

## **CURRENT ACCOUNT, BUDGET, AND PAYMENT ACCOUNT DEFICITS THROUGH ARDL MODEL AND CO INTEGRATION METHODS (1992 – 2015)**

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### **Abstract**

*This study aims at testing the linkage between the budget deficit and the current account balance mainly, and to check the imbalance that exists between them, and the current account deficit of the Jordanian government, which envisage fiscal operations to improve their budget figures. Data off Budget sheet which used in this paper from 1992 up to 2015. But we have got a benefit when we use the Johansen-Jousloiuise (1990)'s maximum likelihood, Co- integration test and the modified Wald- test which was specified by Toda-Yammamoto (1995), and Auto regressive distributed lags (ARDL). The results of ARDL model reveal that the budget deficit, real GDP, and political instability have a positive impact on Current account deficit in the long run, whereas, in the short run, it shows that most significant variables are what influences current account deficit in Jordan. The Granger causality tests reveal that unidirectional causality runs from budget deficit to Current account balance and from current account to real GDP, with no feedback effects.*

*Keywords: ARDL, Co-Integration, Current Account Deficit, Jordan Budget Deficit, Variance Decomposition*

## INTRODUCTION

This study proposed some notes about the budget deficit of Jordan and its current account deficit through many approaches such as, the Co integration method to check whether this deficit relation is extended to future years. Also, it seems that the author of this paper is not aware of other studies on Jordan economy, because, the author used ARDL, variance decomposition and Co integration methods to fully examine the short and long run relationships between the current account deficit, and that of the budget deficit.

### Previous Studies

Agarwal (2004), investigated the budget deficit for certain economic variables for India, (Chihi and Normandin, 2013) investigated the budget deficit for some developing countries, while (Akcey et al., 2001) investigated the Turkey budget deficit, and (Qayyum et al., 2014), presented a theoretical approach model to analyze the effect of foreign aid, external debt, and governance. They have all concluded in their papers that foreign aid and external debt do not affect the growth rate of consumption, but that they have leveled impact on consumption.

The Jordanian government balance sheet (budget) is comprised of three elements, the first one is the assets which comprise of the stock of governments, which included non – financial assets (capital stock, and the stock of financial assets), the second is liabilities which is represented as the stock of financial liabilities, while the third is the net of worth, which can be obtained by the minuses of the total assets from total liabilities. According to this dividend, we can note in Jordan budget that changes in various components items occur due to many factors which affect the sheet balance yearly (we will look at them later), some of these items slip down, while others are rises up because of the transaction valuation effect, the issue of the budget of this nature, reflects all operations and procedures which may increased its expenditures, which are documentations and the accumulation of these assets and liabilities, and which are caused by the mutually agreed interactions between government institutional units.

The Maastricht criteria indicate that the economic and social stability and growth rates pacts to: 1, currency (notes and coins), 2, loans which are closely related to the stock of liabilities, and 3, shares which excluding derivatives, but the most important thing for any government, that is the government debts under control basis?. Other accounts payable, where the fiscal balance (net of lending or borrowing), which should be in equilibrium state as equalization between transaction in financial assets and the transaction of liabilities, therefore we can consider this calculation as an indicator of the financial impacts of government activity on the economic acts of a country.

The term 'deficit' refers to the portion of actual spending of government, which has been spent since the start of the government, accounting for the fiscal year, the deficit only includes actual payments made and does not reflect their future requirements or future needs of social life and inhabitant needs thus the government obligated to pay more. Government budget deficit and debts are concepts used to analyze government's fiscal policies in order of stability and growth pacts. Economists have advised the Jordanian government to be careful about debts, and deficit budget, but they uphold government's claims about the behavior of government payments, and wanting to always levy a lump sum tax on debt holders, which equals outstanding government debt in order to be able to eliminate the debt. On the other hands, Jordanian government faces a huge problem of proving that debt is never a relevant constraint to it, due to increase in financial needs; the government tries year after year to reduce the debts promises to eliminate it, claiming that the government can't defeat. The issue of taxation is one that has been greatly distorted, making the Jordanian debts to be such as little amount as not more than 10% per GD, but also for the purpose of intergenerational redistribution.

