

“The impact of budget deficits on money demand in Jordan: co-integration and vector error correction analysis”

AUTHORS	Husni Ali Khrawish Ahmad Y. Khasawneh Feda'a A. Khrisat
ARTICLE INFO	Husni Ali Khrawish, Ahmad Y. Khasawneh and Feda'a A. Khrisat (2012). The impact of budget deficits on money demand in Jordan: co-integration and vector error correction analysis. <i>Investment Management and Financial Innovations</i> , 9(2)
RELEASED ON	Thursday, 07 June 2012
JOURNAL	"Investment Management and Financial Innovations"
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

0



NUMBER OF FIGURES

0



NUMBER OF TABLES

0

© The author(s) 2025. This publication is an open access article.

Husni Ali Khrawish (Jordan), Ahmad Y. Khasawneh (Jordan), Feda'a A. Khrisat (Jordan)

The impact of budget deficits on money demand in Jordan: co-integration and vector error correction analysis

Abstract

The main objective of this study is to examine the effect of the budget deficit on money demand in Jordan during the period of 1992-2010 using multiple linear regression, co-integration and vector error correction models. The authors also controlled for other macroeconomic variables such as real GDP (RGDP), consumer price index (CPI), real government expenditure (RGE) and interest rate (IR). The co-integration and the multivariate analyses reveal significant and positive long-run relationship between real money demand (RMD) and real GDP (RGDP), real budget deficits (RBD), real internal debt (RID), and real external debt (RED), and negative long-run relationship between RMD and consumer price index (CPI), real government expenditure (RGE) and deposit rate (IR). The vector error correction model reports positive dynamic short-run relationship between real money demand (RMD) and all explanatory variables except deposit rate and external debt which is negative.

Keywords: budget deficits, money demand, real government expenditure, interest rate, public debt, vector error correction, co-integration.

JEL Classification: E41, H62, H63.

Introduction

The objective of this study is to examine and analyze the effect of the budget deficits on money demand in Jordan during the period of 1992-2010. Jordan has had to rely on foreign assistance for support of its budget; the Jordan budget deficit has jumped from JD263.4 million in 1997 to JD1448.1 in 2010 (International Financial Statistics, IMF e-library). According to the data reported in Table 1 public expenditure climbed from JD1411.6 million in

1993 to JD5708.2 million in 2010. On the other side, the total revenues and grants increased from JD1481.4 million in 1993 to JD4260.1 million in 2010.

Domestic revenues (tax and non-tax revenues) were down by 4.1 percent to JD4.192 billion and foreign aid had sharply dropped by 53.6 percent to JD333 million. So, the government would rationalize public spending and ensure more efficient allocation of resources in a bid to rein in the spiraling deficit and public debt.

Table 1. Developments in public revenues and public expenditures (1993-2010, JD million)

Items	2010	2009	2005	2001	1997	1993
Total revenues and grants	4260.1	4187.8	2561.8	2160.8	1688.6	1481.4
Growth rate %	2%	-4%	-15%	5%	-7%	3%
Total expenditure	5708.2	6030.5	3538.9	2316.3	1952	1411.6
Growth rate %	-5%	11%	11%	6%	9%	3%
Overall deficit /surplus	-1448.1	-1842.7	-977.1	-155.5	-263.4	69.8

Source: International Financial Statistics (IFS), IMF e-library.

A recent Central Bank of Jordan (CBJ) report has indicated that the economy, like the other world economies, is still reeling from the consequences of the world economic turmoil. The downward trend was manifested by a significant slowdown in real growth rates, a sharp rise in the state budget deficit, dwindling foreign investment and an extraordinary

drop in exports and expatriate remittances. Also, the gross domestic debts of central government increased from JD6246.8 million in 1998 to JD11153.6 million in 2010 as reported in Table 2. The internal debt represents about 35% from real GDP in 2010 and the external debt represents about 24% in the same year.

