

## The Impact of Monetary policy on Consumption and Investment in Jordan during (1989-2013)

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**Abstract.** Monetary policy is one of the important monetary subjects that can evaluate the performance of the policy and its tools, recent development in financial markets in the past years led to changes in the behavior of countries monetary policies, concentrated to achieve stability in the price level by creating new ideas of how monetary policy affects the economy and its components through linking macroeconomic activities (private spending components) with nominal interest rate. This study aims to analyze and evaluate the impact of Jordanian monetary policy on consumption and investment spending during the period (1989-2013) to predict the impact of monetary policy and its instruments on real economic activities and inflation. The study finds that lending rate affects investment negatively but it does not affect consumption and real GDP in the short run. However, in the long run investment is affected by the co-movements occurred in consumption lending rate and lagged investment. Also, the study finds that real GDP is affected by the co-movements that occurred in real GDP and lending rate. Furthermore, domestic credit is affected by the co-movements that happened in domestic credit and lending rate.

**Keywords.** Consumption, Error correction model, Investment, Lending rate, Monetary policy.

**JEL.**E20, F22, O23.

### 1. Introduction

Monetary policy is one of the significant policies at the level of Macroeconomic and monetary economic since it has an effect on nominal and real economic variables. Therefore, it is important to understand how the monetary policy affects the economy and how to coordinate between this policy and the other economic ones in order to assess the condition of monetary policy within a particular period of time to reduce faults and distortions of economy. Hence, monetary policy makers have to precisely predict and assess the time and effect of monetary policies and instruments on the economy, and to understand the mechanisms and channels through which they affect the real economic activity and inflation of states.

The mechanical transfer of monetary effect is one of the most important monetary topics which can assess the monetary policy and instruments. However, the latest developments in the finance markets during the past years caused accompanied changes in the behavior of states' monetary policies through achieving stability at the general price stickiness in order to find new ideas showing the way that the monetary policy affects economy and economic basic components by attempting to connect the macroeconomic activities (represented by private expenditure components) to the short-term nominal interest rate.

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Due to the significance of the matter, the researcher thought of studying the effect of monetary policy in Jordan during the period (1989-2013), relying on both the descriptive and quantitative approaches which include reviewing relevant literature and previous studies which were conducted on this matter, as well as analyzing the monetary policy in accordance with the suitable standard model for data analysis.

However, Jordanian economy is one of the small economies which are open to the world, and it is exposed to whether internal or external economic shocks as a result of its surrounding regional environment instabilities. One of the major challenges that face Jordanian economy is the world oil price rise, the reduction of world aids, and the debt increase. The study aims at assessing the efficiency of monetary policy performance in Jordan and its effect on the economic variables represented by the real GDP, consumption, investment and domestic credit during the period (1989-2013).

## 2. Theoretical Background

The monetary policy performs through its effects on aggregate demand components, and such effects influence real economy and inflation. The effectiveness level depends on the degree of the change in the policy, and the degree of the ability to predict it by others, as well as the effects of such changes on future outlooks of the policy behavior which affects the degree of consumers and public sector confidence. The channels of monetary policy which affect economy can be divided into the following:

### 2.1. Direct Interest Rate Channel

Such a channel includes short and long-term interest rates as well as business and household sectors, in addition to real interest rates. The increase in short-term interest rates causes an increase in long-term interest rates which might lead to an increase in the cost of capital and a decrease in the demand of capital assets and final goods. This might cause a reduction in the demand of such assets' investment, the aggregate demand and aggregate expenditure. Interest rates have been used in macroeconomic models to analyze the interest rate effect on the cost of capital in order to assess the decisions of expenditure on investment and consumption (final consumption and consumption on hard goods) of business and household sectors. User cost of capital is a major determinant of capital demand for investment and consumption purposes, as the interest rate affects expenditure, particularly when it is spent on capital assets since they are hard ones. Therefore, the increase of stock from such assets includes a cost related to the changes in the interest rate which affect investment and expenditure decisions. Thus, the expected age of the asset, which is usually long-termed, determines the real interest rate and the expected real capital asset value (Boivin et al, 2010; Clarida et al, 2000).

