The Efficiency of Fiscal Policy during the Global Crisis

The Case of Jordan

Presented by

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Abstract

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This paper aims at estimating the government expenditure multiplier both in the short-run and long-run as an indicator to the fiscal policy efficiency to cope with this final global crisis. The more the multiplier is greater than the unity, the more fiscal policy efficiency. For this end, the paper tests monthly data for the period (2004-2010) including the GDP and the government expenditures which was obtained from the Central Bank of Jordan. Also a dummy variable will be added that expresses the crisis shock. In particular, the paper uses three complementary approaches: the Johansen Cointegration, the Error Correction Model (ECM) and the Granger Causality test.

The results show that there is a stable long run relationship between the economic growth and the government spending. The long-run multiplier of government was estimated to be 11.6 which gives an indicator that the government multiplier is effective and the fiscal policy is strong enough to stimulate the economy, while the short run multiplier is only 0.03. It is worth to mention that the results show no effect for the global crisis on the constant or even on the multiplier itself. This neutral result may occured because the fiscal policy was efficient enough together with the monetary policy to cope with the crisis.

The paper recommends at improving the fiscal sector and increasing the demand by accelerating the process of economic reforms and fiscal policy in addition to legislations concerning the business environment and investment. Furthermore, it is important to deepening the coordination between decision makers in the fiscal and monetary policy in one hand, and between the private sector and the public sector in the other hand.

Keywords: Fiscal Multiplier, the Global Crisis, Error Correction Model, Granger-Causality, Jordan.

I Introduction

Jordan's economy is part of the global economy and linked to the economies of different countries through commercial transactions (exports and imports), capital transaction, investment and remittances in the form of aid, grants and transfers. So it is natural, in light of these complex engagements, that the Jordanian economy will be affected to what is happening in the global economy.

The global financial crisis effect on Jordan's economy came too late as the effects started to appear at the end of the first quarter of 2009 as announced by economists. The impact of the crisis was reinforced by the harmed economies of many countries of the Arab region, especially the GCC countries, where thousands of Jordanians work and most of the investments in Jordan come from these countries.

Fiscal policy can play an effective role during economic crises using various instruments. Governments can influence macro-economic productivity level by increasing or decreasing expenditures and/or taxes (Seddeik, 2009). Referring to fiscal policy efficiency, the larger fiscal multiplier indicates a more efficient fiscal policy in maintaining its objectives and acting as a saver side by side with the other partner, the monetary policy (Mashal, 2001).

Wither fiscal multiplier was affected by the global crises or not, and wither the fiscal policy is effective to cope with the crisis or not is a big question. Many studies were made for different countries using different econometric techniques. Some found that the accurate effect still need longer time to occur. While some studies show that the crisis effect was harmful and so fiscal multiplier was changed, others show that the crisis effect was soft and so fiscal multiplier stayed unchanged.

Most of the studies that were made in this field are descriptive. Seddiek (2009) descriped the Egyptian fiscal policy role during the financial crisis and confirmed that the fiscal policy could be more effective to cope with the global crisis by increase the

government spending on labor-intensive investment projects, give subsidies and use taxes for redistribution income. Subedi (2009) made an extensive deep analysis for Nepal fiscal policy and its ability to deal with the world crisis and concluded that fiscal policy alone is not sufficient to coup the adverse impact of global financial crisis. Jointly fiscal as well as monetary measures should be directed to minimize its effects.

Spilimbergo, Symansky, Blanchard and Cottarelli (2008) from IMF's Fiscal Affairs and Research Departments advice that the current crisis calls for two main sets of policy measures. First, measures to repair the financial system. Second, measures to increase demand and restore confidence. While some of these measures overlap, the focus of this note is on the second set of policies, and more specifically, given the limited room for monetary policy, on fiscal policy. They ensure that the optimal fiscal package should be timely, large, lasting, diversified, contingent, collective, and sustainable. They mentioned that spending increases, and targeted tax cuts and transfers, are likely to have the highest multipliers. General tax cuts or subsidies, either for consumers or for firms, are likely to have lower multipliers.

Moving to the empirical works, the papers related to this field are very rare. Actually the empirical working needs longer period to pick up the effects. Simorangkir and Adamanti (2010) examined the impacts of fiscal stimuli and interest rate cut on Indonesian economy using financial computable general equilibrium (FCGE) approach. They found that the combination of fiscal expansion and monetary expansion boosts economic growth of Indonesia effectively. The combination of fiscal and monetary expansion has a large multiplier effect, boosting aggregate demand through increasing consumption, investment, government expenditure, exports and imports.

