LONG-RUN LINKAGE BETWEEN BUDGET DEFICIT AND TRADE DEFICIT IN LEBANON: RESULTS FROM THE UECM AND BOUNDS TESTS

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ABSTRACT

This paper examines the linkage between budget deficit and trade deficit for Lebanon during the period from 1975 to 2003. The purpose is to test the validity of the Keynesian proposition and the Ricardian equivalence in the case of Lebanon. A robust econometric framework called the unrestricted error correction model (UECM) and a cointegration test called the bounds test are used to examine whether budget deficit and trade deficit are cointegrated. The Granger causality test shows that causality runs from trade deficit to budget deficit and the relationship is positive and statistically significant. The empirical analysis in this paper partially supports the Keynesian view that there is a linkage between trade deficit and budget deficit but the direction of causality is reversed which is consistent with many other empirical studies. The result suggests that any policy measures to reduce the trade deficit in Lebanon could well assist in reducing the Lebanese budget deficit.

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Keywords: Trade deficit, Cointegration, Lebanon

1. INTRODUCTION

The relationship between budget deficit and economic variables has attracted a great deal of attention from academics and policy-makers. There is extensive theoretical and empirical literature examining the relationship between trade deficit and budget deficit.

One school of thought argues that budget deficit does have a significant impact on current account deficit (also known as the twin-deficit hypothesis). For example, studies by Fleming (1962), Mundell (1963), Volcker (1987), Kearney and Monadjemi (1990), and Smyth and Hsing (1995) have argued that government deficits cause trade deficits through different channels. In a Mundell-Fleming framework, it is argued that an increase in the budget deficit would induce upward pressure on interest rates, thus, causing capital inflows. This will lead to an appreciation in the exchange rate, leading to an increase in the trade deficit. The Keynesian absorption theory suggests that an increase in the budget deficit would induce domestic absorption and thus, import expansion, causing a current account deficit.

A second school of thought known as the Ricardian equivalence hypothesis (Barro, 1989) argues that every bond-financed deficit has to be met by a future tax increase, given that this tax increase would be predicted by living agents who would adjust their present consumption accordingly. In short, these agents will save the entire proceeds in anticipation of a future tax burden and hence not raise their demand for goods and services. Therefore, the income received by agents from government deficit-spending is all saved and has no effect on consumption and these savings go into the demand for the very same bonds that were supplied to finance government spending which would have no effect on interest rates. In summary, this school of thought argues that shifts between taxes and budget deficits do not impact the real interest rate, the quantity of investment, or the current account balance. In other words, the Ricardian equivalence hypothesis negates any relationship between the two deficits.

Another view argues for a possibility of a unidirectional causality that runs from the current account to the budget deficit. This may be due to the deterioration in the current account leading to a lower economic growth and thus may increase the budget deficit. This view has been empirically supported by Summers (1988), and Islam (1998) for Brazil, and Khalid and Teo (1999) for Indonesia and Pakistan. More recently Alkswani (2000) also supported this view in the case of Saudi Arabia. According to these authors, this can occur if the government utilizes its fiscal stance to target the current account.

There has been extensive empirical literature testing the views of those schools of thought. However, the empirical evidence on the linkage

between trade deficit and budget deficit is mixed. For example, studies such as Abell (1990) and Tallman and Rosensweig (1991) used a simple identity to analyse the linkage between the budget deficit and current account deficit. This identity states that the government budget surplus is equal to the current account surplus plus the excess of investment over private savings. These studies found a strong linkage between the trade deficit and the budget deficit.

Other studies such as Bundt and Solocha (1988), Egwaikhide (1999), and Piersanti (2000) used a complicated dynamic macroeconomic model such as the standard portfolio and general equilibrium models to examine the relationship between the twin deficits. These empirical studies showed that the trade deficit and budget deficit have a positive relationship, and the relationship is statistically significant.

In contrast, other studies such as Evans (1988), and Bachman (1992) found no evidence for the link between the two deficits, thus, supporting the Ricardian equivalence hypothesis.

