International Journal of Finance and Commerce
www.commercejournals.com
Online ISSN: 2664-715X; Print ISSN: 2664-7141
Received: 03-02-2019; Accepted: 04-03-2019; Published: 11-03-2019
Volume 1; Issue 2; 2019; Page No. 10-12

Examining the macroeconomic determinants of FDI inflows in Jordan

Dr. Ayed Al-Zyadat
Department of Financial & Banking Sciences, College of Administrative and Financial Sciences, Irbid National University, Jordan

Abstract
The main objective of this paper is to investigate the macroeconomic determinants of foreign direct investments inflows in Jordan using annual time series data for the 1985-2017 period. It employed autoregressive distributed lag approach to examine long-run and short-run relationships. The results show positive long-run relationships between foreign direct investments inflows and gross domestic product, foreign direct investments inflows and labor productivity, and foreign direct investments inflows and trade openness. In addition, a negative long-run relationship is found between foreign direct investments inflows and inflation rate.

Keywords: foreign direct investment inflows, macroeconomic determinants; jordan.

Introduction

The economic growth of Jordan has been astounding over the past few decades and has been taking huge steps in the way forward to becoming a fully developed country. The success of Jordan is partly and mostly due to the foreign direct investment (FDI) received over the past decades, making it a preferred destination of FDI in the Middle East. FDI is simply defined as investment from one country into another (normally by companies rather than governments) that involves establishing operations or acquiring tangible assets, including stakes in other businesses. Given the importance of FDI to Jordan's growth and economic transformation, this paper is devoted into examining the determinants of FDI inflows.

This paper aims to examine the impact of the selected determinants, i.e., gross domestic product (GDP) labor productivity (LP), inflation rate (IR), and trade openness (TO), of FDI inflows in Jordan so that it can identify the main determinants that influence FDI inflows as a guide for policy makers in formulating their policies with regards to attracting and sustaining high levels of FDI inflows, which is inarguably very much needed for continuous growth and development of the country as it still is dependent on foreign funds for such purpose. Given the strong currents of competition for FDI, it is imperative to re-examine the determinants of FDI for Jordan with the inclusion of recent data to remain relevant with changing business and economic environment albeit the abundance of previous studies on the same issues. In the face of increasing competition for FDI inflows especially among its Middle East neighbors, Jordan needs to be more focused how to over-ride its neighbors in attracting FDI and it is hoped that this simple study can shed some light for policy makers to design appropriate policy measures to optimize FDI inflows into the country.

2. Review of Literature of FDI Inflows Determinants

Over the past decade, several studies examined the relationship between FDI and their determinants using time series models. First, vector autoregressive (VAR) model have been employed by many researchers (Mushtaq *et al*., 2012; Kiran, 2011; Lv & Xiong, 2010; Tsoukalas, 2003) [31, 19, 21, 35]. Second, vector error correction (VEC) model applied by others (Imoudu, 2012; Adam & Tweneboah, 2009; Asaolu & Ogunmuyiwa, 2010; Ahmed, 2008; Kholdy & Sohrabian, 2008; Ibrahim & Aziz, 2003) [17, 1, 5, 2, 18]. Third, other studies have used autoregressive distributed lag (ARDL) approach (Bekhet & Al-Smadi, 2017; Mugableh, 2015a; Almsa fir *et al*., 2011; Faras & Ghali, 2009; Chandran & Krishnan, 2008; Fosu & Magnus, 2006) [6, 27, 3, 12, 11, 14]. Fourth, numerous studies investigated the relationship between FDI and their determinants using generalized autoregressive conditional heteroscedasticity (GARCH) models (Ang, 2008; Cassidy & Callaghan, 2006; Smith-Hillman & Omar, 2005) [4, 10, 34]. Fifth, numerous studies have examined the relationship among FDI inflows and their determinants using panel data models (Fereidouni *et al*., 2011; Hanousek *et al*., 2011; Kok & Ersoy, 2009; Yartey, 2008) [13, 15, 20, 36].

