

## **Dynamic relationship among foreign direct investments, human capital, economic freedom and economic growth: Evidence from panel cointegration and panel causality analysis**

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**Abstract.** *This study investigates the dynamic relationship between foreign direct investment (FDI), human capital, economic freedom and economic growth for the period of 2000-2013 covering 39 countries. In this context, we utilized panel cointegration, panel fully modified ordinary least squares (FMOLS), panel dynamic panel ordinary least squares (FMOLS), and panel vector error correction model (VECM) based Granger causality analysis methods. In this study: i) variables are cointegrated in the long term; ii) according to FMOLS results, FDI, human capital and economic freedom have a positive impact on economic growth; iii) according to panel DOLS results, human capital and economic freedom have a positive impact on economic growth, and finally; iv) panel VEC results supports the relationship between variables both short and long term. In the last chapter, we evaluated the findings obtained from the analysis and suggested some policy recommendations.*

**Keywords:** foreign direct capital investments, human capital, economic freedom, economic growth.

**JEL Classification:** F21, J24, O43, O40.

## 1. Introduction

The globalization of the capital has gradually increased especially for the last twenty years. Similarly, it is observed that foreign direct investments (FDI) have increased gradually across the globe especially since 1990s. As reported by the United Nations 2015 World Investment Report, FDI amount being 207 billion USD in 1990 over the world reached 1 trillion 467 billion USD in 2013 and falling by 16 per cent in 2014 to 1 trillion 228 billion USD (UNCTAD, 2015: p. 2). According to the Report declining in FDI flows was influenced mainly by the fragility of the global economy, policy uncertainty for investors and elevated geopolitical risks. New investments were also offset by some large divestments. The decline in FDI flows was in contrast to growth in GDP, trade, gross fixed capital formation and employment (UNCTAD, 2015: p. 2). Gradual acceleration in the pace of the globalization has made the international capital movements the most important and stable component of the capital flows. There are many reasons for underlying the rise of the importance of the FDI. New job creation in the host country, increase in the technological progress, know how competition are just some of these effects (Adams, 2009: p. 939). Moreover, FDI has an important role in decreasing the poverty and increasing the growth in the host country. Especially FDI happens to flow from the developed countries to the developing countries. The latter countries usually deficient resources to develop their own technologies, and suffer from the technical and institutional restrictions on accumulation of physical and human capital. Domestic financing of investment projects stays restricted and unprotected property rights, corruption, civil and political instability hamper capital accumulation or prevent the use of existing resources. For this reason, foreign direct investments became an attractive source of financing the development in developing countries (Feeny et al. 2011: p. 2). Expected effects of FDI on growth have two directions. Firstly, it is expected to increase the economic growth positively by including new inputs and new technologies into the production function of the host country. Secondly, it is expected to increase existing information accumulation in the host country due to knowledge transfer, workforce education and training, also contribution to the information accumulation can be made through alternative governance applications and institutional arrangements (De Mello, 1999: p. 134).

Many studies in that field indicate that FDI have positive effects on growth. Borensztein et al. (1998), Blomström et al. (1992) are some of these studies. The fact that FDI have various positive effects other than its contribution to a host country's growth, led to conduct studies on the factors affecting these investments. One of such factors is the human capital. Human capital is an important variable that affects both foreign direct capital investments and economic growth. Human capital can be interpreted as a kind of factor from endogenous growth theory (Pourshahabi et al. 2011: p. 71). Following the approaches that attach importance to quantitative growth, emerging from neoclassical growth theories that had prevailed in the literature until 1980s, a new approach taking its roots from economists like A. Smith, J. Schumpeter, N. Kaldor and K. Arrow emerged. In these approaches, which explain growth with endogenous elements and are called as new growth models, the human capital plays an effective role. As the human capital is not included within the knowledge and abilities, economic growth is dependent on progress

in technology and scientific knowledge (human capital accumulation) and these approaches are called as “internal (endogenous) growth models” (Yaylı and Lebe, 2011: p. 31). Human capital is regarded as one of the basic elements of the internal growth. Rise in the level of education enhances the human capital accumulation or stock of the economy and increases the productivity of the labour. That increase in the labour productivity would make positive contribution to the total output is the common view of all growth theories. However, this phenomenon is not expressed theoretically as clear as it has been explained in internal growth models previously (Ay and Yardımcı, 2008: p. 40).