Most of the empirical studies mentioned above examined the relationship between the twin deficits for developed countries. However, there have been very few empirical studies on developing countries. For example, among the few, Islam (1998) examined empirically the causal relationship between budget deficits and trade deficits for Brazil from 1973:1 through 1991:4. Using the Granger causality test, the study showed the presence of bilateral causality between trade deficits and budget deficits.

Khalid and Guan (1999) used the cointegration technique proposed in Johansen and Juselius (1990) to examine the causal relationship between budget and current account deficits. The study was conducted on five developed countries (US, UK, France, Canada and Australia) and five developing countries (India, Indonesia, Pakistan, Egypt and Mexico). The study was conducted from 1950 to 1994 for the developed countries and from 1955 to 1993 for the developing countries. The results suggest a higher correspondence between the two deficits in the long run for developing countries than in developed countries. Furthermore, the direction of causality for developing countries was mixed. For example, for India the direction of causality was bi-directional. The results for Indonesia and Pakistan indicated that the direction of causality runs from the current account deficits to budget deficits. This is because much of the current account deficit was financed by internal

and external borrowing, thus, contributing further to the huge national debt. Interest payments on these debts had increased over the years, leading to these countries running bigger budget deficits.

More recently in the case of Middle East countries, Alkswani (2000) analysed the relationship between the budget deficit and trade deficit in the case of Saudi Arabia. This study used annual time series data covering the period 1970 to 1999 in estimating the cointegration regression and the error correction model representation, and applying the Johansen cointegration method and testing the existence and the direction of causality. The author concluded that there was a long-run relationship between the deficits and affirms the direction of causality from the trade deficit to the budget deficit.

Moreover, Akbostanci and Tunc (2002) used the cointegration method and estimated an error correction model to examine the linkages between budget deficit and the trade deficit for Turkey during the period 1987-2001. They concluded that the twin deficits hypothesis holds, and the Ricardian equivalence hypothesis is not valid in the case of Turkey. The study suggests that any policy measures to reduce the budget deficit could assist in improving the trade balance in Turkey.

The objective of this paper is twofold. First, there are very few empirical studies that have examined the linkage between the budget deficit and trade deficit for developing countries. This study will examine the link between trade deficit and budget deficit for Lebanon from 1975 to 2003. Lebanon has experienced a sustained increase in budget deficits as well as public debt during the last three decades. The budget and trade accounts have always been in deficit since 1975.[1]

Second, given the limited data for many developing countries, a robust specification, namely the unrestricted error correction model (UECM) and a new cointegration method called the bounds test (Pesaran, Shin and Smith, 2001) are used to examine if the trade deficit and budget deficit are co-moving in the long run. The UECM framework used in this paper has several important advantages over traditional error correction methods. The estimates from the UECM formulation are consistent and are asymptotically normally distributed irrespective of whether the underlying variables are to $I(0)$ or $I(1)$ (refer to Pesaran and Shin (1999) and Pesaran (1997)). The UECM estimation and the bounds test are also reliable for small samples (Pesaran and Shin, 1999). Further, endogeneity is less of a problem if the errors in the autoregressive distributed lag (ARDL) model are not serially correlated.

The rest of the paper is organized as follows. Section 2 examines the budget deficit, trade deficit and public debt in Lebanon. Section 3 describes the UECM methodology. The data used in this paper is described in Section 4. In Section 5 the empirical findings are given. Finally, conclusions and policy implications are given in Section 6.

## 2. BUDGET DEFICITS AND PUBLIC DEBT IN LEBANON

Prior to 1975, the government budget was always balanced and the government had never resorted to borrowing. However, from 1975 to 1990, Lebanon was plunged into a civil war. This had a catastrophic effect on the Lebanese economy. As can be seen from Figure 1, the increase in public deficits in Lebanon occurred after 1974. The largest increases occurred after 1980 and peaked in 1990. During the period from 1975 to 1990, there was a marked deceleration in economic growth and private investment activity. The budget deficit, as a percent of GDP, increased from only 3 percent in 1975 to 32.3 percent in 1989, and was one of the highest amongst the Middle East countries. Increased government expenditure and declining government revenues were both responsible for the steep increase in the public sector deficits. Total government expenditure as a percentage of GDP in Lebanon increased from 15.4 percent in 1972 to 39.4 percent in 1990. The dramatic increase in total government expenditure was mainly made up of current expenditure, the generous salaries paid to government employees and the interest payments on the public debt.

