining the efficiency of the monetary policies implemented by central banks. Friedman and Meiselman (1963) after testing the soundness of monetarist against the Keynesian view, found that stability in the economy is greater when monetary theory is adopted, as they proved that there is an effective effect of this policy on nominal income. Similarly, Andersen and Jordan (1968) and Mehar (2021a) proved that monetary policy has a greater impact on GDP than fiscal policy. Mehar (2021a) also revealed that 100 top world companies has raised its production to \$25 billion. In contrast to these findings, other studies have found that GDP who affects monetary policy not vice versa (Tobin, 1970). Waud (1974) after applying the economic model applied by Andersen and Jordan (1968) found an effective influence for both of monetary policy and fiscal policy on the economy.

Many traditional and modern studies have examined in depth the impact of monetary policy and other economic factors on economic growth, the results of these studies varied between certain and refuting this effect. One of the studies that proved this effect was the study of Sargent and Wallace (1975) which relied on the theory of rational expectation and confirmed that stochastic shocks have an effective consequence on the economy, with the same result came out (Barrow, 1978) that the money supply can stimulate gross output. Similarly, many researchers have found that the money supply improves the economy, but only if interest rates are close to zero, which has been called a liquidity trap (Feldstein and Stock, 1994; Francis et al, 2020; Lhuissier et al., 2022; Mitchell, 2020; Pettinger, 2020). Alternatively, some of the results of other studies showed weakness in monetary policies for directing GDP; for example, Sims (1980) concluded that although monetary policy is expected to revive the economy in the event of an increase in the money supply, the results of his study proved that the consequences of this policy on economic growth are unpredictable. Bernanke and Blinder (1992) asserted that monetary policy may succeed in the short term in improving GDP but is limited to controlling GDP at the long level. Bernanke and Mihoy (1998) pointed out that there is ambiguity in the impact of money supply on the general level of the economy because it is difficult to measure the magnitude and accuracy of this effect.

The positive causality for many supplies on GDP was approved also by many researchers for many countries; e.g. Fatima and Iqbal (2003) for five Asian



countries comprises Pakistan, India, Thailand, Indonesia and Malaysia; Mashra et al. (2010) for India; Mehar (2021b), Hussain and Rashid (2006), Chude and Chude (2016) for Pakistan; Al-Rjoub (2004), Shawaqfa (2011) for Jordan, Majid (2007), Ghazali (2008) for Malaysia; Saatcioglu and Korap (2008) for Turkey, Chimobi and Uche (2010) for Nigeria; Zapodeanu and Cociuba (2010) for Romania; Maitra (2011) for Singapore; Aslam (2016) for Sri Lanka; Khobai (2017) for South Africa; Batrancea et al., (2021), Bhar and Malliaris (2021) for USA; World Bank (2021) IMF (2020).

Another studies found insignificant results for the impact of money supplies on economic growth for many countries, e.g. Al-Fawwaz and Al-Sawai'e (2012) for Jordan; Adusei (2013) for Ghana; Ehigiamusoe (2013), Chaitipa et al., (2015) for Nigeria; Ihsan and Anjum (2013) for Pakistan; Hussain and Haque (2017) for Bangladesh; Amaral et al., (2022) for USA; Kamaan (2014) for Kenya.

However, previous conclusions about the positive impact of money supply on economic growth far outweighed the negative results of this relationship, and therefore it can be concluded that despite some adverse results for the absence of money supply effect on GDP, there is a great consensus among researchers on this positive effect; some researchers have appealed that this positive money supply is only in the short term (Okunlola, 2020), while others opposed this view because this effect it is not proven in the long term, for example in the study of Jorda et al. (2020) that conducted on 17 developed countries for a period of 140 years, their results did not prove a constant and detected impact of monetary policy, especially the supply of money on economic advancement expressed in GDP. These findings contradicted by Werner results of (2018) whom approved the positive linkage between money supply and GDP in USA, UK, Germany and Japan in his study that regarded as long term study and covered over 50 years.

