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The Dynamic Interrelationships between Fiscal and Monetary Policies in Jordan

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ABSTRACT: This study aims to answer the question: What is the nature of the relationship between fiscal and monetary policy in Jordan? Are the two policies complementary to each other, alternatives, or go in opposite directions?. This study applies the vector autoregression VAR, the Impulse Response Function test, the Granger Causality test, and the. Variance Decomposition Analysis. The results showed that there is a bidirectional causal relationship between government expenditures and money supply, as well as a bidirectional causal relationship between tax revenues and money supply, the main conclusion that the fiscal policy through the use of government expenditures and tax revenues and the monetary policy through the money supply go in the same direction, and complement each other, this is supported by the fact that the expansionary fiscal policy in Jordan during the study period was also accompanied by an expansionary monetary policy. The monetary authority sets interest rates on loans and there is no significant role for fiscal policy instruments in influencing the interest rate in Jordan. The study recommends harmonization between the declared and implemented policy. Each authority should serve its goals with independence and complementarity between the two policies. In this case, coordination means preventing extremism in pursuing an expansionary or contractionary policy from this or that authority, what is required is that the Central Bank and the Ministry of Finance agree on coordination, integration and balance between objectives.

KEYWORDS: Jordan, Fiscal Policy, Monetary Policy, Macroeconomic Policies Interactions, VAR

INTRODUCTION

Fiscal and monetary policies aim to achieve stable and noninflationary economic growth, but these policies are adopted by different authorities, each authority has its own objectives and instruments. Those instruments include money supply or an interest rate controlled by the central bank, or government expenditures or tax rates controlled by the ministry of finance (Hasan, & Isgut, 2009). While fiscal policies attempt to achieve economic growth that ideally exceeds the central bank, monetary policy attempts to achieve sub-optimal inflation, with the result that both inflation and economic growth can be more extreme than the ideal points for all policy makers) Dixit, & Lambertini, 2001). Therefore, the effective implementation of the two policies requires achieving a high degree of coordination between the policy makers, this makes achieving the goals easier (Laurens, & De La Piedra, 1998), the final impact of these policies on the target variables depends on how each affects the other, in the absence of coordination between them, there will be a case of economic instability, which leads to fluctuations in interest rates, pressures on exchange rates, acceleration of inflation rates, a rise in the budget deficit, an exacerbation of the debt problem, consequently adverse effects on the economy. The coordination does not necessarily mean congruence between the two authorities, it may require opposite but complementary policies. Therefore, the coordination may be in the form of agreements between the two authorities, where agreement about ideal output growth and inflation creates monetary and fiscal symbiosis, which leads to the ideal point despite Disagreement about the relative weight of the two objectives)Dixit, & Lambertini, 2001).

The role of fiscal and monetary policies in the economy passed through several stages, depending on the economic development stage. Economists' opinion about fiscal policy in the economy was linked to the government's role in the economy, as a result, the viewpoint on fiscal policy in economic thought was different., as some schools called for a vital role of the market in the economy, while the role of government is limited to its traditional tasks such as security, defense and justice. Then its role evolved to include creating the appropriate legislative environment to strengthen the economy, removing obstacles that prevent the private sector from participating in the economy, and implementing macroeconomic policies. On the other hand, the view of monetary policy is

related to the role of money in the economy. The role of money in the economy has been widely debated among economists, although economists agreed that changes in the supply and demand for money play an important role in the economy.

The mutual influence between fiscal and monetary policy takes place through several direct and indirect channels. The direct effects are that the expansionary fiscal policy can lead to a high budget deficit, which leads to the emergence the need for financing through the issuance of money by the monetary authority, this means an expansionary monetary policy, which will lead to inflationary pressures, decline in the value of the local currency, this may lead to a currency crisis, so the expansionary fiscal policy led to an expansionary monetary policy. Furthermore, if the deficit is financed through non-monetary methods, that is, through financial markets, this leads to crowding out the private sector, thus affecting economic growth (Hilbers, 2004). One of the direct ways in which fiscal policy affects monetary policy is the use of taxes, as indirect taxes affect the price level, and inflation. In addition, there are indirect relationships, such as the expectation of a large budget deficit in the future, which leads to an increase in the demand for external borrowing, which leads to the instability of the government's financial position, which leads to the instability of financial markets, thus the collapse of the monetary system. However, the size and the maturity of government debt affect future fiscal and monetary policy decisions (Alzyadat, 2020).

Another example of the indirect relationship between fiscal and monetary policies is that the expansionary fiscal policy financed by borrowing means, for economic units, that the government will increase taxes in the future, thus they decide to increase its savings and reduce its consumption, and this is called (Ricardian - Equivalence), this means, the decisions of the economic units and the monetary authority as well, will depend on their awareness of the fiscal policy. It is also noted that even if there is independence for the Central Bank, the fiscal policy affects the objectives of the central bank, so the central bank changes its objectives in order to mitigate the effects of the expansionary fiscal policy on aggregate demand and inflation, this makes the Central Bank adopt tight monetary policy, by raising interest rates or reducing credit, the consequently the higher interest rates discourage economic activity, affect capital flows, inflationary pressures, and a decrease in the value of the local currency (Hilbers, 2004). Instability may arise from a set of fiscal and monetary policy rules that would separately serve to stabilize the economy (Ryoo, & Skott, 2017). Central bank independence attempts to separate monetary and fiscal policy, but it is not a complete separation, because every monetary policy action has fiscal consequences.