Government revenues, on the other hand, remained very low as a proportion of GDP during the period 1975-1990 (around 6 percent), due to the slowdown in economic activity and the inability of the government to collect revenues during the civil war period. Government revenues in the form of indirect taxes, and customs and trade taxes became difficult to collect due to the loss of control over legal ports of entry. The problem was further exacerbated with the increase in the underground economy – illegal imports. In addition, Lebanon's budgetary capital expenditure declined as well from 6 percent of GDP in 1980 to 1.7 percent in 1990. This contributed to the deterioration in Lebanon's public capital stock.

The pre-war (1970 to 1974) public debt was small — the average annual growth of nominal gross public debt registered only 3.5 percent, and the nominal gross public debt as a percentage of GDP averaged 5.4 percent. During the war period (1975-1990), the budget deficits and public debt saw an upward trend, with the budget deficit peaking at 35 percent of the GDP in 1990, and the public debt increasing to 120 percent of the GDP in 1982 (refer to Figure 2). Note that 1982 was the year of the Israeli occupation of Beirut.

Over the post-war period (1991-2003), and as a result of rebuilding the infrastructure and the economy (the government's crucial contribution to the reconstruction effort), there was an acceleration in the growth of government capital expenditure, together with large and expanding current expenditure. However, due to a slow recovery of the revenue-generation capacity at that time, this led to sizable fiscal imbalances. Consequently, government budget deficits increased from 9.2 percent of GDP in 1993 to 20.6 percent in 1996 before declining to around 15 percent in 2003. This huge increase in the budget deficit led to a sustained growth in government debt during the period 1993-2003 (Figure 2). In addition, domestic public debt as a percentage of GDP increased from 44.2 percent in 1993 to around 170 percent in 2003. In nominal terms, the gross public debt increased from US$3.7 billion in 1993 to about US$32 billion in 2003. The external public debt increased from US$0.3 billion to about US$15 billion in 2003 as a result of the *Paris II Conference* in 2002. An aggregate amount of US$4.3 billion was pledged in 15-year loans at reduced rates to support the government's effort to reduce the public debt. The majority of the public debt in Lebanon was in the form of domestic public debt. However, money creation remained the primary method of budget financing with the issuance and sale of treasury bills to the private sector. It has been argued that the main effect of the huge budget deficit, and the way it was financed, led to a permanent deficit in the budget, higher interest rates, increases in the money supply, rising inflation, a depreciation in the Lebanese pound, stagnation and a slowing of economic growth.

