

The Twin Deficits Phenomenon in Some MENA Countries

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Abstract

The main purpose of this paper is analyses the short and long run relationship between budget deficit and trade deficit in some MENA countries. The data cover the period from 1971-2000 (and for I.R. IRAN 1959-2003). The relationship between these variables will be analyses in short and long run by using Johansen co-integration tests, ECM, and Granger causality test.

The empirical evidence provides support to the view of Ricardian Equivalence in Iran (Islamic Rep.), Jordan, Kuwait, Morocco, Oman, and Tunisia. But, the empirical evidence proves the validity of Keynesian proposition (conventional view) only Egypt, Bahrain, Oman, and Turkey.

Keywords: Budget deficit, trade deficit, twin deficit, Granger causality test, Johansen co-integration technique, Keynesian proposition (conventional view), Ricardian Equivalence hypothesis

1- Introduction

Large and persistent budget deficit have occurred with current account deficits in many nindustrial and MENA countries over the past three decade. This problem has motivated widespread interest and discussion concerning the so-called "*twin deficit*" phenomenon.

The main purpose of this paper is analysis the short and long run relationship between budget deficit and trade deficit in MENA countries. Thus, this study tries to test the Ricardian Equivalence, and the Keynesian proposition.

The reminder of the paper is organized as follows. In section 2 the theoretical framework is presented. Section 3 illustrates the twin deficits (budget

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and trade deficits) trends in Iranian economy. Section 4 outlines the econometrics methodology and reports the results. Section 5 concludes.

2- Theoretical Framework

From the national income accounting, we have:

$$\text{GDP} = C + I + G + X - M = C + S + T \quad (1)$$

Where:

C is consumption, G is government spending, I is investment, X is exports of goods and services, M is imports of goods and services, S is saving and T is taxes. From the relation (1), we get:

$$S + T + M = I + G + X \quad (2)$$

Or

$$(X - M) = (T - G) + (S - I) \quad (3)$$

Where:

$(X - M) = \text{TD}$ is the trade deficit

$(T - G) = \text{BD}$ is the budget deficit, and

$(S - I) = \text{SD}$ is the saving deficit.

In relation (3), the left hand side is the foreign deficit, and the right hand side is composed from two deficits: budget (or public) deficit and private saving deficit. The right hand side is also named domestic deficit. [4].

One of the most important analysis in economic literature is the analysis of the relationship between the budget deficit (domestic deficit) and current account deficit (foreign deficit), named as the twin deficit. Two approaches are known to explore the twin deficit phenomenon, the Ricardian equivalence and the Keynesian conventional preposition. The Ricardian equivalence claims that there is no relationship between two deficits. But, the Keynesian proposition argues that there is a positive relationship between trade and budget deficit. In fact, this proposition states that a budget deficit will lead to a current account deficit.

If the public saving is negative, then national saving will decrease. With a lower level of national savings, the interest rates should increase, which will lead

to an increase in the exchange rate. An increasing exchange rate will worsen the trade balance. So, the Keynesian proposition states that the budget deficit leads to an increase in the trade and the current account deficits.

Unlike the Keynesian proposition, the Ricardian Equivalence (one major school of thought) expects no causal impact from budget deficit to trade deficit. This approach reveals that the budget deficit is a result of a tax cut. Tax cut reduces public revenues and saving. This is a temporary procedure. The decrease of the public savings will be compensated for by an equal increase of private savings. The national savings will not be affected. Therefore, the budget deficit has no effect on the current trade deficit. In fact, in the Ricardian model, the driving force behind the current account is the response of consumption to various shocks to the economy. [4, 6, 8, 12, 14, 18, 24, 26, 27].

3- Twin deficits in Iranian economy (1959-2003)

One important characteristic of Iranian (public sector) economics is the persistence of budget deficit during 1959-2003, especially at the years of the post-revolutionary period. Budget deficit increases from 1.1 billion Rials in 1959 to 57 billion Rial in 1971 and to 458 billion Rial in 1977. In other words, budget deficit during 7 years (1971-77) has been increased approximately 8 times [22]. This figure after Iranian revolution had increased very strongly. For example, budget deficit increases from 528.3 billion Rials in 1979 to 2125.2 in 1988, and 1157.3 in 1991, and 4707 in 1999.

