Determinants of foreign investment in maritime nations

Tahar Jouili *

College of Business Administration, Northern Border University, Arar, Saudi Arabia

A R T I C L E   I N F O

A B S T R A C T

This study explores the determinants of foreign direct investment based on panel data analysis. It addresses the relationship of the performance logistics and the shipping connectivity and the foreign direct investment (FDI). This study attempted to fill this gap by estimating the impact of these factors on the FDI, based on World Development Indicators database of 39 developing maritime nations over the period 2007-2016. The aim of the study is to investigate the relationship between countries' foreign direct investment and their logistics performance, and their shipping connectivity. The study has the originality to introduce tow logistics variables (logistics performance and maritime connectivity) in addition to controlling variables (exchange rate, and gross of domestic product). Empirical results suggest that the shipping connectivity, as well as the logistics performance, could be determinants of foreign direct investment. Concerning control variables result is in line with some study, the coefficient of GDP per capita is positive and significant, while the ORE has a significant negative coefficient.

1. Introduction

The Foreign Direct Investment (FDI) is defined as a category of investment that reflects the objective of establishing a lasting interest by a resident a company or individual in one country in business interests in another country, such as ownership or controlling interest in a foreign company (OECD, 2008). The FDI is considered as one of the main levers on which countries expect to rely for sustainable economic development. The development of FDI in any country increases the domestic production, and allows a better use of resources, and easy access to the technology, and new products. FDI can act as a mechanism to accumulate physical capital and transfer human capital to the receiving country, which can increase economic growth rate. Technology transfer increases the efficiency of production factors and this in turn reduces the technological gap between national and international enterprises (Anwar and Nguyen, 2010). FDI is an important source of development financing, particularly for developing and less developed economies, as it contributes to productivity gains by bringing in new investment, better technology, and management expertise and by opening up export markets (Sahoo et al., 2014). FDI usually represents a long-term commitment to host country and contribute significantly to gross fixed capital formation in developing countries (Kaur and Dhillon, 2017).

The analysis of the FDI should be viewed as a necessity in the context of contemporary trends of investment liberalization. The literature on FDI determinants shows that there exist relationship between FDI and several macroeconomic variables, such as: the Gross Domestic Product (GDP), the exchange rate, the host country's market, socio-cultural, economic stability, bilateral investment treaties, the degree of openness, regional integration agreements, language, and culture. Despite the literature on FDI determinants is quite rich, there are other variables that could be influenced the FDI; such as: the performance logistics and shipping connectivity. To our knowledge there are not papers address the relationship of the performance logistics and the shipping connectivity and the FDI. This study attempt to fill this gap by estimating the impact of these factors on the FDI, based on World Development Indicators database of 39 developing maritime nations.

This study does an empirical investigation into the determinants of FDI. It discusses the impact of logistics performance, and the shipping connectivity on the FDI in 39 developing maritime nations. The main aim of the study was to investigate a reliable evaluation of the effect of the aforementioned variables on the FDI of developing maritime nations.

The study has the originality to take a closer looks at the determinants of FDI. The study findings could be help decision-makers to find out the factors used by a foreign investor when developing its investment strategy.

The rest of the paper was structured as follows. The next section provides a literature review on FDI determinants. Section 3 presents the theoretical framework and hypotheses. Section 4 provides a description of data. Section 5 presents the empirical results and discussion. Section 6 was devoted to concluding remarks.