Bénétrix and Lane (2010) examine the cross-country dispersion in fiscal outcomes during 2007-2009 phase of the global crisis. They found that the decline in the overall and structural fiscal balances have been larger for those countries experiencing larger increases in unemployment and where credit growth during the pre-crisis period was more rapid. However, there is no systematic co-variation between fiscal outcomes and a larger number of other macroeconomic variables and country characteristics.

Using a database of 118 banking crises occurred in different countries between 1980 and 2008, Gupta and Mulas-Granados (2009) studied the effectiveness of fiscal policy during these episodes. They found that during financial crises, the budget balance worsens as a result of falling revenues and increasing expenditures. On average, public deficit goes to -5.3% of GDP, for crises that typically last 2.5 years. Also they found a strong relationship between expansionary fiscal policies and a shorter duration of these crises. The composition of this expansion is important, since public consumption is more effective than public investment to reduce the duration of crises, and raising taxes in an attempt to control the deficit is clearly associated with longer durations. At the same time, expansionary budgets do not have a negative impact on subsequent growth, and most importantly, an increase in public investment during these crises is the key for a long-lasting economic recovery.

This paper aims at estimating the government expenditure multiplier both in the short-run and long-run as an indicator for the fiscal policy efficiency during this final global crisis. The more the multiplier is greater than the unity, the more fiscal policy efficiency. For this end, the paper tests monthly data for the period (2004-2010) including the GDP and the government expenditures which was obtained from the Central Bank of Jordan. Also a dummy variable will be added that expresses the crisis shock. In particular, the paper uses three complementary approaches: the Johansen Cointegration, the Error Correction Model (ECM) and the Causality test.

The contribution of this paper is twofold: First, this paper is the first one that examines the fiscal policy efficiency in Jordan during the recent crisis. Second, this paper uses the error correction model which not only solves the spurious correlation problem but also tests and estimates short and long run relationships and shows the dynamics of short-run adjustments towards the long-run equilibrium.

The paper structure will be as the following. Section II provides the theoretical grounds of government expenditure multiplier. In section III a brief description for the impact of global crisis on the main economic indicators. Section IV describes the data and the methodology used in this paper and section V presents the empirical results. The concluding remarks and policy implications are contained in the final section.

II The Theoretical ground of Government Expenditure Multiplier

According to Deardorff (2004), we can derive the government expenditure multiplier from IS-LM equations. Recall the two main equations of IS-LM model:

IS Curve: $Y = C(Y - T(Y)) + I(r) + G$ … … … (1)

LM Curve: $M / P = L(r,Y)$ … … … (2)

Differentiate the model totally and solve for the government spending multiplier, *dY/dG*

$dY = C'(dY - T' dY) + I' dr + dG$ … … … (3)

$dM/P - (M/P^2)\, dP = L_r\, dr + L_y\, dY$ … … … (4)

Where *C'*=marginal propensity to consume out of disposable income, *T'*= marginal tax rate, *I'*= effect (derivative) of the interest rate on investment, and L_r, L_Y = the effects (partial derivatives) of the interest rate and income on liquidity preference.

Since dM=dP=0 by assumption, then we can solve the equation (4) for dr:

$dr = -(L_y / L_r)\, dY$ … … … (5)

Substitute dr in equation (3) to obtain,

$dY = C'(1 - T')\, dY - (I' L_y / L_r)\, dY + dG$ … … … (6)

Subtract the first two terms on the right from both sides and then divide by dG and by the coefficient of dYto get (dY/dG).

$dY/dG = 1 / \{1 - C'(1 - T') + (I' L_y / L_r)$ … … … (7)

In general, the multiplier will be larger the larger in absolute value are C' and L_r and the smaller are T', I', and L_y. This information is useful for fiscal policy's makers whither they want to run an expansionary policy or a tightening one.

III The Impact of Global Crisis

The global financial crisis effect on Jordan's economy came too late as the effects started to appear at the end of the first quarter of 2009 as announced by economists. It was faster than what officials predicted, so the government delayed the reaction to cope with the consequences, and this is what explains the dramatic effects that touched clearly many economic indicators in Jordan as summarized in table (1) below.

