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Trade deficit in Egypt: Is it can be controlled?

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Abstract

This study empirically estimates the critical parameters of trade deficit in Egypt for the period 1970-2014 by using dynamic ordinary least squares (DOLS) approach of Stock and Watson (1993). The analysis is based on time series from 1970 to 2014. Time series properties of the processes that generate the data be assessed to specify the order of integration for each series to satisfy the conditions of applying the DOLS procedure. Our estimation results show that all variables have its theoretical expected sign, which confirm that there exists a positive and significant relationship among the trade deficit in Egypt and real income, relative domestic prices to foreign prices, International reserves. On the other hand, there is a negative and significant relationship between trade deficit and real effective exchange rate.

JEL classification numbers: C22, F13, F14
Keywords: Trade Deficit, DOLS Estimation, Egypt.

1 Introduction

Trade is considered one of the means to achieve growth, employment, and welfare. In many countries, trade has a significant share in the Gross Domestic Product (GDP). International trade is pivotal when countries are not self-reliant in factors of production, consumer goods and capital goods. In the 19th and 20th centuries trade had p–layed a major role to accomplish global economic growth. In several developed and developing countries, international trade and long-term capital flows acted as 'engine of growth' in bringing rapid economic growth and development (Oke 2007). Rodrik (2001) rightly argues that no country has grown without international trade. External trade is one of the main sources of foreign

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exchange earning which is necessary to import capital goods plus other consumer goods and services that are not produced domestically. In business and Economics, foreign trade has always been emphasized for comparative advantage and one of the major components contributing to GDP. A persistent and high deficit in international trade is less likely to resemble the good health of an economy, leaving the question of its sustainability.

The trade deficit has been an intensive subject of interest in Egypt. So, in the recent years, questions were raised about the factors that can affect the trade deficit in Egyptian Economy. This study investigates the factors that affect the trade deficit in Egypt for the period 1970-2014 by using dynamic ordinary least squares (DOLS) approach of Stock and Watson (1993).

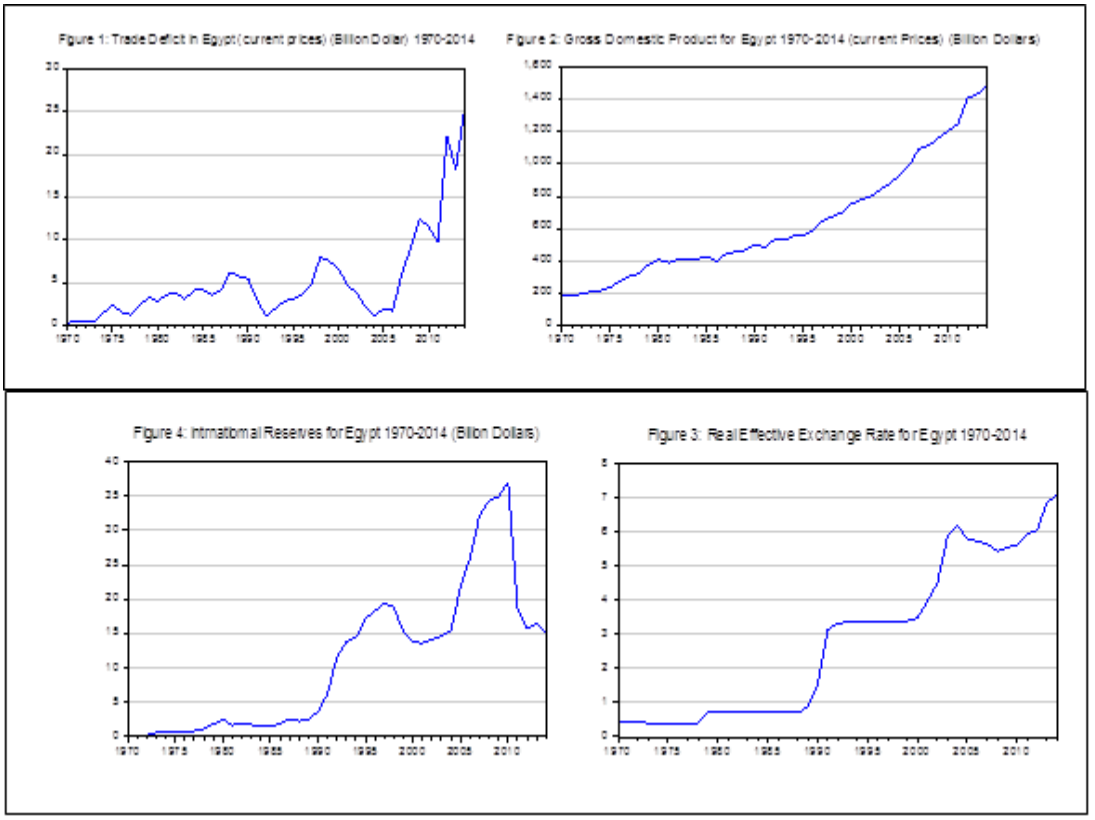
So, current research is significant as it adds to the body of knowledge on the validity of the theories of trade deficit for the case of a developing country like Egypt.