2. Literature review

The literature shows several studies which have attempted to set the determinants of FDI. Numerous variables have been identified in the literature as determinants of FDI. The factors that play a significant role in attracting FDI in Africa countries for Indian investors was socio-cultural, bilateral investment treaties, regional integration agreements, gross domestic product growth, language, and culture (Anusree, 2014). For the Romania case study the main factors taken into consideration by 235 manufacturing companies when building their investment strategies in a specific regions. The foreign investors may see Romania as being formed by two types of regions: the first cluster, proper for those looking for new markets, infrastructure facilities and qualified labor force; and the second cluster, suited for those more cost oriented (Danciu and Strat, 2012). Findings for Thailand the impact of natural disaster on FDI by applying the simultaneous equation approach show that natural disaster does matter for FDI flows. Higher severity of natural disaster, captured by the constructed composite index, tends to lower FDI flows into Thailand other things being equal. The occurrence of natural disasters has negatively influenced FDI. Also a weaker Thai currency tends to increase FDI flows, due to firms taking advantage of low costs of acquiring production and other facilities in Thailand. In addition, there exists a two-way relationship between FDI and the level of economic development (Chaiyasit and Kannika, 2015). China's outward FDI is attracted to countries with high volumes of exports from China, large GDP per capital and rapid GDP growth. As well, China's foreign investments are promoted by natural resources-rich countries and open economic regimes (Zhang and Daly, 2011). For the eastern European countries, there is a coexistence of horizontal FDI and vertical FDI patterns. Similar country characteristics favor horizontal FDI, taking place mainly between the high income countries; between countries of sufficient size similarity; between countries with relatively abundant in factor endowments. Also trade costs in the host country are also relevant to horizontal FDI as it seeks to avoid transportation costs and trade barriers by producing goods locally (Stack et al., 2017). The differences in location advantages represent an important determinant of FDI among potential host countries. The development of market economy, institutions, in particular the private sector, has the biggest influence on the dynamics of FDI inflows into the Serbian economy (Marija et al., 2013). In Vietnam, there is market size, availability of international standard infrastructure, availability of human capital, the level of openness, are the major determinants of FDI. The other determinants of FDI include the GDP growth rate, macroeconomic stability and domestic investment per capita (Anwar and Nguyen, 2010). The analysis of the determinants of the inflows of FDI in India confirms that foreign exchange reserves, openness, Gross Domestic Product and long-term debt have found to have a positive impact on FDI, while the negative impacts of inflation and exchange rate of FDI have been noticed (Kaur and Sharma, 2013). For the EU countries the analysis of the impact of labor and corporate tax on the decisions FDI stocks within shows that the impact of corporate taxation is well documented, while the role labor taxation plays for FDI is much less studied. The labor taxation is an important determinant of FDI decisions (Hansson and Olofsdotter, 2014). The analysis of the relationship between economic infrastructure, gross fixed capital formation, and FDI inflows to Hungary shows that short run, lagged changes in economic infrastructure, as well as lagged changes in private capital formation are positively associated with changes in FDI inflows. The real effective exchange rate is positively correlated with FDI inflows in the long run, but not in the short run (Ramirez and Kőműves, 2014). The analysis of the potential interaction between FDI and the host country's infrastructure base (employing a panel dataset involving 46 countries, using the size of three types of infrastructure capital: telecommunication, power generation, and network of roads or highways) approves that the size of the host country's infrastructure base assists to increase the effect of FDI on real income (Nourzad et al., 2014).

3. Theoretical framework and hypotheses

Although the large number of determinants of FDI shown in the literature review, FDI further study is needed; in order to identify other important factors that foreign investors used to locate investment. The study has the novelty to discuss the relationship between FDI and the logistics performance (LP), and the Liner Shipping Connectivity (LSC).

The considered FDI is defined as the net inflows of investment to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor. The logistics performance reflects perceptions of a country's logistics based on the efficiency of the customs clearance process, quality of trade and transport-related infrastructure, ease of arranging competitively priced shipments, quality of logistics services, ability to track and trace consignments, and frequency with which shipments reach the consignee

