THE RELATIONSHIP BETWEEN TRADE OPENNESS AND INVESTMENT IN SYRIA

Adel Shakeeb MOHSEN[*]

ABSTRACT

This study attempts to investigate the effect of trade openness, GDP and population on the investment in Syria over the period 1980-2010. The cointegration test indicates that investment is positively and significantly related to the trade openness, GDP and population. Population has the biggest effect on the investment. The Granger causality test indicates bidirectional short-run causality relationships between trade openness, GDP, population and investment. There are also unidirectional long-run causality relationship running from trade openness to investment, and bidirectional long-run causality relationships between GDP, population and investment. The study result indicates that it is vital for the Syrian government to still adopt the economic policy in liberalizing foreign trade in order to motivate the investment in the country.

1. INTRODUCTION

Improving the investment and creating an attractive investment climate is one of the most important goals of any country, because investment plays a vital role in economic growth by providing a source of output, income and employment creation in the country. Besides, trade openness can motivate investment through simplifying import and export procedures, which in turn encourage producers to increase and improve their production and investment in the country.

Like any other country, Syria tries to create an attractive investment climate and improve the investment in order to achieve a higher level of economic growth. Therefore, Syria has adopted many measures to encourage the investment. Trade liberalization is one of these measures that have been adopted by the government. By the early 1990s, the government passed the Investment Law No. 10 in 1991 to give producers many advantages and exemptions, which encourage them to increase their investment in the country (Seifan, 2009). Since 2000, the government has worked gradually to reform the Syrian economy and liberalize foreign trade through simplifying import and export procedures, and removing most tariff and non-tariff barriers. At the end of 2002, the tariffs on imported raw materials were reduced to 1%, and the ban on imported cars was removed as well as the tariff on cars imports was reduced (Ismail, 2005). Moreover, the Ministry of Economy and Trade issued more than 204 decrees in 2007 and

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[*]Economics PhD student at Universiti Sains Malaysia, Penang, Malaysia, Email: adelmhsen@hotmail.com

about 128 decrees in the first half of 2008 on the import liberalization of a wide range of goods and products to liberalize the Syrian market (NAPC, 2008). Furthermore, the government's strategy to motivate the investment in Syria during the first decade of the 21st century included the opening of private and Islamic banks, creating private insurance companies, creating industrial cities, providing the necessary industrial infrastructure, improving the quality of the human capital, and creating of the Damascus stock market (DSM) which opened its doors in March 2009 (UNIDO, 2009). That has encouraged the local and foreign investment in Syria (SIA, 2009). Figure 1 shows the gross fixed capital formation of Syria, from 1980 to 2010. It is clear that there was a big rise in the value of investment in Syria in the 21st century. Investment increased from SYP 156092 million in 2000 to SYP 337421 million in 2010 (see Figure 1).

Figure 1. Gross fixed capital formation of Syria, at constant 2000 price, 1980-2010
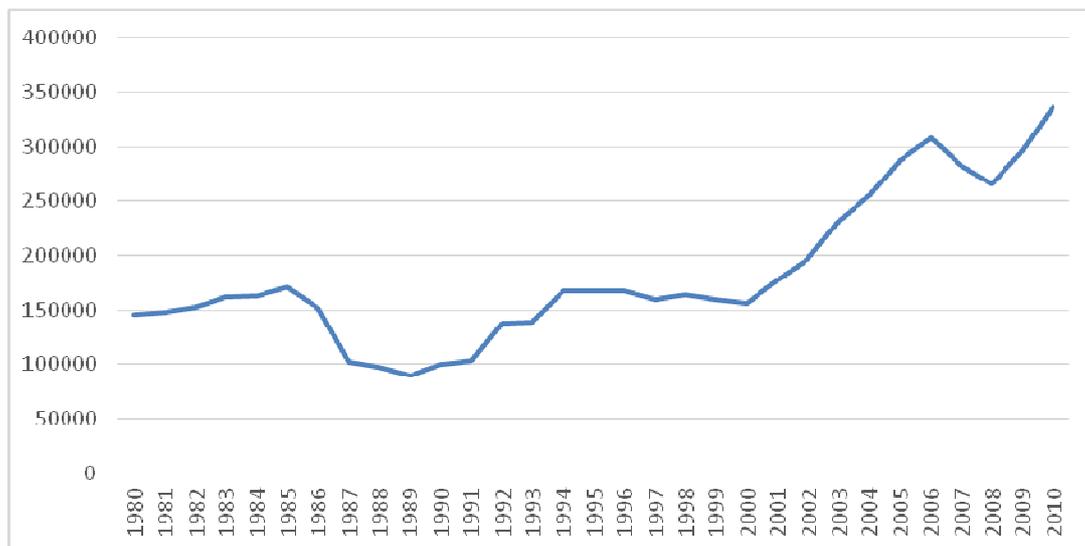
References: Central Bureau of Statistics