Interest rates are also relevant to the investment decisions made by household and business sectors through the so-called theory (Tobin's  $q$ ), which is defined as the market value of a facility divided by the cost of capital replacement. The higher the value ( $q$ ), the higher the facility value – higher than the cost of capital replacement – and the higher the investment expenditure (Boivin et al, 2010).

Moreover, interest rates are directly affected by the policies adopted by monetary authorities which depend on several factor which mainly include the institutional framework, the financial market structure and organization, the reaction of economic facilities, as well as the composition of financial assets and liabilities. Consequently, this is one of the most important channels in industrial countries as direct and indirect interest rate gaps interpret about 80% of investment movements which influence the GDP. Contrary to what is familiar in emerging

markets, there are many obstacles which prevent the interest rate channel from performing effectively such as having developed financial and debt markets, in addition to interest rate binding restrictions, especially in the countries which have state-owned commercial banks, which might limit such banks' ability of providing loans in accordance with commercial standards and measures (Horvath & Maino, 2006; European Central Bank, 2002).

Some think that the changes in short and long-term interest rates affect liquidity, so that it is the main reason behind inconstancies of production, mainly those of small economies which are open to the world. Price stickiness for those who follow a stringent monetary policy might increase nominal and real interest rates which might increase the cost of capital and decrease the investment expenditure, so that the aggregate demand and real GDP could be reduced. On the other hand, following an expansionary monetary policy reduces nominal interest rates which might reduce real interest rates, and this might lessen the decrease in the price of capital and increase investment and real GDP (Kuttner & Mosser, 2002).

### *2.2. Consumption Channels*

This channel reflects the effect of monetary policy on the prices of domestic assets such as shares and real estate, and it performs according to the changes in market values of shares, real estate and household sector resources. This channel includes wealth effect which takes consumption, saving and their application in life cycle hypothesis into account. Furthermore, the changes in growth and inflation rates determine the long-term interest rate. Consequently, if the monetary policy reaction aims at preserving the predictions concerning growth and inflation rates, the long-term interest rates will not change, whereas if the changes in monetary policy are imperceptible and unexpected by individuals, this might result in changes in long-term interest rates. Therefore, the current value of any assets (hard goods) has an inverse relationship with the long-term interest rate and a direct relationship with the rate earned on total assets (Moreno, 2008; Ando & Modigliani, 1963).

The efficiency of this channel differs from one economy to another, and this depends on many factors such as the economic performance level, organization level of capital markets, macroeconomic outlooks, future profits, short-term interest prices, speculation in the market if any, as well as the changes in risk premium. It is possible to say that it is impossible to predict the performance of this channel in emerging markets in comparison with industrial countries due to fluctuation of macroeconomic standards of such markets (Kamin et al, 1998).

### *2.3. Exchange Rate Channel*

The significance of such a channel depends on the intermediate goods' participation rate in tradable goods' production. The higher this rate, the higher the effect of exchange rate on GDP and demand. In contrast, the lower this rate, the more limited the effect of exchange rate on domestic production, and the more accelerated on inflation. The Exchange Rate Channel is very important for emerging economies because the exchange rate of such economies' currencies is greatly affected by the inconstancies occur in international exchange markets, and because exchange rate is a basic and significant tool for the private sector predictions related to inflation. Furthermore, the changes in exchange rates affect the general balance sheet of facilities and individuals who have assets and liabilities in foreign currencies. The relationship between interest rates and exchange rate depends on what is called risk premium. The lower and more stable the risk premium, the more predictable the receptivity of exchange prices in case of interest rate movements (Mohanty & Turner, 2008).