Table 2. Developments in the gross domestic debts of central government (JD million) and the percentage of internal and external debt of real GDP through the period of 1998-2010

Years	Gross domestic debt of central government	% internal debt of real GDP	% external debt of real GDP
1998	6,246.8	16%	95%
1999	6,318.8	16%	93%
2000	6,388.4	17%	89%
2001	6,169.8	19%	78%
2002	6,397.5	20%	74%

Table 2 (cont.). Developments in the gross domestic debts of central government (JD million) and the percentage of internal and external debt of real GDP throw the period of 1998-2010

Years	Gross domestic debt of central government	% internal debt of real GDP	% external debt of real GDP
2003	7,221.1	24%	76%
2004	7,313.7	24%	66%
2005	7,516.1	28%	56%
2006	7,643.3	23%	48%
2007	7,913.8	25%	40%
2008	9,631.5	31%	30%
2009	10,077.6	35%	25%
2010	11,153.6	35%	24%

Source: International Financial Statistics (IFS), IMF e-library.

This study investigates the relationship between budget deficits (the excess of spending over revenue) and real money demand (RMD measures currency, the desire of households and businesses to hold liquidity). Budget deficit may lead to instability in the economy through its effect on money demand. It is expected that budget deficit will be financed by issuing T-Bills, bonds and direct borrowing from internal institutions like banks and external debt from foreign institutions and foreign governments. That is, budget deficits represent a demand for funds by the government.

We believe that the primary objective of this study is to provide answers to the following questions: (1) What is the relationship between budget deficits and money demand? (2) What are the determinants of the real money demand (RMD) in presence of persistent budget deficits? (3) What is the relationship between public debt, internal and external, and the real money demand (RMD)? Finally, this study will be useful for policy makers to equilibrium between fiscal policy and monetary policy.

This study is organized as follows. Section 1 incorporates the theoretical and literature review. The theoretical model is described in the section 2 along with the description of variables and data. Econometrics analysis and empirical results are discussed next. The concluding remarks are given in the final section.

1. Theoretical and literature review

Money demand means the desire of households and businesses to hold assets and easily exchanged the goods and services to liquidity. For this reason, the money demand is sometimes called the demand for liquidity (Steven M. Suranovic & Robert Winthrop, 2005.) Many researchers are often divided the money demand into two distinct categories: the transactions demand and the speculative demand. Also, the researchers believe that money demand will depend positively on the level of real GDP and the price level due to the demand for transactions and that money demand will depend negatively on average

interest rates due to speculative concerns (Steven M. Suranovic & Robert Winthrop, 2005; Chrystal and Thornton, 1988; Bernheim, 1989).

The researchers and economists divided the relationship between budget deficits and money demand into three schools, these schools are: Neoclassical, Keynesian, and Ricardian approaches. The analysis of these approaches are based on the macroeconomic models (Chrystal and Thornton, 1988; Bernheim, 1989). Accordingly, Neoclassicals and Keynesians are often depended on the increase of budget deficit which resulting from increasing government spending, that will increase the national income. Thus, it is required the government issues bonds to finance its deficit. So, the net wealth rises because of interest payments on bonds (Joines, 1985).

According to the Ricardian view the budget deficits have no impact on money demand in the long run but according to the Neoclassicals and Keynesians view there are significant and positive relationship between budget deficits and money demand in the short run (Wadad Saad and Kamel Kalakech, 2009). Other researchers and economists believe that deficit budget is necessary to satisfy demand for savings in excess of what can be satisfied by private investment (Pavlina R. and Tcherneva, 2007). So, it is required to create the money supply which can lead to a credit bubble and a financial crisis.

William Vickrey (1996) argued also that deficit budget is necessary to satisfy demand for savings in excess of what can be satisfied by private investment. Also, there are many researchers who examined the relationship between budget deficit and money demand (Laumas, 1989; Yellen, 1989; Vamvoukas, 1989; Tanner and Devereux 1993; Dua, 1993; Knot and De Haan, 1995; and Reinhart and Sack, 2000). There have found a significant positive effect on money demand.