As for Jordan, the attention to the influence of monetary policy on enhancement of Jordanian economy has been the subject for many investigators within this scope. For example, AL-Rjoub (2010) once measured the impact of the money supply on the Jordanian economy from 1968 to 1995, found that this effect is only lasts for less than a year, especially in the first and second quarters next the increase or decrease in money supply levels, but then again this effect starts to drop and fade after the third quarter of the year. In a recent study carried out by Obeidat et al. (2021) on the impact of monetary policy on the Jordanian economy, where researchers focused on increasing credit financing for individuals and private sector, the results of the study showed that this increase in credit maintained general stability in the economy; the study called for establishment of a security market that supports the economy, especially if it turns out that there is a weakness in the financial market.

In other previous studies that undertaken in Jordanian setting about the same subject, the study of Mishal and Abu-Dallo (2014) that similar to our study applied Granger's model to ensure the effect of money supply on GDP from 1990 to 2010, the study established a practical evidence for the unidirectional causality between money supply and GDP. With the same conclusion came Shawagfeh (2011) after

examining the relationship between broad of money and GDP in Jordan for the years from 1993-2009; his results also established an evidence for the long run effect for money supply on real GDP. Equally, the results of Al-Fawwaz and Al-Sawai (2012) and Sawaie (2017) on the same issue also accepted the short run influence for money supply on values of GDP for the period of 1992 up to 2014; and they all advised that government policy makers should efficiently utilize money supply to upsurge GDP. In the same vein the present finding of Mugableh (2019) also contradicted with previously reviewed positive results for the influence of monetary policy on GDP; his variables such as interest rate and money supply failed to prove substantial effect on economic growth for the period of (1990-2017). Likewise, Al-Zoubi et al (2013) after investigating the interaction between monetary policy with economic growth for the period of 1996-2011 in Jordan, discovered that there is no significant reaction between monetary policy and economic growth.

## **METHODOLOGY**

### **Sample and Method**

The study follows the quantitative analytical approach on market data, where the impact of the monetary policy followed by the Central Bank of Jordan represented by the money supply on the GDP will be measured. The methodology will employ use time series statistics released by central bank bulletins and reports that provide accurate cumulative data on Money Supply (M2), Consumer Price Index (CPI) and Real Gross Domestic Product (RGDP). The St. Louis model that developed by Federal Reserve Bank of St. Louis will be followed as method for the analysis of relations and indicators for study variables.

The study sample consisted of 60 observations covering the time period from the start of the third quarter of 2008 until the end of the second quarter until 2023, the total numbers of years included are 15 years. This period is sufficient and appropriate to measure the effect of the independent variable (money supply) on the dependent variable (GDP). This sample is regarded as the most recent sample that will be used to examine the study issue.

### **Variables and Equation of the Study**

In order to achieve the purpose of the study that mainly emphasizes on ensuring the effectiveness of monetary policy on economic growth represented by GDP. There are three variables, namely Real Gross Domestic Product (RGDP), Money Supply (M2) and Consumer Price Index (CPI).

Real Gross Domestic Product (RGDP) represented by the adjusted price of the GDP, which is calculated by the price of products and services that created in the nation within a certain period. Meanwhile, Money Supply (M2) represents the total

money supply in the market and is calculated through the total money circulating in the market, local and foreign demand deposits in dinars and foreign currencies, savings deposits in all currencies, semi-cash, and everything classified as money according to central bank. Lastly, Consumer Price Index (CPI, 2010=100): It is calculated through the average prices of goods and services in the market.

The study follows some previous research methodologies such as the study of Friedman and Meiselman (1963) and the study of Anderson and Jordan (1968); moreover, the study applies the St. Louis model, which was adopted in many of earlier studies to measure the influence of money supply on real GDP, the equation that will be used is articulated as following:

$$\text{LogRGDP}_t = \alpha_0 + \sum_{i=0} \beta_i \text{LogM2}_{t-i} + \sum_{i=0} \gamma_i \text{LogCPI}_{t-i} + E_t \quad (1)$$

where, the log of (RGDP) is donated to the natural logarithm of the real GDP, while the log of (M2) donated to aggregate money supply; Log (CPI) donated to the general price index and E is donated the error term.