That channel has used open macroeconomic models through Uncovered Interest Rate Parity (UIP), so the more floating the exchange rates, the higher the outflow capital, and the lower the nominal exchange rate. In contrast, the slower the rate adjustment, the lower the real exchange rate, and the higher the tradable goods in comparison with the non-tradable goods (Zams & Cooray, 2007).

However, the real increase in the local currency value means that there is a decrease in the prices of imported goods, which might directly reduce domestic inflation through what is called (Exchange Rate Pass Through), but this depends on the rate of foreign imports, the rise rate of currency value and the total environmental characteristics of economy, taking stability level of microeconomics into account (Kara et al., 2005; Devereux et al, 2003).

### 2.4. Credit Channel

This channel depends on interest rate and the internal changes it causes in the External Finance Premium which represents the difference between external assets (share issuance or debt) and internal assets which include retained profits. The external finance and its incurred interests reflect the defect included in finance markets and the problems which facilities face in the process of earning the necessary finance due to a lack of financial data or information asymmetry between loaners and borrowers (Bernanke & Gertler, 1995; Mishkin, 1995).

Credit channel includes two internal channels which are Bank Lending Channel and Balance Sheet Channel. For the Bank Lending Channels, the problems of information asymmetry between commercial banks and money providers (depositors) lead such banks to create restrictions on earning the sources of funds available for lending contrary to demand deposits. Thus, Lending process becomes more difficult and expensive especially for small commercial banks whose capital is insufficient in comparison with large banks whose capital is sufficient and huge. Following a stringent monetary policy by monetary authorities, as well as the small banks' inability to provide alternative sources of funds available for lending will put pressure upon such banks to reduce their lending activities, which provides evidence that, first, banks that have bigger capital and sufficient liquidity have resources to reduce the effects of the stringent monetary policy, and, second, the sufficiency of a bank capital is a key factor of its ability to continue its lending activities especially when there are reverse movements in the monetary policy. Over-liquidity of banks sometimes might be a source of loan supply since they might be an alternative to capital or foreign debts that can be earned (Aban, 2013).

In regard to the Balance Sheet Channel or what is called "Financial Accelerator" or "Broad Credit Channel", it focuses on the possible effect of monetary policy changes on the balance sheet as well as income data of loaners and borrowers. One of the most significant changes that are taken into consideration is net wealth of borrowers, monetary flows and liquid assets as the financial attitude and condition of borrowers have a key role in such a channel which perform according to the changes in the nominal interest rate. Moreover, the changes in interest rates might cause changes in the demand of different types of assets and values of assets owned by borrowers, which might influence their own financial attitude, their own net wealth and their ability to earn consumption and investment loans together. Therefore, the borrowers' ability to earn loans has a direct relationship with the external finance premium, i.e. the net wealth has an inverse relationship with the required external finance premium. So that, the greater the borrowers' financial solvency, the lower their conflict of interest with loaners since borrowers will have more ability of self-financing and will be able to provide more financial guarantees for their liabilities (Bernanke et al, 1999; Blinder & Stieglitz's, 1983).

### 3. Previous Studies

Several studies have been conducted to review the mechanical transfer of monetary effect in different economies. The most important studies concerning such a matter can be sum up as follows:

*First:* A study was conducted on the European Union countries during the period (2002-2011) in order to know the effect of the global financial crisis on the European Union by studying the impact of lending conditions and standards on this crisis using quarterly data. The study also found that the monetary policy in the European Union countries have been affected by the global crisis, but the effect degree was different from one facility to another and from one bank to another. Such an effect depends on the size of the bank itself and the degree the Household sector affected by this crisis. The study also found that the shocks occur in the monetary policy are partially transmitted through the lending channel, which proves the importance of this channel for economy.