Therefore, in order to achieve the macroeconomic objectives, it is necessary to know the nature of the relationship between macroeconomic policies. Accordingly, the problem of the study involves verifying the nature of the interactions between the fiscal and monetary policies in Jordan, and how each affects the other. Based on annual data for the period 1970 - 2020 and applying the appropriate econometric methods to reach results that help economic policy makers.

LITERATURE REVIEW

Studies on the interrelationships between fiscal and monetary policies using the new dynamic Keynesian general equilibrium model confirm that strategic integration or substitution of both policies depend critically on the types of shocks that strike the economy, and on the assumptions made about the underlying structural model (Muscatelli, et al. 2004). The New Keynesian model proposes a degree of substitution between the two policy instruments in response to unexpected shocks in policy bases, the historical simulations showed that since the 1990s the two policies instruments have moved together in a more complementary manner (Muscatelli, et al. 2004). The relationship between fiscal and monetary policies is reflected in the role played by monetary authorities and the banking system in financing government budget deficits. According to monetarist; an increase in the budget deficit causes an increase in money supply financing the budget deficits by obtaining seigniorage, (Koyuncu, 2014). if debt is purchased by the banking system - either by the central bank or the commercial banking system. The government debt is entered into the portfolios of commercial banks, the reserve assets increase, unless this increase is offset by other transactions. This allows commercial banks to expand their lending activity to the private sector and thus increase the money supply. If the central bank desires the commercial banks to purchase government bonds, it provides the commercial banks with cash reserves to do so. Therefore, the central bank increases its liabilities and thus the money supply expands financing budget deficits through domestic borrowing will lead to much more inflationary results sequences than monetary financing in the long run. Because; the budget deficits will be financed by borrowing or printing money, monetary policy will be under the oppression of budget deficit. Government expenditure affects the money supply in relation to the issuance of currency, as it affects the money supply through currency issuance operations to finance the government expenditures. Therefore, an increase in government expenditure in the economy would raise the money supply, as these government cash flows are directed towards its various items to end up in the various components of the money supply such as deposits or cash in circulation outside the banking system. Benelbar, and Bouabid, (2020) confirmed that the higher the government expenditure, the higher the money supply.

The independence of central banks determines the effect of budget deficits on the money supply. Countries with independent central banks tend to show a weak correlation between budget deficits and the money supply, (Burdekin, & Wohar, 1990). Some

factors contribute to mitigating the impact of government expenditure on the money supply, as government expenditure allocates a part of it to imported goods, as well as the flow of international capital in response to changes in international interest rates and exchange rates. Government expenditure also distributes incomes to state employees in terms of wages and salaries, part of these incomes goes to savings in financial institutions as deposits, which leads to an increase in the cash reserves of commercial banks and enhances the ability of commercial banks to grant credit.

The classical macroeconomic model, showed that a temporary increase in government expenditure can lead to a rise in the real interest rate. Many economists have tried to prove the conclusion through empirical analysis. Empirical studies of the positive relationship between government expenditure and the real interest rate that a temporary increase in government spending will lead to a rise in the real interest rate (Du, 2015). Adam, et al. (2018) found that every 1% rise in government expenditure led to a decrease in the interest rate by 1.48%, whereas every 1% rise in money supply led to an increase in the interest rate by 1.16%. The results also revealed a short-run effect of government expenditure and money supply on the interest rate.

The economic studies dealt with the interrelationships between the fiscal policy instruments, these studies proved the strength of the relationship between tax revenues and government expenditures., as the tax revenues obtained determine the maximum volume of government expenditure (Blackley 1986), government expenditures increase as a result of the increase in government revenues. Within the framework of Say's Law, expenditures follow the level of revenues available in Its fluctuations, the higher the income and the higher the state's revenue, the greater the government expenditures. But sometimes if the mechanism of change in tax revenues is counter-cyclical, it is expected that expenditures will rise as a result of lower revenues due to increased expenditures for unemployment insurance (Romer and Romer, 2010), also, tax policy affect all aspects of the economy, not only the behavior of companies and individuals, and thus affect government expenditures. some practical studies have confirmed that the impact of tax policy on the government expenditures is similar to its effect on the private sector, so this must be taken into consideration when designing tax policy. (Gordon and Wilson, 1999). Moreover, government expenditures are determined before government revenue, which is known in the literature as the expenditure tax hypothesis (Furstenberg et. al. (1986). rather than adopting the approach of raising funds first to finance spending later)Carneiro, et al. 2004). Some empirical studies support the expenditure tax hypothesis such as: (Koren, & Stiassny, 1995; Koren, & Stiassny, 1998; Carneiro, et al. 2004; Hussain, 2004; Hong, (2009). As well as Afonso, and Rault, (2009) proved that the expenditure tax hypothesis exists for Italy, France, Spain, Greece and Portugal, while the tax and expenditure hypothesis exists for Germany, Belgium, Austria, Finland and the United Kingdom. (Chang, et al. 2002; Darrat, 1998) and Subhani, et al. 2012) confirm the tax and expenditure hypothesis for Japan, South Korea, Taiwan, the UK and the USA., the expenditure tax hypothesis applies only to Australia and South Africa. In the case of Canada supports the financial synchronization hypothesis. In the case of New Zealand and Thailand. Owoye, 1995; Kollias, & Makrydakis, 2000; Chang, & Ho, 2002; Vamvoukas, 2012) support the fiscal synchronization hypothesis that tax and expenditures decisions are taken simultaneously by the fiscal authority. also, Kollias, and Paleologou, (2006) supported the fiscal synchronization hypothesis of Denmark, Greece, Ireland, the Netherlands, Portugal and Sweden while the results suggest the institutional segregation hypothesis in the case of Austria, Belgium and Germany.