Table (1): Economic Indicator Before and After the Crisis

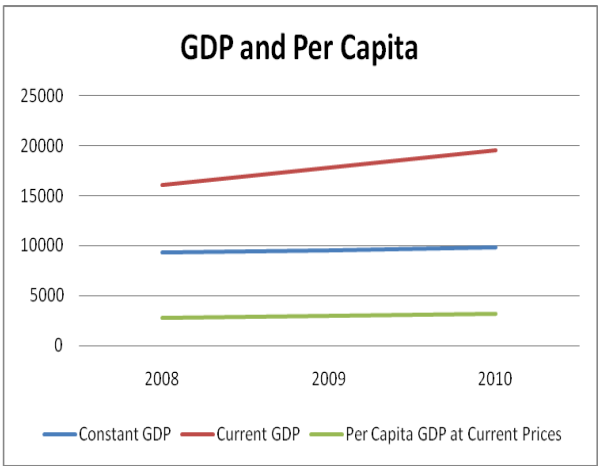
Million JD

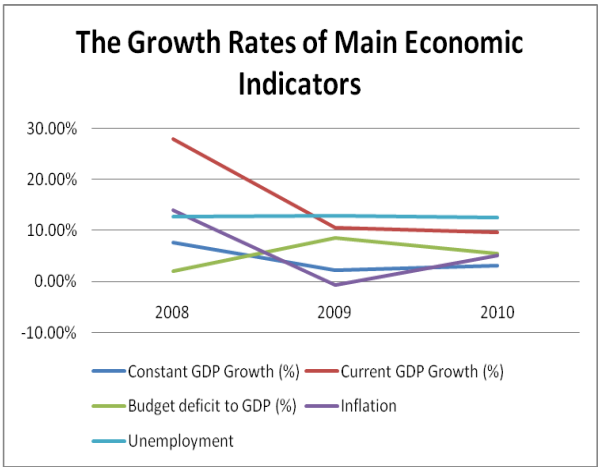
The Main Economic Indicators	2008 The year before the impact appear	2009 The year of the impact beginning	2010 The year of recovery beginning
Constant GDP	9298.2	9514.4	9808.6
Constant GDP Growth (%)	7.6 %	2.3 %	3.1 %
Current GDP	16108.0	17815.6	19527.9
Current GDP Growth (%)	27.9 %	10.6 %	9.6 %
Per Capita GDP at Current	2754	2979	3194
Budget deficit	-338.2	-1509.3	-1046.4
Budget deficit to GDP (%)	2.1 %	8.5 %	5.4 %
Current Account Deficit	-1445.2	-802.4	-835.8
Exports	5633.0	4526.3	4986.4
Imports	12069.0	10107.7	10836.2
Public Debt (external +	8860.7	10317.5	12590.8
Public Debt to GDP (%)	55.0 %	57.9 %	58.9 %
Direct Investment	2005.7	1722.9	1208.0
Inflation	13.9	-0.7	5.1
Unemployment	12.67	12.87	12.49
Remittances	2242.0	2214.2	2247.3
Foreign Grants	718.3	333.4	401.7

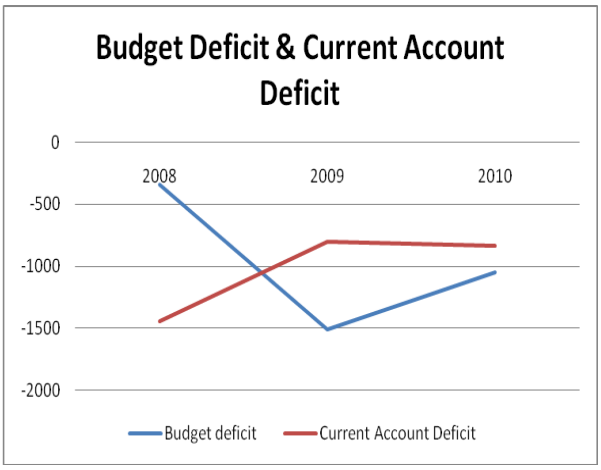
Source: Central Bank of Jordan, Ministry of Finance, and Department of Statistics.

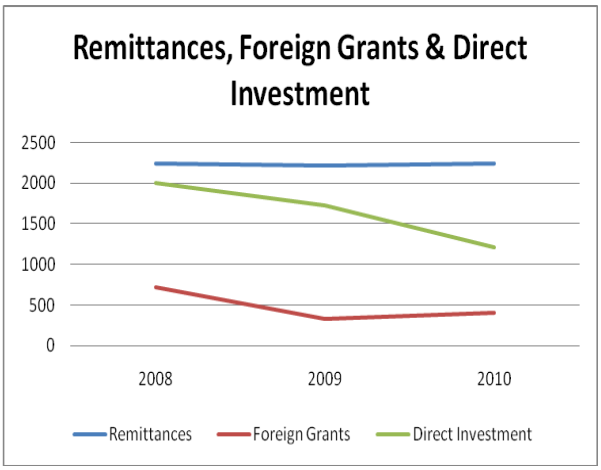
It is obvious that most of the economic indicators were affected negatively after the crisis. For example, the GDP growth rate decreased in 2009 to 2.3%, while it was 7.6% in 2008. The budget deficit increased by 8.5% to reach 1509.3 million JD in 2009 comparing with 338.2 million JD in 2008. Referring to exports, it was decreased by 19.6. It is worth to mention that the public debt increase by 16.4% in 2009 and its ratio to the GDP increase to reach around 58% which is really a danger that should be focused on seriously in the coming period. An important source for Jordanian government revenues is the foreign grants which were unfortunately decreased severely by 53.6%.