One relevant question which has always been raised is that, 'to what extent could the fiscal policy adjustment contribute to resolving the external imbalances'? Judging by a situation whereby the relationship between fiscal policy and the current account have attracted interest among the policy makers and central bank governors, the scholarly efforts of people such as Ramzan and Ahmad (2014) have shown that the external debt has a negative impact on growth, but that this adverse effect, in the presence of sound macroeconomic policies. This means that the study of this economic phenomenon should refer to more previous studies related to this work's finding, and which varies among different countries; some results also vary due to the types of econometric techniques of other results, and due to the data period of study. (Bahman and Oskooee, 1989), also (Zaman Zadah and Mehrara, 2011), reveals that some countries have a direct positive relationship - as a result of their economic policies - between the budget deficit and the current account deficit. They examined the relationship between budget deficit and non oil current deficit for the Iranian economy during the period 1959 -2007, depend Johnsen–Jouslious Co integration and Vector error correction model (VECM), they discovered that through Granger causality test, that there is a relationship between the series its assigned a bilateral relationship between the two variables.

Also, (Madanat and Shooter, 2008) revealed the Keynesian proposed hypothesis to the Jordanian economy, the funds in their study which stood for every increase in the budget deficit was found to have reduced the current account deficit, this indicates that the increase of in budget deficit has a positive effect on the current account deficit of Jordan, if we refer to the Keynesian propositions which claimed that the public budget deficit can effect positive savings.

(Hakro, 2009), in his paper has proposed the multivariate time series on data from Pakistan, and using the VAR model, he demonstrated that the causality link of the deficit is flowing from budget deficit to prices, to interest rate, to capital flows, to exchange rate, and trade deficit. (Oguro and Sato, 2014) and in their findings, (Cui and Gong, 2008) revealed that the view of aid effects on growth rate can only be negative or positively decided by a good monetary policy and its environment. The researcher of this study noted that government decisions relating to the study period faced many financial troubles in budget deficit, and that these decisions were made in a discrete way to compel the listing of generations, also, the official services which were publicly held for government were increased during the period of study, in other words, the net worth declined sharply after the government's privatization process, hence, the whole process followed through government's calculations excluded the political and economic beneficiary and the social security benefits in Jordan. To be more precise, one can argue from the negotiations of parliament of budget that corruption has overshadowed civil rights, and that the government's remedy at this level, is merely to impose already existing taxes or to create new ones. Then, there were other free monetary policies that could not prevent the rich consumers from indulging in more consumption of goods and services, or from concealing their wealth; however, the government makes money from avenues such as, taxes and custom duties, avenues which have high rates of evasion. The government economic primary budget deficit measures the direct government pay out of the current generation of taxpayers, and this is otherwise perceived as the theoretical analyses which support all contractual obligations of Jordan.

Some recent economic models were setup to check financial distress, while others were encouraged to develop new techniques to achieve the government plans, many authors as, Biertler–Kiyotaki and Querallo (2012), they assumed in their paper that government policies have been formed according to market situations and are not similar to their own types of financial fractions, therefore, that these policies have no direct impacts on the financial fragility that led to the distress situation. Also, these models' assumptions included the fact that they had leverage constraints on the intermediary, and the resultant side effects are funded because of the capacity of the private sector firms. Tabellini (1990), and (1991) as well as in a recent study, suggested that social security and debts of government may be secured by similar political mechanisms, in this sense, amateur social security systems would create entitlements that can be as safe as government debts. Pate, E, and Franco (2003) discussed the issues of some commentators which have cast effect on the effectiveness of the fiscal implications which has affected in the stability and growth pacts, and also put forward proposals to increase transparency.

In their study, which focused on some U.S. states, and on the roles of budget, Miliesi – Ferretti (2003), as a result of their paper stated that there was hampered by some measurement problems. Other studies such as Bunch's (1991), shows that some U.S. states with constitutional debt limits, used public authorities to circumvent of government borrowing restrictions. Rubin, et al. (2004) have explained that the substantial deficit may have negative effect influence expectations and confidence which could generate a self reinforcing negative cycle, financial markets and real economy. Others who subscribed to this were Akbostanci, and Tunc (2001), Lochman and Francis (2002); all of them adhered to the Keynesian propositions in which an increase in the budget deficit as a result this causes worsen the current account position. However, it is obvious from a small, open and developing economies such as Jordan, who depends highly on foreign capital inflows (e.g. Foreign direct investments, and foreign investment portfolio), that to finance its economic developments, the budget position of a country may be affected by large capital inflows or small amount of it, but because the Jordan finance depends on debts to finance their needs, and debts hereby accumulates from one year to another, the country may eventually run into a budget deficit. Mansouri (1998) stated that there are a bi-directional, short and long run casualties relationships between fiscal policies and external deficit. Bartolini, and Lahiri (2006), they suggested that the fiscal deficit, saying that the Keynesian model accompanied by the budget deficit.

Also, many researchers such as Megarbane (2002) studied the current account imbalances in order to reveal the possible link between budget deficit and the current account deficit. The main application of this paper therefore, is to analyze the relationship between budget deficit and payment balance in Jordan budget, by studying the current account deficit in Jordan, using the ARDL model and the Co integration of Johnsen-jousloise's methods, and examine Toda - yammamoto's causality test between them if there is a causal relationship, with impulse response to them.