*Second:* A study was conducted on a group of East African countries to know the effect of monetary policy changes on the economic activity and inflation during the period (2000-2010) using monthly data. The study found that the changes in the production level were due to the inconstancies of international reserve levels of such countries not the changes in the interest rates, while the changes in the inflation level are a result of the changes in the interest rate. The study also found that the expansionary monetary policy increases production without affecting the price level, and that the significant monetary channels of such countries are Exchange Rate and Credit Channels. (Davoodi et al, 2013)

*Third:* In an attempt to recognize the bank lending channel effect on the shocks of monetary policy for 35 commercial banks in Philippines during the period of (2008-2011), they were selected according to the size of their tangible assets. The study found that the growth rate of loans granted for both household and business sectors are affected by shocks which occur in the monetary policy as the growth rate of loans which are granted by small banks is more affected by monetary policy movements than that of large banks. The study also found that increasing interest rates on loans reduces the supply of loans for small bank, too.

*Forth:* A study was conducted during the period (1981-2010) to assess the receptivity of real GDP and the general level prices to the changes in bank lending rates, exchange and credit rate in Malawi. The study found that inflation, real GDP and exchange rate respond to the monetary policy changes. In Addition, it found that the monetary policy performs in a consistent manner with the economic predictions of economic activities. (Mwabutwa et al, 2013)

*Fifth:* In order to recognize the effect of financial innovations on the interest rate channel in Pakistan, a study was conducted during the period (1981-2010). The study found that it is difficult to measure the financial innovations as some use bank assets as a GDP indicator, while others use the broad money attributed to the narrow money supply. The study also found that the relationship between the interest rate and the GDP gap is inverse, which indicates that the measures adopted by the monetary authorities in Pakistan to influence the interest rate are not efficient.

*Sixth:* A study was conducted during the period (1998-2011) in order to evaluate the monetary policy in Poland after the global financial crisis. The study found that the shocks in interest rates are directly affected on Consumer Prices Index (CPI) and the real production whether it is the industrial production or the real GDP. The increase in short-term interest rates is followed by a small increase in the local currency value, then a significant drop in the value of the currency.

This leads to a slump of real economic indicators which reduces investment level due to the high cost of funds assigned for lending.

*Seventh:* A study was conducted on Macedonia to recognize the effect of monetary policy and exchange rate system on the real GDP and the general level of prices during the period (1997-2008). The study found that the increase in money supply does not affect real GDP because of the commercial banking sector shallowness and lack of financial sector development. On the other hand, the study found that the change in money supply has a strong effect on the general level of prices, and that the changes in the exchange rate affect the price of domestic goods, as the depreciation of local currency to Euro, leads to a sharp and fast rise in the prices of manufacturing industries, in addition to a rise in retail price indicator.

*Eighth:* In an attempt to evaluate the mechanism of monetary policy in Jordan during the period (1995-2005), the study found that the difference between three-month-interest rates on the certificates of deposits along with federal interest rates influence banking interest rates of commercial banks and the foreign reserves. The study also found that stock prices and exchange rates do not affect the macroeconomic activity. (Poddar et al,2006)

#### 4. Research Variables

The study will use the following variables: the interest rate for borrowing purposes, the real market GDP, final consumption, investment and granted domestic credit volume. The data used will be annual during the period (2013-1989). Data will be logarithmically expressed except for the interest rate for borrowing purposes. However, the study variables were obtained from the data available at the World Bank.

##### 4.1. The Standard Model

Before starting the estimation of the model, it is necessary to do some important tests including the following:

##### 4.2. Unit Root Test

This test is prepared to determine whether the study sample is stationary or has a Unit Root. This can be conducted doing Augmented Dickey Fuller Test (ADF) and many others. The study conducted the Augmented Dickey Fuller Test, and the test results found that the sample has a Unit Root at the Level and that it is not stationary, but it is stationary in the first difference at 5% of significance as shown in Table 1 below.