The relationship between human capital and economic growth has been examined in many studies. Human capital affects economic growth basically through increasing the productivity of physical capital, increasing productivity, creating employment opportunities, technological development and its spread (Çakmak and Gümüş, 2005: p. 61). An economy where investments in human capital and growth rates are low has eventually insufficient industrial production, which is the driving force behind the development, and will be deprived from the ability to develop and use information technologies. Human capital model is dependent on investments to be made on production capacities of individuals, fundamental education and professional training of individuals (Altay and Pazarlıoğlu, 2007: pp. 100-101). Moreover, human capital stock has a great importance in terms of international spread of technology and its importance in technological development of a country. Besides, human capital has important weight among factors necessary for developing countries to become developed ones (Ay and Yardımcı, 2007: pp. 102-103). FDI also contribute to the human capital of a host country. FDI can positively affect the production activities of domestic enterprises. Local firms can have the opportunity to develop their activities by learning from and interacting with foreign firms. In addition, foreign direct investments increase the human capital quality of a host country and improves the know how and management skills of local firms (Bangoa and Sanchez-Robles, 2003: p. 530). It is observed that human capital in host countries is a determinant of foreign investments in developing countries besides the view that FDI contribute to the human capital of host countries. For example, Lucas (1990) assumes that deficiency of human capital in less developed countries discourages foreign capital inflow (Noorbakhsh et al., 2001: p. 1595).

FDI is an important factor in solution of restricted local capital and problems of low productivity in most of the developing countries. Therefore, FDI is regarded as a potential growth factor in a receiving country. Another factor that has an effect on foreign direct investments and growth is the economic freedom (Pourshahabi et al., 2011: p. 72). The countries with higher economic freedom level do have more efficiency and higher growth rates. The countries which have higher economic freedom are more attractive for foreign investors. There is a strong relationship between economic freedom and growth (Bangoa and Sanchez-Robles, 2003: p. 530). In recent years, numerous scholarly studies have analyzed these relationships in detail and, almost without exception, have found that countries with higher and improving economic freedom grow more rapidly and achieve higher levels of per-capita GDP (Gwartney et al., 2015: p. 22). Personal choice, freely floating exchange rates, free entry into markets and competition, protection of individual rights are considered within the economic freedoms. Economic freedom is considered in

five categories in the world economic freedom report and economic freedom index is determined by these five criteria. They are size of the public sector, legal system and intellectual rights, strong money, free international trade and regulations, respectively (Gwartney et al., 2012: p. 174). The major factors contributing to the long-term increase in economic freedom are reductions in marginal income-tax rates, more stable monetary policy, a decline in the use of military conscription, and liberalization of trade policies (Gwartney et al., 2015: p. 16). General quality of the investment environment in a host country plays a critical role in attracting foreign direct capital investments. However, investment environment is determined by many economic and non-economic factors which complicate making a definite indicator of an investment environment (Quazi, 2007: p. 335).

This study aims to investigate the multidirectional relationships among FDI, human capital, economic freedom and growth. Under this purpose: i) the impact of FDI, human capital and economic freedom on economic growth will be examined by cointegration analysis; ii) dynamic relationship between FDI, human capital, economic freedom and economic growth will be investigated by causality analysis. In this context, this study is consisted of three sections. First chapter will focus on empirical studies which were carried out previously on this subject and these studies will be analyzed in four separate categories according to their directions of empirical results and their sample. In the second section, some information will be provided about econometric model, dataset and results obtained from the analysis. This study employs data covering 2000-2013 period and 39 countries are included in the econometric model. Finally, results obtained from the analysis will be discussed and some policy will be suggested in the conclusion.

## 2. Literature survey

The studies on determinants of economic growth have recently gained pace with human capital, economic freedom and FDI. This topic preserves its place as one of the most discussed topics and there is no definite consensus in the literature. Borensztein et al. (1998) examined the relationship between FDI and economic growth for 69 developing countries and concluded that FDI had positive effect on growth, and this was dependent on human capital level in the host country. Blomström et al. (1992) found significant and positive relationship between FDI and growth in a study covering 1960-1985 period for 78 countries. Al-Iriani (2007) came to the conclusion that FDI was an important determinant of the growth in his study carried on countries within the Arab States of the Gulf Council. Baharrumshah and Thanoon (2006) found that FDI had positive and significant effect on both the short and the long term growth, and FDI's effect on the growth was higher than the effect of the domestic savings on the growth, in their study conducted on East Asia countries. Rabiei and Masoudi (2012) examined the relationship between FDI and economic growth for eight Islamic countries. As a result of the study they concluded that there was a positive relationship between economic growth and FDI. Zhang (2001) examined the relationship between FDI and economic growth in their study on East Asia and Latin American countries. They concluded that foreign direct capital

investments had positive effect on economic growth in five countries (Hong Kong, Indonesia, Singapore, Taiwan and Mexico) out of 11 countries included within the study.

In contrary to the mentioned studies indicating the positive effect of FDI on host country's economic growth, there are some studies indicating that FDI had negative or no effect. For example, De Mello (1999) asserts that there is a weak relationship between FDI and growth in a study performed on OECD member and non-member countries. Carkovic and Levine (2002) reach the conclusion that FDI did not have any standalone effect on the growth but rather it contributed to the growth along with its other determinants, Mencinger (2003) could not find any causality relationship between FDI/GDP and Fixed Capital Investments/GDP in a study covering the period between 1994 and 2000 for transition economies. Durham (2004) came to the conclusion that FDI did not have any effect on economic growth in the full sense. Değer and Emsen (2006) found that FDI was an important factor in economic growth of transition economies. However, no significant relationship was found between FDI and growth for Central West Asia countries in the study. Solomon (2011) analyzed the relationship between FDI and economic growth in terms of the factors of the host country. In this study where how economic development, human capital, financial development, quality of economic and political environment affect the relationship between FDI and economic growth was analyzed, it was revealed that mentioned variables had significantly affected the relationship between FDI and the economic growth.