The paper was organized into five sections; first section which has to do with introduction includes the objective of the study and the contributions of previous studies, while the second section centers on the model, the third section has to do with data and methodology, the fourth section the empirical results and negotiation of the analysis, and the fifth section concluded remarks.

### **Fiscal Performance Indicator**

The fiscal indicators of Jordan economy are important in this study to help in determining the relationship between the budget and the current account deficit. Table (1) shows that.

Table 1: Fiscal Performance of Jordan

Indicators	1980 - 1992	1992 -2005	2005 -2015
Government Revenue (% of GDP)	23.76	26.81	31.19
Government Expenditure (% of GDP)	31.89	35.18	38.29
Growth of G. Revenue (%)	10.17	13.29	19.29
Growth of Expenditure (%)	21.43	26.18	28.19
Budget deficit excluding Grants (% of GDP)	8,08	8.37	7.07

Source: Authorship calculation of international fiscal statistics, C. D's, 1995, 1998, 2005, 2012 and 2014.

Also, several issues of monthly reports got from the central bank of Jordan for the periods under study

From table (1) above, we can see that there is an evidence of a persistent government budget deficit during the recovery review period, and this can be cleared by huge expenditure outlay, while revenue generation remained below expenditure level. The budget deficit in the periods between 1980 – 1992 was recorded (8,08% of GDP) as average, this deficit was increased during the periods between 1992 – 2005 to be (8.37% of GDP), but it declined to (7.05 of GDP), this is due to government policy which decreased both the government's expenditure, and social services, and imposed new taxes, increased the ratio of old taxes, imposed new custom fees, and raised the prices of oil, services and goods. Table (2) illustrates the external sector performance indicators of Jordan economy.

Table 2: External Sector Performance Indicators for Jordan Economy

Indicators	1980 -1992	1992 - 2005	2005 -2015
Exports (% of GDP)	19.65	26.83	25.47
Imports (% of GDP)	24.56	32.78	39.14
Trade balance (% of GDP)			
Gross international reserves excluding Gold by million U.S dollars	4.675.876	6.785.345	8.654.869
Foreign Aid flow (average) million U.S dollars	875.867.324	1.578.546.231	2.346.765.122
Nominal exchange rate appreciation %	4.9	13.28	15.46
Bilateral real exchange rate with U.S dollars	- 0.341	1.392	1.337

Source: author's calculation of international fiscal statistics, C. D's, 1995, 1998, 2005, 2012 and 2014.

Also, several issues of monthly reports got from the central bank of Jordan for the periods under study.

The trade balance of Jordan was negative throughout the review period, reflecting an excess of imports over exports, the deficit was high during all covering review periods, and it gradually is worsened in the many years that followed, extending to 2015, even when the government decided to decline in importations, and doubled the exports in their macroeconomic policy, yet, this policy was not successful, due to an increase in the number of refugees. Thus, we could

see a situation whereby, imports as a percentage of GDP still got higher and remained so, over the corresponding exports of goods and services, however, the imports jumped to nearly 39% of GDP, then it fell back to 37.62% percent of GDP in the last 7 years when the government adopted an economic recovery and rehabilitation programs aimed at sustaining and promoting economic stability, and also strengthening business confidence, and consequently, exports gradually picked up.

## RESEARCH METHDOLOGY

### Model Specification

#### *Co-Integration Method*

The relations between the net lending or borrowing of the Jordanian government, can be stated as:

$$\Delta pt = \Delta Mat - \Delta MLt + p \Delta Ft + \Delta CXt \dots\dots\dots (1).$$

$$\Delta pt = at + p\Delta Ft + \Delta CXt \dots\dots\dots (2).$$

$\Delta CXt$ : represents the change of financial and non financial assets or liabilities.

$Ft$ : Changes in financial liabilities per time, where  $MLt$  represents the changes of stock in financial assets, and  $p$  is the value of a unit of public capital Main stock of nonfinancial assets of the government.