3. Data and Methodology

Annual time series data have been collected for the 1985-2017 period from the World Bank https://data.worldbank.org/country/jordan. However, the general form of the model is specified as follows:

$$FDI = f(GDP, LP, IR, TO) \quad (1)$$

To investigate long-run and short-run relationships among FDI inflows and their determinants, several steps of the methodology are used. The current paper employs Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) statistics tests to detect the level of stationarity either at *I(0)*, *I(1)* or *I(d)*. Before processing ARDL approach, it needs to ensure that the variables are not *I(2)* stationary level to avoid spurious results (Pesaran *et al*., 2001; Bekhet & Mugableh, 2012; Mugableh, 2013; Bekhet & Mugableh, 2013; Mugableh, 2015b; Mugableh, 2015c; Bekhet & Mugableh, 2016; Mugableh, 2017a; Mugableh, 2017b; Mugableh, 2018a; Mugableh & Oudat, 2018b; Mugableh & Oudat, 2018c) [33, 8, 7, 7, 26, 27, 9, 28, 29, 30, 22, 23]. In addition, Pesaran *et*

al. (2001) [33] developed bounds testing approach and argued that the long-run equilibrium relationships could be estimated based on standard F-statistics tests and the short-run relationship can be directly estimated. The ARDL approach could be formulated in natural logarithmic form as the following:

$$\Delta LogFDI_t = \alpha_0 + \alpha_{1t} LogFDI_{t-1} + \alpha_{2t} LogGDP_{t-1} + \alpha_{3t} LogLP_{t-1} + \alpha_{4t} LogIR_{t-1} + \alpha_{5t} LogTO_{t-1} + \sum_{s=1}^{h} \alpha_{6s} \Delta LogFDI_{t-s} + \sum_{s=0}^{h} \alpha_{7s} \Delta LogGDP_{t-s} + \sum_{s=0}^{h} \alpha_{8s} \Delta LogLP_{t-s} + \sum_{s=0}^{h} \alpha_{9s} \Delta LogIR_{t-s} + \sum_{s=0}^{h} \alpha_{10s} \Delta LogTO_{t-s} + \varepsilon_t \quad (2)$$

Where Δ is the first difference operator; α_0 is the intercept term; α_i ($i = 1\ldots., 5$) represents the long-run coefficient of the variables; α_i ($i = 6\ldots.. 10$) represents the short-run coefficient of the variables; ε_t denotes the error term. The decision rule is based on compare the calculated F-statistics value with the critical values tabulated at statistical tables (Pesaran & Pesaran, 2009) [32]. If the calculated F-statistics value are greater than the upper bounds value, *I(1)*, the null hypotheses, H_0: α_i ($i = 1\ldots. 5$) = 0, no co-integration, would be rejected. Therefore, the variables included in the models share long-run relationship.

4. Results Analysis

The results of ADF and P.P unit root tests indicate that all variables are stationary at I(1) (see Table 1). Therefore, if all the variables are stationary at I(0), I(1) or both, the ARDL approach would be used.

Table 1: Results of unit root tests

Variables	ADF Test	PP Test
	I(1)	I(1)
Log FDI	-3.40***	-5.89*
Log GDP	-3.65**	-3.56**
Log LP	-5.47*	-5.49*
Log IR	-3.95*	-6.15*
Log TO	-5.08*	-7.29*

Note: *, **, *** denote statistically significance at 1%, 5% and 10% levels respectively.

Table 2 shows that the H_0 of no co-integration among the variables in FDI_t model is rejected at 5% significance level.

Table 2: Co-integration test results

Series model	Calculated F-statistic value	Significance level	Bounds F-statistic critical value		Decision
			I(0)	I(1)	
ΔLog FDI	5.123	5%	3.189	4.329	Co-integrated

Table 3: Results of long-run relationships analysis

Series model	Constant	Log FDI_{t-1}	Log GDP_{t-1}	Log LP_{t-1}	Log IR_{t-1}	Log TO_{t-1}
ΔLog FDI	-0.29	-------	0.49***	I.34***	-0. 21***	0.73***

Note: ***denote statistically significance at 10% level.

Table 3 presents the estimation of the long run coefficients for the variables in the model of the study. However, the results show that there is a positive relationship between GDP and FDI; LP and FDI; TO and FDI. In addition, there is a negative relationship between IR and FDI. This means that an increasing of GDP, LP, and TO would lead to increase the FDI. Furthermore, the decreases of IR would lead to increase FDI and vice versa.

4. Conclusions and Policy Implications

This paper explores the macroeconomic determinants of foreign direct investments inflows in Jordan using annual time series data for the 1985-2017 period. It employed the ARDL approach to examine long-run and short-run relationships. The results show positive long-run relationships between foreign direct investments inflows and gross domestic product, foreign direct investments inflows and labor productivity, and foreign direct investments inflows and trade openness. In addition, a negative long-run relationship is found between foreign direct investments inflows and inflation rate. In general, the results of this study are important for policy makers, foreign investors, corporations and academics, since they are interested in the relationships among FDI inflows and their determinants. However, the results of this study recommend that the Jordanian policy makers should pay more attention to the current regulations by adding more facilities that ultimately helps to attract more foreign investors and create new power of productivity in Jordanian economy.

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