The paper is structured as follows: Introduction in Section 1. Section 2 provides some stylized facts about Egyptian economy and the behavior of trade deficit and its determinants in Egypt. Section 3 presents the theoretical background on which the models are based and also gives an empirical review of the literature. Section 4 discusses the data, evaluates the specifications of the economic models and describes the econometric methodology that will be adopted. Section 5 reports on the empirical results and Section 6 summarizes the concluding remarks.

2 Stylized Facts about Egyptian Economy and the Behavior of Trade and trade Deficit in Egypt

Egypt is classified as a lower-middle income country with a real per capita Gross Domestic Product (constant 2005 US$) in 2014 of $1467. It is one of Middle East and North Africa (MENA) countries that boost a population of 89.6 million, as of 2014. However, over the past decade, Egypt achieved major economic progress. Its real GDP grew at about 6.3 % during 1970-2014; foreign direct investment inflows amounted by 4.78 billion dollar, which represents 1.67% of GDP in 2014 (http://data.worldbank.org/indicator/). This performance was accompanied by increased trade openness, export promotion policies.

In this respect, as it shown in table (A-1), trade deficit has witnessed sharply increase since 2006 that increase accompanied with decrease in international reserves since 2010 and steady increase in gross domestic product (GDP). We also can observe that. real effective exchange rate has witnessed remarkable increase during 1970-2014.



Source: http://data.worldbank.org/indicator/.

As shown in table 1, total trade has increased from 1.88 billion dollars to 134 billion dollars during the period 1970-2014, with average growth rate 10.18%. At the same period, trade/GDP ratio increased from 24.48% to 46.77%, so this ratio has been doubled during the period (World Bank, World Bank Development Indicator, http://data.worldbank.org/indicator/)

Table 1: Some key trade indicators of Egypt (1970-2014)

	Value (billion dollar)		% of GDP*	
	1970	2014	1970	2014
Merchandise Exports	0.76	27.1	9.93	9.46
Services Exports	0.34	21.9	4.43	7.64
Total Exports	1.1	49	14.32	17.1
Merchandise Imports	0.79	67.5	10.29	23.56
Services Imports	0.65	17.5	8.46	6.11
Total Imports	1.44	85	18.75	29.66
Total Trade	1.88	134	24.48	46.77

Source: http://data.worldbank.org/indicator/.
* calculated by the author.

Table 2 illustrates that trade account balance suffering from increasingly deficit from 0.34 billion dollars to 36 billion dollars during the period 1970-2014, with annual average growth rate amounted by 11.18 percent. Although the merchandise account balance deficit increased dramatically with average growth rate 17.49 percent during the period 1970-2014. On the other hand, services account balance during the same period changed from deficit to surplus during the period 1970-2014, with average growth rate 15.02 percent. The higher average growth rates of the trade and the merchandise account balance deficits increase the necessity of find solutions for controlling this problem.

Table 2: Trade account (1975-2014)

	Value (billion dollar)		Average Annual Growth rate(%)	% GDP*	
	1970	2014	1970-2014	1970	2014
Merchandise Exports	0.76	27.1	8.46		
Merchandise Imports	0.79	67.5	10.64		
Merchandise Account Balance	-0.03	-40.4	17.49	0.39	15.05
Services Exports	0.34	21.9	9.93		
Services Imports	0.65	17.5	7.77		
Services Account Balance	-0.31	4.4	15.02	4.04	1.54
Trade Account Balance	-0.34	-36	11.18	4.43	12.57

Source: http://data.worldbank.org/indicator/.
* calculated by the author.