Mohammad Aslam Chaudhary and Ghulam Shabbir (2005) examined the study of macroeconomic impacts of budget deficits on Pakistan's foreign sector.

They found that money supply is positively related to foreign reserves, bank credit and borrowing 'of the public sector to finance deficit. They also found that money demand is negatively related to interest rate but positively related to income.

Many researches argued also that the increase of deficit budget depend on the financing through excessive expansion in domestic credit, created excessive supply of money over demand, and therefore, led to foreign reserve outflows (Dua, 1993; Knot and De Haan, 1995; and Reinhart and Sack, 2000).

2. Methodology

This study applies a version of a model developed by Laumas (1989), Yellen (1989), Vamvoukas (1989), Johansen (1988), Johansen and Juselius (1990), Tanner and Devereux (1993), Dua (1993), Knot and De Haan (1995), and Wadad Saad and Kamel Kalakech (2009) to examine the effect of the budget deficits on money demand in Jordan during the period of 1992-2010 using a group of econometrics techniques. We analyze the effect of a budget deficit in addition to number of macroeconomic variables on money demand using the following equation:

$$\ln RMD = f(X, Y), \quad (1)$$

where \ln is the natural logarithm, RMD is the real money demand, X is a vector of macroeconomic variables (namely, real GDP, consumer price index, government expenditure and interest rate), Y are the budget deficits (the excess of spending over revenue).

In order to estimate the $\ln RMD$ function, the following basic linear model of $\ln RMD$ is specified as:

Model 1:

$$\ln RMD_t(X, Y) = a_0 + a_1 \ln RGDP_t + a_2 IR_t + a_3 \ln CPI_t + a_4 \ln RBD_t + a_5 \ln RGE_t + \varepsilon_t. \quad (2)$$

Model 2:

$$\ln RMD_t(debt) = b_0 + b_1 \ln RID_t + b_2 \ln RED_t + \varepsilon_t, \quad (3)$$

where \ln is the natural logarithm, RMD is the real money demand, $RGDP$ is the real GDP, RGE is the real government expenditure, IR is the deposit interest rate, CPI is the consumer price index, RBD are the budget deficits, ε is the error term and t is the time, RID is the real internal debt, RED is the real external debt.

The second model specifies the impact of government public debt classified as internal and external on real money demand. Government usually fund the budget deficit through debt, the burden of the debt considered one major economic factor. It

affects most of the economic condition variables especially in developing countries. We argue that government budget deficit affect the money demand through borrowing made by the central government, thus we move a step further to investigate the effect of public debt on real money demand (model 2).

2.1. Data and sample. Like other developing countries, Jordan has a shortage of data availability therefore our sample is restricted to the available data time span. We formed yearly time series data set of the variables of interest during the period of 1992-2010. The data set was sourced from the central bank of Jordan yearly time series data base and the international financial statistics (IFS), IMF e-library.

2.2. Variables measurement. Independent and dependent variables of this study have been measured by depending on the results of previous studies.

2.2.1. Dependent variables. **2.2.1.1. Real money demand (RMD).** Real money demand (RMD) are affected by several factors. These factors are: the level of income, the interest rates and the inflation. These factors are uncertainty about the future, and it is affected by money demand. There are three types of money demand; transactions, precautionary and speculative. Real money demand also function as, $MD/P\$ = f(Y\$, I\$)$, where $MD/P\$$ is often positively related to changes in real GDP ($Y\$$) and the average interest rate ($I\$$) according to the liquidity function. So, $RMD = f(P, Y, I)$, where RMD is the real money demand, P is the current price level, Y is the real GDP and I is the average interest rate.

2.2.2. Independent variables. Independent variables of the study on which data were collected include the following.

2.2.2.1. The real GDP (RGDP). Real GDP is evaluated at the market prices and it is measured by:

$$GDP = Private\ consumption + Gross\ investment + Government\ spending + (Exports - Imports), \text{ or}$$

$$GDP = C + I + G + (X - M).$$

2.2.2.2. Real government expenditure (RGE). Real government expenditure (RGE) includes two types of expenditures: Government consumption and Investment excluding transfer payments.