With the aim of obtaining accurate indications of the relationship between the variables of the study, the integrity of each of the proposed variables will be verified. Therefore, the two-unit root test will be performed using the Dickey-Fuller (ADF) argument that originated by Dickey and Fuller in 1979, and the Phillips-Perron (PP) model that offered by Philip and Pearson in 1988, the use of these two tests is intended to define the order for the integration of variables. Grounding on the results of these two tests if all of non-stationary variables shown an integration at order I (1) then the test of Johansen (1988) co-integration will be applied to establish such co-integration that represent the linkage among variables in the long-run as reported by Engle and Granger in 1987 and Johansen 1988.

Consequently, if the values of the variables reveal a co-integration state, then the vector error correction models (VECMs) are suggested as the most suitable estimation technique that might establish the dynamic connection between study variables (Sargan, 1964). Another related test is also suggested as the fitted model for estimation by means of Fully Modified Ordinary Least Squares technique (FMOLS). This framework is appropriate to investigate the interaction between variables if they are co-integrated as suggested by Philips and Hansen (1990). The great benefit of this model is, it adjusts the least squares' method to deal with any expected serial correlations in residuals and endogeneity for the independent variables and their contribution to co-integration (Philips, 1995).

## **RESULTS AND DISCUSSION**

### **Descriptive Statistics**

Since there is a possibility for erroneous relationships when estimating variables, variables will be subject for the tests of Dickey-Fuller (ADF) and the Phillips-

Perron (PP) to uncover the existence of unit root for variables. The results in tables 1 and 2 review the values of these two tests where the decision for variables stationary relies on the majority of these results.

After performing the two test we the results for the research variables; as demonstrated in tables 1 & 2 the variables are found with a stationary state in the first difference for integration of order of 1 or I (1); these results specify that the probability values for each of both assessments are lower than 5% after the estimation of initial difference for each of the variables; therefore, the null hypothesis is not validated for the presence of unit root among variables of the study.

**Table 1: The ADF Test Values**

	Level				1st diff.			
	Intercept	p-value	Trend and intercept	p-value	intercept	p-value	Trend and intercept	p-value
<b>Log(RGDP)</b>	-4.441	0.000	-2.019	0.578	-3.842	0.004	-4.486	0.004
<b>Log(M2)</b>	-1.417	0.567	-2.499	0.327	-9.539	0.000	-9.593	0.000
<b>Log(CPI)</b>	-1.602	0.475	-2.259	0.448	-5.968	0.000	-5.888	0.000

Source: Researchers Analysis, Using E-Views  
Significance: \*=5%, \*\*=1%

**Table 2: The PP Test Values**

	Level				1st diff.			
	Intercept	p-value	Trend and intercept	p-value	intercept	p-value	Trend and intercept	p-value
<b>Log(RGDP)</b>	-2.106	0.242	-5.247	0.000	-14.591	0.000	-17.215	0.000
<b>Log(M2)</b>	-1.739	0.406	-2.454	0.349	-9.592	0.000	-9.656	0.000
<b>Log(CPI)</b>	-1.585	0.483	-2.469	0.341	-5.928	0.000	-5.830	0.000

Source: Researchers Analysis, Using E-Views.  
Significance: \*=5%, \*\*=1%

The determination for the ideal (optimal) lag length is regarded as the bases for discovering of causality between variables, and the base for cointegration tests for selecting the appropriate estimating method. Hence, in the current analysis step, the VAR test is performed to specify the optimal lag. After performing this test, the results revealed that the appropriate lag length is (4). Table 3 display the VAR lags exclusion according to Wald assessment. The results show that majority of values are below 1%; also, the joint results for all of variables in presented lags are less than 1%; therefore, we reject the joint null hypothesis and accept the alternate one that all of endogenous variables are statistically significant.