Unfortunately, the war has started in Syria since 2011, which caused a huge damage on the social and economic condition of the country, and created a new situation quite different than in before 2011. Many factories have been destroyed, the infrastructure has been damaged, investment has been declined, foreign trade has been declined, and the depreciation of the exchange rate of the Syrian pound has increased (SCPR, 2014).

The main objective of this study is to investigate the effect of trade openness on investment in Syria from 1980 to 2010, in order to know whether the government's economic policy in liberalizing foreign trade was a successful policy to motivate the investment in the country, and if it is vital for the Syrian government to still adopt the same policy after stopping the war. The organization of this study is as follows. The next section is the literature review and Section 3 provides a brief discussion on the methodology. Section 4 reports the empirical results, and the conclusion and recommendations are presented in Section 5.

2. PREVIOUS STUDIES

Many studies investigated the effect of trade openness on investment, and many other studies tested the effect of other factors like oil price, GDP and population on the investment of different countries.

Asante (2000) found that a restrictive trade regime has had a negative effect on private investment, while trade liberalization affects it positively. However, Bibi et al (2012) found that trade openness affects negatively the domestic investment in Pakistan, because trade openness helps in creating more chances for the outflow of capital out of the economy. Besides, Ouattara (2004) found that private investment in Senegal is affected positively from public investment, real GDP and foreign aid, while terms of trade affect it negatively. Furthermore, Lesotlho (2006) found that GDP growth, credit to the private sector, real interest rate and real exchange rates affect investment positively. Ajide and Lawanson (2012) also found that real GDP, real interest rate, credit to the private sector, the terms of trade, and reforms dummy have a positive impact on private investment in Nigeria. However, the exchange rate has a positive impact on domestic investment in the long run and negative impact in the short run.

Many studies tested the determinants of private investment in Jordan. For example, Al-Badry (1998) found that GDP growth rate, exports and the credit facilitating affect positively private investment, while real exchange rate, real interest rate, and government investment affect it negatively. However, AL-Abdulrazag (2003) found that GDP growth rate, population growth rate, real interest rate, and government investment spending on construction activities have a positive and significant effect on private investment in the construction sector. AL-Abdulrazag (2009) also found that government investment affects positively private investment. Besides, Al-khatib et al (2012) found that GDP growth rate, FDI, exports, human capital, domestic credit, and the development level of the financial sector have a positive and significant effect on domestic investment in Jordan.

Frimpong and Marbuah (2010) found that in the long and short run real GDP, public investment, credit to the private sector, inflation, real interest rate, real exchange rate and regime of constitutional rule have a positive effect on private investment in Ghana, while openness affect it negatively, because trade liberalization leads to the rise in the foreign competition of domestic private investors which affect private investment negatively. However, Naa-Idar et al (2012) found that inflation, GDP, trade openness and exchange rate have a positive impact on the investment in Ghana.

3. METHODOLOGY

The vector autoregression (VAR) model will be used in this study. Our model consists of four variables: investment, tread openness, GDP, and population in Syria. Investment is the dependent variable. The model is presented as follows:

$$lnINV = \alpha + \beta_1\,OPEN + \beta_2\,lnGDP + \beta_3\,lnPOP + \varepsilon_t$$

where α is the intercept, β_1, β_2, and β_3 are the coefficients of the model, *lnINV* is the natural log of gross fixed capital formation in real value (millions of SYP), *OPEN* is the tread openness (the percentage of total exports and imports to GDP), *lnGDP* is the natural log of the gross domestic product (millions of SYP), *lnPOP* is the natural log of population, and ε_t is the error term.