This equation and its component are affected by the fluctuation of prices, and the exchange rates. It is also affected by interest rates, but in the opinion of this researcher, there have been always a difference between the net worth of government and the net of borrowing, this can be interpreted to mean, that government net worth includes the net capital deformation of government, this excluded valuation change which occurred in the country, therefore, the government net worth can be as follows:

$$\text{Net worth} = Mat - Ft + pMa \dots\dots\dots(3) .$$

The balance sheet of Jordanian government can be determined by the difference between the government savings ( $Sgt$ ), and the aggregate investment ( $Igt$ ), actually, the government saving is the difference between the revenues of the government and the expenditures, the following equation presents the savings of government as:

$$Sgt = \varphi + Ret + Rt ML MLt - 1 + rt MA MAT-1 - exp ct - r ft tFt t-1 \dots\dots\dots(4)$$

Where

Exponent CT: is the government expenditures (including net capital transfers), and  $\varphi$  is total tax revenue,  $Rt$  is the non tax and non interest revenue,  $MA$ : is the rate of returns on government's non financial assets,  $r ft t$ ,  $Rt ML$  is the rate of financial asset returns.

The suggestion to amend the fiscal balance between  $S_{gt}$ , is referred to by excluding net investment expenditures. Jordanian government tries to do some procedures to solve the deficit requires that the sum of government assets should be presented in discount value of future tax spending, hence, we expressed the equation as:

$$\sum \text{Int} (1+r)^{-t-i} \geq P_{ex} (1+r)^{-t-l} + UT \dots \dots \dots (5).$$

When:

$\sum \text{Int}$ : is the non interest revenue,  $P_{ex}$  is the primary expenditures, and  $r$  is the interest rate. The Fiscal measures in Jordan budget can have an impact on the government in temporal position, when they have reduced their present spending and this happened during the period of December in the year 2012, and they tried to treat the deficit in their opinion by increasing taxes, in order to make some effect in the revenue of future taxes receipts, they declined the cost of pension reform which reduced public benefits in order to correct the public accounts, and to finance the future spending, and borrowed more loans from local financial markets and from external sources, to finance the government activities and to repay some of the existing debts.

The  $\varphi_{saj}$ , of the matrix  $\varphi$ , is the impulse response:

$$\varphi_{saj} = d Y_i t + s / d U_{j,t} \dots \dots \dots (6)$$

It is possible to decompose the  $h$ - step ahead of forecast error variance in order to be able to determine the proportions due to each shock  $U_{jt}$ .

Beyond the structural fiscal measures, there is a non structural fiscal measure in board categories, the highlighting of which have effects on the fiscal balance, government debts, as well as on the net worth and future taxes. They are in the following categories:

#### A. **Special Dividends**

The booking revenues arising from the tax revenues, which constitute the capital gains on Jordanian central bank gold holdings, is to reduce the budget deficit, the dividend is large and exceptional ones – off payments based on accumulated reserve or holding gains.

#### B. **Asset Sales (Privatization and Corporation)**

Sales of nonfinancial assets are classified as category of gross fixed capital formation in the Jordanian capital account and they proceed typically imply an increase in money transaction as currency and deposits in the financial accounts.

#### C. **Capital Flows Injections**

#### D. **Quasi – Fiscal Activities**

#### E. **Securitization**

#### F. **Off - Budget Items and Infrastructure**



### ARDL Model

When we were conducting the bound- test which states the hypothesis of zero Co integration, we therefore conduct the Form of ARDL equation, which is as follows:

$$\Delta cab t = b_0 + \sum_{i=1}^n b_{1i} \Delta CAB t - 1 + \sum_{i=1}^n b_{2i} \Delta B D t - 1 + \sum_{i=1}^n b_{3i} \Delta R G D P t - 1 + \sum_{i=1}^n b_{4i} \Delta I N T - 1 + i=1 n b 5 i \Delta R E E R t - 1 + a 1 C A B T - 1 + a 2 B D t - 1 + a 3 R G D P t - 1 + a 4 I N t - 1 + a 5 R E E R t - 1 + \theta D W + \epsilon t \dots\dots\dots(7)$$

F-test static which is used to test the significance of lagged levels of the variables, and to find out the existence of Co integration with the critical values are reported as two sets by Pesaran et al. (2001), and Narayan (2004) who divided it into upper and lower critical bands, the upper bound's critical value assumes that all series are Co integrated of 1 (1), while the lower critical bound values assume that all series are Co integrated of 1(0), the calculated of F- statics is compared with the critical values which was provided by Pesaran et al. (2001). F –statics test falls outside the critical boundary, and a conclusive inference can be drawn without considering the order of integration of the underlying regresses. To reject the null hypothesis of Co integration, F- statics should be higher than the upper critical value bound, and alternatively, if the F-statics is lower than the bound values, the unit root test should be conducted to check the order of integration of the variables. If all variables are found to be 1(0), then, the decision is based on lower bound value.