FIGURE 1
Budget Deficit in Lebanon, 1970-2003 (percentage of GDP)
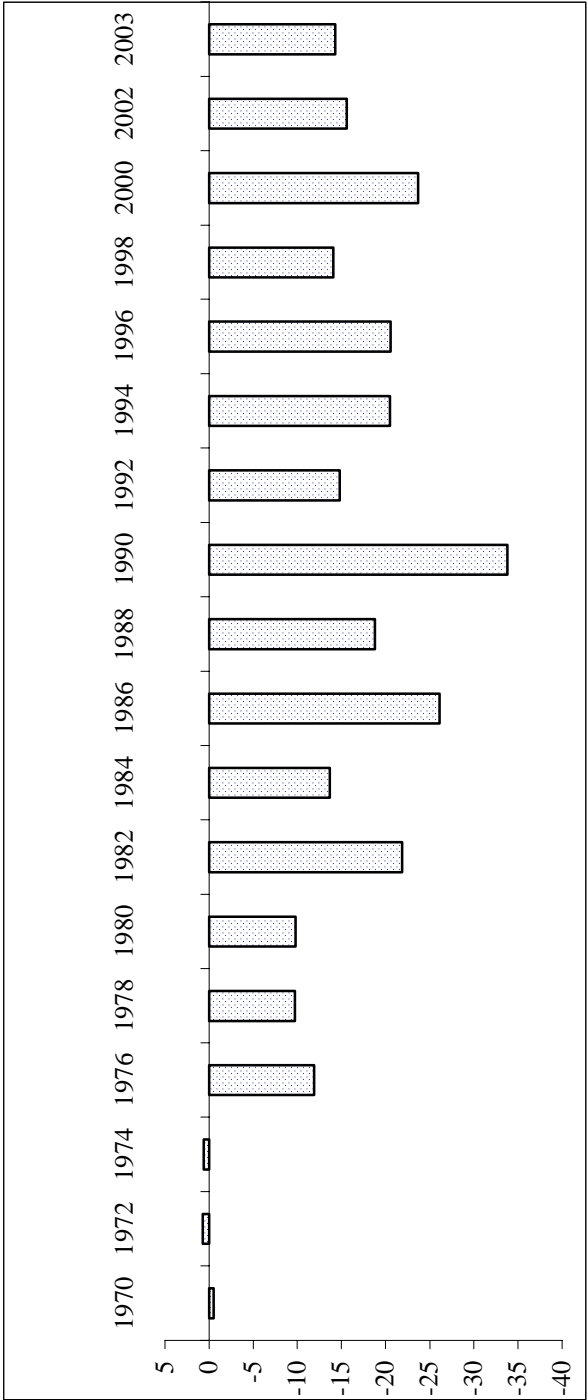
Sources: Based on data provided in *Monthly Bulletin, Quarterly Bulletin* and *Annual Report* of Banque du Liban (various years), Cashin et al. (1995), and Eken and Helbling (1999); and author's calculations.

FIGURE 2
Public Debt in Lebanon 1970-2003 (Percentage of GDP)
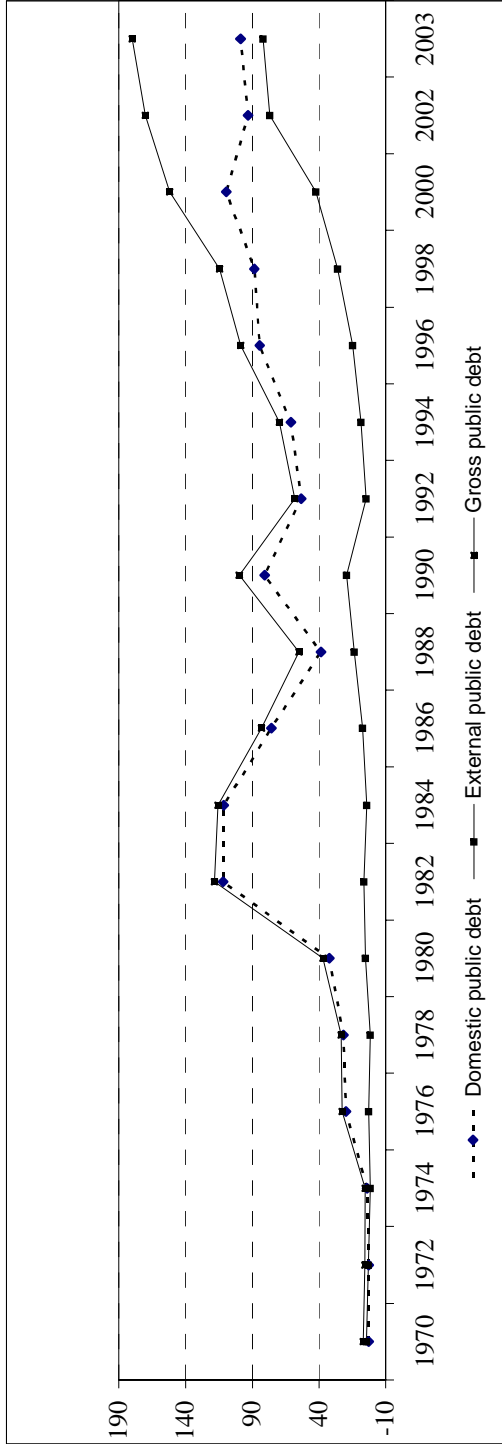
Sources: Based on data provided in *Monthly Bulletin, Quarterly Bulletin* and *Annual Report* of Banque du Liban (various years); Lebanon (various years), Cashin et al. (1995) and Eken and Helnling (1999); and author's calculation.