3 Literature review

There are considerable numbers of literature regarding the trade deficit. For some, it resembles a problem; for others, it does not. An overview of trade account of different countries suggests that many countries are passing through a trade deficit and this issue has been discussed in national, international, economic and political arena. The debate on trade deficit is most likely to revolve around its impact on the economy, way to finance it and its nature (causes, size and persistence) in question. There are writers and institutions focused on analyzing the issue from the viewpoint of developed and developing countries. In the former case, voices are raised to say that it is not a problem per se while in the later there are studies which have shown that trade deficit retards growth and development thereby inviting financial crises, deindustrialization, unemployment, and so on. Here are some arguments on the issue.

Mohammad (2010) investigated the long run and short determinants of trade deficit in Pakistan. Annual data for the period of 1975 to 2008 is used. For long run Johansen co integration technique is adopted, while Vector error correction model is used for short run analysis. Foreign income, domestic consumption, real effective exchange rate and foreign direct investment are the variables tested. Results showed that all the variables have a significant effect on the trade deficit in Pakistan

Falk (2008) analyzed the determinants of the trade balance using panel data for 32 industrialized and emerging economies for the period 1990–2007. The results

based on fixed effects models and linear mixed models allowing for random slope coefficients, show that the trade balance as a percentage of GDP is significantly positively related to real foreign GDP per capita of the trading partners. Real domestic GDP per capita has a negative effect on the trade balance. A real depreciation of the real exchange rate index leads to an improvement of the trade balance. However, in countries with a negative trade balance and/or a large positive net foreign direct investment position the trade balance is much less sensitive to movements in the real effective exchange rate index.

Ghosh and Ramakrishnan (2006) perceive the current account deficit from three perspectives, as the difference between the value of exports and imports of goods and services; gap in national investment and saving; and inter-temporal trade. If the deficit is due to high [external] investment, according to the authors, it does reflect only a low level of savings and no need to worry provided investments are channeled to output growth. Similarly, there is no harm of importing more goods, the authors contend, thereby incurring a trade deficit today and exporting the same tomorrow enjoying a surplus. In addition, if the deficit is easily financed by foreign capital as done by Australia and New Zealand, it is not bad but it can be bad if there is problem of financing the deficit due to withdrawal of private financing as in Mexico in 1995 and Thailand in 1997. Moon (2001, 2005) presents extensively in his papers about how a trade deficit hampers the economic growth of countries and leads to accumulation of higher foreign liabilities, dependence, distortion of national priorities, slower growth and development, and potential financial crises as in Latin American and East Asian countries in the past.

Hacker and Hatemi (2002) investigated the relationship between the trade balance and the exchange rate for the Czech Republic, Hungary, and Poland with respect to Germany. They found evidence of a positive long-run relationship between the trade balance and the exchange rate for all three countries. The Czech Republic and Poland seem to possess characteristics that lead to the J-curve effect. This is not the case with Hungary.

Baharumshah (2001) employd an unrestricted VAR model for the bilateral trade balances of Thailand and Malaysia with the United States. and Japan for the period 1980 to 1996. He found support for a stable and positive long-run relationship between trade balance and the exchange rate. The evidence on the short-run response of the trade balance supporting the J-curve effect is mixed. A delayed J-curve seems to apply to Thai data, whilst no support for the J-curve was found in Malaysian data. Bahmani-Oskooee and Kantipong (2001) investigated disaggregated data the J-curve between Thailand and her main trading partners Germany, Japan, Singapore, United Kingdom, and the United States for the period 1973 to 1997. They found evidence of the Jcurve in bilateral trade with the U.S. and Japan only.

Griswold (1998) for example, see the trade deficit not as bad news, not resulting from unfair trading practices of other countries and nor due to lack of competitiveness but due to emergence of other factors in the macro economy not directly related to trade. The author claims that trade deficit simply resembles the

mirror image of a surplus in the capital account and the growing economy of a country propelled by high investment. In contrast, in line with the 'worry position', the arguments are that trade deficit leads to a higher external debt which can crash down any time in the future alongside stopping of foreign financing. Udwadia and Agmon (1988) view the trade deficit from economic, political and moral standpoint and argue that it is a "no problem" situation. The authors argue that any potential crises due to a persistent trade deficit are overstated by political and moralistic perspectives and it has little implication with the economic impacts. From a political corner, the argument is that a trade surplus is contended as 'good for the country' and a must for those who think that power comes from profit. On moral ground the deficit is 'bad' when people say, 'do not consume more than your means' and 'save for a rainy day'. However, the authors have acknowledged the interplay of these three perspectives to turn the trade deficit as a problem.
From the above discussion, we can say that trade deficit is existent in many countries, economists have different perceptions to consider it as a problem, and regarding the sources of problem.