Alagöz et al. (2008) analyzed the relationship between FDI and economic growth. As a result of the study no causality relationship was found between FDI and economic growth. Carkovic and Levine (2002) determined that foreign direct investments did not have significant effect on economic growth, and had irregular effects in five year periods. Akinlo (2004) found that both private investments and delayed FDI did not have significant relationship with economic growth. Adams (2009) investigated the effects of domestic investments and FDI on economic growth in Sub-Saharan Africa countries. The study revealed that domestic investments had significant and positive relationship with growth both through least squares method and fixed effects estimation, and a positive relationship between FDI and growth only through estimation by least squares. Yang (2008) found that there was a positive relationship between FDI and growth in Latin American, OECD, European and Central Asian countries, a negative relationship between FDI and growth in Middle East and African countries, and no relationship between FDI and growth in other countries for various time intervals.

There are some studies considering the relationships among FDI, human capital and economic freedoms in addition to aforesaid studies. For example, Balasubramanyam et al. (1999) reached the conclusion that positive relationship between FDI and growth depended on the size of domestic markets, a competitive environment and human capital. Alfaro et al. (2006) reached the conclusion from their study that FDI affected the growth positively in countries where financial markets are developed, and also market structure and human capital had positive effects on how FDI affected growth. Li and Liu (2005) came to the conclusion that human capital had positive effect on FDI and economic growth in developing countries. Baharumshah and Almasaied (2009) found that FDI had

positive and significant effect on economic growth, also human capital and financial markets were in interaction with FDI. Noorbakhsh et al. (2001) conducted an empirical study on human capital and FDI of developing countries. Their analysis results indicate that human capital is an important determinant of FDI statistically and its importance increased by time. Talpos and Enache (2010) examined the relationship between human capital and FDI in a study they conducted. The study revealed a positive relationship between human capital and FDI for Central and East European countries.

Calvo and Sanchez-Robles (2003) tested the relationship between economic freedom, FDI and economic growth through panel data analysis. The analysis revealed that economic freedom in host country affected the FDI positively. Azman-Saini et al. (2010) analyzed that FDI did not have a direct effect on the growth. Secondly, it was found that economic freedom was a determinant of long term growth. Lastly, a positive correlation was obtained between economic freedom and effect of FDI on growth.

When we examined the studies focused on the relationship between FDI and economic freedoms, it was found that; Pourshahabi et al. (2011) analyzed the relationship between FDI, economic freedom and growth for OECD countries. First model suggested that human capital, size of the market, political stability and inflation affected FDI positively and had an important effect on FDI in the countries. However, it was concluded that although the relationship between economic freedom and FDI was positive in OECD countries it did not have a significant importance. Second model suggested that FDI, economic freedom, public consumption expenditures, public investments and human capital directed the growth. Pearson et al. (2012) analyzed the relationship between economic freedom, economic growth and foreign direct investments in a study on USA. The study covering the period between 1984 and 2007 suggested that both economic freedoms and growth rate in each state were important variables affecting FDI flows positively. Ay et al. (2013) analyzed the relationship between economic freedom and growth for Middle East countries and found negative relationship between them for this group of countries. Heriot and Theis (2008) examined the relationship between economic freedom and FDI. Analysis revealed that countries with more economic freedom were more successful in drawing FDI. Caetano and Calerio (2009) analyzed the relationship between economic freedom and FDI in a study for Middle East Africa Countries and European Countries. As a result of the study it was determined that there was positive relationship between economic freedom and FDI. Quazi (2007) analyzed the relationship between economic freedom and FDI for seven East Asia countries (China, Indonesia, Korea, Malaysia, Philippines, Singapore and Thailand) in his study. The study found that economic freedom is an important determinant of FDI investments. Kapuria-Foreman (2007) revealed that economic freedoms had a positive effect on FDI in a study conducted on developed countries. Mangir et al. (2011) found a positive relationship between FDI in terms of market size (growth rate) and trade gap for Poland, but determined these relationships in one direction for Turkey, in a study carried out for Poland and Turkey. Nasir and Hassan (2011) reached the conclusion that there was a significant and positive relationship between economic freedom and FDI in a study for South Asian countries.