The short run estimates can be determined, and we can obtain the ARDL estimates when a Co integration relationship is ascertained with the error correction estimate of the ARDL model, from the ARDL model we can perform the error correction equation as:

$$\Delta cab t = b_0 + \sum_{i=1}^n b_{1i} \Delta CAB t - 1 + \sum_{i=1}^n b_{2i} \Delta B D t - 1 + \sum_{i=1}^n b_{3i} \Delta R G D P t - 1 + \sum_{i=1}^n b_{4i} \Delta I N T - 1 + i=1 n b 5 i \Delta R E E R t - 1 + a 1 C A B T - 1 + \Omega E C M + \epsilon t \dots\dots\dots(8)$$

### Data Sources

- 1 - The issues of finance ministry of Jordan's debts (several issues for foreign debts of government since 2001 – 2009).
- 2- Central bank of Jordan (several issues from 2001 to 2016).
- 3- Arab unified economic reports for several years related to study period.
- 4- I. M.F reports (several issues related to the study period). Many financial time series appears to be non – stationary, new statistical issues arose when analyzing non - stationary data, unit root tests are used to detect the presence of a unit root in order to determine whether the data are stationary or not, in this paper, the researcher used different methods of detecting non – stationary data:

- Visual Inspection of Time Series of Non- Stationarity
- Formal statistical tests comprising of unit root tests such as: Augmented Dickey -Fuller test and KPSS test. Many tests are used to support findings on the basis of estimating unit root tests of ADF and KPSS by autocorrelation and normality test, and Jarque – Bera test. The second support comes from using Garch model; there are three stylized facts about the volatility of budget deficit (time series), as general, first stylized fact in financial series which are fat tails, the second is volatility mean reversion, and the third is volatility clustering, testing data with alternative approach which is introduced by Johnsen – Jusloise, according to some notice which was explained previously in the model part of this paper, the Granger causality is used to test and check the type of relationships which exist between the deficit of budget, then, Toda – Yamamoto’s causality test was used to insure about this relationships between variables and impulse response to test which has been done. In this paper, we have used in the analysis procedures such as: the OLS method, also the Akaike criterion for the specifications of the lags pairs, and list of endogenous variables followed, then, impulse response diagram was done.

## EMPIRICAL RESULTS

### Q-Statistic and Serial Correlation And Normality

When we drawing the conclusions from the estimated regression, it is necessary to perform residual diagnostic, in order to be sure of the assumptions of the paper are satisfied, we utilized the Q- statistic and correlogram to have the results, this can be provided by the Ljung – Box test, and the Q- statistics draw of autocorrelation of residuals, the P –value of Breusch – Godfrey test then LM test to confirmed the absence of serial correlation of up to second order, these results let us to say of no autocorrelation available results in table (3), null hypotheses is rejected by the Durbin – Watson test of no serial correlation of series, the result is (1.99) equal to normal result, and which is in the acceptance region and Rho is equal to 0.1468.

Table 3: Normality Tests for Data

Variables / tests	Coefficients	P – value
Current account deficit		
<input type="checkbox"/> Dormok– Hensen	3.13392	0.20367
<input type="checkbox"/> Shapiro–Wilkenson	0.92230	0,964889
<input type="checkbox"/> Lillieffors	0.180276	0.07
<input type="checkbox"/> Jerque– Bera	1.57717	0.455626
Budget deficit		
<input type="checkbox"/> Dormok– Hensen	24.8704	0.0000087
<input type="checkbox"/> Shapiro–Wilkenson	0.714711	0.0000422
<input type="checkbox"/> Lillieffors	0.315638	0.0000

□ Jerque– Bera	6.90376	0.031689	Table 3...
Payment balance deficit			
□ Dormok– Hensen	7.11016	0.283579	
□ Shapiro–Wilkenson	0.852905	0.004786	
□ Lillieffors	0.227302	- 0.01	
□ Jerque– Bera	2.42913	0.29684	

### Autocorrelation Test

From payment balance autocorrelation, we noticed that after the 5th lags, ACF damped out slowly toward zero also PCF, while PCF had spikes at 4th lags which disappears afterwards, and decays oscillating toward zero. While the autocorrelation function for the budget and current account, and the Jarque – Bera statistics indicated so that the residuals of the regression by the OLS method are distributed normally.

### Stability Test

We can testify the series for stability and structural breaks by the. We can't reject the null hypotheses according the P- value of the results of the test, therefore, we started the stability test with a recursive residual test which can help us to detect visually potential break points. We noticed that the recursive residuals are within the confidence limits of series interval periods, these are represents the potential points for the structural breaks in the series, we can go furthermore to test the series with Chaw – test. Result of the test let us to conclude that the null hypotheses is rejected of the constancy of parameter at the 5 % level.