METHODOLOGY

To estimate the interrelationships between fiscal and monetary policies in the Jordanian economy during the period (1970 – 2020), this study uses VAR models. If the variables in the (VAR) model are jointly integrated, then a Vector Error Correction Model (VECM) can be used. From the VAR model, the use of Impulse Response Functions, and the Variance Decomposition to test the interrelationships between fiscal policy variables (government expenditures and tax revenue) and monetary policy variables (money supply, interest rate on loans).

The VAR form can be written in (Reduced Form) as follows:

$$X_t = \sum_{i=1}^{n} A_i \; X_t$$

$$X_t = \left[G_t \cdot T_t \cdot M_t \cdot R_t \right]$$

$$U_t = \left[u_t^g \cdot u_t^t \cdot u_t^m \cdot u_t^i \right]$$

X_t the vector of variables, Where G: the government expenditures, T: the tax revenue, M: the money supply, R: the interest rate on loans.

$$G_t = \varphi_{g^{\prime}}$$

$$T_t = \phi_g G_{t-i} + \phi_d T_{t-i} + \phi_m M_{t-i} + \phi_r R_{t-i} + \varepsilon_{6_t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$M_t = \theta_g$

$R_t = \lambda_g$

$t - i$: The number of time lags in the model that can be determined using the Akaike (AIC) and Schwartz (SC) criteria, consistent with the lags of the fiscal policy and monetary policy.

Table (1) showed that all the variables are stable in degree I (1) (after taking the first difference).

Table 1. Augmented Dickey-Fuller Test

Variable	Level		1st difference		The result
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	I (1)
G	3.094491*	-0.533962	-4.441901*	-2.281846*	I (1)
T	2.46278	3 -0.220059	-2.654297	-4.397985	I (1)
M	0.576472	-0.680129	-1.947105	-1.947105	I (1)
R	-2.750669	-2.724170	-4.051676	-4.000375	I (1)

* Means that it is significant at the level of 5%

To determine the optimum number of time lag, the lowest values for (AIC) and (SC) are chosen, which corresponds to the optimal time lag. After applying these two criteria, the results as shown in table (2), which shows that the lowest value for (AIC) is at periods of time lag equal to (4), and for Schwartz (SC) at periods of time lag equal to (2). Choosing the number of periods of lags equal to (2), this suitable for the annual data and the study period, it is consistent with studies that have chosen the number of periods close to this number.

Table 2: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1145.929	NA	2.10e+16	48.93316	49.09062	48.99242
1	-959.4263	333.3245	1.49e+13	41.67772	42.46501	41.97398
2	-922.7602	59.28991	6.26e+12	40.79831	42.21544*	41.33158
3	-908.3582	20.83686	6.98e+12	40.86631	42.91328	41.63660
4	-863.5678	57.17924*	2.22e+12*	39.64118*	42.31799	40.64849*

* indicates lag order selected by the criterion

The results of the co-integration test (Trace Test) and (Maximum Eigenvalue), as shown in Table (3), showed the existence of two co-integrated relationships, so the time series of variables in this study are considered co-intgreation. This indicates the existence of long-term equilibrium relationships between the variables, that is, they do not diverge too far from each other in the long run to show similar behavior, in this case a Vector Error Correction Model (VECM) can be used.

Table No. (3) Co-integration test results

A: Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Eigenvalue	Trace	0.05	Prob.**
No. of CE(s)		Statistic	Critical Value	
None *	0.609572	84.59306	55.24578	0.0000
At most 1 *	0.423588	38.50795	35.01090	0.0203
At most 2	0.188940	11.51222	18.39771	0.3466
At most 3	0.025207	1.250994	3.841466	0.2634

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

B: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.609572	46.08511	30.81507	0.0003
At most 1 *	0.423588	26.99573	24.25202	0.0211
At most 2	0.188940	10.26122	17.14769	0.3736
At most 3	0.025207	1.250994	3.841466	0.2634

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

When applying the Granger causality test to fiscal and monetary policy instruments in Jordan, the results in table (4) show that there is a bidirectional causal relationship between government expenditures and money supply, as well as a bidirectional causal relationship between tax revenues and money supply. In addition, there is a one-way causal relationship between the government expenditures and the tax revenue. The results do not indicate a causal relationship between fiscal policy instruments (government expenditures, tax revenue) and the interest rate.

Table No. (4): Granger Causality Tests

Null Hypothesis:	F-Statistic	Prob.
T does not Granger Cause G	8.66299	0.0007
G does not Granger Cause T	1.21924	0.3052
M2 does not Granger Cause G	3.15383	0.0025
G does not Granger Cause M2	9.18455	0.0005
R does not Granger Cause G	1.37186	0.2643
G does not Granger Cause R	0.40093	0.6721
M2 does not Granger Cause T	2.80087	0.0116
T does not Granger Cause M2	7.65390	0.0014
R does not Granger Cause T	0.51967	0.5983
T does not Granger Cause R	0.16242	0.8506
R does not Granger Cause M2	0.38489	0.6828
M2 does not Granger Cause R	0.40876	0.6670