### 3. Theoretical model

In this study, which examines the relationship between FDI, human capital, economic freedom and growth, a linear regression model in panel data format such as below was set up.

$$\ln Y_{it} = \alpha_{0i} + \alpha_{1i} FDI_{it} + \alpha_{2i} H_{it} + \alpha_{3i} FREE_{it} + u_{it}; \quad i = 1, \dots, N; t = 1, \dots, T. \quad (1)$$

Here,  $\ln Y$  represents the natural algorithm of GDP per capita (current \$), FDI represents the ratio of foreign direct capital investments to the GDP (%), H represents the rate of total (elementary school) schooling (%) representing the human capital, FREE represents the economic freedom index. It is expected in the study that FDI and H coefficients are positive, and coefficient of the FREE variable is negative or positive.

The data set used in the analysis covers the period between 2000 and 2013 and includes 39 countries. These countries are Australia, Austria, Canada, Finland, Denmark, France, Germany, Iceland, Italy, Japan, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Spain, Sweden, Switzerland, Turkey, United Kingdom, USA, Bulgaria, China, Czech Republic, Hungary, India, Iran, Israel, South Korea, Nigeria, South Africa, Thailand, Mexico, Chile, Croatia and Ireland respectively. LNY, FDI and H data were obtained from World Bank Development Indicators (2014), data pertaining to the FREE variable were compiled from the reports available in the website [economicfreedom.org](http://economicfreedom.org).

### 4. Data sources and empirical results

In this study the relationship among FDI, human capital, economic freedom and growth will be analyzed in the framework of panel cointegration and panel causality. Relevant relationship will be examined in four phases. In the first phase, stationarity of the variables were examined with Levin et al. (2002, LLC) and Maddala and Wu (1999) panel unit root tests. In the second phase, long term relationship between variables will be tested with Pedroni (1999) panel cointegration test. In the third phase, cointegration coefficients will be estimated through Panel OLS and Panel FMOLS estimators. In the last phase, Panel Vector Error Correction based Granger causality test is used in order to examine the causality relationship between variables.

#### 4.1. Panel unit root tests

It is necessary to test the stationarity of the variables before proceeding to the empirical analysis. If data pertaining to the variables are stationary then regression analysis will be used to determine the relationship between the variables, if not stationary then fake regression issue will arise. In this case existence of cointegration relationship between the variables will be tested. In this context, Fisher-ADF test developed by Maddala and Wu (1999) and Levin et al. (2002, LLC) test will be used to test panel unit root presence in this study.

It is necessary to estimate the following model for LLC panel unit root test:

$$\Delta y_{it} = \mu_i + \rho y_{it-1} + \sum_{j=1}^m \alpha_j \Delta y_{it-j} + \delta_{it} + \theta_t + \varepsilon_{it} \quad (2)$$

Here;  $\Delta$  denotes first difference operator,  $m$  denotes lag length,  $\mu_i$  and  $\theta_t$  denote unit specific fixed and time effects respectively.  $\rho = 0$  zero hypothesis for all  $is$  will be tested

against  $\rho < 0$  hypothesis for all  $i$ s. Rejection of the zero hypothesis will mean that the series is stationary.

Fisher-ADF test developed by Maddala and Wu (1999) combines  $\rho$  values obtained from unit root tests for each cross section  $i$ . The test is not parametric and has chi-square distribution with  $2n$  freedom degree. The  $n$  in the test is the number of cross-section data in the panel. This test statistics is as follows:

$$\lambda = -2 \sum_{i=1}^n \log_e(p_i) \sim \chi^2_{2n(d.f.)} \quad (3)$$

Here:  $p_i$  denotes  $p$  value obtained from ADF unit root test for unit  $i$ . ADF-Fisher test has the advantage of not being dependent on different lag lengths in individual ADF regressions (Hossain and Saeki, 2011: p. 322).

**Table 1.** Results of the panel unit root test

Variables	LLC Test		ADF-Fisher Test	
	Statistical Value	Prob. Value	Statistical Value	Prob. Value
InY	1,695	0,9541	45,274	0,9925
FDI	-0,885	0,1875	113,623*	0,0001
H	1,151	0,9356	42,027	0,9997
FREE	0,665	0,7471	43,355	0,9995
$\Delta$ InY	-5,131*	0,0000	133,052*	0,0000
$\Delta$ FDI	-9,475*	0,0000	336,315*	0,0000
$\Delta$ H	-12,746**	0,0000	264,324*	0,0000
$\Delta$ FREE	-15,962*	0,0000	329,491*	0,0000

\* indicates 1% significance level.

The empirical results obtained from panel unit root test are shown in Table 1. General view of the variables are stationary in first difference, namely  $I(1)$ , while they are not stationary in level value according to the unit root test results. In this case the presence of long term cointegration relationship between the variables should be tested. If there is cointegration between the variables then the obtained regression will not be misleading.