**Table 1.** Augmented Dickey Fuller Test Results

Variable	Level		1st difference	
	t-statistics	Prob	t- statistics	Prob
RGDP	-2.998064	0.9515	- 2.998064	0.0037
CON	-2.991878	0.3284	-2.998064	0.0027
INV	-2.991878	0.0912	-2.998064	0.003
LR	-2.998064	0.1115	-1.957204	0.0091
DC	-1.958088	0.8709	-1.9564060	0.0019

##### 4.3. Cointegration Test

Finding that the variables under study are not to be stationary at the Level but stationary at the first difference, conducting a direct economic analysis leads to misleading results. As a result, it is obligatory to recognize whether there is a long-term relationship between the study variables study, or there is what is called integrative relationship. The Cointegration test includes the recognition of the relationship between variables under study, and whether there is a long-term

integrative relationship between the variables. This can be applied through Johansen Cointegration Test. The test results show a long-term integrative relationship of first class, I (1), between the study variables, as described in Table 2 below.

**Table 2. Cointegration Test results**

Hypothesized No of CE(s)	Eigenvalue	Trace Statistics	0.05Critical Value	Prob
None	0.716340	95.12572	69.81889	0.0001
At most 1	0.688368	66.14619	47.85613	0.0004
At most 2	0.665039	39.32975	29.79707	0.0030
At most 3	0.455232	14.17370	15.49471	0.0783
At most 4	0.008813	0.203591	3.841466	0.6518

#### 4.4. Error Correction Model Test (ECM)

The variables were stationary at the first difference, with at least one integrative vector as the appropriate methodology for standard data analysis is to use the Error Correction Model. The mathematical formula of (ECM) model can be written as follows:

$$y_t = \alpha + Bx_t + \varepsilon_t \quad (1)$$

Whereas :

$y_t, x_t$  : Independent random variables

$\varepsilon_t$ : Error coefficient

Formula (1) can be reformulated to take into account the integrative direction and characterization of ECM model:

$$\theta(L)\Delta y_t = \delta + \phi(L)\Delta x_{t-1} - \gamma z_{t-1} + \alpha(L)\varepsilon_t \quad (2)$$

$$z_t = y_t - Bx_t \quad (3)$$

## 5. Results

First: In the short term, the study has concluded the following:

1. The interest rate for the borrowing purposes reversely affects investment, as an increase in the interest rate by 1% leads to a reduction in investment rate with 0%, which is statistically significant.

2. The Interest rate for the borrowing purposes does not affect consumption nor real GDP.

3. Domestic credit does not affect consumption, investment nor GDP.

In the long term:

1. Investment is reversely affected by joint movements that occur in investment, consumption and the interest rate for the borrowing purposes during the first period of delay, and this effect is statistically significant as the 10% increase in such factors might reduce investment by 28%.

2. Consumption is not affected by joint or individual movements and changes that occur in both investment and the interest rate for the borrowing purposes.

3. The GDP is adversely affected by joint movements that occur in the GDP and the interest rate for borrowing purposes during the first delay. This effect is statistically significant as the 10% increase of such factors reduces the GDP by 7%.

4. Domestic credit is reversely affected by the joint movements that occur in the volume of credit and the interest rate for the borrowing purposes during the first delay. This effect is statistically significant as the 10% increase of such factors reduces the domestic credit volume by 2.7%

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5. Domestic Credit is affected by the interest rate for the borrowing purposes during the first delay, and this is statistical significant.

6. Domestic credit is affected by the volume of credit during the first delay, and this is statistical significance.

### Appendixes

**Appendix 1.** Shows the results of Error Correction Model Test between investment, consumption and the interest rate for borrowing purposes