4 The model and the methods

The trade balance measured as the difference between the value of country's exports and imports and as a percentage of nominal GDP. Alternatively, as we use in our study, one can use the logarithm of the ratio of imports to exports as the dependent variable (Rose and Yellen, 1989).
Previous empirical and theoretical work suggests that the trade balance is influenced by a number of important factors. In the following, we advance a number of hypotheses concerning the relationship between the trade balance and the possible factors influencing the balance of trade, which we will proceed to evaluate in the following empirical work The trade deficit is generally affected as follows:

$$TD=f(Y, DF, REER, R) \quad (1)$$

where TD is trade deficit, Y is real income, DF is the relative domestic prices to foreign prices, REER is the real effective exchange rate and finally R is international reserves.
This paper therefore aims to employ recent developments in co-integration analysis. Given the extent to which such estimates are needed for planning national economic development, their precision becomes of crucial importance.
So, this study investigates the relationship between trade deficit and real income, relative prices, real effective exchange rate and international reserves in Egypt for the period 1970-2014 by using dynamic ordinary least squares (DOLS) approach of Stock and Watson (1993). The analysis is based on time series from 1970 to 2014. Time series properties of the processes that generate the data will be

assessed to specify the order of integration for each series to satisfy the conditions of applying the DOLS procedure.
The model that has been estimated is:

$$\log(MX) = \beta_0 + \beta_1 \log(RGDP) + \beta_2 \log(DF) + \beta_3 \log(REER) + \beta_3 \log(R) + \varepsilon \qquad (2)$$

Where MX is trade deficit expressed as the ratio of exports to imports (M/X), RGDP is real income, DF is relative domestic prices to foreign prices, REER is the real effective exchange rate, R is international reserve as a percentage of gross domestic product and "ε" is the error term.
This study used the annual data from 1970 to 2014. All data in this study was obtained from World Bank Development Indicator, the data has been converted to real values (2010 constant prices) by using consumer price index (2010=100). All these factors are illustrated at Table (A-1) in the appendix.

5 Empirical results

Phillips-Perron (PP) unit roots test is calculated for individual series to provide evidence as to whether the variables are stationary and integrated of the same order.
The results for each variable appear in Table 3. As shown in Table 3, the null hypothesis of a unit root can't be rejected for levels of all variables but the null hypothesis is rejected for the first differences of all variables. Therefore, we conclude that the series are integrated of order one.

Table 3: PP Unit root test results

		PP
Log(MX)	Level	-2.537421
	First Diff.	-6.070553[a]
Log(RGDP)	Level	-0.595140
	First Diff.	-7.026410[a]
Log(DF)	Level	0.300910
	First Diff.	-2.676384[c]
Log(REER)	Level	-0.520675
	First Diff.	-4.183598[a]
Log(RG)	Level	-2.018119
	First Diff.	-4.274808[a]

Notes: PP- Phillips and Perron (1988) unit root test with the Ho: Variables are I (1); a, b and c indicate significance at the 1%, 5% and 10% levels, respectively.

Table 4 and Table 5 give the results of the Likelihood Ratio tests based on the Maximum Eigenvalue and the Trace of the stochastic matrix respectively. Both these tests confirm the existence of one cointegrating vector between the variables, i.e. the existence of long-run relationship between them.

Table 4: Cointegration test based on Trace of the Stochastic Matrix

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.585833	73.43064	69.81889	0.0250
At most 1 *	0.357120	33.76377	47.85613	0.5148
At most 2 *	0.176665	13.88290	29.79707	0.8472
At most 3 *	0.091053	5.135235	15.49471	0.7943
At most 4 *	0.018475	0.839153	3.841466	0.3596

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level

Table 5: Cointegration test based on Maximal Eigenvalue of the Stochastic Matrix

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.585833	39.66688	33.87687	0.0091
At most 1 *	0.357120	19.88087	27.58434	0.3495
At most 2 *	0.176665	8.747664	21.13162	0.8522
At most 3 *	0.091053	4.296082	14.26460	0.8269
At most 4 *	0.018475	0.839153	3.841466	0.3596

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level

Since the variables are cointegrated, they can be represented equivalently in terms of a long run DOLS framework.