#### 4.2. Panel cointegration test

Panel cointegration test developed by Pedroni (1999) is frequently used in the literature to test long term cointegration relationship between non-stationary variables. Seven different test statistics were developed to test zero hypothesis defined as “There aren’t any Pedroni cointegration relationships”. Pedroni obtains these statistics from advantages got from panel cointegration regression. The four of these tests are consisted of in-group statistics (panel- $v$ , panel- $\rho$ , semi-parametric panel- $t$  and parametric panel- $t$ ), other three are consisted of intergroup (group-  $\rho$  statistics, semi-parametric group- $t$  statistics and parametric group- $t$ ) statistics.

**Table 2.** Results of Pedroni panel cointegration tests

Test	Intercept	Intercept and trend
Panel $v$ -Statistic	0.2534	16.7021*
Panel $\rho$ -Statistic	3.3412	4.9564
Panel PP-Statistic	0.1152	-0.5403
Panel ADF-Statistic	-0.4273	-1.9547**
Group $\rho$ -Statistic	5.9556	7.3804
Group PP-Statistic	-1.7621**	-5.3338*
Group ADF-Statistic	-0.9901	-4.9351*

\* indicates 1% significance level; \*\* indicates 5% significance level.



Table 2 shows the Pedroni panel cointegration test results. Considering the fixed effects model, group PP statistics reject the null hypothesis at %5 significance level. Considering the fixed effects and trend models, 3 of the 7 statistics show the rejection of null hypothesis at %1, and panel ADF statistics rejects null hypothesis at %5 significance level. These results supports that there is a cointegration relation among variables in the long term.

**4.3. Estimation of panel cointegration coefficients**

The second step after estimation of panel cointegration relationship is the estimation of long term cointegration coefficients. For this cause panel fully modified ordinary least squares (FMOLS) and panel dynamic ordinary least squares (DOLS) methods developed by Pedroni (2000, 2001) will be used. FMOLS and DOLS estimators were developed after deviated results were seen in estimation of series having long term relationship among them, through least squares method. FMOLS method corrects the autocorrelation and endogeneity problem through a non-parametric approach, whereas in the DOLS method the autocorrelation is eliminated and estimation is made by taking variables with their lag values.

**Table 3.** Panel cointegration coefficients (lnY dependent variable)

Variables	Panel FMOLS	Panel DOLS
FDI	0.0095** [2.14]	0.0040 [0.522]
H	0.0058* [8.95]	0.0068* [3.49]
FREE	0.2202* [25.39]	0.2195* [9.32]

\* indicates 1% significance level.

\*\* indicates 5% significance level.

Values within square brackets is t statistics

Table 3 shows the results of panel DOLS and FMOLS. According to the panel FMOLS results, long term coefficients (FDI, H, FREE) are significant at 5%, 1%, 1% significance level respectively and positive. According to these results, FDI representing the foreign direct capital investments, H representing the human capital and FREE representing the economic freedom affect the economic growth (lnY) positively. Panel DOLS results show that long term coefficients of H and FREE are significant at 1% significance level respectively and positive. However, coefficient of FDI is statistically insignificant. In a similar manner, both human capital and economic freedom have a positive impact on economic growth according to DOLS test results.

**4.4. Panel granger causality test based on vector error correction model**

Based on the panel cointegration test results the variables are correlated in the long term but the cointegration test does not give information about the direction of this relationship. For this reason, error correction model (VEC) was used to determine the direction of the relationship. This model gives information about both the short and long term causality. In this framework, a panel VEC model can be written as follows:

$$\Delta y_{it} = \alpha_{1i} + \sum_{k=1}^q \beta_{11ik} \Delta y_{it-k} + \sum_{k=1}^q \beta_{12ik} \Delta x_{it-k} + \lambda_{1i} \hat{\epsilon}_{it-1} + v_{1it} \tag{4}$$

$$\Delta x_{it} = \alpha_{2i} + \sum_{k=1}^q \beta_{21ik} \Delta x_{it-k} + \sum_{k=1}^q \beta_{22ik} \Delta y_{it-k} + \lambda_{2i} \hat{\varepsilon}_{it-1} + v_{2it} \quad (5)$$

In no. 4 and 5 equations  $\Delta$  denotes first difference,  $q$  denotes lag length,  $\lambda$  denotes error correction term. The short term causality relationship between the variables was tested through Wald statistics. The long term causality relationship was tested by examining the statistical significance of the coefficient of the error correction term.

**Table 4.** Granger causality test results based on panel vector correction

	Short Term Causality				Long Term Causality
	$\Delta \ln Y$	$\Delta FDI$	$\Delta H$	$\Delta FREE$	ECT(-1)
$\Delta \ln Y$		0.052 (0.81)	0.481 (0.49)	6.898 (0.00)*	-0.225 [-7.59]*
$\Delta FDI$	2.945 (0.08)***		0.598 (0.43)	0.052 (0.81)	-7.671 [-1.28]
$\Delta H$	3.056 (0.08)***	0.445 (0.50)		1.301 (0.25)	0.062 [0.35]
$\Delta FREE$	12.223 (0.00)*	2.285 (0.13)	0.352 (0.55)		0.699 [2.69]*

\* indicates 1% significance level; \*\* indicates 5% significance level.