2.2.2.3. The deposit interest rate (IR). The interest rate (R) is divided into Nominal interest rates and real interest rates. Nominal interest rates depends on the value time of the money, and real interest rate depends on the systematic and regulatory risks, and it is measurement by the value time of the money. Also, *Real rates = Nominal rates - (Inflation + Currency adjustment)*.

2.2.2.4. The consumer price index (CPI). Consumer price index is measured by:

$$CPI = \frac{\text{Base year basket quantities multiplied by current year prices}}{\text{Base year basket quantities multiplied base year prices}}$$

2.2.2.5. *Real budget deficits (RBD)*. Budget deficits mean the increase of spending over revenues of budget. Deficits are sometimes called the Public debt. Public debt increases or decreases as a result of the annual *unified budget* deficit or surplus. The gross domestic debts are often divided into two categories: internal debt (RID) and real external debt (RED).

2.3. Description of variables. Table 3 summarizes the statistics of both dependent and independent variables for the entire sample.

Table 3. Descriptive statistics of dependent variables during the period (1992-2010)

Variable	Obs	Mean	Std. dev.	Min	Max
LRMD	19	4.470881	.340929	4.039298	4.930132
LRGDP	19	4.291819	.2923861	3.872561	4.76177
IR	19	5.932237	2.046282	2.491667	9.098333
LREXD	19	4903.5	519.7256	3640.2	5510.1
LRIND	19	2649.385	1929.44	898	6576
LGE	19	3.400451	.2962796	3.021275	3.929672
LGD	19	.815291	1.281262	-1.567793	2.744074
LCPI	19	4.476725	.1837721	4.198705	4.824306

From Table 3, it can be seen that the mean of the various explanatory and dependent variables for the entire sample of macroeconomic variables and the real money demand. These variables are similar in mean and std. deviation to those in Lebanon over the period from 1973 to 2007 (Wadad Saad and Kamel Kalakech, 2009).

Table 4 presents a correlation matrix of the *RMD* (real money demand) and macroeconomic variables over the period of 1992-2010. It can be seen that *IR* (deposit interest rate) is negatively related to *RMD*. It also shows that *RGDP* (real GDP), *CPI* (consumer price index), *RBD* (real budget deficits) and *RGE* (real government expenditure) are positively related to *RMD*. These results similar to the results found by Knot and De Haan (1995), Reinhart and Sack (2000), Wadad Saad and Kamel Kalakech (2009), and Mohammad Aslam Chaudhary and Ghulam Shabbir (2005).

Table 4. Correlation matrix of the *RMD* and macroeconomic variables over the period of 1992-2010

	LRMD	LRGDP	LRGD	LRGE	LCPI	IR
RMD	1.0000					
LRGDP	0.9813	1.0000				
LRGD	0.8077	0.8186	1.0000			
LRGE	0.9720	0.9930	0.8225	1.0000		
LCPI	0.9286	0.9770	0.8169	0.9668	1.0000	
IR	-0.7755	-0.6834	-0.4720	-0.6842	-0.5836	1.0000

Table 5 presents a correlation matrix of the *RMD* and internal and external debts. From Table 5 it can be seen that internal debt is positively related to *RMD*. This means an increase in internal debt will rise the demand for real money *RMD* and vice-a-versa.

Table 5. Correlation matrix between *RMD* and internal and external debts over the period of 1992-2010

	LRMD	LRIND	LREXD
LRMD	1.0000		
LRIND	0.9532	1.0000	
LREXD	-0.7535	-0.8882	1.0000

Table 5 also shows negatively relationship between *RMD* and real external debt. These results are similar to the results found in Lebanon over the period from 1973 to 2007 (Wadad Saad and Kamel Kalakech, 2009), and in Pakistan (Mohammad Aslam Chaudhary and Ghulam Shabbir, 2005).

2.4. Hypotheses. Based on the above discussion it can form the hypotheses as follows.

1. Internal debt.

Ho1: There is a significant positive relationship between RMD and internal debt.