In Table 6, we see the results of the long run DOLS estimates for equation 2. The explanatory power is high (R2=87). All the explanatory variables are significant at 1% level except for real GDP which is significant at 5% level.

$$\log(MX) = 1.59 + 0.22\log(RGDP) + 0.65\log(DF) - 0.81\log(REER) + 0.13\log(RG) + \varepsilon \quad (3)$$

Table 6: DOLS estimates in the long run (1970-2014)

Variable	Coefficient
C	1.59[a]
LOG(RGDP)	0.22[b]
LOG(DF)	0.65b[a]
LOG(REER)	-0.81[a]
LOG(RG)	0.13[a]
	R^2 = 87
	Durbin-Watson: 2.00

Source: Table (A-3) in Appendix. a and b indicate significance at the 1% and 5% levels, respectively.

6 Concluding remarks and policy implications

This study empirically estimates the critical parameters of trade deficit in Egypt for the period 1970-2014 by using dynamic ordinary least squares (DOLS) approach of Stock and Watson (1993). The analysis is based on time series from 1970 to 2014. Time series properties of the processes that generate the data be assessed to specify the order of integration for each series to satisfy the conditions of applying the DOLS procedure. Our estimation results show that all variables have its theoretical expected sign, which confirm that there exists a positive and significant relationship among the trade deficit in Egypt and real income, relative domestic prices to foreign prices, International reserves. On the other hand, there is a negative and significant relationship between trade deficit and real effective exchange rate.

The Egyptian current account deficit is in danger of falling into a vicious circle, as the borrowing required to finance this deficit makes our international debt grow, and the interest payments required to service our growing foreign debt are becoming a significant negative factor in the current account balance. The trade deficit in Egypt can be controlled, the combination of liberalizing financial markets, high real interest rates, and financial volatility abroad could attract massive inflows of financial capital into Egypt, which in turn could push up the value of the Egyptian pound and made Egyptian products less price-competitive than they would be otherwise. This tilt in economic policies toward the interests of the financial sector has thus disadvantaged producers of tradeable manufactures, services, and agricultural products in Egypt.

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Appendix (A)

Table (A.1): Economic Data (1970-2014)

Period	Trade deficit (Current Prices) (Billion Dollar)	Gross Domestic Product (Current Prices) (Billion Pound)	Real Effective Exchange rate	International Reserves (Current Prices) (Billion Dollar)
1970	0.35	3.06	0.43	0.17
1971	0.42	3.24	0.43	0.16
1972	0.51	3.39	0.43	0.21
1973	0.50	3.81	0.40	0.53
1974	1.51	4.34	0.39	0.71
1975	2.41	5.22	0.39	0.54
1976	1.57	6.73	0.39	0.57
1977	1.28	8.34	0.39	0.83
1978	2.27	9.80	0.39	1.05
1979	3.38	12.71	0.70	1.80
1980	2.83	16.50	0.70	2.48
1981	3.61	17.32	0.70	1.68
1982	3.81	20.78	0.70	1.81
1983	3.08	24.17	0.70	1.70
1984	4.12	28.50	0.70	1.49
1985	4.21	33.13	0.70	1.59
1986	3.54	38.36	0.70	1.78
1987	4.13	51.57	0.70	2.56
1988	6.25	61.71	0.70	2.26
1989	5.73	76.79	0.87	2.50
1990	5.46	96.14	1.55	3.62
1991	2.95	111.24	3.14	6.19
1992	1.05	139.10	3.32	11.62
1993	1.98	155.20	3.35	13.85
1994	2.85	175.00	3.39	14.41
1995	3.10	204.00	3.39	17.12
1996	3.69	229.40	3.39	18.30
1997	4.75	265.90	3.39	19.37
1998	8.06	287.40	3.39	18.82
1999	7.49	307.60	3.40	15.19
2000	6.61	340.10	3.47	13.79
2001	4.74	358.70	3.97	13.60
2002	3.83	378.90	4.50	14.08
2003	2.15	417.50	5.85	14.60
2004	1.07	485.30	6.20	15.34

Period	Trade deficit (Current Prices) (Billion Dollar)	Gross Domestic Product (Current Prices) (Billion Pound)	Real Effective Exchange rate	International Reserves (Current Prices) (Billion Dollar)
2005	2.03	538.50	5.78	21.86
2006	1.74	617.70	5.73	26.01
2007	5.97	744.80	5.64	32.21
2008	9.11	895.50	5.43	34.33
2009	12.55	1042.20	5.54	34.90
2010	11.47	1206.60	5.62	37.03
2011	9.73	1371.10	5.93	18.64
2012	22.12	1656.60	6.06	15.67
2013	18.29	1843.80	6.87	16.54
2014	25.76	2101.90	7.08	14.93

Source: World Bank, *World Bank Development Indicator*.