The error term EC were estimated in (VECM), using fiscal policy variables (government expenditure and tax revenue), and monetary policy variables (money supply, interest rate on loan). The results of the estimate showed that the error term in the equation of government expenditures was significant and negative, meaning that government expenditures in Jordan adjusts in the long term in response to changes in the expenditures themselves, changes in tax revenues and monetary policy variables, the value of the EC coefficient was 012, this indicates that the corrective steps towards the long-term equilibrium relationship between the variables are 12% annually, meaning that 12% of any deviation from the long-term equilibrium is corrected in the following year.. The results of (VECM) in the first part of Table (5) indicate that government expenditures respond to changes in fiscal and monetary policy instruments in the long run, as the results show that the money supply affects expenditures positively, and the interest rate negatively affects, as well as Tax revenues. positively affect government expenditure the results in second part of the table (5) indicate that the government expenditures respond to changes in fiscal and monetary policy instruments in the short run, the results of ECM showed that the money supply positively affects government expenditures, as the value of the estimated parameter is (0.32) and its effect decreases in the second period. The effect of the interest rate is weak and not significant. The value of the coefficient (EC) in the tax revenue equation was estimated at 0.05, and this indicates that the corrective steps towards the long-run equilibrium relationship between the variables are 5% annually, meaning that 5% of any deviation from the long-run equilibrium is corrected in the following year. The results of the VECM in Table (5) indicate that the money supply affects tax revenues positively in the long run, the interest rate negatively, and government expenditures positively affect tax revenues in the long run. While, in the short run, the results indicate that the money supply has a positive and statistically significant effect on tax revenues in the first lag period (t-1), and turns into a negative effect in the second lag period. The effect of the interest rate is negative on tax revenues in the short run.

The value of the coefficient (EC) in the money supply equation is 0.02, and this indicates that the corrective towards the long-run equilibrium relationship between the variables are 2% annually, meaning that 2% of any deviation from the long-run equilibrium is corrected in the following year. The results of the VECM estimation in Table (5) indicate that government expenditures affect the money supply positively in the long run, tax revenues positively affect the money supply in the long run, while the interest rate affects it negatively. In the short run, the results indicate that government expenditures positively affect the money supply. The effect of tax revenues on the money supply is positive in the short run.

The coefficient (EC) in the interest rate equation is positive and insignificant which means that the interest rate does not change in the long run in response to changes in the money supply and fiscal policy variables (government expenditures and tax revenues).

Table (5): Vector Error Correction Estimates

Variables	Eq. 1 D(G)	Eq. 2 D(T)	Eq. 3 D(M)	Eq. 4 D(R)
Long Run Equation				
EC(-1)	-0.121455 [-2.45611]	- 0.054693 [-2.27577]	-0.019260 [-2.01393]	0.155723 [1.90648]
G(-1)	0.521596 [2.44247]	0.181535 [1.87691]	0.196979 [2.01393]	-0.155723 [1.90648]
T(-1)	0.423718 [3.76241]	0.423718 [3.76241]	0.423718 [3.76241]	0.423718 [3.76241]
M(-1)	0.397593 [3.54975]	0.397593 [3.54975]	0.397593 [3.54975]	0.397593 [3.54975]
R(-1)	-0.034009 [-3.20898]	-0.034009 [-3.20898]	-0.034009 [-3.20898]	-0.034009 [-3.20898]
C	1.665141	1.665141	1.665141	1.665141
Short Run Equation				
D(G(-1))	0.315993 [1.58467]	-0.150569 [-0.51245]	0.207426 [2.02309]	1.168198 [0.85544]
D(G(-2))	0.274478 [1.30033]	-0.174351 [-0.56056]	0.048811 [1.44973]	0.404741 [0.27998]
D(T(-1))	0.149531 [1.99638]	0.193085 [1.87317]	0.203480 [2.63698]	-0.258945 [-0.25195]
D(T(-2))	-0.039822 [-0.30261]	0.159433 [1.82222]	0.116491 [1.72161]	0.574442 [0.63740]
D(M(-1))	0.319163 [2.14324]	1.887385 [2.99878]	0.332736 [1.51502]	-4.850338 [-1.65810]
D(M(-2))	-0.087036 [-0.59251]	-1.198449 [-2.36480]	-0.209857 [-1.18668]	3.361576 [1.42716]
D(R(-1))	-0.000197 [-0.00688]	0.080583 [1.90801]	-0.028247 [-1.91664]	0.612176 [3.11867]
D(R(-2))	0.015680 [0.51527]	-0.106903 [-2.38413]	0.008870 [0.56690]	-0.115015 [-0.55189]
C	-0.010076 [-0.29666]	0.023484 [0.46925]	0.044698 [2.55950]	-0.016328 [-0.07020]
R-squared	0.448474	0.532150	0.762685	0.388105
Adj. R-squared	0.264632	0.376200	0.683580	0.184140
S.E. equation	0.074988	0.110494	0.038557	0.513550
F-statistic	2.439456	3.412308	9.641431	1.902801

The results of the Impulse Response Function, and Variance Decomposition

The insignificance of the coefficients of the lagging variables in the model does not invalidate the existence of a causal relationship between the variables as long as the (EC) coefficient is statistically significant, so after estimating the error term in the VECM model for the variables of fiscal and monetary policy, it will be used to identify the size and nature of the impact of each variable in the model, the parameters estimated in the VECM model are difficult to interpret most of the time individually, so the results of this test are used to estimate the variance decomposition , and the Impulse response functions. The following is an analysis of the results of these two instruments:

Government Expenditure

Figure 1 shows the historical decomposition of government expenditure over the study period, the most important source of shocks lies with government expenditure itself. The government routine of successive Jordanian governments, which is to determine the level of current government expenditures with the levels of previous expenditures when preparing the budget, contributed to the increase in government expenditures, as figure (2) shows that (05%) of a positive shock in government expenditures positively affects the government expenditures itself. This is consistent with the existence of a positive and strong relationship between current expenditures and expenditures in the previous period. the shocks in tax, money supply, and interest rate are also important. Absorption shocks have an important role in offsetting the negative own shocks particularly during the study period. The results of the Variance Decomposition of government expenditures: show that changes in money supply explain about (5%) of random errors in government expenditures, the impact of money supply on government expenditures decreases until it reaches (2%) in the tenth period. This result supports the weak positive relationship between government expenditure and money supply. the relationship between government expenditures and the interest rate, it is clear from figure (2) the response of the government expenditures to a random shock of one standard deviation in the interest rate negatively affects government expenditures in all periods. Tax revenues play an important role in influencing government expenditures in Jordan, as Figure (2) shows the response of the government expenditures to a positive shock in tax revenues that positively affects government expenditures. the results of the variance decomposition in Table (6) shows that changes in tax revenues explain about (40%) of random errors in government expenditures, this means that government expenditures in Jordan follow the level of tax revenues, as the increase in tax revenues means the expansion of government expenditures. This is consistent with the existence of a positive relationship between government revenues and government expenditures, the justification for this relationship is that revenues represent a source of financing for expenditures, so that the economic reform programs adopted by the Jordanian government focused on increasing domestic revenues, especially tax ones, to finance government expenditures. The government estimates tax rates to provide sufficient revenue to finance government expenditures required to boost economic prosperity (Alzyadat, & AL-Nsour, 2021).

Figure 1: the historical decomposition of government expenditure

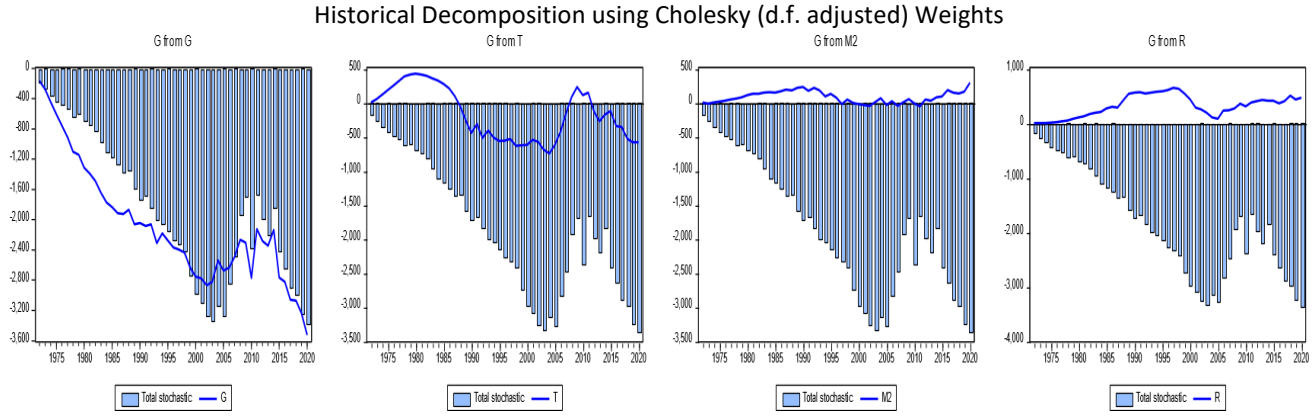


Figure (2) the Impulse Response Function of Government Expenditures

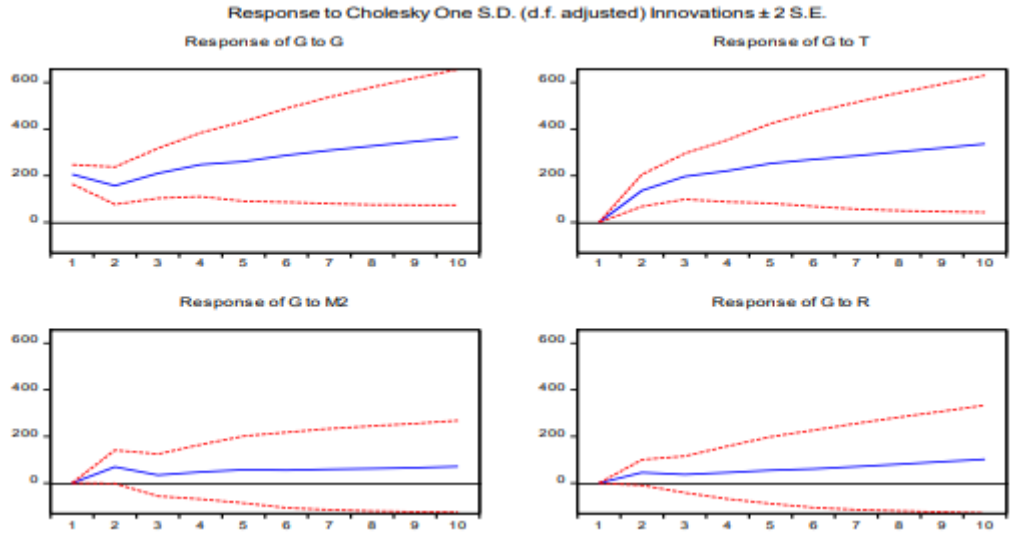


Table (6): The Variance Decomposition of Government Expenditure

Period	S.E.	G	T	M2	R
1	205.8323	100.0000	0.000000	0.000000	0.000000
2	304.4143	72.37106	20.15839	5.210715	2.259840
3	422.2569	62.45098	32.23326	3.374157	1.941605
4	541.0936	58.96948	36.29997	2.847418	1.883126
5	656.6130	55.88181	39.43156	2.703053	1.983582
6	770.4369	54.49924	40.94855	2.484909	2.067296
7	882.6069	53.76270	41.67217	2.346564	2.218572
8	994.1294	53.22480	42.11351	2.244299	2.417385
9	1105.919	52.82951	42.36000	2.168733	2.641760
10	1218.478	52.46665	42.52036	2.129449	2.883535

The Tax Revenues

Figure (3) shows the response of the tax revenue reaction to a random shock of one standard deviation in the money supply or any sudden shock in the money supply of one standard deviation positively affects tax revenues in all periods. As for the interest rate, it affects positively and weakly and continues in subsequent periods, and its impact diminishes to reach less than (2%) in the tenth period. Figure 4 shows the historical decomposition of tax revenue over the study period. the most important source of shocks lies with government expenditure and tax revenue itself.