Values within brackets are probability values and values within square brackets are t statistics.

Table 4 indicates both long and short term panel granger causality test results based on vector error correction model. According to the findings, there is a bidirectional causality relationship between economic freedom and economic growth and unidirectional causality relationship from economic growth to FDI and human capital in the short term. In the long term, there is a unidirectional causality relationship from FDI, human capital and economic freedom to economic growth and from FDI and human capital to economic freedom at the 1% significance level. In other words, both short and long term causality results support the feedback mechanism (bidirectional causality) between economic growth and economic freedom.

## 5. Summary and conclusions

Theoretically, FDI are expected to close savings gap or lead to capital accumulation by increasing current savings, and thus to increase economic growth in host countries where multinational companies make investments in. Besides, it can be asserted that FDI plays an important role in increasing economic growth by creating positive externalities in local market. It can be accepted that human capital factor from endogenous growth models has effect on economic growth. Human capital affects the economic growth basically through increasing productivity of physical capital, providing productivity gains, creating employment opportunities, leading to technological development and its spread. Moreover, FDI increases the quality of the human capital of a host country and improves know how and management skills of local firms. Thus, human capital and FDI are fundamental elements for economic growth of developed and developing countries. Developed human capital along with attractive investment environment for foreign investors increases FDI inflow and this process increases the direct effect through increasing skills level of manpower, and there are some indirect effects like increase in health and socio-political stability. It can be said that another effective factor on economic growth is economic freedom. It is known that countries with higher level of economic freedom also have more efficiency and higher growth rates.

According to the results obtained from the study, there is a positive relationship among long term FDI, human capital, economic freedom and economic growth. The variables are correlated in the long term according to the panel cointegration test results. Thus, FDI representing the foreign direct capital investments, H representing human capital and FREE representing economic freedom affect economic growth (lnY) positively. Causality findings indicate that there is a bidirectional causality relationship between economic growth and economic freedom and a unidirectional causality relationship from economic growth to FDI and human capital in the short term. Thus, it was determined that economic growth plays an important role in attracting FDI.

Additionally, bidirectional causality relationship between economic freedom and economic growth show that they affect each other. In the long term, we found that there is a unidirectional causality relationship from FDI, human capital and economic freedom to economic growth and from FDI and human capital to economic freedom. In other words, both short and long term causality test results support the feedback mechanism (bidirectional causality) between economic growth and economic freedom. These results indicate that in the long term, FDI, human capital and economic freedom affect the economic growth. FDI and human capital have an impact on economic freedom as well.

Consequently, when FDI, human capital, economic freedom and economic growth are taken into consideration together, it can be accepted that there is a relationship among them. The macroeconomic impact of this relationship is felt in national economies with different channels by propagation mechanism. For this purpose, policies that will be applied can be as followings: countries should create a charming environment for foreign investors and focus on human capital to provide sustainable growth. Besides, they should ensure freedom of entry and competition in the markets and make an arrangement related to protection of personel rights. In order to attract long term capital movements, host countries need sufficient human capital, economic stability and free markets and legislative regulations made for this purpose and, contribute to improve economic freedom in these countries. These regulations can be put in order as protection of intellectual property rights, reduction of regimentation and removal of legal barriers to capital flows. These elements both increase FDI and contribute to improve economic freedom. Furthermore, economic freedom is an effective factor to attract FDI. Thereby, freedom in economic activities and investments accelerates domestic and foreign investments and contributes to economic growth. Finally, it should be considered that human capital improvement is a key element to provide a sustainable economic growth. Thus, human capital influences economic growth positively by enabling to increase productivity and benefit technological progress. However, while FDI contributes to human capital in host country, it is also in need of skilled labour that has high management, information, business sense. Therefore, it is believed that skilled labour could be effective in creating a suitable environment for the improvement of economic freedom in the country.