3. THE METHODOLOGY

The Granger-causality test was used to determine empirically the direction of causality between the budget deficit and trade deficit in Lebanon. The causality test involves estimation of the following vector autoregressive (VAR) models. If trade deficit (TD) 'Granger-causes' budget deficit (BD), denoted as TD →BD, then the VAR model would be:

(1) $\ln TD_t = \sum_{i=1}^{p} \alpha_i \ln TD_{t-i} + \sum_{j=1}^{q} \beta_j \ln BD_{t-j} + u_t,$

where u_t is the residual.

On the other hand, if BD →TD, then the VAR model is:

(2)

$\ln BD_t = \sum_{i=1}^{p} \delta_i \ln BD_{t-i} + \sum_{j=1}^{q} \phi_j \ln TD_{t-j} + v_t,$ where v_t is the residual.

Once the direction of the causality has been established using the Granger-causality test, the relationship between the twin deficits is characterized by the following vector autoregressive model of order p, VAR (p):

(3)

where $z_t = [y_t, x_t]'$, μ is the vector of constant terms $\mu = [\mu_y, \mu_{xt}]'$, t is a linear trend, $\delta = [\delta_y, \delta_{xt}]'$ and ϕ_j is a matrix of VAR parameters for lag j. In the context of this study, if $BD \to TD$ then $y_t = \ln TD_t$ and $x_t = \ln BD_t$. On the other hand, if $TD \to BD$, then $y_t = \ln BD_t$ and $x_t = \ln TD_t$. The variables estimated are in natural logarithms, so that the estimated coefficients are the elasticities.

As mentioned in Section 1, the two series y_t and x_t can either be $I(0)$ or $I(1)$. Note that even the series in x_t can be of different order of integration, either $I(0)$ or $I(1)$.

The error term ε_t can be partitioned conformably as $\varepsilon_t = \begin{bmatrix} \varepsilon_{y,t}, \varepsilon_{x,t} \end{bmatrix}' \sim (0, \Omega)$, where Ω is positive definite, where:

(4)

The vector error correction model (VECM) version of (3) is as follows:

(5) $\qquad \Delta z_t = \mu + \delta t + \lambda z_{t-1} + \sum_{j=1}^{p-1} \gamma_j \Delta z_{t-j} + \varepsilon_t, t = 1, 2, \dots$

where $\Delta = 1 - L$, and

(6)

The long-run multiplier matrix is given by λ, and can be characterized as:

(7)

where, *I* is an identity matrix. The diagonal elements of matrix λ are left unrestricted, hence allowing for the possibility of the series having a different order of integration, either *I*(0) or *I*(1). If   then *y* is *I*(1). In the case when $\lambda_{yy} < 0$, then *y* is *I*(0).

The specification in (5) can be written as an ARDL[*p, q*] model such as:

$$\Delta y_t = \alpha_0 + \alpha_1 t + \varphi y_{t-1} + \psi x_{t-1} + \sum_{i=1}^{p-1} \beta_{y,i} \Delta y_{t-i}$$

(8)

$$+ \sum_{j=1}^{q-1} \beta_{x,j} \Delta x_{t-j} + u_t, t = 1, 2, \dots$$

where φ and   are the long run multipliers,   , and $\beta_{x,j}$ are the short-run multipliers.