Figure (3): the Impulse Response Function of tax revenues

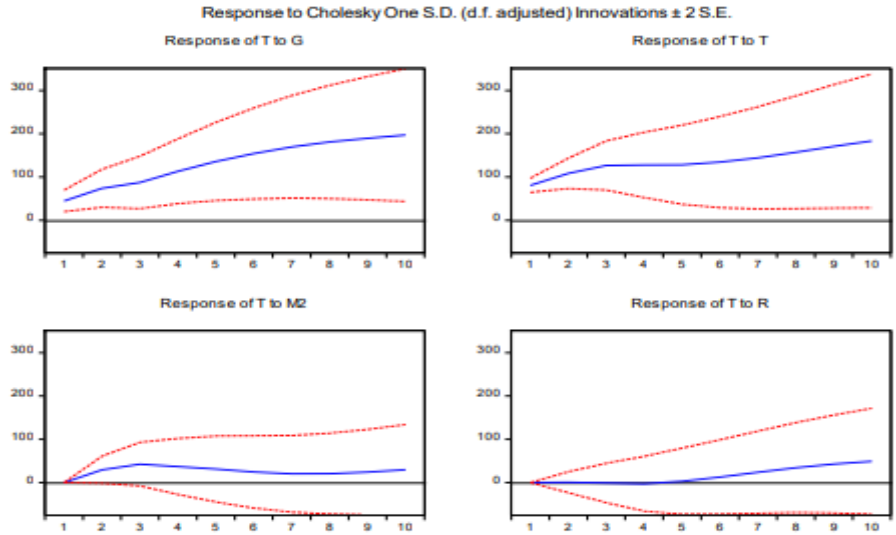
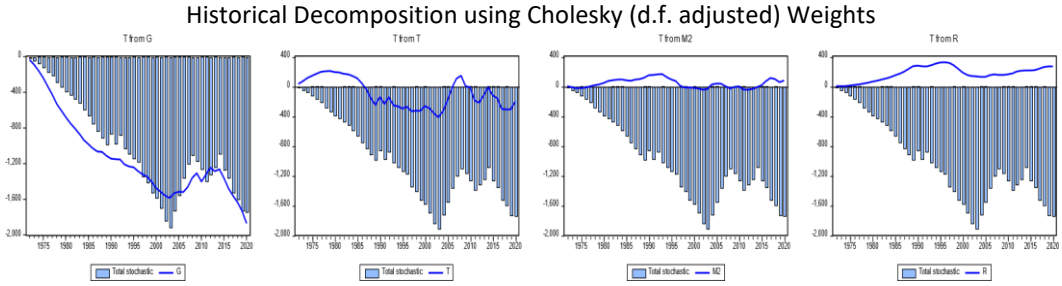


Table (7): The Variance Decomposition of Tax Revenues

Period	S.E.	G	T	M2	R
1	205.8323	23.51346	76.48654	0.000000	0.000000
2	304.4143	28.03413	68.69646	3.268470	0.000938
3	422.2569	28.98210	65.86866	5.146557	0.002676
4	541.0936	33.80674	61.28121	4.900197	0.011855
5	656.6130	39.12276	56.62205	4.239484	0.015708
6	770.4369	43.53385	52.86667	3.486724	0.112753
7	882.6069	46.73894	50.06337	2.844246	0.353451
8	994.1294	48.64276	48.26570	2.379675	0.711865
9	1105.919	49.55526	47.25659	2.077491	1.110657
10	1218.478	49.87360	46.72856	1.910217	1.487619

Figure (4): the historical decomposition of government expenditure



The Money Supply

Figure (5) shows the response of the money supply to a positive shock o in government expenditures and tax revenues, positively affects all periods. The results of the **variance decomposition** show that changes in government expenditures explain about (1%) of random errors in money supply in the second period, the impact of government expenditures on the money supply increases to (50%) in subsequent periods. tax revenues explain about (28%) of the changes in the money supply in the first periods, and their impact rises to reach about (40%) in the tenth period. About (70%) of changes in money supply are due to changes in money supply itself. the impact diminishes to reach about (6%) in the tenth period. Figure 8 shows the historical decomposition of money supply over the study period. the most important source of shocks lies with government expenditure and tax revenue. This is consistent with the existence of a positive relationship between government expenditures and money supply.

