A Causal Relationship Between Foreign Direct Investment, Economic Growth and Export: Empirical Case For Jordan

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Abstract

The purpose of this research is to focus on the association among exports, economic growth, and foreign direct investment in Jordan. Predictions for economic growth effects were completed for the time interval from the first quarter in 2003 until the fourth quarter in 2013. Cointegration and Vector Error Correction paradigm were executed. Consequences of the research asserts the presence of long run association links among study variables. Conclusions show that exports influence GDP in a positive way, comparatively foreign direct investment has no effect on GDP. According to the methodology employed, the study confirmed a negative association of foreign direct investment on economic growth for the case of Jordan.

1 Introduction

The function of foreign direct investment (FDI) and exports in promoting economic growth has much been recognized. The surge in output and in the growth of an economic might be attributed to the role of exports and the openness of the economy (Szkorupováa, 2014). Exports are regarded as an important resource for foreign currency deemed by

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developing nations to hamper their balance of payment deficits and fight unemployment (BABALOLA et al., 2012).

FDI has many advantages in terms of relocating new technologies, learning managerial skills, and in terms of capital flux. Over and above, exports is another tool to link the local economy with the other world and in gaining prosperity and enforcing economic advancements (TEMİZ and GOKMEN, 2011).

The association between economic growth and foreign direct investment (FDI) has spurred massive practical studies. Many research focused on the influence of foreign direct investments and exports on economic growth in many countries and using variant time spans, as well as diverse econometric methodologies. Rather the consequence of exports and FDI on developing countries economic growth is varied (Dritsaki and Stiakakis, 2014). Although the assumption that nations that obtain extra FDI will advance faster, but confusion is still surrounding this argument (TEMİZ and GOKMEN, 2011). From here, the current paper is intended to investigate the long-run causal association relating economic growth with both exports and foreign direct investment, overbearing that such long run association do prevail.

This research is organized in the following way: section 2 presents a brief on Jordan's economy followed in section 3 with review of the relevant literature, and then Section 4 presents data and econometric methodology utilized. Section 5 offers the empirical outcomes and eventually, section 6 concludes.

2 Jordan's Economy

Jordan has inadequate resources, dependent on aid and according to World Bank classification is an upper-middle income country (UM). The foundation for the industry sector is limited and the service sector outbalance other economic sectors, and 92% of its total area is almost dry. It has a chronic deficit in balance of trade, which can be changed through the change in the growth balance among imports and exports. Imports progress is growing in a slow motion and exports growth rising notably. Increasing exports of manufactured notable goods are confronted with the increased competition from more efficacious imports, that one implies that some national industries will not last. In addition, Jordan's population are growing at a rate that reached at 2.2 %(The World Bank, 2015) leads to high employment challenges, and an even higher growth of population in the region mean that employment opportunities in the region may not be that easy accessible. Though Jordan attempted to downsize its deficits through aid from foreign donors and through fluctuating remittances, rather its development options are uneasy by its weak natural asset coupled with high unrest situation in the region and high unemployment rates.

3 Literature Review

There is a massive research studying the link relating FDI and exports effects on the growth of an economy. These influences are tested utilizing different models through varied countries and unequal time series. The outcome of these researches is presented in this section.

The related written previous studies has given a thorough confirmed theoretical argument on the relationship of FDI export to the growth of an economy. That is, the national and foreign sources for FDI do contribute to countries growth economy through different

channels of technical upgrading and high standards for investment in different types of human capital, particularly in developing countries (Apergis et al., 2008). The studies by Szkorupováa(2014) and Iqbal et al. (2010) demonstrated the long run association connecting FDI, exports with their interrelation to economic growth. Over and above Dash and Parida (2013) asserted a two-way association between FDI and growth of an economy, besides the connection of economic growth with service exports. Chakraborty and Mukherjee (2012) concluded a one-way association connecting economic grot to FDI and the latter effect on national investment in India. As in Almfraji and Almsafirc (2014) also pointed out to the FDI- economic growth linkages which verified to be positively significant. Khan et al. (2012) revealed a weak association between FDI and the growth of an economy. Whilst Alhajhoj (2007) concluded that export sector influenced the growth of an economy and this positive effect spill over in the long-run into other economic sectors

The study by BABALOLA et al. (2012) explained the interrelations connecting the growth of an economy with FDI and exports and other control variables such as gross fixed capital formation, degree of openness to trade, inflation rate, exchange rate, and terms of trade all react in a number of systematic way. For example, an increase in exports raise the degree of openness that ends up with a in technological transfer via FDI and hence raising the level of gross fixed capital formation and consequence effect on exchange rate and inflation rate stabilization.