Using the specification in (8), we can test if y is co-moving with x_t. The test is called the bounds test as proposed in Pesaran, Shin and Smith (2001) and is carried out in the following manner. First, we estimate the model in (8) using the ordinary least squares (OLS) method. Second, we test the absence of a long-run relationship between y_t and x_t by restricting the coefficients of y_{t-1} and x_{t-1} to be zero. The bounds test is similar to the Wald-type test (*F*-statistics), where the null and alternative hypotheses are as follows:

$H_0 : \varphi = 0$ and $\psi = 0,$
$H_1 : \varphi \neq 0$ and $\psi \neq 0.$

However, the asymptotic distribution of the bounds test statistic is non-standard under the null hypothesis of no cointegration between y_t and x_t. The computed *F*-statistics under the null hypothesis are compared with the critical values given in Pesaran, Shin and Smith (2001). Here, the computed *F*-statistics (F_{Bounds}) are compared with the lower critical bound (*LCB*) and the upper critical bound (*UCB*).

If $F_{Bounds} > UCB \Rightarrow y_t$ is cointegrated with x_t
If $F_{Bounds} > LCB \Rightarrow y_t$ is not cointegrated with x_t
If $LCB \leq F_{Bounds} \leq UCB \Rightarrow$ result is inconclusive

In the latter case, the order of integration of the explanatory variables needs to be ascertained before a conclusive outcome can be drawn regarding the long-run relationship between y and x.

The rejection of no cointegration implies that there exists a stable long-run relationship between y_t and x_t. In this case, we can use the two-step strategy of the method proposed in Pesaran and Shin (1999) to estimate the long-run coefficients (elasticities) for our model. The estimation of the bounds test and the long-run elasticities was carried out using MICROFIT 4.0.

$\psi\beta_{y,i}$

3.1 SOURCES OF DATA

In this study, we use annual data from 1975 to 2003 and the data were obtained from the *Monthly Bulletin*, *Quarterly Bulletin* and *Annual Report* of Banque du Liban (various years) and the *International Financial Statistics* (International Monetary Fund, 2006). It is worth noting here that this study uses values of trade deficit and budget deficit at 1974 constant prices.

4. THE EMPIRICAL RESULTS

We examine the order of integration of the variables using the Phillip-Perron (1988) unit root test. We use this test because it allows for milder assumptions on the distribution of errors. Further, the test controls for higher order serial correlation in the series and is robust against heteroskedasticity. Based on the Phillip-Perron test, we find y and x to be integrated of order one, $I(1)$ (refer to Table 1).

TABLE 1

Test for Unit Roots for the Variables Using the Phillip-Perron test

Variable		Test Statistic	Order of Integration
ln*TD*	Level	-2.26	
	Δ*TD*	-6.28*	*I*(1)
ln*BD*	Level	-3.14	
	Δ*BD*	-5.63*	*I*(1)

Notes: 1. * significant at the 1% level based on the MacKinnon critical values.
2. The test was conducted with intercept and trend. The optimal lag was chosen using the Newey-West automatic truncation lag (Newey and West, 1994). Based on the Newey-West automatic test, 2 lags were chosen.

Based on the Granger Causality test (from Table 2), there exists a uni-directional relationship between the trade deficit and budget deficit. That is, at the 10 percent significance level we do not reject the null hypothesis that the trade deficit Granger causes budget deficit.

To select the appropriate model in (8), we estimate the ARDL[*p,q*] using different lag length for *p* and *q*, i.e., *p* and *q* equal to a value

TABLE 2
Test for the Direction of Causality for the Variables

Null Hypothesis	F-statistics	p-value
LnTD does not Granger Cause lnBD	2.9199	0.0784***
LnBD does not Granger Cause lnBD	1.1923	0.3252

Note: *** significant at the 10% level.

between 1 to 6. We do not proceed with p and q greater than 6 due to loss of degree of freedom. Several specifications with different lags are tested for statistical significance and for consistency with the cointegration method. Model specifications that are neither statistically significant nor cointegrated are discarded. We use the Akaike information criterion (AIC) to choose the appropriate lag length for the ARDL model. The specification we use here is the unrestricted intercept and with trend (Pesaran, Shin and Smith, 2001). Thus, the ARDL model given in (8) can be expressed as:

$$\Delta \ln TD_t = \alpha_0 + \alpha_1 t + \varphi \ln TD_{t-1} + \psi \ln BD_{t-1}$$