Figure (5): **the Impulse Response Function of money supply**

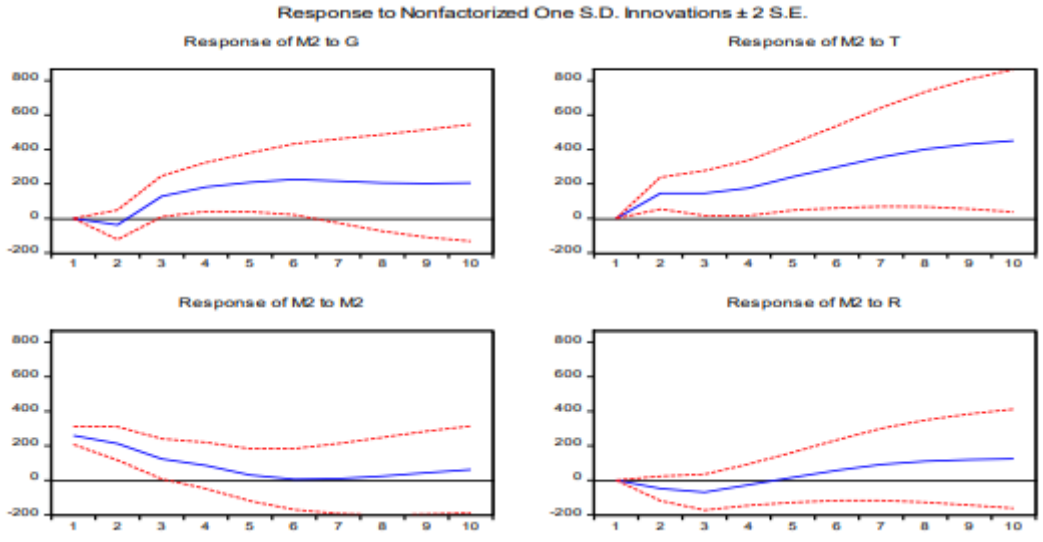
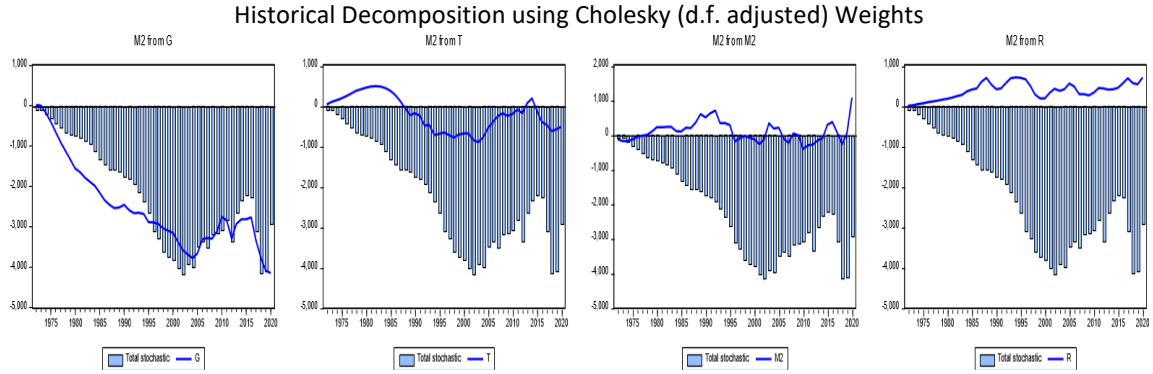


Table (8): The Variance Decomposition of money supply

Period	S.E.	G	T	M2	R
1	205.8323	0.151714	9.027105	90.82118	0.000000
2	304.4143	1.222975	28.65521	68.60718	1.514638
3	422.2569	18.98467	29.46483	48.57388	2.976624
4	541.0936	34.49919	29.10459	34.21254	2.183675
5	656.6130	45.25177	29.76175	23.45050	1.535984
6	770.4369	51.18493	30.91387	16.38154	1.519661
7	882.6069	52.97460	33.12285	11.98558	1.916967
8	994.1294	52.82899	35.59343	9.232235	2.345343
9	1105.919	52.05930	37.75435	7.519328	2.667022
10	1218.478	51.26481	39.41509	6.440642	2.879456

Figure (6) the historical decomposition of money supply



The Interest Rate

Figure (7) shows that government expenditures positively affect the interest rate in the second period, and turn negative and continue in subsequent periods. The results of the **variance decomposition** analysis show that changes in government expenditures explain less than (1%) of the random errors in the interest rate. This result reinforces the difference about the effect of government expenditures on the interest rate, according to the (IS-LM) model, which indicates that an increase in government expenditures leads to a rise in the interest rate. As for the other view, it says that the increase in government expenditures will not necessarily cause the interest rate to rise. The results were in support of this point of view, as there is no role for government expenditures in influencing the interest rate on loans in Jordan. As for tax revenues, they positively affect the interest rate and turn negative in the seventh period and continue in subsequent periods. Changes in tax revenues explain about (1%) of the changes in the interest rate, and it decreases to about (0.5%) in the tenth period. If the tax rises, savers demand a higher interest rate to maintain the same level of the previous real return before the tax rates are adjusted. Figure 8 shows the historical decomposition of interest rate over the study period. the most important source of shocks lies with interest rate itself. The results of **variance decomposition** analysis also showed that more than 75% of the changes in the interest rate are due to changes in the interest rate itself, and 25% of the changes in the interest rate are due to changes in the money supply. This means that the monetary authority determines the interest rates and there is no significant role for fiscal policy instruments to influence the interest rate on loans in Jordan.