The analysis begins with the unit root test to determine whether the time series data are stationary at levels or first difference. The Augmented Dickey Fuller (ADF) unit root test is used in this study to test for the stationary of the variables. After determining the order of integration of each of the time series, and if the variables are integrated of the same order, the Johansen cointegration test will be used to determine whether there is any long-run or equilibrium relationship between the investment and the other independent variables in the model. If we found that the variables are cointegrated, the Granger causality tests will be conducted based on the VECM to determine the causality relationships among variables. On the other hand, if there is no cointegration among the variables, the VAR model will be employed to test for short-run Granger causality between the variables. Lastly, impulse response functions (IRF) test and variance decomposition (VD) analysis are used in this study to help in determining whether the independent variables play any important role in explaining the variation of investment at short and long forecasting horizons.

This study uses annual time series data of Syria during the period from 1980 to 2010. This data collected from the World Bank. All variables in this study are in real value. Besides, all data will be expressed in the logarithmic form, except for OPEN.

4. EMPIRICAL RESULTS AND DISCUSSION

From the results of the ADF unit root test in Table 1, we can see that all the variables are not stationary at the levels, but became stationary after first differencing at least at the 5 percent level of significance. This means that all the variables are integrated of order 1, that is, I(1).

Table 1. ADF unit root test results

ADF	Level			First difference		
	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None
lnINV	-0.367683	-3.443119	0.578826	-2.195454	-3.58665 **	-3.432274 ***
OPEN	-1.286164	-2.600719	0.134984	-6.172008 ***	-6.053857 ***	-6.229452 ***
lnGDP	1.117441	-1.771122	2.094763	-3.741055 ***	-4.786693 ***	-1.980987 **
lnPOP	-0.671752	-1.781639	2.934987	-1.461458	1.250879	-2.105626 **

Note: *** Denotes significance at the 1 per cent level, and ** at the 5 per cent level.

4.1. Johansen Cointegration Test Results

After determining that all the variables are stationary in the first difference, we can use the cointegration test to determine the presence of any cointegration or long-run relationship among the variables based on the Johansen cointegration test. But before running the cointegration test, we run the VAR model first to determine the optimal lag length, based on the minimum Akaike Information Criterion (AIC). Due to the limited number of observations, the maximum lag has been set to 4 in the lag length selection process. The optimal lag length selection is 4 lags based on the AIC.

After we have determined the number of lags, we proceed with the cointegration test for the model. Table 2 shows that there are three cointegration equations based on the trace and maximum eigenvalue tests. In other words, the results indicate that there is a long-run relationship between lnINV, OPEN, lnGDP, and lnPOP.

Table 2. Johansen cointegration test results

No. of CE(s)	Trace Statistic	Probability	Max-Eigen Statistic	Probability
r = 0	153.30180***	0.00000	66.14682***	0.00000
r ≤ 1	87.15500***	0.00000	53.21304***	0.00000
r ≤ 2	33.94195***	0.00040	26.05839***	0.00090
r ≤ 3	7.88356	0.08700	7.88356	0.08700

Note: *** Denotes significance at the 1 per cent level, and ** at the 5 per cent level

After having found a cointegration relationships among the variables lnINV, OPEN, lnGDP, and lnPOP, the cointegrating equation was normalized using the real INV variable. Table 3 shows the normalized cointegrating vector.

Table 3. Cointegration equation normalized with respect to INV

lnINV	OPEN	lnGDP	lnPOP	C
1.000000	-0.021871	-1.046569	-1.171234	-15.211030
	(0.002450)	(0.05620)	(0.18369)	(1.68450)

From the Table 3, the long-run lnINV equation can be written as:

lnINV = 15.211030 + 0.021871 OPEN + 1.046569 lnGDP + 1.171234 lnPOP

The cointegration equation above shows that the INV is positively related to OPEN, GDP and POP. The coefficient of OPEN indicates that for every one unit increases in trade openness, investment will increase by 2.19 percent. This suggests that trade openness has an important role in improving the investment through boosting exports and making importing of intermediate, capital goods and new technology much easier, which motivate the investment in the country. Our finding agrees with the results of Asante (2000) and Naa-Idar et al (2012).