(9)
$$+ \sum_{i=1}^{p-1} \beta_{y,i} \Delta \ln TD_{t-i} + \sum_{j=0}^{q-1} \beta_{x,j} \Delta \ln BD_{t-j} + u_t$$

The model ARDL[4, 5] is chosen as the optimal specification based on the AIC for our study. The estimated model for the budget-trade deficit is given in Table 3. Various diagnostic analyses of the residuals (Breusch-Godfrey serial correlation test, White's heteroskedasticity test, Jarque-Bera normality test) are conducted to ensure the residuals satisfy the standard regularity conditions. Based on the Durbin-Watson test and the Bruesch-Godfrey serial correlation LM test, the errors are not serially correlated. White's test shows that the errors are homoskedastic. Based on the autoregressive conditional heteroskedastic (ARCH) test, we do not reject the null hypothesis that the errors are homoskedastic. Further, the Jarque-Bera test does not reject the null hypothesis that the errors follow a normal distribution.

The regression specification error test (RESET) proposed by Ramsey (1969) is used to test if the model is correctly specified. Based on the RESET test, we do not reject the null hypothesis that the estimated model is correctly specified. Based on the residual tests, and the model specification test, the estimated parameters for the model are unbiased, efficient and consistent.

TABLE 3
The Estimated ARDL Model for the
Budget –Trade Deficit Specification

Dependent Variable: ΔBD_t	Sample Period 1975-2003	
Variables	Coefficient	*p*-value
Constant	-1.2221	0.832
T	0.0598	0.590
$\ln BD_{t-1}$	-1.9367	0.122
$\ln TD_{t-1}$	1.7637	0.005*
$\Delta \ln BD_{t-1}$	0.6802	0.455
$\Delta \ln BD_{t-2}$	0.4607	0.545
$\Delta \ln BD_{t-3}$	0.1247	0.810
$\Delta \ln BD_{t-4}$	-0.2068	0.620
$\Delta \ln TD_{t-1}$	-1.2870	0.134
$\Delta \ln TD_{t-2}$	-0.8570	0.137
$\Delta \ln TD_{t-3}$	-0.4776	0.403
$\Delta \ln TD_{t-4}$	-1.0814	0.038**
$\Delta \ln TD_{t-5}$	-0.5300	0.064***
ECM (-1)	-1.8568	0.024**
R-squared	0.8128	
Akaike Information Criteria (AIC)	-4.5041	
Durbin-Watson	2.2122	
LM Test (Serial Correlation)	1.2461	0.264
White's Heteroskedasticity Test	0.3736	0.280
Autoregressive Conditional Heteroskedasticity	0.0874	0.918
Normality Test	0.0874	0.918
Ramsey's RESET Test	1.1690	0.280

Note: *, **, *** significant at the 1%, 5% and 10% levels, respectively.

4.1 ESTIMATING FOR A LONG-RUN RELATIONSHIP

We investigate the long-run relationship between the budget deficit and trade deficit using the bounds test. Based on this test, the computed *F*-statistic is 8.23, and the 5 percent and 10 percent critical bounds are [6.56, 7.30] and [5.59, 6.26], respectively (see Table 4). Since the computed *F*-statistics are above the *UCB* at the 5 percent significance level, there exists a long-run relationship between the budget deficit and trade deficit.

TABLE 4
Bounds Test for Cointegration Analysis

Computed *F*-Statistics (F_{Bounds})	8.23	
Critical bounds (10% level)	*LCB*: 5.59	*UCB*: 6.26
Critical bounds (5% level)	*LCB*: 6.56	*UCB*: 7.30

Note: Critical bounds are from Pesaran, Shin and Smith (2001).