**Table 3: Results of VAR Exclusion using Wald test**

Results of Chi-squared for the lag exclusion; the p-values appear in [ ]				
	Log RGDP	Log M2	Log CPI	Joint effect
<b>Lag 1</b>	37.643	109.336	118.771	218.944
	[3.15e-06]	[0.000000]	[0.000000]	[0.000000]
<b>Lag 4</b>	11.621	4.581	7.118	46.214
	[4.49e-06]	[0.073666]	[0.281955]	[3.96e-06]
<b>Df</b>	3	3	3	9

Source: Researchers Analysis, using E-Views.

To ascertain the causality effect for each variable on other variable and to demonstrate more exploration of the relationships between these variables. According to Granger (1969) the explanatory power is essential for this type of research, therefore Granger test was run to identify the explanatory power for the relationships among variables so as to detect the explanatory power of each variable on other variables. The results in table 4 for Wald test show that there is a unidirectional relationship between money supply and real GDP, the p-value for this relationship statistically significance (less than 5%) with f-statistic of 11.530.

Based on this result the null hypothesis can be rejected, and the alternative hypothesis is accepted for the presence of the relationship between the money supply and real GDP. Reviewing of the other results for Granger test we can observe there is also unidirectional relationship between CPI and RGDP; the f-stat is 12.280 and statically significant, thus we also reject the null hypothesis for the influence for CPI on RGDP and validate the alternate one that there is an effect for CPI on RGDP. The other Granger results in the table failed to predict any further relationships.

**Table 4: VAR Lag Exclusion Wald Test's Results**

	Null hypothesis	F-Statistic	P-value
1	Log M2 Does not Granger cause log RGDP	11.530	0.003
2	Log RGDP does not Granger cause log M2	3.302	0.191
3	Log CPI does not Granger cause log RGDP	12.280	0.002
4	Log RGDP does not Granger cause CPI	0.021	0.989
5	Log CPI does not Granger cause log M2	4.835	0.089
6	Log M2 does not Granger cause Log CPI	2.695	0.259

Source: Researcher findings, using E-views.

Although our results for ADF and PP test indicated that the study variables are stationary in nature, but for further reassurance of study hypotheses and to exclude the probability of equilibrium problem presence or the existence of cointegration in long run we conducted Johansen Cointegration investigation, and the results are presented in Table 5. The results for Johansen test of Cointegration for both of Trace and Maximum Eigenvalue examinations excludes any cointegration in (None and at most 1), the p-value is lower than 0.05; accordingly, we can reject the existence of cointegration. On the contrary, the results of (At most 2) for the same tests Trace and Maximum Eigenvalue showed a long run equilibrium for the study variables and thus accepting cointegration presence.

**Table 5: Johansen Cointegration Test Results**

Hypothesized No. For cointegration propositions.	Trace stat.	Critical value	Mackinnon p-value	Decision
None *	42.110	29.797	0.001	Rejected
At most 1*	16.554	15.494	0.034	Rejected
At most 2	0.455	3.841	0.499	Accepted
	Maximum Eigen stat.	Critical value	Mackinnon p-value	
None *	25.556	21.131	0.011	Rejected
At most 1*	16.099	14.264	0.025	Rejected
At most 2	0.455	3.841	0.499	Accepted

Source: Researcher's findings using E-views.

For further verification for the association between the money supply (M2) and real gross domestic product (RGDP), the results of Vector Error Correction Model (VECM) test were reviewed in the next Tables 6 and Table 7. The t-stat result valued to -3.346 and significant, hence, such consequence excludes the neutralization for the supply of money at the long-term.

**Table 6: Results for VECM estimates for Long Run Elasticities**

Variables	Coefficients	Standard error	t- Stat.
Log M2 for (-1)	-0.502	0.150	-3.346**
Log CPI for (-1)	-0.404	0.407	-0.909

Source: Researchers finding using E-views.