2. External debt.

Ho2: There is a significant positive relationship between RMD and external debt.

3. RGDP (real GDP).

Ho3: There is a significant positive relationship between RMD and RGDP (real GDP).

4. IR (deposit interest rate).

Ho4: There is a negative relationship between RMD and IR (deposit interest rate).

5. CPI (consumer price index).

Ho5: There is a positive relationship between RMD and CPI (consumer price index).

6. BD (budget deficits).

Ho6: There is a positive relationship between RMD and RBD (budget deficits).

7. RGE (real government expenditure).

Ho7: There is a positive relationship between RMD and RGE (real government expenditure).

3. Econometric models and results

Since we deal with time series data it is important to start by checking whether the variables are stationary

or not using the unit root test. We employ both Augmented Dickey Fuller (ADF) (1979) and Phillips Perron (PP) (1988) tests.

$$\Delta y_t = a + \alpha y_{t-1} + \eta + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \beta_3 \Delta y_{t-3} + \dots + \beta_k \Delta y_{t-k} + \varepsilon_t.$$

Table 6 shows the unit root test for the variables of the two models. The unit root test indicates that all variables in model (1) are not stationary in the level form using both ADF and PP tests while they are stationary at the first difference form. That is all variables are integrated of the same order $I(1)$.

Table 6. Unit root test using both ADF and PP tests for models 1 & 2 variables

Variables	ADF		Order of integration	PP		Order of integration
	Levels	First differences		Levels	First differences	
LRM	-0.259	-3.289**	$I(1)$	-0.320	-3.366**	$I(1)$
LRGDP	-1.250	-3.789*	$I(1)$	-1.201	-3.788*	$I(1)$
LRGE	-0.104	-4.197*	$I(1)$	-0.032	-4.259*	$I(1)$
LRGD	-1.250	-3.789*	$I(1)$	-1.201	-3.788*	$I(1)$
LCPI	0.722	-4.319*	$I(1)$	0.790	-4.324*	$I(1)$
IR	-0.655	-1.716***	$I(1)$	-1.098	-1.961	$I(2)$
LRIND	-0.303	-3.581**	$I(1)$	0.180	-3.870*	$I(1)$
LREXD	0.133	-3.751*	$I(1)$	0.244	-3.749*	$I(1)$

Note: * statistically significant at 5%, ** statistically significant at 5%, *** statistically significant at 10%.

Since the variables in both models are integrated of the same order we can test for the existence of co-integration vector(s) between the variables. Johansen co-integration test (1995) developed a test for the existence of long-run relationship between the variables of interest. Table 7 shows the results of Johansen co-integration test which provides evidence of long-run relationship between the variables. In the left panel of the table, we reject the first null hypothesis of zero co-integration vectors because the trace statistics is less than the 5% critical value, however we cannot reject the second null hypothesis that there is at most one co-integration vector because the trace statistics less than the 5% critical value. In conclusion, Johansen test suggests

a long-run relationship between the variables in model (1). When the government deficit increases public debt also increase to cover the deficit which should affect the demand for real money. Therefore, we move one further step in our investigation by checking the impact of public debt (internal and external) on real money demand. The public debt can be sourced from internal or external agencies thus we investigate the effect of the internal and external debt on real money demand. The unit root test, Table 6, indicates that all variables are $I(1)$. Johansen co-integration test also is performed in Table 7. It indicates the existence of one co-integration vector at most. That is there is positive relationship between both internal and external debt in the long run.

Table 7. Johansen test for co-integration for models 1 and 2

Null hypothesis	Model 1		Model 2	
	Trace statistics	5% critical value	Trace statistics	5% critical value
Zero co-integration vector	108.4348	94.15	41.9011	29.68z
At most 1 vector	61.7746*	68.52	7.7625*	15.41
At most 2 vectors	33.6200	47.21	1.9769	3.76
At most 3 vectors	16.9444	29.38	-	-

Note: * statistically significant at 5%.