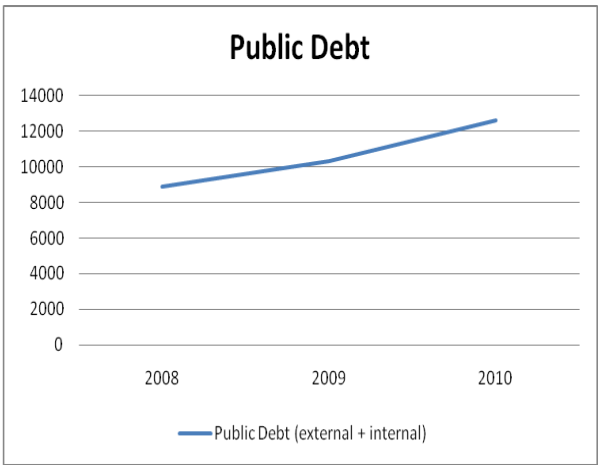
Figure (1): The Trend of Main Economic Indicators in Jordan

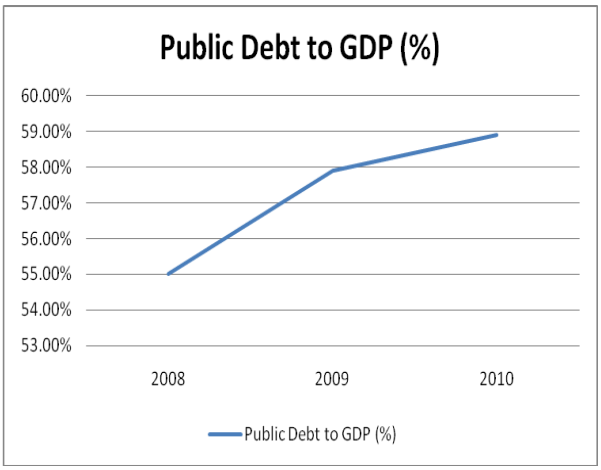





Budget Deficit & Current Account Deficit
0
-500
-1000
-1500
-2000
2008
2009
2010
Budget deficit
Current Account Deficit


Remittances, Foreign Grants & Direct Investment
2500
2000
1500
1000
500
0
2008
2009
2010
Remittances
Foreign Grants
Direct Investment





So what did the fiscal policy do to heal this harmed economy? In my opinion, even if the policy makers tried their best, there will be the big challenge for the fiscal policy that restrict moving freely and acting more efficient. The imbalances three gaps that characterized the economy of Jordan, the budget deficit, current account deficits and the public debt, restrict the ability of the economy to recover and to achieve higher growth rates and to be more competitive. The economy of Jordan needs a serious concentrated and comprehensive reform program.

Referring to budget speech 2011, Finance Minister Mohammad Abu Hammour said that the government's procedures to stimulate the economy contributed to the foundation for the beginning of economic recovery. He said that the budget of 2011 will concentrate on the deficit, strengthen the financial stability and improve the investment environment. He stressed that the programs of the budget involving a clear and stable controls to correct the

path of public finance and enhance financial stability, in addition to control the government spending and reduce the fiscal deficit as a first step in dealing with debt and contribute to improving the investment environment and self-reliance and stimulate the economic growth.

It was necessary to take corrective and strict actions to cope with the imbalances created by the crisis, especially the escalation of government expenditure, to stimulate the demand which led to an increase in the budget deficit significantly during that period. Also the government made many important procedures to stir the real estate, transportation, agriculture, exports, and Industry and information technology services and software. He added that the new income tax law that lowered the tax on all categories of taxpayers increased the purchasing power of this large segment of citizens because the law exempted about 98% of the income tax. Moreover, the law has contributed to encourage investment.

IV Data and Methodology

In this section we proceed with the empirical examine of the long-run and short-run multipliers of fiscal policy for Jordan. For this purpose we use an annual data over the period (2004-2010) including the constant GDP at current prices (the log value) and the government expenditures divided by the deflator (to get the real value) which was obtained from the Central Bank of Jordan. For measuring the crisis effect, the paper will use two dummy variables for the constant and for the slope.