Table (A.2): Econometric Data (1970-2014)

Period	(Import/Export)	Gross Domestic Product (2010=100) (Billion Pound)	Relative domestic prices to foreign prices	Real Effective Exchange rate	International Reserves/ GDP$
1970	1.32	3.06	0.09	0.43	1.32
1971	1.37	3.24	0.09	0.43	1.37
1972	1.43	3.39	0.09	0.43	1.43
1973	1.37	3.81	0.09	0.40	1.37
1974	1.82	4.34	0.09	0.39	1.82
1975	2.05	5.22	0.09	0.39	2.05
1976	1.53	6.73	0.09	0.39	1.53
1977	1.36	8.34	0.10	0.39	1.36
1978	1.70	9.80	0.10	0.39	1.70
1979	1.63	12.71	0.10	0.70	1.63
1980	1.40	16.50	0.11	0.70	1.40
1981	1.46	17.32	0.11	0.70	1.46
1982	1.55	20.78	0.12	0.70	1.55
1983	1.43	24.17	0.13	0.70	1.43
1984	1.60	28.50	0.15	0.70	1.60
1985	1.61	33.13	0.16	0.70	1.61
1986	1.63	38.36	0.19	0.70	1.63

Period	(Import/Export)	Gross Domestic Product (2010=100) (Billion Pound)	Relative domestic prices to foreign prices	Real Effective Exchange rate	International Reserves/ GDP$
1987	1.81	51.57	0.22	0.70	1.81
1988	2.03	61.71	0.25	0.70	2.03
1989	1.81	76.79	0.29	0.87	1.81
1990	1.63	96.14	0.32	1.55	1.63
1991	1.29	111.24	0.37	3.14	1.29
1992	1.09	139.10	0.40	3.32	1.09
1993	1.16	155.20	0.44	3.35	1.16
1994	1.24	175.00	0.46	3.39	1.24
1995	1.23	204.00	0.52	3.39	1.23
1996	1.26	229.40	0.54	3.39	1.26
1997	1.32	265.90	0.56	3.39	1.32
1998	1.59	287.40	0.57	3.39	1.59
1999	1.55	307.60	0.57	3.40	1.55
2000	1.41	340.10	0.57	3.47	1.41
2001	1.28	358.70	0.57	3.97	1.28
2002	1.24	378.90	0.57	4.50	1.24
2003	1.12	417.50	0.59	5.85	1.12
2004	1.05	485.30	0.64	6.20	1.05
2005	1.07	538.50	0.64	5.78	1.07
2006	1.05	617.70	0.67	5.73	1.05
2007	1.15	744.80	0.71	5.64	1.15
2008	1.17	895.50	0.81	5.43	1.17
2009	1.27	1042.20	0.91	5.54	1.27
2010	1.25	1206.60	1.00	5.62	1.25
2011	1.20	1371.10	1.07	5.93	1.20
2012	1.48	1656.60	1.12	6.06	1.48
2013	1.37	1843.80	1.21	6.87	1.37
2014	1.59	2101.90	1.31	7.08	1.59

Source: World Bank, *World Bank Development Indicator*.

Table (A-3): Dynamic Ordinary Least Squares (DOLS) Regression Results

Dependent Variable: LOG(MX)				
Method: Dynamic Least Squares (DOLS)				
Date: 05/13/16 Time: 09:20				
Sample (adjusted): 1970 2013				
Included observations: 44 after adjustments				
Cointegrating equation deterministics: C				
Fixed leads and lags specification (lead=1, lag=1)				
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 40.000)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LOG(RGDP)	0.216034	0.078615	2.747990	0.0106
LOG(CPIEGY/CPIUSA)	0.648850	0.091314	7.105691	0.0000
LOG(REER)	-0.811383	0.100942	-8.038105	0.0000
LOG(RESGDP)	0.125936	0.033063	3.809014	0.0007
C	1.593399	0.220931	7.212214	0.0000
R-squared	0.868620	Mean dependent var	0.334488	
Adjusted R-squared	0.790765	S.D. dependent var	0.170981	
S.E. of regression	0.078211	Sum squared resid	0.165157	
Durbin-Watson stat	2.002724	Long-run variance	0.003734	