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**References**


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- Adams, S., 2009. Foreign Direct investment, Domestic Investment, and Economic Growth in Sub-Saharan Africa. *Journal of Policy Modeling*. 31. pp. 939-949.
- Akinlo, A., 2004. Foreign Direct Investment and Growth in Nigeria: Anempirical Investigation. *Journal of Policy Modeling*. 26. pp. 627-639.
- Alagöz, M., Erdoğan, S. and Topallı, N., 2008. Foreign Direct Investment and Economic Growth: Evidence from Turkey 1992-2007. *Gaziantep University, Journal of Social Sciences* 7(1). pp. 79-89.
- Alfaro, L., Chanda, A., Kalemli-Ozcan, S. and Sayek, S., 2006. FDI and Economic Growth: The Role of Local Financial Markets <<http://www.nber.org/papers/w12522>>
- Al-Iriani, M., 2007. Foreign Direct Investment and Economic Growth in the GCC Countries: A Causality Investigation Using Heterogeneous Panel Analysis. *Topics in Middle Eastern and North African Economies, electronic journal, Volume 9, Middle East Economic Association and Loyola University Chicago* <<http://www.luc.edu/orgs/meea/>>
- Altay, A. and Pazarlıoğlu, M.V., 2007. Human Capital in the International Competitive Power: Econometric Approach. *Selcuk University Karaman Journal of Faculty of Economics and Administrative Sciences*, 12 (9), pp. 96-108.
- Ay, A., and Yardımcı, P., 2008. Analysis of Ak Type Endogenous Economic Growth Based on Human Capital Accumulation Through Var Method in Turkey. *Journal of Treasury*. 155. pp. 39-54.
- Ay, A., Yardımcı, P., 2007. The Role of Trade and Human Capital in Endogenous Economic Growth and Technological Change of Turkey (1963-2002): A Cointegration Analysis of Peseran's Bound Test. *Journal of Economics Business and Finance*, 22(252), pp. 99-115.
- Ay, A., Acet, H. and Özcan, C.C., 2013. Testing the Relationship between Economic Freedoms and Growth by Panel Causality Application: Case of Middle East Countries. *World Academy of Science, Engineering and Technology, International Journal of Social, Behavioural, Educational, Economic, Business and Industrial Engineering*, 7(8), pp. 2208-2213.
- Azman-Saini, W.N.W., Baharumshah, A.Z. and Law, S.H., 2010. Foreign Direct Investment, Economic Freedom and Economic Growth: International Evidence. *Economic Modelling*, 27, pp. 1079-1089.
- Baharumshah, A.Z. and Thanoon, M.A.M., 2006. Foreign Capital Flows and Economic Growth in EastAsian Countries. *China Economic Review*. 17. pp. 70-83.
- Baharumshah, A.Z. and Almasaied, S.W., 2009. Foreign Direct Investment and Economic Growth in Malaysia: Interactions with Human Capital and Financial Deepening. *Emerging Markets Finance & Trade*. 45(1). pp. 90-102.
- Balasubramanyam, V.N., Salisu, M. and Sapsford, D., 1999. Foreign Direct Investment as an Engine of Growth. *The Journal of International Trade & Economic Development: An International and Comparative Review*. 8(1). pp. 27-40.
- Blomsröm, M., Lipsey, R.R. and Zejan, M., 1992. What explains developing country growth? National Bureau of Economic Research. *Working Paper*, No. 4132.1992.
- Borensztein, E., Gregorio, J., Lee, J-W., 1998. How does Foreign Direct Investment Affect Economic Growth?. *Journal of International Economics*. 45. pp. 115-135.
- Calvo, M.B. and Sanchez-Robles, B., 2003. Foreign Direct Investment, Economic Freedom and Growth: New Evidence from Latin America. *European Journal of Political Economy*. 19. pp. 529-545.