Following the recent literature we examine the long-run and short-run multipliers of fiscal policy by employing an Error-Correction mechanism methodology (ECM). First, the paper will test the stationary of the variables using Augmented Dickey Fuller (ADF) test. Second, the cointegration between the variables will be tested using Johansen method. Then the paper will proceed with (ECM) to investigate the long-run equilibrium conditions

and short-run adjustment mechanisms. Finally, the Granger-causality direction will be tested.

Descriptive Statistics

This part describes the main features of a collection of data quantitatively which aim to summarize a data set. Also, it provides simple summaries about the sample and the measures together with simple graphics analysis to form the basis of quantitative analysis of data (Mann, 1995).

Table (2): Descriptive Statistics of the Sample

Variable	Mean	Median	SD	Max	Min
y	3.3	3.3	0.06	3.5	3.2
g	1.8	1.8	0.4	3.1	1.1
dummy	0.3	0.0	0.5	1.0	0.0
gdummy	0.5	0.0	0.8	2.1	0

Where the main variables used in our econometric investigations correspond to the following data:

y_t = log of the GDP index at constant price;

g_t = log of government consumption expenditure (divided by the GDP deflator)

dummy= 1 for observations in 2009–2010

= 0, otherwise (i.e., for observations in 2004–2008)

gdummy= dummy variable that may affect the slope of the regression of y on g.

The Dummy variables

The dummy variables, as Gujarati 2004 stated, can enter the model and affect the regression results by four ways:

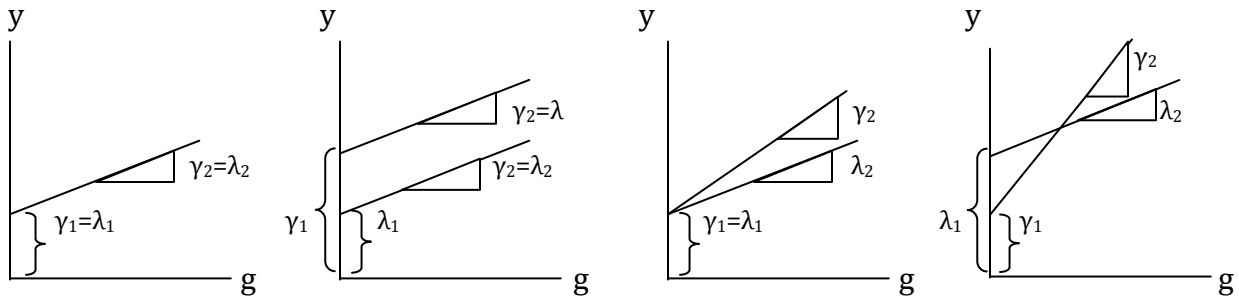
1. Both the intercept and the slope coefficients are the same in the two regressions. This, the case of **coincident regressions,** is shown in figure (2.a).

2. Only the intercepts in the two regressions are different but the slopes are the same. This is the case of **parallel regressions,** which is shown in figure (2.b).

3. The intercepts in the two regressions are the same, but the slopes are different. This is the situation of **concurrent regressions,** which is shown in figure (2.c).

4. Both the intercepts and slopes in the two regressions are different. This is the case of **dissimilar regressions,** which is shown in figure (2.d).

Figure (2): Plausible Y-G Regressions



(*a*) Coincident regressions (*b*) Parallel regressions (*c*) Concurrent regressions (*d*) Dissimilar regressions

The Correlation Matrix

The correlation matrix estimates the relationships among the variables.

Table (3): Correlation Matrix

	y	g	dummy	gdummy
y	1.000000	-0.186773	0.587739	0.587967
g	-0.186773	1.000000	0.058323	0.077114
dummy	0.587739	0.058323	1.000000	0.995369
gdummy	0.587967	0.077114	0.995369	1.000000

Table (3) shows that there is no correlation between any of the variables except between the dummy and gdummy as expected because they are derived from each other (highly related).

Unit Root Test (ADF)

It is worth to mention that the integration properties of the variables are investigated by conducting Augmented Dickey-Fuller (AD) test. The following table reports the results.