Below reasons are causes of government expenditure increase in Iranian post-revolutionary period [5]:

1. Public sector expansion in Nationalization process.
2. War with Iraq.
3. Dependency to unreliable oil market.
4. Paying too much subsidy to common people.
5. Establishing new institutions and organizations.
6. Loss of governmental companies.
7. Expenditures of war immigrants.
8. Imports of goods (especially military and necessary goods and services).

On the other hand, below factors are obstacles of government revenues growth after post-revolutionary period:

1. Decreasing the share of oil revenue in public revenue (especially in 1986).

2. Devaluation of Iranian currency.

Above mentioned factors are caused that the gap between government expenditures and revenues increased. Thus budget deficit has been expanded.

The ratio of budget deficit to GDP is an index for government success in controlling of budget deficit. During of war period (1980-1988), this ratio has been increased rapidly. It is increased from 10.28% in 1980 to 20.06% (approximately two times) in 1988. This results shows failure of government activity in controlling budget deficit. Also this ratio has been 0.05% in 1959 and increased to 1.27% in 1977. From 1989 to 1991, budget deficit and the trend of budget deficit to GDP ratio decreased. Despite increasing in expenditures, these fluctuations are due to increasing in income from foreign exchange selling.

The most serious problem in deficit financing in Iranian economy is financing from banking system. Borrowing from banking system causes increasing government debt and in turn, increase money supply and liquidity. On the average, budget deficit financing from banking system during 1963-1991 approximately has been 65%, after revelation 79%, and during 1986-1990 about 102%. Such policies causes liquidity in pre-revolutionary period earn average growth of 24%, in post-revolutionary period 22%, and also in during 1959-1999 about 23%. Therefore, budget deficit financing from banking system is another characteristic of public sector economics in Iran.

The other characteristic of Iranian economy during 1959-2003 is oscillatory trend in trade balance, especially in during 1989-2003

4- Econometric Methodology and Estimated Results

In this paper, we will study the relationship between budget deficit and trade deficit, named as the twin deficit, in some MENA countries. For this aim, we used some modern econometric approaches for analyzing the time series properties of variables and the relationship between them. Thus, we tested

- 1) The stationarity of the variables by using ADF test
- 2) The co-integration relations by using Johansen techniques, and
- 3) The Granger causality test for determining causality direction.

4-1- Unit Roots Testing

The data employed in this study are annual data (1971-2000) available from the International Financial statistics (IFS) for MENA countries. They are current account and budget deficit (or surplus).

The preliminary step of co-integration procedure is testing for the presence of a unit root in the series of interest. Thus, we first investigate the unit root properties of the data using ADF test statistics. Table (1) reports results for some of the MENA countries¹. Since the stationarity tests are known to be sensitive to lag length selection, the optimum lag length is specified using the Akaike Information criterion (AIC) and the Schwartz Bayesian Information Criterion (BIC).

Table (1) reveals that the null of nonstationarity cannot be rejected for all level series. Thus, two variables in all countries are nonstationary (or Integrated of order one I (1)). Analyzing first differenced data (not reported) suggests that all variables are integrated of order zero (or stationary).

4-2- Johansen co-integration Tests

Having determined that the variables are first-differenced stationary and thus they have the same order of integration, we used tests suggested by Johansen (1988, 1991). In determining the number of co-integrating vectors (r), the LR test based on λ_{\max} (maximal Eigenvalue of the stochastic matrix) and λ_{trace} (trace of the stochastic matrix) are used. In order to check the robustness of the results to the order of the VAR, the Johansen co-integration tests are carried out using two-, three-, and four-year lag length, and five specifications presented in Microfit 4.1 software.

The results of trace and maximal value tests appear in table 2. These tests show that we can easily reject the null hypothesis of no co-integrating vectors between budget deficit and current account deficit only in Bahrain, Egypt, and turkey. In other countries, that is, IRAN (Islamic R.), Jordan, Kuwait, Morocco, Oman, and Tunisia, there is no long-run equilibrium relationship between the two variables.

1- Data for other countries is insufficient for analysis.

Mohammadi (1994), by using data during 1962-92 from Iranian economy, concludes that there is a relationship between two deficits in long run. But in my study (1959-2003), it is revealed that there is no relationship between two deficits. Mohammadi (1994) used the ratio of trade balance and budget deficit to GDP, but in this study, we use budget deficit a current account deficit variables. Because of different period and different indexes, the results in two studies are contrast.