Chowdhury and Mavrotas (2006) assumed that GDP is responsible for FDI and not the opposite for the case of Chile. Rather in Thailand and Malaysia, a two way linkages moving from FDI and economic growth do exists. TEMİZ and GOKMEN (2011) showed a causal relation of FDI and export. Muhammad et al. (2012) also concluded along run connection of openness with economic growth and confirmed the export led growth hypothesis.

Other research by Batten and Vinh Vo (2009) demonstrated the positive association of FDI on the growth of an economy in countries exhibiting high levels of education levels and degree of open to international trade and stock market advancement and with a minimum rate of growing population. In Cyprus Feridun (2004) asserted the one-way association moving from FDI to economic growth. Whereas for Greece Dritsaki (2004) assumed the association relating trade, FDI and economy growth. Liu et al. (2009) found a two-way of association connecting FDI (inward), merger and acquisition (inwards), trade and the growth of an economy in nine countries in Asia. Apergis et al. (2008) tried to reassess the significance of FDI to the growth of an economy in twenty-seven transition countries. The results indicated that FDI has a prominent effect to economic growth with these countries that are witnessing also high standards of income and have went into successful privatization schemes.

Yao (2006) confirmed the positive association between FDI, exports with economic growth, while Chang (2005) proposed that FDI has a clear influence on exports and growth of the economy. Yan et al., (2011) tested the serial correlation between FDI and economic growth in Nepal ad pointed out to the existence of auto-correlation, which if not present the FDI will not affect GDP in a proper way. For Othman et al. (2012), they illustrated the presence of long run association connecting tourism industry, FDI and the growth of an economy in 18 major international tourism destinations. Mello Jr. (1997) debated the influence of FDI on economic output in the FDI receiving country, which relies on the level of efficiency transition to domestic institutions, where FDI cause surge

in returns to the local output and a raise in the FDI value added content related to output in developing countries.

Hermes and Lensink (2003) examined the effect of financial system development in their association with FDI and the growth of an economy, and that relationship was asserted in thirty-seven countries of the study. Whereas, Nwosa et al. (2011) demonstrated in Nigeria the positive association relating financial development with FDI and economic growth. Sun (2011) demonstrated the connection between growth of an economy and FDI in China and that the error correction idiom has a disputable effect on the association relating FDI and economic growth in the long-run.

Table 1: Summary of Relevant Literature

Author, Year	Aim	Country studied	Time line	Methodology	Conclusion
Szkorupováa (2014)	Analyzed association-linking FDI, (EG)& exports.	Slovakia	(2001-2010) (10 years)	1.Cointegration 2.VECM.	Long-run causal links among (EG), FDI & exports.
Batten & Vinh Vo (2009)	Studied linkages between (FDI) &(EG).	79 countries	(1980–2003) (24 years)	Panel data modelling technique.	FDI has positive effect on (EG)in countries with specific characteristics
Othman et al. (2012)	Investigated association connecting tourism industry development & GDP & FDI.	18 major international tourism destinations	2007	ARDL	Long run relationship between tourism industry, (EG) & FDI.
Nwosa et al. (2011)	Focused on association relating FDI, financial development & (EG).	Nigeria	(1970- 2009) (40 yrs)	ADF	Association among financial development, foreign investment & (EG).
Iqbal et al. (2010)	Inspect association connecting international trade, FDI, & (EG)	Pakistan	1998-2009 (12 yrs)	Cointergration.	Long run association among FDI, international trade & (EG).
Chakraborty & Mukherjee (2012)	Test long-run association between FDI, domestic investment & (EG)& in which direction	India	1996.Q12-2009.Q2 (14 yrs)	1.Unit Root Test 2.Cointegration Test 3.Causality Test.	One-way association from (EG) to FDI & from FDI to domestic investment.
Muhammad et al. (2012)	Evaluate long run association of openness policy & (EG)	Pakistan	1970-2012 (43 Yrs)	1.Cointegration 2. Error Correction Model.	Long run association relating openness & (EG).
Dritsaki (2004)	Explored association connecting FDI, trade, & (EG).	Greece	1960-2002 (43 Yrs)	Cointegration analysis.	Causal association among trade, (EG)& FDI.
Almfraji & Almsafirc (2014)	Reviewed studies investigating association realting FDI & (EG).	Different	(1994-2012) (19 Yrs)	Literature research.	FDI-(EG) relation is associated positively