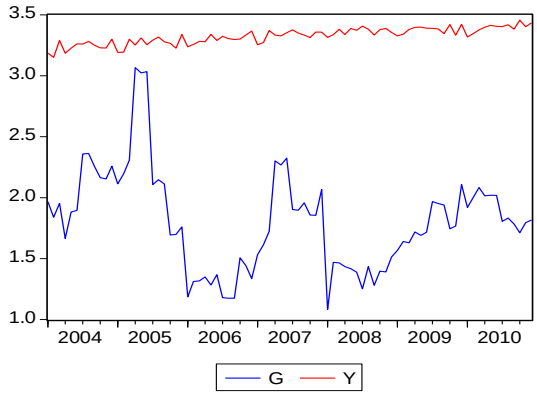
Table (4): the Unit Root Test

Variables	At The Level	At The First Dif.	Prob. (1st Dif.)	Stationarity
Y	-1.590	-8.821	0.0000	Stationary at the first difference*
G	-2.786	-10.944	0.0001	Stationary at the first difference*
Dummy	-0.616	-9.055	0.0000	Stationary at the first difference*
GDummy	-0.488	-8.973	0.0000	Stationary at the first difference*

* Stationary at 1%.

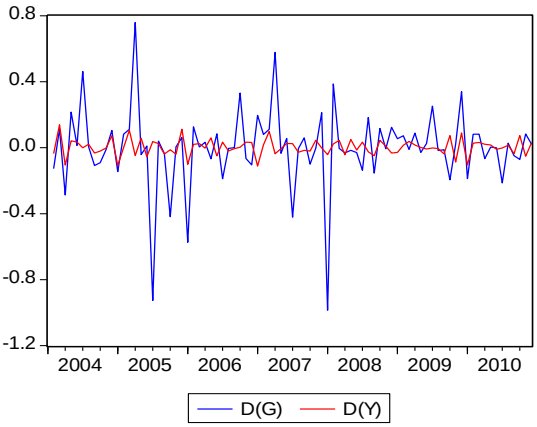
All the variables are stationary at the first difference. We can get the same result if we graph the two variables (log GDP & deflated government expenditures).

Figure (3): The Log GDP and the Deflated Government Expenditure at the level



It is clear, from figure (3), that the data are not stationary at the level while figure (4) shows a stationary relationship with a trend between them. The trend could be confirmed by running the Johansen Cointegration test.

Figure (4): The Log of GDP and the Deflated Government Expenditure at the First Difference



Spurious Regression

Running OLS regression given the current situation of non-stationary variable the coefficient of independent variable X may be highly statistically significant, and, although the R^2 value is low, it is statistically significantly different from zero. From these results,

you may be tempted to conclude that there is a significant statistical relationship between Y and X, whereas a priori there should be none. This is in a nutshell the phenomenon of spurious or nonsense regression**,** first discovered by Yule. Yule showed that spurious correlation could persist in nonstationary time series even if the sample is very large. According to Granger and Newbold, an $R^2 > d$ is a good rule of thumb to suspect that the estimated regression is spurious (Gujarati, 2004).

By running the OLS regression, the results show that there is a significant relationship between GDP and deflated government expenditures (t-value=2.68) but with no effect of the dummy variables (see table A1 in the appendix).

But is this regression in this paper spurious? Or is there a genuine long run relationship? It is worth to mention that when the series is not stationary and when R^2 value is less than D-W value, then the OLS regression may make sense (not spurious). But since the paper need to estimate the relationship not only in the long run but also in the short run, then we should find another way to investigate the relationship between them. First of all, it is important to do the cointegration test by applying the Johansen multivariate cointegration analysis.

Cointegration Test

Cointegration means that despite being individually nonstationary, a linear combination of two or more time series can be stationary. The Maximum Likelihood procedure (Johansen's test), suggested by Johansen (1988 and 1991) and Johansen and Juselius (1990), is particularly preferable when the number of variables in the study exceeds two variables due to the possibility of existence of multiple cointegrating vectors. The advantage of Johansen's test is not only limited to multivariate case, but it is also preferable than Engle-Granger approach (Gonzalo, 1990).

Two statistic tests used to determine the number of cointegrating vectors. The Trace test and the Maximal eigenvalue test. The results of trace and maximal values tests is reported in table (5) and suggest the rejection of the null hypothesis of no cointegration but not the null of at most one or two cointegrating vectors between the variables at the 5%

level. This means that the whole structure of the fiscal multipliers variables is cointegrated and that there is a stationary linear combination between the variables.

Table (5): the Johansen Cointegration

Johansen Cointegration	Computed Value	Critical Value (5%)	Prob.
Trace Statistic	22.878	15.494	0.0032
Max-Eigen Statistic	18.589	14.264	0.0097

According to HQ: Hannan-Quinn information criterion (HQ) that determine the lags length, the lags = 2

According to the results of Trace Statistic and Max-Eigen Statistic tests, there is a long run relationship between the variables and the cointegrated time series must have an Error Correction Model. The cointegration analysis permits to test and estimate short and long run relationship between variables using the (ECM) approach which also helps to solve the spurious correlation problem among economic variables.