Significance: \*=5%, \*\*=1%

Note: f-statistics = coefficient / standard error

Based on these results the Error Correction Term equation for cointegration is formulated as follows:

$$ECT_{t-1} = \text{LogRGDP}_{t-1} - 0.693 \text{LogM2}_{t-1} + 0.086 \text{LogCPI}_{t-1} - 1.233 \quad (2)$$

Referring to Table 7 results for the Error Correction Term (ECT), the results display an important positive relationship between the money supply and real GDP. The adjustment rate for the long-equilibrium response variable is approximately about 40%. This ratio (40%) is explained by the fact that the deviation is corrected after the third quarter and therefore the long-term equilibrium is restored at least after three and a half quarters.

**Table 7: Results for VECM Short Run Estimates of Elasticities**

Variables	Coefficients	t-Stat.
D log for RGDP (-1)	-0.498	-5.762**
D Log for RGDP (-2)	-0.686	-11.451**
D log for RGDP (-3)	-0.674	-8.712**
D log for M2 (-1)	0.009	0.064
D log for M2 (-2)	-0.406	-2.900*
D log for M2 (-3)	-0.342	-2.369*
D log for CPI (-1)	0.642	1.465*
D log for CPI (-2)	0.692	1.567*
D log for CPI (-3)	0.382	0.960
ECT (-1)	-0.404	-6.075**
C	0.017	5.878
R-Squared	0.914	

Source: Researcher's findings using E-views.

Significance: \*=5%, \*\*=1%

According to Hargreaves (1994) framework, applying of Fully Modified Least Squares (FMOLS) test establishes the required check for the values robustness due to its power for recognizing dependable estimates in small sample sizes. The results in Table 8 show values of the (FMOLS) for the effect of the money supply. The results reveal positive significant impact for the money supply, which is approximately about 68%, and this is explained by that; a 1% increase in the money supply will lead to an increase of 0.68% in real GNP in the short term in the second quarter alone. Furthermore, the results also report the significance impact for CPI on RGDP.

**Table 8: The Results for FMOLS Long Run Elasticities**

Variables	Dep. Variable: Log RGDP			
	Coefficients	Std. Err	t-Stat.	p-value
Log of M2	0.683	0.077	7.806**	0.000
Log of CPI	0.317	0.204	3.279**	0.008
C	1.143	0.466	2.451	0.017
R-Squared	0.922			
Adj. R-Squared	0.917			

Source: Researcher's findings using E-views.

The general review for previous table results show positive coefficients for the influence for the Money Supply (M2) and the Consumer Price Index (CPI) on RGDP, this indication for the positive association between the money supply and GDP also can be witnessed for effect for price index coefficient on RGDP, as the increase of 1% in the general price index indicates an increase of about 0.32 in GDP.

In order to examine the suitability of model we run the VEC residual serial correlation LM test, the results are presented in Table 9. As the table show, all of probability values are above 5% for the first three lags which means there is no serial correlation, but the results for last lag 4 the values showed serial correlation among variables.

**Table 9: VEC Residual Serial Correlation LM Results**

Lags	LM-Stat	Prob.
1	10.62172	0.3025
2	11.64820	0.2339
3	9.188496	0.4201
4	17.47858	0.0417

Prob. from chi-square with 9 df.

Source: Researchers findings using E-views.

Table 10 also represents the normality test for the three variables of the study. As appear in the table, despite that the RGDP (component 1) is not normally distributed, the other variables money supply (component 2) and consumer price index (component 3) are normally distributed, moreover the joint normality is above 5%, thus, we conclude the overall model is normally distributed.

**Table 10: VEC Residual Normality Test**

Component	Jarque-Bera	Df.	Prob.	Normality
1	5.955232	2	0.0509	Not Normally Distributed
2	1.307994	2	0.5200	Normally Distributed
3	1.015359	2	0.6019	Normally Distributed
Joint	8.278585	6	0.2184	Normally Distributed

Source: Researchers findings using E-views.