4.2 ESTIMATING THE LONG-RUN ELASTICITIES

The estimated long-run coefficients (elasticities) for the UECM model are given in Table 5. In the long run, the budget deficit in Lebanon is found to have a positive and significant (at the 1 percent significance level) impact on the trade deficit, with an elasticity of 0.8178. This implies that a 1 percent increase in the budget deficit will result in an increase of 0.8178 percent in the trade deficit in Lebanon.

TABLE 5
Estimated Long Run Coefficients

Dependent Variable: ln*BD*	Sample Period: 1975-2003	
Variable	Coefficient	*p*-value
Trend	0.4042	0.002
Ln*BD*	0.8178	0.000

5. POLICY IMPLICATIONS AND CONCLUSIONS

Our empirical results support the Keynesian view that there is a weak linkage between budget deficit and trade deficit for Lebanon from 1975 to 2003. Using the UECM approach and the bounds test, we show that the budget deficit and trade deficit have a positive significant relationship in the long run. A one percent increase in trade deficit will lead to a 0.8172 percent increase in budget deficit. The direction of causality runs from the trade deficit to budget deficit. The empirical result from this study for Lebanon is consistent with Khalid and Guan (1999), who showed that for Indonesia and Pakistan the direction of causality runs from current account deficits to budget deficits, given the fact that these countries suffer from huge debt problems.

The above results are not surprising for Lebanon, as from 1975 to1990 the country was plagued by civil war. Much of the economy was decimated in the process. To finance government expenditure and the war during this period, the government borrowed from both internal and external sources. The 'twin-deficit' problem sustained during the post war period (from 1990 to 2000) was because of increases in import of capital goods (along with consumption goods), mainly for reconstruction of vital infrastructures and economic development. Again, this trade gap has been mainly financed from domestic and other external resources. As a result of rebuilding the infrastructure and the economy, there was acceleration in the growth of government capital expenditure. The post-war development was also financed by internal and external borrowing. As such, both the domestic and external public debt has been on an upward trend (refer to Figure 2). The increase in national debt over the period also increased the cost of servicing the national debt, resulting in the government running a larger budget deficit in this period. Note that during this period (1975-2003), export growth saw a downward trend, while imports accelerated.

The empirical results from this paper have important policy implications in terms of managing effectively the 'twin-deficit' problem. From this study, we show that stablising the trade deficit problem will help to manage the budget deficit problem in Lebanon. In this case, our

results provide a view that policy measures which can be taken to reduce the trade deficit could assist in reducing the budget deficit in Lebanon. The Lebanese economy depends heavily on the service sector (66 percent of GDP in 2000) such as finance, tourism, and business. Many of the services are exportable, and have the potential to contribute huge sums in foreign currency. Policies and strategies to strengthen the supply and demand side in these key sectors mentioned above will reverse the terms of trade in favour of Lebanon.

In addition, there are other measures, which are also important to tackle this problem. For example, raising national savings by reducing the government deficit and increasing the rate of private savings is a good way to reduce the trade deficit in Lebanon. We also believe that there are other policy measures which could also play a role in improving the trade balance in Lebanon, such as the coordination of monetary and fiscal policy; greater focus in improving the productive capacity and delivery systems in the key sectors of the economy, and policies to attract FDI and promoting exports should be encouraged. Therefore, the trade variable cannot be treated as the only fully controllable policy variable.Therefore, the ARDL model in this study can be extended to include other variables such as exchange rate and interest rate to depict this relationship as they are also important in the twin deficits processes.

In summary, this paper shows that there is a weak linkage between the trade deficit and budget deficit and the direction of causality runs from the trade deficit to the budget deficit. Hence, this paper brings evidence from a developing country on the twin deficit relationship, as well as its direction, which is consistent with earlier studies. From the above discussions, the 'twin-deficit' problem can be managed effectively if the economic environment is conducive to sustain growth, i.e., stable social and political environment, and sound supply and demand side policies.

ENDNOTES

1.   It is worth noting here that this period includes the pre-civil war period (1970-1974), the civil war period (1975-1991), the civil peace and the reconstruction period (1992-2003).

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