### The Unit Root Tests

As the result of table (4) unit root test of ADF and KPSS are rejected, the null hypotheses of the presence of a unit root in the data according to the p- value and critical values of both tests, table (4) declares these results. In table (5), the results of structural breaks in both the slope and intercept, also show a strong proved against unifying hypotheses, and all results in the table show that all variables under investigation rejects unit root hypotheses, hence we can consider that two structural breaks are stronger than one.

Table 4: Augmented Dickey – Fuller Test and KPSS TEST

Variables	ADF, 1st diff	KPSS 1st diff
Budget deficit	1.87352 **	0.737732
	0.607934**	0.560366
	0.87653*	0.546358

\*\* significant at 5, 10 levels

Critical values of KPSS test are: (0.357), (0.483). (0.697) at 10%, 5%, 1% levels

Table 5: Unit Root Test Results, Allowing for Two Structural Breaks

Variables	TB 1	TB 2	T-student	HO: unit root
Budget	1999	2005	- 6.75**	Reject
Current account	1999	2008	- 5.3362*	Reject
Payment balance	1999	2012	- 7.1029**	Reject

\*\* Sign at 5% level, and \* sign at 5%, 10 % level

### Garch Model

Garch model provides a reasonable model for analyzing financial time series in order to capture the volatility of the series, and in the same time to estimate the conditional volatility, the sign of residuals or shock has no effects on the conditional volatility.

### Co Integration Method of Engle – Granger and Johansen – Juselius's Method

Both Johansen – Juselius method and the Engle – Granger's method is represented the short-run in components of the ECM, if null hypotheses rejected this means that there is no autocorrelations available in the data, thus the results of analysis are still asymptotically. This approach serves the analysis to a better performance as it does not push the short term of residuals, unit roots are often found in the levels of spot and forward budget.

A: OLS results indicate that overall significance in results of OLS is reflected in the value of F-statistics we reject the null hypotheses and statistically significance of slope coefficients, where  $R^2$  is good fitness of the model (0.714), where the adjusted R is (682), and P – value of coefficient payment balance is statistically significant, and the Jordanian current account deficit is statistically significant, and the ratio of log likelihood is not large enough (- 158.2957). Table (6) shows the results of the regression.

Table 6: OLS Results of Series, Dependent Variable: Budget Deficit Data (1992 - 2015)

Variables	Coefficients	ST /Error	T - value	Prob – level
Const	507.6953	255.785	1.9857	0.0626 *
Current account	0.0519836	0.222616	0.2353	0.8180
Payment balance	0.352990	0.106418	3.317	0.0057 ***

Sign at 5% level, and \*\*\* sign at 1%, 5%, 10% levels

R <sup>2</sup>	0.7139		
Log likelihood	- 158.2957		
F – (2, 19)	22.46131	Prob value	0.000013
Rho	0.550577		
D. W	0.900448		

Table 7: Testing for Unit Root of Ut

1st order autocorrelation for et	-0,6231
Tau _ c	-3.20423
Estimated value	-0.80548
P – value	0.16725

B: In table (7), the results show that the residuals are stationary by ADF test, which could lead to a strong rejection of the presence of a unit root in the residual in favor of stationarity hypotheses. The various hypotheses tested from no Co integration ( $r = 0$ ), to the increasing number of cointegration vectors, where all values of  $\lambda$  trace and LR max statistics according to the table (8), these results are higher than the cross pondering of the critical value at 5 percent level, this means that we can reject the null hypotheses of no Co integration. According to  $\lambda$  max, the result of analysis exists that there is one Co integrating equation available in the series, in hence one integrating the relationship between variables. The Eigen values are significant at the 5 percent level, also, then  $\lambda$  trace are insignificant, but the  $\lambda$  max is insignificant, therefore, at least one Co integration equation is available, the Co integration equation is: Budget deficit

= - 498.314 (constant) - 5.44 payment deficit - 2.28 current account deficit.

Log likelihood; (- 390.784).

Table 8: Eign Value,  $\lambda$ trace and  $\lambda$ max of Co Integration Test of Series

Eigenvalue	$\lambda$ trace	P - value	$\lambda$ max	P – value
0.34572	14.990	0.78371	8.515	0.8639
0.25671	6.4746	0.6442	5.9334	0.6225
0.026700	0.54126	0.4619	0.59127	0.3783

C: Table (9) stated the long - run relationship matrix between budget deficit and current account and payment balance deficits. The table shows the availability of long – run relationship, if the same conditions are going to be continued in future of Jordanian budget or if it is going to deteriorate more than it is now.