The coefficient of lnGDP indicates that for every one percent increases in GDP, investment will increase by 1.05 percent. When GDP increases, which is an indicating that the economic situation in the country is good, this motivates producers to increase their investment to earn more profits, while a decline in the GDP makes producers reluctant to increase their investment in the country, because a decline in the GDP means that the national economy has some problems affecting it negatively. Our finding is in line with Al-Badry (1998), Ouattara (2004), Frimpong and Marbuah (2010), Ajide and Lawanson (2012) and Naa-Idar et al (2012).

The coefficient of lnPOP indicates that for every one percent increases in population, investment will increase by 1.17 percent. With increases in population, hands to work will increase and the domestic demand of various goods and services will increase too, which motivate produces to increase their production in the country. Hence, increases in population can motivate the investment in the country. AL-Abdulrazag (2003) also found that population affects positively the investment.

4.2. Granger Causality Tests Results

Since the variables in the model are cointegrated, the Granger causality tests based on the VECM are used to determine the short and long run causal relationships among the variables. The Granger causality test results based on the VECM are shown in Table 4. The significance of the coefficient of the lagged error correction term shows the long run causal effect. It is clear that there are bidirectional short-run causality relationships between OPEN, lnGDP, lnPOP and lnINV. Besides, there are unidirectional long-run causality relationship running from OPEN to lnINV, and bidirectional long-run causality relationships between lnGDP, lnPOP and lnINV.

Table 4. Granger causality test results

	Independent variables				
	$\sum$ lnINV	$\sum$OPEN	$\sum$ lnGDP	$\sum$lnPOP	ect(-1)
$\sum$ lnINV	-	4.315575(3)**	2.742821(2)**	3.768394(3)**	-2.943278*
$\sum$OPEN	2.873812(2)**	-	3.695711(3)**	1.372017(2)	-0.318207
$\sum$ lnGDP	4.734271(3)**	2.034684(2)	-	1.831901(2)	-3.763485**
$\sum$lnPOP	3.593297(4)**	1.123658(2)	2.084514(2)**	-	-2.978536*

Notes: ect(-1) represents the error correction term lagged one period. The numbers in the brackets show the optimal lag based on the AIC. D represents the first difference. Only F-statistics for the explanatory lagged variables in first differences are reported here. For the ect(-1) the t-statistic is reported instead. ** denotes significance at the 5 per cent level and * indicates significance at the 10 per cent level.

4.3. Impulse Response Functions (IRF) Test Results

Impulse response functions (IRF) allow us to study the dynamic effects of a particular variable's shock on the other variables that are included in the same model. Besides, we can examine the dynamic behavior of the times series over ten-year forecast horizon. There are many options for transforming the impulses. We will use the generalized impulse response functions (GIRF). Figure 2 shows that when there is a shock in OPEN, lnGDP or lnPOP, lnINV will respond positively in the following years. However the effect of the shock in lnGDP on lnINV is going down from the first to 10th year. Hence, it is important to improve the economic situation in Syria by improving the infrastructure and creating an attractive investment climate, as well as opening up the Syrian economy to foreign trade and improving the quality of the human capital.

Figure 2. Generalized impulse response functions (GIRF) results
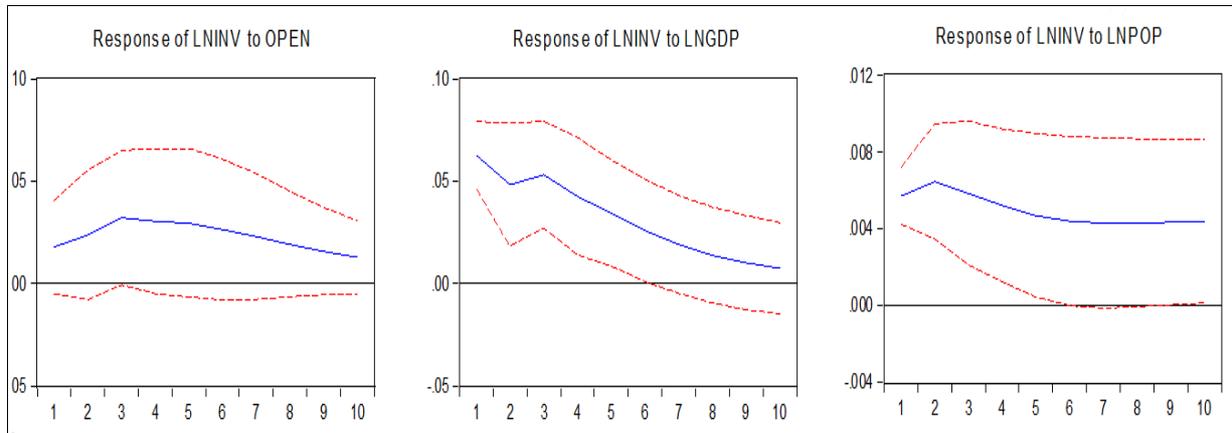
4.4. Variance Decomposition (VD) Analysis Results