Error Correction Model

We now proceed with the estimation of an error correction model (ECM) for fiscal multipliers' variables to investigate the adjustment mechanisms towards the long-run equilibrium represented by the cointegration relationship. ECM shows the dynamics of short-run adjustments towards the long-run equilibrium (Chua and summers, 2004). The relationship between co-integration and error correction models was first suggested in Granger (1981). The estimation results for the error correction models are presented in the appendix (see table A2).

The results show that there is a stable long run relationship between y and g because the t-statistics of these variables are significant but not in the short run. This relationship explains that the effect comes from g to y in the long run while it was bidirectional in the short run. The long-run multiplier of government was estimated to be 11.6 which far exceed the unity. In fact it gives an indicator that government multiplier is effective or the fiscal policy itself is strong enough to stimulate the economy, while the

short run multiplier is only 0.03. It is worth to mention that the results show no effect for the global crisis on the constant or even on the multiplier itself. But since the economic indicators show that the economy of Jordan was affected, then this neutral results may occured because of the shortage of data and so the effect need more time to occur or maybe because the Jordanian economy has proven resilient to the global financial crisis as Mr. Dominique Strauss-Kahn, Managing Director of the International Monetary Fund (IMF), stated. Also the fiscal policy was efficient enough together with the monetary policy to cope with the crisis.

Granger Causality/ Block Exogeneity Wald Test

Wald tests could be used for testing causality in a VAR or VEC set up in a number of ways. The Wald tests are valid asymptotically if there I sufficient cointegration among the variables. This procedure called the sequential Wald tests are shown to have good properties across a number of specifications (Toda and Phillips, 1993). As Granger representation theorem suggests if the variables are cointegrated then there must be a causal relationship among them running at least in one direction, a pair wise Granger causality and Block Exogeneity Wald test for zero restrictions on the coefficients on the VAR or VEC model are employed.

As there exists cointegrating relationship in the model, Granger Causality/Block Exogeneity Wald Test is employed to ascertain the direction of causality.

VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(G)			
Excluded	Chi-sq	df	Prob.
D(Y)	3.126709	1	0.0770
All	3.126709	1	0.0770
Dependent variable: D(Y)			
Excluded	Chi-sq	df	Prob.
D(G)	1.701143	1	0.1921
All	1.701143	1	0.1921

According to HQ: Hannan-Quinn information criterion (HQ) that determine the lags length, the lags = 2

By employing Granger-causality/Block Exogeneity Wald Tests, which estimates the χ square value of coefficient on the lagged endogenous variables, the results show that there is bidirectional causality between the two variables. Government expenditure Granger Causal for GDP, and GDP is Granger Causal for government expenditure.

VII Conclusion and Recommendations

According to IMF, the global financial crisis is likely to leave long-lasting scars on the world economy, but governments can act to stimulate a quicker revival and counter output losses. Jointly fiscal as well as monetary measures should be directed to minimize the adverse impact of global financial crisis.

This paper concentrate on the fiscal policy role to cope with the global financial crisis and aims at estimating the government expenditure multiplier both in the short-run and long-run as an indicator to the fiscal policy efficiency during this final global crisis. The more the multiplier is greater than the unity, the more fiscal policy efficiency. For this end, the paper tested monthly data for the period (2004-2010) including the GDP and the government expenditures which was obtained from the Central Bank of Jordan. Also two dummy variables were added that expresses the crisis shock. In particular, the paper uses three complementary approaches: the Johansen Cointegration, the Error Correction Model (ECM) and the Granger Causality test.

The results show that there is a stable long run relationship between the economic growth and the government spending. This relationship explains that the effect comes from g to y in the long run while it was bidirectional in the shortrun. The long-run multiplier of government was estimated to be 11.6 which gives an indicator that government multiplier

is effective or the fiscal policy itself is strong enough to stimulate the economy, while the short run multiplier is only 0.03. It is worth to mention that the results show no effect for the global crisis on the constant or even on the multiplier itself. But since the economic indicators show that the economy of Jordan was affected, then this neutral results may occured because of the shortage of data and so the effect need more time to occur or maybe the fiscal policy was efficient enough together with the monetary policy to cope with the crisis.

Recommendations

1. The solution to the current financial and macroeconomic crisis requires bold initiatives aimed at rescuing the financial sector and increasing demand.
2. Accelerating the process of reform economic and financial policy in addition to legislations concerning the business environment and investment.
3. Deepening the coordination between decision makers in the fiscal and monetary policy and between the private sector and the public sector.
4. Taking into account the requirements of stimulating local investors and encourage the development of programs directed to poor communities and to empower category middle age of the establishment of small and medium-sized enterprises.