Based on Johansen test's results, we conclude that there is long-run relationship in the money demand models. Therefore, the estimations in Table 8 can be economically interpreted. The empirical results of the multivariate regression model (1) and model (2) using the method of OLS indicate that all variables in the first model are statistically significant although they don't carry the expected sign. The right panel of Table 8 shows the empirical results of the second model, it shows that both kind of government debt, internal debt and external debt, are statistically significant with the expected signs.

The OLS multivariate estimation shows initial signs of relationship between budget deficit and money demand. The estimations indicate significant positive long-run relationship between real money demand (LRMD) and real GDP (LRGDP). This is consistent with the theory of money demand, the higher the income level the higher the purchasing power and then higher level of living and hence more money demand. The coefficient of the government expenditures (LRGE) is significantly negative, the higher the government expenditure the lower the money demand. The coefficient of budget

deficit (*LRGD*) is significantly positive. This can explain that more government deficit implies more domestic borrowing which lowers the purchasing power of the economy. Both the coefficients of the deposit rate (*IR*) and the consumer price index (*LCPI*) are significantly negative. The deposit rate is the opportunity cost of holding money, therefore, the higher the deposit rate the higher the opportunity cost thus lower the money demand. The higher inflation rate may cause higher expected inflation rate which according to the theory of assets demand, others assets'

expected return is expected to be higher relative to money thus the demand for money is lower. This result is similar to those results that are obtained by Knot and De Haan (1995), Reinhart and Sack (2000), Wadad Saad and Kamel Kalakech (2009), and Mohamad Aslam Chaudhary and Ghulam Shabbir (2005).

As for the internal and external debt, the right panel of Table 8 reports a significant positive relationship between *RMD* and both *RID* and *RED*. This is consistent with the hypothesized relations.

Table 8. Multivariate regression empirical results

	Model 1			Model 2		
	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
<i>LRGDP</i>	1.954129*	6.68	0.000	-	-	-
<i>LRGE</i>	-.4739624**	-2.09	0.056	-	-	-
<i>LRGD</i>	.0231292**	2.13	0.053	-	-	-
<i>LCPI</i>	-.8617937*	-3.65	0.003	-	-	-
<i>IR</i>	-.023685*	-3.81	0.002	-	-	-
<i>CONSTANT</i>	1.675462*	3.71	0.003	.93707	1.19	0.262
<i>LRIND</i>	-	-	-	.6980858*	8.73	0.000
<i>LREXD</i>	-	-	-	.4242394**	2.86	0.017
<i>R²</i>	0.9933			0.8362		
<i>F</i>	387.24*			25.52*		
No. of observations	19			19		

Note: * statistically significant at 1%, ** statistically significant at 5%, *** statistically significant at 10%.

A further step in our investigation takes place, because the results of our previous test show that $0 < r < 1$ (*r* indicates no. of co-integration vectors). We employ the vector error correction model (VECM).

Modified VEC model 1:

$$\Delta LRMD = \beta_0 + \beta_1 ECT_{t-1} + \sum \beta_{2i} LRMD_{t-i} + \sum \beta_{3i} LRGDP_{t-i} + \sum \beta_{4i} LCPI_{t-i} + \sum \beta_{5i} LRGD_{t-i} + \sum \beta_{6i} LRGE_{t-i} + \sum \beta_{7i} DEPRATE_{t-i} + \varepsilon_t.$$

Modified VEC model 2:

$$\Delta LRMD = \beta_0 + \beta_1 ECT_{t-1} + \sum \beta_{2i} LRIND_{t-i} + \sum \beta_{3i} LREXTD_{t-i} + \varepsilon_t.$$

The VECM indicate the dynamic short-run analysis of the variables in the model, the coefficient of the lagged error correction factor has significant negative sign at 5% level of significance (Table 9). This coefficient indicates the speed of adjustment to long-run equilibrium that affects short run movement. The negative sign ensures that all explanatory variables involved in the study of money demand work together to reach the equilibrium in the short run. The absolute value of the coefficient of *ECT_{t-1}* equals 67.36% of the disequilibrium in the real money demand adjusted per year.