Table (9): Long – Run Matrix (Alpha &amp; Beta) of Series

Variables	Budget	Current account	Payment balance
Budget	- 0.28207	0.20849	- 0.19452
Current account	0.067681	- 0.69779	0.29566
Payment balance	0.46952	-0.20034	- 0.036918

D: The ECM model: this model can be used to follow the short - run dynamic relationships in the series, and it can be used to distinguish the short and long – run relationship, when the variables in the long –run model are stated to be integrated, then, there must be exist an associated error correction ECM. Table (10) shows the equation of ECM, VECM equation of budget deficit correction model is:  $-0.56538$  payment balance deficit -  $0.61442$  current account deficit. The result of correction model ECM coefficient is  $-0.263241$  and St/Error is too little, the p- value is  $0.3783$ . It is insignificant, no serial correlation due to the use of 1st difference of the series. Lastly, the AIC equal  $46.2779$  is the best criteria due to the smallest criterion results that it has over others.

Table 10: VECM of Budget Deficit Equation

VECM system, lag order 1 Co integration, rank = 1, Unrestricted constant

	Budget		0.32650	
	Payment balance		-0.56538	
	Current account		-0.61442	
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
Const	152.653	175.891	0.8679	0.39688
EC1	-0.263241	0.166268	-1.5832	0.13078
R-squared	0.122235	Adjusted R-squared		0.073470
Rho	0.188200	Durbin-Watson		1.551003

#### E: Granger Causality

Restricted and unrestricted models of Granger causality are tested by Wald test, table (11) shows that hypotheses are rejected in both restricted and unrestricted Error correction models. The calculated F – statistics indicates the rejection of null hypotheses.

Table 11: Wald – Test for Granger Causality Restricted and Unrestricted Model

	Calculated F –stat	DF- NUM	Df	Null hypotheses (Ho )
Unrestricted	22.32615	2	23	Reject Ho
Restricted	12.4611	2	23	Reject Ho

#### F: Toda – Yammamoto's Causality Test

This test would result in a table (11) leading us to conclude that two variables budget deficit and the current account deficit does not Granger cause each other, in other words, they appear to be independent, also, another test for the budget deficit and payment balance deficit does not Granger cause each other, an enhancement of the test shows us a bidirectional Granger causality relationship between variables.

Table 12: Toda – Yammamoto's Granger Causality Test of Series

Null –hypotheses (Ho)	M – Wald test	Prob – level
Budget deficit does not cause Granger causality. cause current account deficit	4.7876	0.3654
Budget deficit does not cause Granger causality cause payment balance deficit	5.21663	0.4573
The current account deficit does not cause causality Granger cause Budget	0.92254	0.2431
The payment balance deficit does not cause causality Granger cause Budget	0.87124	0.6542

The summary of the coefficient estimate of VAR model is declared in the table (13).

Table 13: Summary of Coefficients Estimate and t-value of VAR Model for Jordan

Dependent variable:  $\Delta$ Trade balance

Constant & t –value	$\Delta$ Balanced budget (-1) & t –value	$\Delta$ Balanced budget (-2) & t –value	$\Delta$ Trade Balance (-1) & t –value	$\Delta$ Trade balance (-2) & t –value	Adjusted R (R <sup>2</sup> )
0.013 (0.284)	-1.21 ( -2.01 )	-0.256 ( -0.391 )	-0.378 (-0.459 )	-0.138 ( -0.974 )	0.18

As a result of the table from VAR analysis of data are mixed by contrast inverse causality, it is observed between  $\Delta$ GBB, thus, Jordan policy makers made some changes in the policy, which gave an evidence that the deficit changes in response to changes in the trade deficit was delayed for at least one period, because it is statistically significant, inverse causality between  $\Delta$ GBBt, and  $\Delta$ CAB is detected although the numerical magnitude of coefficient on  $\Delta$ CABt-1 is quite small. The results of the variance decomposition analysis are shown in table (14).

Table 14: \*\*Summary of Variance Decomposition Analysis of Jordan Data

Sample period	Variance decomposition of \	% of variance explained by shocking the budget deficit equation	% of variance explained by shocking the current accounting equation
1980 – 1992	Budget deficit	84.2	14.8
	Current account	21.3	75.8
1992 -2005	Budget deficit	86.7	16.2
	Current account	23.7	82.4
2005 -20015	Budget deficit	89.5	19.3
	Current account	25.2	86.2