## **CONCLUSION**

The current study was stimulated by the ongoing widespread debate about the effectiveness of monetary policy in improving economic performance. Many of prior studies have been conducted globally on this issue, and these studies varied between studies in advanced global economies and in economies with less development such as developing countries. The previous investigations result on the role of monetary policy represented by the money supply still produce positive results and sometimes negative results or mixed results on this effect on gross domestic product (GDP). The current study was conducted with a main objective that is verifying the effectiveness of this policy on real GDP in a developing country such as Jordan.

Despite of conducting several studies on the Jordanian environment about this issue, there is quiet some ambiguity surrounding the success of the monetary policies that applied by government agencies represented by the Ministry of Finance and the Central Bank of Jordan. Therefore, in order to shed more light and make further investigation, this study was conducted. The data of the study comprised time series data obtained from the bulletins and quarterly cumulative statistics of Central Bank of Jordan covered a period of 15 years from the third quarter of 2008 to the second quarter of 2023 with a total of 60 observations.

The St. Louis methodology was adopted in order to validate the objectives of the study performing the essential statistical tests such as stationarity and cointegration tests for study variables which shown that data were stationary at all levels. Furthermore, after applying Granger's test to verify the causal relationships and their direction between money supply and general price index as independent variables and real GDP as response variable, the results of this test showed unidirectional relationship between these independent variables and real GDP, and therefore the null hypotheses were rejected since the results approved their effect in justifying the changes in RGDP. In order to create further evidence of the robustness of this relationship an additional test was carried out such as VECM and FMOLS to predict the study model; the results for both of investigations established an essential positive influence for money supply on RGDP; similar positive results were revealed by both tests for the impact for money supply on economic advancement expressed in RGDP in Jordanian context.

Grounding on the results of this study, the study reached several implications: the study showed the importance of adopting monetary policy methods such as the use of money supply to promote the economic level by raising the level of GDP in both the short term and long term. Moreover, the results of the study emphasize the necessity to increase the attention of government agencies for development, reviewing, improving of such policies and employing them in a rational manner to improve economic performance that strengthen economic of the state and the welfare of society. The study also emphasizes the role of financial principals whom should act in favor of efficient investment environment in addition to work hardly for financial sector cohesion with means of monetary policies.

An additional implication of the study is related to the application of monetary policies that enable government to sustain acceptable inflation levels and also maintaining adequate interest rates that attracts more local and external investments to business environment. since the study results recognized money supply as essential component for economic growth, this conclusion suggests that financial principals in government and in central bank should increase their devotion to the essential elements of money supply such as liquidity in market, internal and external reserves and open market operations.

Similar to all studies, rarely any study without limitations, this study confronted several limitations, the most important of which is that, the study was applied on a specific economic environment that is a developing country (Jordan), thus our results may be limited to generalizability to all countries. Also, one of the limitations related to the selected period of time in which the study was conducted that covered 15 years, hence the results of the study may differ if it was conducted over a longer period than that.

Also, one of the determinants is the inclusion of periods in which the study variables were affected by the Corona pandemic (period after 2019 and until the time for conducting this study), this period is regarded as an outlier for Jordanian GDP and thus the GDP data might be biased by this time period. In addition to these limitations an additional limitation can be added which is related to the variables that have been chosen to estimate the impact of monetary policy on real GDP. The final limitation is concerned with the statistical methods that are applied which may be considered one of the determinants of the study because it is possible that under other tests the results or accuracy of results may vary.

Based on these limitations future research that anticipated to be carried out on this topic can avoid such limitations by selecting more than one country or a group of countries with similar economic attributes. Further research also can enlarge the period of the study; also, researchers may select other variables than monetary policy to investigate their effect on economic growth. researchers could also adopt other methodologies for testing the influence of monetary policy on economic movement.

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