That is, money demand needs about one year and 4 months to return to its long-run equilibrium. The other variables have their expected significant signs. *LRGDP* is positively related to real money demand in the short run, and *LCPI* has significant positive short-run relationship with the real money demand. Deposit rate is negatively related in the short run with real money demand. *LRGE*, *LRGD* are also positively related with the real money demand in the short run.

On the other hand the *VECM*, the right panel of Table 9, shows a short-run positive relationship between internal debt and real money demand and negative short-term effect of external debt. The error correction coefficient is significantly negative and tells that 82.69% of the disequilibrium in the real money demand is adjusted per year. That is, money demand needs about one year and 2 months to return to its long-run equilibrium.

In conclusion, we have shown that there is positive and significant effect of government budget deficit on real money demand in both long term and short term. In addition, there exists a positive effect of internal debt on *RMD* at both long and short terms. Moreover, there is short term negative effect and long term positive effect of external debt on *RMD*.

Table 9. Co-integrating equation based on the VECM for models 1 and 2

Variables	Model 1			Model 2		
	Coefficients	Z-statistics	p-value	Coefficients	Z-statistics	p-value
ΔLrm	.3177286***	1.64	0.094	-	-	-
$\Delta LRGD$.0021614**	2.19	0.026	-	-	-
$\Delta LRGE$.257435*	2.60	0.009	-	-	-
ΔCPI	.0269827*	18.78	0.000	-	-	-
ΔIR	-.0353395*	-6.75	0.000	-	-	-
ECT_{t-1}	-.6736331**	2.55	0.011	-.8269395	2.08**	0.037
$\Delta LRIND$	-	-	-	1.311733	60.30*	0.000
$\Delta LREXD$	-	-	-	-.3297017	-42.50*	0.000
R^2	0.3368			0.8366		
Chi-squares	7.10**			25.59389*		
Log likelihood	22.74532			86.21774		

Note: * statistically significant at 1%, ** statistically significant at 5%, *** statistically significant at 10%.

Summary and conclusions

This study examined the relationship between budget deficits and RMD measured currency, travelers' checks, and checking account deposits and held assets by households and businesses that can be easily exchanged for goods and services, over the period from 1992 to 2010.

The importance of this study is determined by the effect of budget deficits on money demand, which may lead to instability in the economy due to the expectations about the financing of the deficits. Budget deficits represent a demand for funds by the government that must be met by issuing of T-Bills and bonds and direct borrowing from internal institutions like banking and external debt from foreign institutions and foreign countries.

There are different approaches between the researchers of economists about the relationship between budget deficits and real money demand where the neoclassical and Keynesian models assume a positive relationship between money demand and

budget deficits, the Ricardian models suppose that there is no impact of the budget deficits on money demand.

The study follows a functional model which was employed earlier by Laumas (1989), Yellen (1989), Vamvoukas (1989), Johansen (1988), Johansen and Juselius (1990), Tanner and Devereux (1993), Dua (1993), Knot and De Haan (1995), and Wadad Saad and Kamel Kalakech (2009) using Multiple Linear Regression Model. In conclusion, we have shown that there is positive and significant effect of government budget deficit on real money demand in both long term and short term. In addition, there exists a positive effect of internal debt on RMD in both long and short terms. Moreover, there is short term negative effect and long-term positive effect of external debt on RMD.

Finally, this study will be useful for the financial policy makers to achieve equilibrium between fiscal policy and monetary policy and this study is useful for monetary and financial authorities.