Figure (7) the Impulse Response Function of interest rate

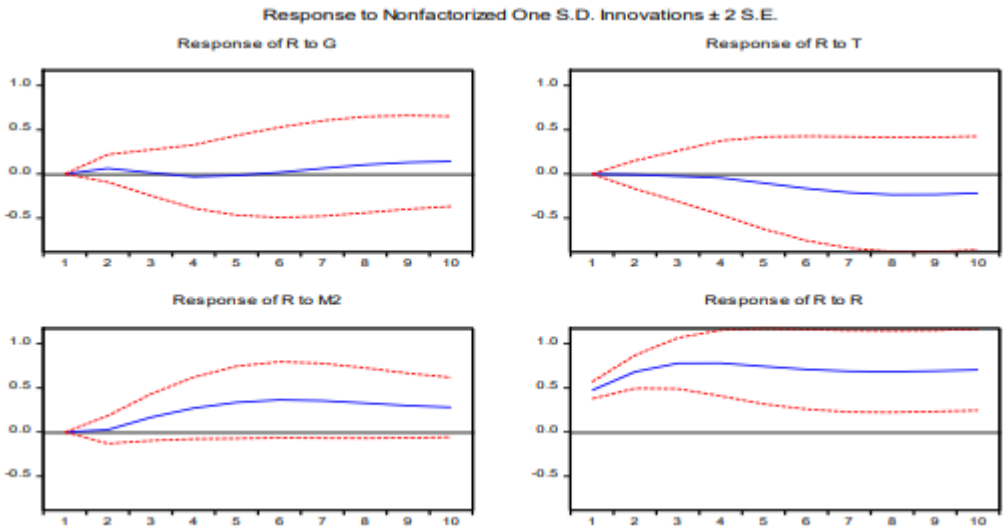
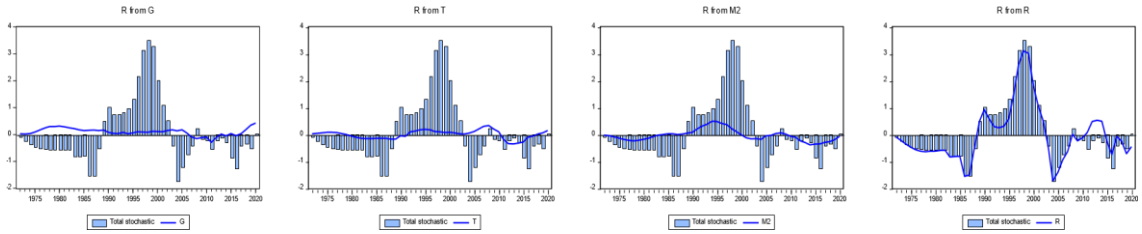


Table (9): The Variance Decomposition of interest rate

Period	S.E.	G	T	M2	R
1	205.8323	0.110456	0.916180	4.498515	94.47485
2	304.4143	0.975152	0.895362	5.543833	92.58565
3	422.2569	0.573837	1.203322	10.34273	87.88011
4	541.0936	0.382296	1.413065	14.98971	83.21492
5	656.6130	0.311245	1.276732	18.93182	79.48020
6	770.4369	0.266534	1.052744	21.96203	76.71869
7	882.6069	0.224741	0.889894	23.90787	74.97750
8	994.1294	0.208975	0.806208	24.96707	74.01775
9	1105.919	0.232559	0.754730	25.43096	73.58175
10	1218.478	0.287803	0.699926	25.56527	73.44701

Figure (8) the historical decomposition of interest rate

Historical Decomposition using Cholesky (d.f. adjusted) Weights



CONCLUSIONS

In light of previous tests of the relationship between fiscal and monetary policies instruments in Jordan, the most important results can be summarized as follows:

The results of the causality test showed that there is a bidirectional causal relationship between government expenditure and money supply. The results of estimating error correction terms in the (VECM) showed that the money supply affects government expenditures positively in the long and short run, as well as government expenditures affect the money supply positively in the long and short run. The results of the Impulse response function test showed that the money supply positively affects government expenditures, also government expenditures positively affect the money supply. the historical decomposition of government expenditure shows that the most important source of shocks lies with government expenditure itself. The results of the Variance Decomposition analysis show that shoch in the money supply explain about (2%) of the random errors in government expenditures. Also, changes in government expenditures explain about (18%) of random errors in the money supply, the impact of government expenditures on the money supply increases to (50%) in the tenth period. This indicates that the fiscal policy through the use of government expenditures and the monetary policy through the money supply go in the same direction,

they complement each other, this is supported by the fact that the expansionary fiscal policy in Jordan during the study period was also accompanied by an expansionary monetary policy. The results of the causality test showed that there is a bidirectional causal relationship between tax revenue and money supply. The results of the VECM estimate indicate that the money supply affects tax revenues positively in the long run. But in the short run, the results indicate that the money supply positively affects tax revenues in the first lag period (t-1), and turns into a negative effect in the second lag period. Tax revenues positively affect the money supply in the long and short run. The Impulse response function test shows that the money supply positively affects tax revenue. As for tax revenues, it affects negatively in the first and second periods, turns positive and continues in subsequent periods. The results of the variance Decomposition analysis showed that changes in the money supply explain about (5%) of the changes in tax revenues, and their impact decreases to (2%) in the tenth period. As for changes in tax revenues, they explain about (28%) of the changes in the money supply, and their impact increases to (39%) in the tenth period. The contractionary fiscal policy through tax revenues was also accompanied by an expansionary monetary policy. As for the relationship between fiscal and monetary policy through the interest rate on loans, the results show the absence of an important role for fiscal policy instruments in influencing the interest rate. The results of the causality test showed that there is no causal relationship between government expenditures, tax revenues and the interest rate. The results of the VECM estimate showed that the interest rate does not adjust in the long run response to changes in fiscal policy instruments. The results of the historical decomposition and the variance Decomposition showed that more than 75% of the changes in the interest rate are due to changes in the interest rate itself, and 25% of the changes in the interest rate are due to changes in the money supply. This means that the monetary authority determines the interest rates and there is no significant influence of fiscal policy instruments on the interest rate on loans in Jordan.

Based on the results this study recommends harmonization between the declared and implemented policy. Each authority should serve its goals with independence and complementarity between the two policies. In this case, coordination means preventing extremism in pursuing an expansionary or contractionary policy from this or that authority, what is required is that the Central Bank and the Ministry of Finance agree on coordination, integration and balance between objectives.

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