- Caetano, J. and Caleiro, A., 2009. Economic Freedom and Foreign Direct Investment: How Different are the MENA Countries from the EU. *Scientific Research, iBusiness*. 1. pp. 65-74.
- Carkovic, M., Levine R., 2002. Does Foreign Direct Investment Accelerate Economic Growth. University of Minnesota, Department of Finance Working Paper <[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=314924](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=314924)> 2012.
- Çakmak, E. and Gümüş S., 2005. Human Capital and Economic Growth in Turkey: An Econometric Analysis (1960 - 2002). *Ankara University SBF Journal*, 60(1), pp. 59-72.
- De Mello, L.R., 1999. Foreign Direct Investment-Led Growth: Evidence from Time Series and Panel Data. *Oxford Economic Papers*, 51(1), pp. 133-151.
- Değer, M.K., and Emsen, Ö.S., 2006. Foreign Direct Investments and Economics Growth Relationships in Transition Economies: Panel Data Analysis. *Cumhuriyet University Journal of Economics and Administrative Sciences*, 7(2), pp. 121-137.
- Durham, J.B., 2004. Absorptive Capacity and the Effects of Foreign Direct Investment and Equity Foreign Portfolio Investment on Economic Growth. *European Economic Review*, 48(2), pp. 285-306.
- Heritage, 2014. Economic Freedom Indicator <<http://economicfreedom.org>>
- Feeny, S. Iamsiraroj, S. and McGillivray, M., 2011. Growth and Foreign Direct Investment in the Pacific Island Countries. *Alfred Deakin Research Institute*, Deakin University. <[http://sustineo.com.au/sites/default/files/publications/spdi\\_111\\_growth\\_fdi\\_in\\_the\\_pacific.pdf](http://sustineo.com.au/sites/default/files/publications/spdi_111_growth_fdi_in_the_pacific.pdf)>
- Gwartney, J., Lawson, R. and Hall, J., 2012. Economic Freedom of the World 2012 Annual Report. *Fraser Institute*, p. 22.
- Gwartney, J., Lawson, R. ve Hall, J., 2015. Economic Freedom of the World: 2015 Annual Report, *Fraser Institute*, p. 174.
- Heriot, K.C. and Theis, J., 2008. Foreign Direct Investment and Economic Freedom: An Empirical Investigation. *Turner College of Business Columbus State University* <[https://www.researchgate.net/profile/Kirk\\_Heriot/publication/265221683\\_Foreign\\_Direct\\_Investment\\_and\\_Economic\\_Freedom\\_An\\_Empirical\\_Investigation/links/551455660cf2eda0df30d469.pdf](https://www.researchgate.net/profile/Kirk_Heriot/publication/265221683_Foreign_Direct_Investment_and_Economic_Freedom_An_Empirical_Investigation/links/551455660cf2eda0df30d469.pdf)>
- Kapuria-Foreman, V., 2007. Economic Freedom and Foreign Direct Investment in Developing Countries. *The Journal of Developing Areas*. 41(1). pp. 143-154.
- Levin, A., Lin, C.F. and James Chu, C.S., 2002. Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties. *Journal of Econometrics*, 108(1), pp. 1-24.
- Li, X., and Liu, X., 2005. Foreign Direct Investment and Economic Growth: An Increasingly Endogenous relationship. *World development*, 33(3), pp. 393-407.
- Maddala, G.S. and Wu, S., 1999. A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test. *Oxford Bulletin of Economics and Statistics*, 61(1), pp. 631-652.
- Mangır, F., Ay, A. and Saraç, T.B., 2011. Determinants of Foreign Direct Investment: A Comparative Analysis of Turkey and Poland. *Economic and Environmental Studies*, 12(1), pp. 65-85.
- Mencinger, J., 2003. Does Foreign Direct Investment Always Enhance Economic Growth?. *Kyklos*, 56(4), pp. 491-508.
- Nasir, Z.M. and Hassan, A., 2011. Economic Freedom, Exchange Rates Stability and FDI in South Asia. *The Pakistan Development Review*, 50(4), pp. 423-433.
- Noorbakhsh, F. Paloni, A. and Youssef, A., 2001. Human Capital and FDI Inflows to Developing Countries: New Empirical Evidence. *World Development*, 29(9), pp. 1593-1610.
- Pedroni, P., 1999. Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. *Oxford Bulletin of Economics and Statistics*, 61(1), pp. 653-670.
- Pedroni, P., 2000. Fully Modified OLS for Heterogeneous Cointegrated Panels. *Advances in Econometrics*, 15, pp. 93-130.

- Pedroni, P., 2001. Purchasing Power Parity Tests In Cointegrated Panels. *Review of Economics and Statistics*, 83(4), pp. 727-731.
- Pearson, D. Nyonna, D. and Kim, K.J., 2012. The Relationship between Economic Freedom, State Growth and Foreign Direct Investment in US States. *International Journal of Economics and Finance*, 4(10), pp. 140-147.
- Pourshahabi, F., Mahmoudinia, D., and Soderjani, E.S., 2011. FDI, Human Capital, Economic Freedom and Growth in OECD Countries. *Research Journal of International Studies*, 19, pp. 71-81.
- Özcan, B., and Arı, A., 2010. An Anlysis on Determinants of Foreign Direct Investment: OECD Sample. *The School of Economics, Journal of Econometrics and Statistics*, 12, pp. 65-88.
- Quazi, R., 2007. Economic Freedom and Foreign Direct Investment in East Asia. *Journal of the Asia Pacific Economy*, 12(3), pp. 329-344.
- Rabiei, M. and Masoudi, Z.G., 2012. Foreign Direct Investment and Economic Growth in Eight Islamic Developing Countries. *European Journal of Scientific Research*, 68(4), pp. 487-493.
- Solomon, E.M., 2011. Foreign Direct Investment, Host Country Factors and Economic Growth. *Ensayos Revista de Economía*, 30(1), pp. 41-70.
- Talpos, I. and Enache, C. 2010. Searching For Human Capital Determinants of Foreign Direct Investment Inflows in the EU New Member States. *Annales Universitatis Apulensis Series Oeconomica*, 12(1), pp. 483-494.
- Yang, B., 2008, FDI and Growth: A Varying Relationship across Regions and Over Time. *Applied Economics Letters*, 15(2), pp. 105-108.
- Yaylalı, M. and Lebe, F., 2011. Empirical Analysis of the Relationship between Human Capital and Economic Growth. *Marmara University Journal of Economics and Administrative Science*, XXX(1), pp. 23-51.
- Zhang, K.H., 2001. Does Foreign Direct Investment Promote Economic Growth? Evidence from East Asia and Latin America. *Contemporary Economic Policy*, 10(2), pp. 175-185.
- UNCTAD, 2013. World Investment Report Global Value Chains: Investment and Trade for Development. *New York and Geneva: United Nations*.
- UNCTAD, 2015. World Investment Report, Reforming International Investment Governance. *New York and Geneva: United Nations*.
- World Bank, 2014. World Development Indicators <<http://data.worldbank.org/indicator>>