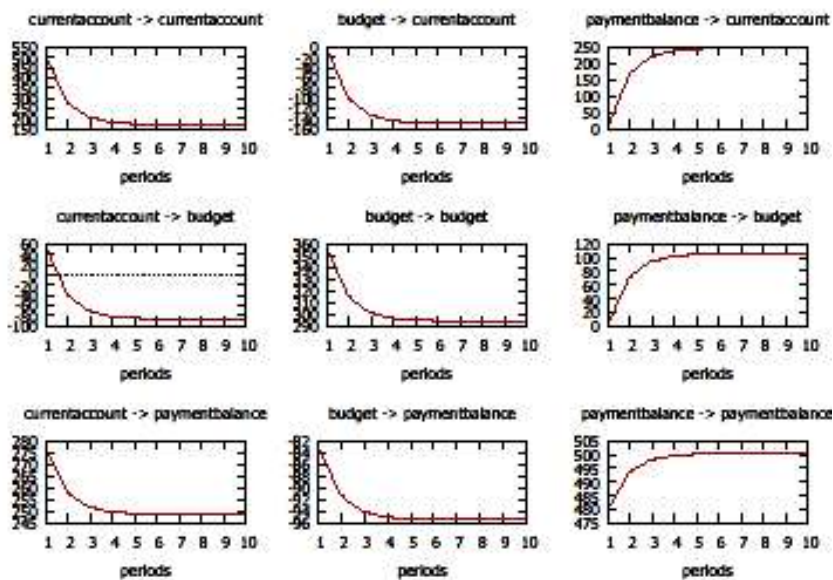
\*\* : The Choleski decomposition algorithm is used, which added interest to the decomposed residuals or orthogonal.

Variance decomposition is estimated to find out the effects of innovations in budget and current account, and three samples were carried out in the analysis. The decomposed variance estimates are indicative of the magnitude, and the longevity of the Jordanian data, we can note that there are shocks to the budget deficit, thus, the trade deficit or current account balance can explain any of the forecast errors alone, the trade deficit is an exogenous variable in this situation.

G: Impulse Response

As in figure (2) in this model, there is a unidirectional dynamic relation from the deficit of payment balance and current account to the budget deficit, to follow the short - run dynamic relationships in the series, and it can be used to distinguish the short and long – run relationship, when the variables in the long –run model are stated to be integrated, then, there must be exist an associated error correction ECM. Table (10) shows the equation of ECM, VECM equation of budget deficit correction model is:  $-0.56538$  payment balance deficit -  $0.61442$  current account deficit

Figure 2 : Impulse Response of Series



The result of correction model ECM coefficient is  $-0.263241$  and St/Error is too little, the p-value is  $0.3783$ . It is insignificant, no serial correlation due to the use of 1st difference of the series. Lastly, the AIC equal  $46.2779$  is the best criteria due to the smallest criterion results that it has over others.



As a result of the table from VAR analysis of data are mixed by contrast inverse causality, it is observed between  $\Delta GBB$  and  $\Delta CAB$ , thus, Jordan policy makers made some changes in the policy, which gave an evidence that the deficit changes in response to changes in the trade deficit was delayed for at least one period, because it is statistically significant, the Granger causality relationship between  $\Delta GBB_t$  and  $\Delta CAB$  is detected to be inverse, although the numerical magnitude of coefficient on  $\Delta CAB_{t-1}$  is quite small. The results of the variance decomposition analysis are shown in table (14).

### CONCLUDED REMARKS

This study recommends that it is very important to look after the manner of how the government dealing with both external and internal debts, because, it shifted the liquid of money from local financial market and its impact to the actuation of economics due to all the austerity policies, and reduction of external and internal debt did not achieve tangible results, also, government must reconsider the rate of expenditure to the budget regarding economic needs, at the time in which the rate of spending of education, work recode, health care, food, subsidiary, also if we add the prosperity consume index to conclude the achievement of Jordanian government which is classified by U.N as number twenty fourth country of all states of the world, classified as fifty one of health index, these indexes are tied with effectiveness and credibility to the political system.

The aim of this paper is to examine the budget deficit and other main components of the deficit, of current account and the deficit of payment balance, therefore, date not stationary designed in its level as therefore the first difference has done of all variables to be in stationary position, and the budget deficit is considered as a dependent variable, and other variables are counted as independent variables, the period of the study extended from 1992 up to 2012, this period is full of events such as rises of oil prices, then commodity prices and first and 2nd gulf war, the adjustment and structural program in Jordan economy, then, the privatization process which failed and did not satisfy the effort to improve the economics and treat the debt problem. The researcher used the normality test and the Q – statistics, then the unit root to insure the normality test and to ensure that they are well distributed, then, we have used chaw test to check of the structural breaks in series, and then co integration procedure was proposed is Toda – yammamoto causality test was used to insure the type of relationships, whether there is a relationship between variables, insofar if there is directional or bidirectional, or whether it is unidirectional relationships, also, VECM model was utilized to find the error correction equation follow the short - run dynamic relationships in the series, and it can be used to distinguish the

short and long – run relationship , when the variables in the long –run model are stated to be integrated, then, there must be exist an associated error correction ECM.

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