Moemeni-Vesalian (1999) , by using simultaneous equations and 3SLS technique , shows that there is positive relationship between two deficits , but Ghetmiri & Samadi (1995) , and Samadi & Sameti (2005) shows that there is (contrast to other studies) no direct relationship between budget deficit and trade deficit in short term in Iranian economy. First study used data from 1963-1994, but two later studies 1959-1991, and 1959-2002.

4-3- Granger Causality test

Johansen co-integration method only confirms the existence (or absence) of a long run equilibrium relationship between two variables and does not say which of the one variable cause the other. The ECM and Ganger causality tests help to determine the direction of causality between two deficits. The estimated results of ECM and Granger causality tests are presented in table (3). The results show that, only in Bahrain, Egypt, Oman, and Turkey there is a unidirectional causality between budget deficit and trade deficit. More important, the direction of causation running from budget deficit to trade deficit cannot be rejected at 5% level of significance in Egypt.

In Bahrain, Oman, and Turkey, the direction of causation running from trade deficit to budget deficit cannot be rejected at 5%, 5%, and 1% level of significance, respectively. In other countries, there is no causality relationship between two variables.

Anorou and Ramchander (1998) , contrary to most findings in the literature, finds trade deficits to cause fiscal deficits and not vice versa in five developing Southeast Asian economies--namely, India, Indonesia, Korea, Malaysia and the Philippines. *The above results are consistence with* the results for Bahrain, Oman, and Turkey in this paper.

Table 1: ADF unit root tests (1971-2000)

MENA Countries	Variables	Specification	Optimal Lag	Test stat.	Order of integration
<i>Bahrain</i>	CA	Constant (c)	3	-2.49	I (1)
		c, Trend(t)	3	-2.61	I (1)
	BD	c	3	-0.99	I (1)
		c, t	3	-2.66	I (1)
<i>Egypt</i>	CA	C	3	-1.74	I (1)
		c, t	3	-1.82	I (1)
	BD	c	3	-2.12	I (1)
		c, t	3	-1.93	I (1)
<i>IRAN, I.R. of (1959-2003)</i>	CA	C	3	-1.68	I (1)
		c, t	3	-2.35	I (1)
	BD	c	3	-1.96	I (1)
		c, t	3	-2.41	I (1)
<i>Jordan</i>	CA	C	3	-1.97	I (1)
		c, t	3	-1.34	I (1)
	BD	c	3	-1.32	I (1)
		c, t	3	-2.21	I (1)
<i>Kuwait</i>	CA	C	3	-2.017	I (1)
		c, t	3	-2.30	I (1)
	BD	c	3	-1.4	I (1)
		c, t	3	-1.32	I (1)
<i>Morocco</i>	CA	C	3	-1.76	I (1)
		c, t	3	-2.89	I (1)
	BD	c	3	-3.22	I (1)
		c, t	3	-2.75	I (1)
<i>Oman</i>	CA	C	3	-1.27	I (1)
		c, t	3	-2.59	I (1)
	BD	c	3	-1.67	I (1)
		c, t	2	-2.55	I (1)
<i>Tunisia</i>	CA	C	2	-2.16	I (1)
		c, t	2	-2.75	I (1)
	BD	c	2	-1.85	I (1)
		c, t	1	-3.15	I (1)
<i>Turkey</i>	CA	C	3	-1.6244	I (1)
		c, t	3	-1.6205	I (1)
	BD	c	3	-2.11	I (1)
		c, t	3	-2.65	I (1)

Table 2: Johansen co-integrating test (1971-2000)