The variance decomposition (VD) for 1-year to 10-year forecast horizons will be applied to explain how much of the uncertainty concerning the prediction of the dependent variable can be explained by the uncertainty surrounding the other variables in the same model during the forecast horizon.

Table 5. Variance decomposition (VD) analysis results

Variance Decomposition of lnINV:				
Period	S.E.	lnINV	OPEN	lnGDP	lnPOP
1	0.037382	100.0000	0.000000	0.000000	0.000000
2	0.041861	84.93361	11.30107	2.320181	1.445142
3	0.047849	65.27382	26.10944	6.368652	2.248084
4	0.053730	65.42666	26.22032	5.846241	2.506779
5	0.060879	54.91818	31.57273	9.136431	4.372662
6	0.064828	52.22974	28.42750	12.35160	6.991158
7	0.067859	47.73740	26.49572	12.81034	12.95654
8	0.069326	45.76793	28.60220	12.35801	13.27187
9	0.070222	45.46484	29.32095	12.27832	12.93590
10	0.071581	44.56026	29.79940	13.66697	11.97337

The forecast error variance decompositions of the variables in our model are given in Table 5. In the first year, the error variance of INV is exclusively generated by its own innovations and has been decreasing since then for the various forecast horizons. However, at the 10-year forecast horizon, its own shocks contribute about 45% of the forecast error variance. On the other hand, OPEN, lnGDP and lnPOP shocks explain 30%, 14% and 12% respectively of the forecast error variance of INV. Furthermore, the contributions of OPEN and lnGDP in explaining lnINV forecast error variance have increased during the 10-year forecast period.

5. CONCLUSION

This study investigated the effect of trade openness, economic growth and population on the investment in Syria using annual time series data from 1980 to 2010. The model has four variables, with the investment as the dependent variable and trade openness, GDP, and population as the independent variables. The ADF unit root test, Johansen cointegration test, Granger causality tests, impulse response functions (IRF), and variance decomposition (VD) analysis were used in this study. The ADF test results indicate all variables are I(1). The Johansen cointegration test showed that trade openness, GDP and population have a positive and significant long-run relationship with investment. Furthermore, from the Granger causality tests, we found that there are unidirectional long-run causality relationship running from trade openness to investment, and bidirectional long-run causality relationships between GDP, population and investment. While in the short run there are bidirectional short-run causality relationships between trade openness, GDP, population and investment. The impulse response functions (IRFs) indicated that when there is a shock in trade openness, GDP or population, investment will respond positively in the following years. The variance decomposition (VD) analysis showed that over a ten-year forecasting horizon, trade openness, GDP and population shocks explain 30%, 14% and 12% respectively of the forecast error variance of investment.

Based on the results of this study, trade openness makes the process of import and export much easier, which in turn motivates producers to increase their investments in the country. Besides, improving the economic situation in the country helps in creating an attractive investment climate, and population growth creates more hands to work and increases the local demand of different goods and services, which motivate the investment in the country. Hence, it is vital for the Syrian government to improve the investment climate, open up the Syrian economy to foreign trade and improve the quality of the human capital in order to encourage the investment in the country. Finally, the government's economic policy in liberalizing foreign trade was a successful policy to motivate the investment in the country. Hence, it is vital for the Syrian government to still adopt the same policy after stopping the war.

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