References

1. Abu Hammor Mohammad (2011). The Budget Speech 2011 of Finance Minister in front of the Parliament.
2. Benetrix, Agustin and Lane, Philip (2010). International Dirrerences in Fiscal Policy During the Global Crisis. NBER Working Paper No.16346.
3. Central Bank of Jordan (CBJ). Statistic Database.
4. Chua, C. , Summers P. (2004). Structural Error Correction Model: A Bayesian Perspective. Melbourne Institute of Applied Economic and Social Research, the University of Melbourne.
5. Deardroff, Alan (2004). Macroeconomics lectures. University of Michigan.

6. Gonzalo, C. (1994). Five Alternative Methods of Estimating Long-run Equilibrium Relationship. Journal of Econometrics.
7. Granger, C. W. J. (1969) Investigating causal relations by econometric models and cross-spectral methods. Econometrica.
8. Gujarati Damodar (2004). Basic Econometrics, Fourth Edition. The McGraw-Hill Companies.
9. Gupta and Mulas-Granados (2009). The Effectiveness of Fiscal Policy During Banking Crises: An Empirical Assessment of 118 Cases. IMF Working Paper.
10. Johansen, S. (1988). Statistical Analysis of Cointegration Vectors. Journal of Economic Dynamics and Control.
11. Johansen, S. (1991). Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models. Econometrica.
12. Johansen, S. and Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration – with Applications to the Demand for Money. Oxford Bulletin of Economicsand Statistics.
13. Mann PS (1995). Introductory Statistics, 2nd Edition, Wiley.
14. Ministry of finance (MOF). Statistic Database.
15. Mishaa'l, Zakia (2001). Trade Openness and Performance of Fiscal and Monetary Policies. Yarmouk University.
16. Seddiek Ramadan (2009). Fiscal Policy Role in the Global Economic Crisis: The Case of Egypt. The 13th Scientific Conference of Faculty of Law.
17. Simorangkir, Iskandar and Adamanti, Justina (2010). The Role of Fiscal Stimuli and Monetary Easing in Indonesian Economy during Global Financial Crisis: Financial Computable General Equilibrium Approach. EcoMod2010, Istanbul.
18. Spilimbergo A. , Symansky S. , Blanchard O. , Cottarelli C. (2008). Fiscal Policy of the Crisis. IMF Staff Position Note.
19. Subedi Shanta (2009). World Financial Crisis and Fiscal Policy in Nepal. United Nation Economic and Social Commission for Asia and the Pacific.
20. Toda, H.Y. and Phillips, P.C.B., (1993) "Vector autoregressions and causality" Econometrica 61, 1367-1393.

Appendix

Table (A1): OLS Regression

Dependent Variable: Y
Method: Least Squares
Sample: 2004M01 2010M12
Included observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	-0.038478	0.014351	-2.681254	0.0089
GDUMMY	0.063579	0.072250	0.879988	0.3815
DUMMY	-0.029623	0.133668	-0.221618	0.8252
C	3.369915	0.026578	126.7920	0.0000

R-squared	0.400273	Mean dependent var	3.325436
Adjusted R-squared	0.377783	S.D. dependent var	0.066184
S.E. of regression	0.052207	Akaike info criterion	-3.020760
Sum squared resid	0.218044	Schwarz criterion	-2.905007
Log likelihood	130.8719	F-statistic	17.79799
Durbin-Watson stat	1.040025	Prob(F-statistic)	0.000000

Table (A2): ECM Results

Cointegrating Eq:	CointEq1	
G(-1)	1.000000	
Y(-1)	11.61157	
	(2.70958)	
	[4.28537]	
C	-40.42226	
Error Correction:	D(G)	D(Y)
CointEq1	-0.136811	-0.028151
	(0.04695)	(0.00807)
	[-2.91407]	[-3.48666]
D(G(-1))	-0.149164	0.024388
	(0.10873)	(0.01870)
	[-1.37190]	[1.30428]
D(Y(-1))	1.035052	-0.396760
	(0.58535)	(0.10067)
	[1.76825]	[-3.94131]
C	-0.050008	-0.002933
	(0.03366)	(0.00579)
	[-1.48565]	[-0.50660]
DUMMY	-0.472811	-0.052820
	(0.58285)	(0.10024)
	[-0.81120]	[-0.52695]

GDUMMY	0.342935	0.042525
	(0.31673)	(0.05447)
	[1.08274]	[0.78070]
R-squared	0.144812	0.407603
Adj. R-squared	0.088550	0.368629
S.E. equation	0.231642	0.039837
F-statistic	2.573878	10.45845
Log likelihood	6.692414	151.0451