within the scheduled time. The Shipping Connectivity shows how well countries connect to global shipping networks based on the status of their maritime transport sector. The potential interactions between the dependent and explanatory variables are shown in Fig. 1.
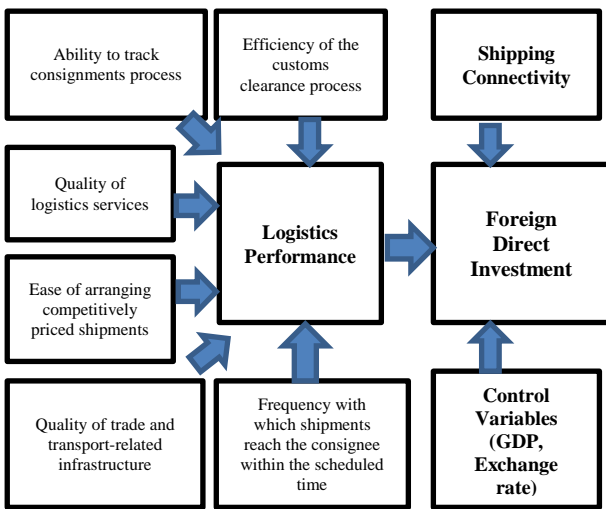

Fig. 1: Determinants of FDI

This study assumed that there are significant relationships between explanatory variables and the FDI at maritime nations. Hypothesis statements could be presented as follows: H1: the LSC has a significant and positive impact on FDI at maritime nations. H2: the LP has a significant and positive impact on FDI at maritime nations. To test the preceding hypotheses, we suggest determining the impact of SC and LP using panel data. The model is presented by (Eq. 1.) as follows:

$$FDI_{it} = \beta_0 + \beta_1 SC_{it} + \beta_2 LP_{it} + \beta_3 GDP_{it} + \beta_4 ER_{it} + \varepsilon_{it} \quad (1)$$
$$i = 1, \dots, N \qquad t = 1, \dots, T$$

where, FDI designates the foreign direct investment. SC designates the Liner Shipping Connectivity. ER represents the Exchange Rate. LP denotes a Logistics Performance. GDP designates the Gross Domestic Product. The subscript i indexes country and N, the number of maritime developing countries studied, t indexes year and T are the number of years studied. The exponent's $\beta_1, \beta_2, \dots; \beta_4$ are the parameters of exogenous variables, β_0 is the intercept coefficient that shows the rate at which FDI will change independently of stated explanatory variables. Finally, ε is the error term in the model.

To ablated the effect of the asymmetric distributions (scores, day, dollars, number) the Eq. 1 was transformed into a logarithmic form. The empirical model to be estimated can be formulated as (Eq. 2.) presented as follows:

$$Ln(FDI_{it}) = \beta_0 + \beta_1 Ln(SC_{it}) + \beta_2 Ln(LP_{it}) + \beta_3 Ln(GDP_{it}) + \beta_4 Ln(ER_{it}) + \varepsilon_{it}$$
$$(2)$$
$$i = 1, \dots, N \qquad t = 1, \dots, T$$

where, (Ln) denotes natural logarithms.

4. Data

The panel data set consists of 39 developing maritime nations on the basis of yearly data over the period from 2007 through 2016. The sample of maritime nations is selected on the basis of data availability. The data are collected from the World Development Indicators.

The panel data set consists of 39 developing maritime countries on the basis of yearly data over the period from 2007 through 2016. The sample of maritime countries is selected on the basis of data availability. The data are collected from the World Development Indicators. The data and variables examined consist of:

- FDI is measured by foreign direct investment net inflows (% of GDP). The International Monetary Fund is the data source.
- SC is measured by Liner Shipping Connectivity Index (maximum value in 2004 = 100). The United Nations Conference on Trade and Development is the data source of LSCI.
- LP is measured by Logistics Performance Index (Overall score, 1=low to 5=high). The main data source of LPI is the World Bank database
- ER is measured by real effective exchange rate index (2010 = 100). The International Monetary Fund is the data source.
- GDP per capita, the related indicator is in constant 2010 U.S. dollars published by the World Bank national accounts data.

Table 1 summarized the values of used variables and descriptive statistics associated for the period 2007–2016 (before transforming to a logarithm).