Dash & Parida (2013)	Examined association among trade services, FDI & economic output.	India	(Q1.1996–Q1.1997) + (Q4-2010–Q42011)	1.Co-integration 2.VECM	Two-way realtion between FDI & economic output & between services exports & economic output.
BABALOLA et al. (2012)	Examined association among exports, (FDI) & (EG).	Nigeria	(1960-2009) (50 Yrs)	Phillips-Peron technique.	At least six cointegrating vectors exist.
Sun (2011)	To find an association relating FDI & (EG).	China	2010	Cointegration.	One-way association moving from (EG) to FDI.
Khan et al. (2012)	Whether (EG)or decline in a diminishing behavior of FDI do exist	Pakistan	(2001-2010) (10 Yrs)	Multiple regression Model.	Weak association connecting FDI with (EG).
Yan et al. (2011)	Tested the serial association among FDI & (EG).	Nepal	(1983-2007) (25Yrs)	1. Durbin-Watson Test. 2. Cochrance-Orcutt.	FDI has no effect on GDP.
TEMİZ & GOKMEN (2011)	To discover relationship between FDI & export.	Turkey	(12.1991-10.2010) (20Yrs)	1.Unit root test, 2. Cointegration test. 3. VECM	Association relating FDI & export.
Li & Liu (2005)	To decide whether (FDI) influence (EG).	84 countries	(1970–1999)	1.Single equation 2.Simultaneous equation system	Association among FDI & (EG).
Chowdhury & Mavrotas (2006)	Tested the direction of association among FDI & (EG).	Malaysia Thailand Chile	(1969-2000) (32 Yrs)	Toda-Yamamoto test	GDP cause FDI in Chile and not the opposite. Two-way connection among FDI & GDP in Malaysia & Thailand.
Liu et al. (2009)	Focused on association relating FDI, economics growth, exports & imports.	9 Asian economies	(1970-2002) (33 Yrs)	VECM	Two-way linkages among FDI, trade, (M&As) and growth.
Alhajhoj (2007)	Examined long-term association linking (EG) & exports.	Kingdom of Saudi Arabia	(1970– 2005) (36 Yrs)	1. VAR. 2. Impulse Response Function (IFR). 3. Granger-causality.	Export sector influence (EG).
Feridun (2004)	Inspected the association between GDP per capita and FDI.	Cyprus	(1977-2002) (26 Yrs)	1.Granger causality 2.VAR	One-way association moving from FDI to economic growth.
Mello Jr.	Surveyed developments in	Developing	(1970-1990)	1.Case studies.	FDI influence on (EG) is upon sale of

(1997)	literature on (FDI) influence on growth.	Countries (DC)	(21 Yrs)	2.Growth Accounting Approach.	efficiency spillovers to domestic firms.
Apergis et al. (2008)	Check importance of FDI on (EG).	27 transition economies	(1991–2004) (14 Yrs)	1.Panel cointegration. 2. Causality tests.	FDI associated with economic growth in transition countries
Dritsaki (2004)	Investigated association relating trade, FDI & (EG).	Greece	(1960-2002) (43 Yrs)	1.Cointegration analysis. 2.Granger causality.	There is a causal relationship between Trade, Foreign Direct Investment (FDI) & (EG).
Yao (2006)	Studied influence of FDI & exports on economic performance.	28 Chinese provinces	(1978–2000) (23 Yrs)	1.Pedroni's panel unit root test 2.Arellano & Bond's dynamic panel data estimating	Exports and FDI have a prominent and positive influence on (EG).
Chang (2005)	Analyzed association among unemployment, trade, FDI & (EG).	Taiwan	(1988-2003) (16 Yrs)	1.VAR 2.Iimpulse response function.	(EG) & exports influence FDI positively
Hermes & Lensink (2003)	Examine role of financial system in supporting association between (EG) and FDI	67 LDCs	(1970-1995) (26 Yrs)	Voluminous growth regression.	Countries in Latin America & Asia attracted FDI & consequently to economic growth.