MENA Countries	LR Test Based on	Unres. Int, no trend				Unres. int., res. trend				Unrest. Intercept., Unre. trends				r
		Order of VAR		Order of VAR		Order of VAR		Order of VAR						
		2	r	3	r	2	r	3	r	2	r	3	r	
<i>Bahrain</i>	λ_{\max}	11.56	0	14.43	1	26.43	1	18.49	1	26.4	1	18.44	1	1
	λ_{trace}	18.98	1	15.83	1	37.83	1	26.33	1	37.67	1	26.23	1	
<i>Egypt</i>	λ_{\max}	10.43	0	12.69	0	19.95	1	28.69	1	19.78	1	28.62	1	1
	λ_{trace}	4.96	0	18.87	1	24.91	1	37.24	1	24.59	1	36.75	1	
<i>IRAN (1959-2003)</i>	λ_{\max}	10.67	0	11.49	0	10.96	0	11.55	0	10.92	0	11.47	0	0
	λ_{trace}	14.47	0	15.11	0	17.25	0	18.17	0	16.07	0	16.49	0	
<i>Jordan</i>	λ_{\max}	11.38	0	12.50	0	11.53	0	18.83	1	8.49	0	18.33	0	0
	λ_{trace}	12.59	0	13.55	0	17.91	0	27.99	1	10.89	0	18.73	0	
<i>Kuwait</i>	λ_{\max}	10.63	0	8.85	0	10.75	0	10.53	0	10.47	0	10.49	0	0
	λ_{trace}	17.66	1	11.49	0	21.05	0	14.84	0	20.99	0	14.77	0	
<i>Morocco</i>	λ_{\max}	10.83	0	10.08	0	11.49	0	10.4	0	11.12	0	8.43	0	0
	λ_{trace}	12.50	0	14.13	0	15.77	0	15.69	0	15.29	0	13.59	0	
<i>Oman</i>	λ_{\max}	15.09	1	13.89	1	16.5	0	16.89	0	16.17	0	16.47	0	0
	λ_{trace}	18.36	1	14.82	0	19.985	0	20.71	0	17.39	0	17.36	0	
<i>Tunisia</i>	λ_{\max}	9.12	0	8.92	0	13.21	0	18.86	0	13.03	0	18.61	1	0
	λ_{trace}	11.86	0	12.24	0	22.3	0	24.95	0	22.10	0	24.62	1	
<i>Turkey</i>	λ_{\max}	24.02	1	6.22	0	27.97	1	8.43	0	27.96	1	8.4	0	1
	λ_{trace}	27.96	1	8.39	0	31.91	1	13.90	0	31.21	1	13.08	0	

Table (3): ECM and Granger causality tests

MENA Countries	BD does not GC CA F (prob.)	CA does not CG BD F (prob.)	No obs.	Lag
<i>Bahrain</i>	0.959 (0.431)	3.547 (0.035)	26	3
<i>Egypt</i>	3.58 (0.033)	1.04 (0.397)	26	3
<i>IRAN(1959-2003)</i>	0.257 (0.701)	0.551 (0.65)	45	2
<i>Jordan</i>	1.435 (0.26)	0.136 (0.874)	26	2
<i>Kuwait</i>	0.308 (0.819)	0.6808 (0.572)	25	3
<i>Morocco</i>	0.856 (0.439)	0.371 (0.694)	26	2
<i>Oman</i>	1.942 (0.159)	3.58 (0.03)	25	3
<i>Tunisia</i>	1.197 (0.322)	0.096 (0.908)	26	2
<i>Turkey</i>	1.0007 (0.333)	5.726 (0.0099)	27	2

Note: Optimal number of lags is chosen by using AIC and SBC Criteria

5- Summary and Concluding Remarks

This paper explores the relationship between budget and trade deficits, named as twin deficit, in some MENA countries using annual time series data covering the period 1971-2000 (and 1959-2003 for I.R. IRAN). The purpose of the paper is to test empirically the validity and rational of Keynesian proposition (conventional view) and the Ricardian Equivalence hypothesis. The Keynesian proposition confirms the existence of a positive relationship between budget and trade deficits, and the Ricardian Equivalence hypothesis neglects any relationship between them.

To reach our purpose, we analysis stationarity properties of data, applies the Johansen co-interration method, ECM modeling, and Granger causality and tests the existence and the direction of causality between variables.

We could not find any co-integrating relationship between the twin deficits in Iran (Islamic Rep.) , Jordan , Kuwait , Morocco , Oman , and Tunisia , but a co-integrating association was observed between two deficits in Bahrain , Egypt , and Turkey. Causality tests based on ECM and Granger test shows that there is a unidirectional causality between two deficits in Egypt (from BD to CA), Bahrain, Oman, and Turkey (from CA to BD). In other words , the empirical evidence provides support to the view of Ricardian Equivalence in Iran (Islamic Rep.) , Jordan , Kuwait , Morocco , Oman , and Tunisia. As stated earlier, the Ricardian Equivalence expects no causal impact from budget deficit to trade deficit. In fact, in the Ricardian model, the driving force behind the current account is the response of consumption to various shocks to the economy.

Also, the empirical evidence proves the validity of Keynesian proposition (conventional view) only Egypt, Bahrain, Oman, and Turkey.

Therefore, finding of this paper can be helpful in designing of fiscal polices in MENA countries, especially in Iranian economy.

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