Table 1: Summary Statistics (before taking logarithm)

Var	Mean	Standard Deviation	Min	Max
FDI	6.334895	14.58375	-43.4626	198.3055
SC	40.97762	32.71809	2.1	122.7
LP	3.504793	0.451933	2.213333	4.225967
GDP	1.13E+12	2.64E+12	8.39E+09	1.69E+13
ER	23.0301	89.73231	0.268828	676.9578

The values appeared in Table 2 approve the existence of linear correlation coefficients between the pairs of retained variables. These values confirm that the correlation between explanatory variables is low.

Table 2: Correlation matrix

	FDI	SC	LP	GDP	ER
FDI	1				
SC	0.1607	1			
LP	0.1109	0.6254	1		
GDP	-0.1023	0.4237	0.3434	1	
ER	-0.0007	-0.0933	-0.1086	-0.0276	1

We note that certain acceptable negative and positive correlations between the explanatory variables and explained variable. Furthermore, almost of correlation coefficients between explanatory variables are low. These results confirm

the validity of the model and that its regression could be applied.

5. Empirical results

We examine the relationships between FDI stocks and SC index, LP index, ER and GDP per capita for 39 maritime nations via panel data analysis using STATA for the period 2007–2016. Table 3 contains the estimating results of Eq. 2.

The results in Table 3 enable us to draw the interactions between FDI and both of LP and SC. The empirical results show a significant relationship between the most explanatory variables and the FDI. Indeed, lower values (under 0.05) of p-values indicate that FDI is statistically affected by SC. The GDP per capita, the LP, and the ER have a significant effect on the FDI at the level of 5%.

Table 3: Regression results; dependent variable: Ln(FDI)

Variables	Coef.	Std. Err.	P>|t|
constant	5.146734***	1.678391	0.002
Ln(SC)	0.037712***	0.00389	0.000
Ln(LP)	5.496802**	2.363127	0.020
Ln(GDP)	0.680129**	0.569405	0.039
Ln(ER)	-19.8287**	7.928305	0.012
R^2	Within	Between	Overall
	0.1539	0.6716	0.4226

(**), and (***) indicate that the parameter is statistically significant at levels of 5% and 1%, respectively

The coefficient of SC is positive and significant (at level of 1%). This suggests that an increase in SC index lead to increase of FDI the considered countries. This implies that foreign investors prefer countries endowed a high SC index. Also, the coefficient of LP is positive and significant (at level of 5%). This indicates that an increase in LP index contributes to increase of FDI the pooled examine countries. This implies endowed countries of a high PL index are most preferred for foreign investors. These results are consistent with our expectations on the impact of SC and LP on the FDI of developed maritime nations studied. Thus, H1 and H2 could be accepted.

Concerning control variables, the coefficient of GDP per capita is positive and significant. Such result is in line with the literature. Concerning the second control variable, the results approve a significant negative coefficient of ORE for the countries panel studied. Such result is in line with some study such as (Zhang and Daly, 2011).

6. Conclusion

The recent economic literature approved that foreign direct investment is becoming an important element for the development of any economy. Given the importance of the FDI, countries try to attract FDI for achieving sustainable economic growth. Governments are called to provide all the appropriate conditions to attract multinational companies so that to contribute to their economic growth through increasing capital accumulation,

creating new job opportunities, and raising total factor productivity.

The literature shows the agreed influential factors on the FDI as the Gross Domestic Product and the exchange rate. This paper takes closer look new FDI explanatory variables, such as the shipping connectivity, and the logistics performance. Results show that both of the variables are statistically significant and have a major impact on the FDI for the countries studied. Given the approved positive and significant impact of LP and SC on the FDI, government's maritime states are called upon to improve these factors so as to serve foreign investors and to attract them.

This study makes a significant contribution to the maritime economics literature. It contributes to understanding the determinants of FDI at maritime nations. The findings provided an empirical framework that supports the view that the logistics performance and the maritime connectivity are essential to the host country to attract foreign investors. The study has empirically shown the positive impact of LP and SC on FDI. Also, it highlights the importance of analyzing the determinants of FDI focusing on logistics factors as specific variables affecting foreign investor's decisions.

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