4 Data and Methodology

The economic relationship that going to be studied is given below.

LGDP = f (LFDI, LEXP)

Where GDP is gross domestic product, FDI is foreign direct investment and EXP is exports.
The equation is examined according to the data gathered quarterly during the interval from Q1.2003–Q4.2013.Both exports and GDP are seasonally clear, that is written with "sa" in the end of time series'title. Both these series, undergone seasonal adjustment because some observe fluctuation occur at the same time each years. Then, individual data were transformed by the natural logarithm before the testing to reduce variability. Individual time series transformed by logarithm are marked with a capital letter "L" before the each time series' title. The time series plots are presented in Figure 1 and descriptive statistics are given in Table 2.
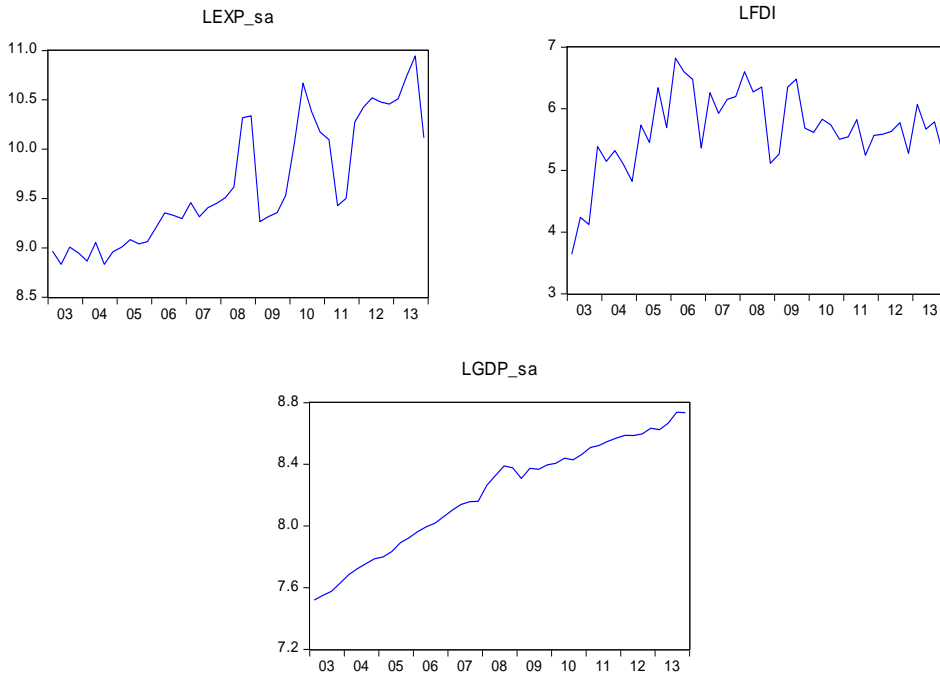

Figure 1: Time Series Plots

Table 2: Descriptive Statistics

	LEXP_sa	LGDP_sa	LFDI
Mean	9.648	8.207	5.655
Median	9.439	8.317	5.678
Standard deviation	0.626	0.360	0.656
Skewness	0.463	-0.379	-0.814
Kurtosis	1.811	1.902	4.153
Observations	44	44	44

It can be seen from Figure 1 that LEXP_sa and LFDI series fluctuate up and down while LGDP_sa shows an increasing trend. In addition, Table 2 indicates the distribution of all the series deviates from standard normal.

5 Results

Results of ADF test are shown in Table 3. The table presents information about the stationary testing of each time series at the levels and at first differences. As the results indicate all the time series are stationary at the first differences, thus the assumption for further analysis of the long run relationship is met.