	Cointegrating Eq:	CointEq1	
	INV(-1)	1.000000	
		0.051809	
	CON01(-1)	(0.11769)	
		[ 0.44022]	
		0.808175	
	LR(-1)	(0.44666)	
		[ 1.80935]	
	C	-32.08775	
Error Correction:	D(INV)	D(CON01)	D(LR)
CointEq1	-1.283804 (0.43237) [-2.96926]	-0.400037 (0.48475) [-0.82525]	0.098603 (0.03335) [ 2.95622]
D(INV(-1))	0.640204 (0.37760) [ 1.69545]	0.223070 (0.42335) [ 0.52692]	-0.021569 (0.02913) [-0.74045]
D(INV(-2))	0.309163 (0.27889) [ 1.10855]	-0.308305 (0.31268) [-0.98601]	-0.039748 (0.02151) [-1.84749]
D(CON01(-1))	-0.017725 (0.20816) [-0.08515]	0.076889 (0.23338) [ 0.32946]	0.030114 (0.01606) [ 1.87530]
D(CON01(-2))	-0.251217 (0.22384) [-1.12232]	-0.294930 (0.25095) [-1.17523]	-0.001105 (0.01727) [-0.06401]
D(LR(-1))	1.974409 (2.89800) [ 0.68130]	2.710994 (3.24909) [ 0.83439]	0.905311 (0.22356) [ 4.04947]
D(LR(-2))	0.316345 (2.41241) [ 0.13113]	-3.164550 (2.70467) [-1.17003]	-0.501200 (0.18610) [-2.69314]
C	0.270340 (0.73983) [ 0.36541]	0.198124 (0.82946) [ 0.23886]	-0.016656 (0.05707) [-0.29184]
R-squared	0.488957	0.270362	0.849575
Adj. R-squared	0.233436	-0.094458	0.774362
Sum sq. resids	162.8465	204.6942	0.969130
S.E. equation	3.410556	3.823744	0.263104
F-statistic	1.913569	0.741084	11.29562
Log likelihood	-53.23607	-55.75187	3.129739
Akaike AIC	5.566915	5.795625	0.442751
Schwarz SC	5.963658	6.192367	0.839494
Mean dependent	0.382422	0.149386	-0.061818
S.D. dependent	3.895391	3.655016	0.553886
Determinant resid covariance (dof adj.)			10.76101
Determinant resid covariance			2.773124
Log likelihood			-104.8697
Akaike information criterion			11.98815
Schwarz criterion			13.32716

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**Notes:** Vector Error Correction Estimates. Included observations: 22 after adjustments. Standard errors in ( ) & t-statistics in [ ]

**Appendix 2.** Shows the results of Error Correction Model Test between credit and interest rate for borrowing purposes

Cointegrating Eq:		CointEq1	
DC(-1)		1.000000	
		9.510190	
		(2.05833)	
LR(-1)		[ 4.62034]	
C		-168.1047	
Error Correction:		D(DC)	D(LR)
	CointEq1	-0.089412	-0.024372
		(0.12039)	(0.00704)
		[-0.74269]	[-3.46083]
	D(DC(-1))	0.319099	0.045624
		(0.25506)	(0.01492)
		[ 1.25106]	[ 3.05787]
	D(DC(-2))	0.017454	0.031479
		(0.29471)	(0.01724)
		[ 0.05923]	[ 1.82601]
	D(LR(-1))	-3.599302	0.733252
		(3.32584)	(0.19455)
		[-1.08222]	[ 3.76903]
	D(LR(-2))	1.156089	0.236526
		(4.14023)	(0.24218)
		[ 0.27923]	[ 0.97663]
	C	0.125960	-0.028389
		(1.00441)	(0.05875)
		[ 0.12541]	[-0.48319]
R-squared		0.290974	0.817181
Adj. R-squared		0.069404	0.760050
Sum sq. resids		344.2218	1.177831
S.E. equation		4.638304	0.271320
F-statistic		1.313236	14.30363
Log likelihood		-61.46933	0.984403
Akaike AIC		6.133575	0.455963
Schwarz SC		6.431132	0.753520
Mean dependent		0.453278	-0.061818
S.D. dependent		4.808156	0.553886
Determinant resid covariance (dof adj.)		1.573742	
Determinant resid covariance		0.832392	
Log likelihood		-60.41533	
Akaike information criterion		6.765030	
Schwarz criterion		7.459330	

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