References

1. Annual reports issued by the Central Bank of Jordan (2010).
2. Barro, R. (1974). "The Ricardian Approach to Budget Deficits", *The Journal of Economic Perspectives*, Vol. 3, No. 2, pp. 37-54.
3. Bernheim, B.D. (1989). "A Neoclassical Perspective on Budget Deficits", *Journal of Economic Perspectives* (spring), pp. 55-72.
4. Cheng, B.S. (1998). "The Causality between Budget Deficits and Interest Rates in Japan: An Application of Time Series Analysis", *Applied Economics Letters*, Vol. 5, No. 7, pp. 419-422.
5. Chrystal, K.A., and D.L., Thornton (1988). "The Macroeconomic Effects of Deficit Spending: A Review", Review, Federal Reserve Bank of St. Louis, November, pp. 48-60.
6. Darrat, A.F. (1990). "Structural Federal Deficits and Interest Rates: Some Causality and Cointegration Tests", *Southern Economic Journal*, Vol. 56, No. 3, pp. 752-759.
7. Dua, P. (1993). "Interest Rates, Government Purchases, and Budget Deficits: A Forward Looking Model", *Public Finance Quarterly*, Vol. 21 (October), No. 4, pp. 470-478.
8. European Commission (2011). Assessment of the 2nd tranche implementation of sector budget "Support to the Public Financial Management Reform Programmed in Jordan", Working paper, No 263912, Version 1.
9. Gully, O.D. (1994). "An Empirical Test of the Effects of Government Deficits on Money Demand", *Applied Economics*, 26, pp. 239-247.

10. Joines, D.H. (1985). "Deficits and Money Growth in the United States: 1872-1983", *Journal of Monetary Economics*, 16, pp. 329-351.
11. Johansen, S. (1988). "Statistical Analysis of Cointegrating Vectors", *Journal of Economic Dynamics and Control*, 12, pp. 231-254.
12. Johansen, S., and K. Juselius (1990). "Maximum Likelihood Estimation and Inference on Cointegration – With Applications to the Demand for Money", *Oxford Bulletin of Economics and Statistics*, 52 (2), pp. 169-210.
13. Johansen, S. (1991). "Estimation and Hypothesis Testing of Co-integration Vectors in Gaussian Vector Autoregressive Models", *Econometrical*, 59, No. 6, pp. 1551-1580.
14. Knot, D. and J., De Haan (1995). "Fiscal Policy and Interest Rates in the European Community", *European Journal of Political Economy*, Vol. 11, No. 1, pp. 171-187.
15. Laumas, G.S. (1989). "Anticipated Federal Budget Deficits, Monetary Policy and the Rate of Interest", *Southern Economic Journal*, Vol. 56 (October), No. 2, pp. 375-382.
16. Mohammad Aslam Chaudhary and Ghulam Shabbir (2005). Macroeconomic impacts of budget deficits on Pakistan's foreign sector, *Pakistan Economic and Social Review*, Vol. 43, No. 2, pp. 185-198.
17. Pavlina R. Tcherneva (2007). "Chartalism and the tax-driven approach to money", *Handbook of Alternative Monetary Economics*.
18. Reinhart, V. and Sack, B. (2000). "The Economic Consequences of Disappearing Government Debt", *Brookings Papers on Economic Activity*, 2, pp. 163-220.
19. Steven M. Suranovic & Robert Winthrop (2005). "Cultural Effects of Trade Liberalization", International Trade, available at <http://ideas.repec.org/s/wpa/wuwpit/0511003>.
20. Statistics issued by the Jordanian General Statistics Departments (2010).
21. Some statistics derived from the UNCTAD Handbook of Statistics (2010).
22. Tranner, F. and J. Devereux (1993). "Deficits and Demand for Money", *Southern Economic Journal*, 60, pp. 316-326.
23. Vamvoukas, G.A. (1998). "The Relationship Between Budget Deficits and Money Demand: Evidence from a Small Economy", *Applied Economics*, 30, No. 3, pp. 375-82.
24. Vickrey, William (1996). Fifteen Fatal Fallacies of Financial Fundamentalism: A Disquisition on Demand Side Economics, Columbia University Working Paper.
25. Wadad Saad and Kamel Kalakech (2009). The Impact of Budget Deficits on Money Demand: Evidence from Lebanon, *Middle Eastern Finance and Economics*, 3, pp. 65-76.
26. Yellen, J. (1989). "Symposium on the Budget Deficit", *Journal of Economics Perspectives*, 3 (20), pp. 17-21.