Table 3: ADF Unitroot Tests

Variables	Level		1st differences	
	Lagged	**Test statistic ADF**	**Lagged**	**Test statistic ADF**
LEXP	9	0.498	9	-5.328**
LGDP	9	-1.835	9	-3.739**
LFDI	9	0.404	9	-6.301**

Note: ** denotesignificanceat the5% level.

The GDP is the dependent variable and FDI and exports are the independent ones. The Johansen test going to be executed so as examine the existence of a long run and short run association. The Johansen test is set up on two test statistics; these are the Trace and Max-eigen statistic. The Johansen cointegration results are shown in Table 4. Based on the discovering of the long run relationship between the time series, the cointegration link was established.

Table 4: Johansen Co-integration Test

H_0	Trace statistics	Max-eigen statistic
$r = 0$	36.708**	20.438
$r \leq 1$	16.269**	13.175
$r \leq 2$	3.094	3.094

Note: ** denotesignificanceat5% level.

The cointegration equation is composed as the followings:

$$LGDP = -0.039LFDI + 0.535LEPX + 3.278. \tag{1}$$

The above-mentioned equation exhibit that as long as FDI raises by 1% then a decline in GDP of 0.039% and if EXP raises by1 % then GDP increase by 0.535%.
The Johansen test indicates a long run reliance linking the three variables. Rather, Johansen test is avoiding the chance of the short-run variations between the two studied variables. The vector error correction model (VECM) is used to observe these fluctuations throughout cointegration. The VECM has the following equation:

$$\Delta LGDP\_sa_t = lagged(\Delta LGDP\_sq, \Delta LFDI_t, \Delta LEXP\_sq) + \lambda \mu_{t-1} + V_t \tag{2}$$

As the term lagged demonstrate particular number of defers interpreting variables. The optimum number of defers (delays) is determined by Akaikein formation standards and the chosen value are 2. point to the variable first difference, is the predicted residual element of the long-run association, calculated from cointegration test and defined as return rate in long-run equilibrium and Vt is the random element of white noise. A suitable adjustment of the model was checked through different residual component tests. Precisely, autocorrelation, normality and heteroscedasticity tests was performed. Based on Table 6, testing has eliminated the occurrence of the three events and asserted that the model is like enough chosen. Results of VECM is presented in Table 5.

Table 5: Vector Error Correction Model

Variables	D(LGDP_sa)
CointEq1	-0.0103
D(LGDP_SA(-1))	0.0068
D(LGDP_SA(-2))	0.0151
D(LFDI(-1))	0.0129
D(LFDI(-2))	0.0098
D(LEXP_SA(-1))	-0.0284
D(LEXP_SA(-2))	-0.0112

Table 6: Diagnostic Tests Results

Hypothesis Testing	Null Hypothesis	Statistic
Serial Correlation LM Test	Serial correlation do not exist at lag order h	7.905
Heteroskedasticity Test	Variance of the residuals is invariant over time	83.282
Normality Test	The distribution of the residuals are normal	11.319

For Jordan, the outcome of adjusted coefficient were low which is 1% of short run deviations off the equilibrium provision are adjusted through changes in GDP, the dependent variable within the lag length of two quarters.

6 Conclusion

The purpose of this paper is to investigate foreign direct investment and exports effect on the growth of Jordan's economy by utilizing quarterly data from 2001-2013. In the first place, in order to achieve a more reliable result, growth domestic product and export are seasonally adjusted. Next, the three series are tested using the ADF test and it revealed that after the 1st different all the series become stationary. Our analysis continues using Johensen test to explore the presence of long run or short run association among parameters used. Results indicate long run term association do exist within the mentioned variables. Cointegration equation had shown negative association relating GDP and FDI, rather positive association linked GDP and export. This finding proves that for Jordan, export rather than foreign direct investment encourages economic growth. Finally, as all the series have the same level of stationary and the Johansen test displayed cointegration among the variables, the analysis proceeds utilizing vector error correction model (VECM). Outcomes of the model uncovers that approximate 1% rate of convergence to long-term balance of short-run shocks. This indicates that convergence rate to the long-term equilibrium is very slow.

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