The purpose of this study is to analyze the effect of foreign direct investment on industrialization in 19 developing countries, which have upper-middle income level in the 2000-2013 period. Panel Ordinary Least Squares (OLS), Fixed Effects (FE) and Random Effects (RE) Models was applied in order to determine this effect. Although there are a lot of studies that examined the effect of foreign direct investment on economic growth, there are few studies that examined the effect of on industrialization in the empirical literature. In this respect this study has importance on both to contribute to literature in this issue and to make proper economic policy suggestions.

According to the analysis results, while the export and gross capital formation variables have an important effect, the foreign direct investment variable has no effect on industrialization in developing countries. Empirical results are largely consistent with studies on this issue.

**Keywords:** Foreign Direct Investment, Industrialization, Panel Data Analysis.

Analiz sonuçlarına göre, gelişmekte olan ülkelerde, ihracat ve gayri safi sermaye oluşumu değişkenleri sanayileşme üzerinde önemli bir etkiye sahipken, dolaysız yabancı sermaye yatırım değişkeni sanayileşme üzerinde etkiye sahip değildir. Ampirik sonuçlar büyük ölçüde bu konudaki çalışmalar ile tutarlıdır.

Anahtar kelimeler: Dolaysız Yabancı Sermaye Yatırımı, Sanayileşme, Panel Veri Analizi.

1. INTRODUCTION

As exports have been for a long time viewed as an engine of economic growth, empirical assessment of the role of Foreign Direct Investment (FDI) in a host country’s export performance is important. It is common view that FDI promotes exports of host countries by means of (a) augmenting domestic capital for exports, (b) helping transfer of technology and new products for exports, (c) facilitating access to new and large foreign markets, and (d) providing training for the local workforce and enhancing technical and management skills. In addition to this FDI may have some other effects such as (a) decreasing or replacing domestic savings and investment, (b) transferring technologies which are low level or unsuitable for the host country’s factor proportions, (c) target primarily the host country’s domestic market and thus not increase export, (d) inhibiting the expansion of indigenous firms that might become exporters, and (e) not helping developing the host country’s dynamic comparative advantages by focusing only on local cheap labor and raw materials (Zhang, 2005).

FDI has major importance to economic development. Financial resources and links to export markets are be provided by FDI. Furthermore, an inflow of foreign capital may contribute to the upgrading of both managerial and technological effectiveness and improve human capital. Upgrading of both managerial and technological effectiveness and improve human capital may be promoted by an inflow of foreign capital. This way industrialization in developing countries maybe triggered by FDI. A positive net outcome of inward FDI is particularly uncertain in developing countries in which skilled labor is inefficient and markets are small (Soreide, 2001).

There is little general agreement whether FDI make a net positive contribution to the process of development. On the one hand, proponents note that FDI provides a means for the transfer of capital, technology, and managerial skills to developing countries, that it can gener-
ate considerable tax revenues, create employment and provide access to international markets. On the other hand, negative arguments range from its excessive cost and/or the inefficient use of resources vis-a-vis development goals to increased dependence upon industrial countries, a loss of sovereignty, and the undermining of cultural values. Often points can be argued both ways depending on one’s vantage point. For example, FDI can be seen as either a means of breaking local monopolies, or as dominating and thus restricting competition in host country markets (Kobrin, 1975).

Rowthorn and Ramaswamy (1999) have expressed that if the share of manufacturing employment has declined continuously in a country, this will be a phenomenon that is referred to as deindustrialization. According to Clark (1957), Lawrence and Slaughter (1993), Sachs and Schatz (1994), Rowthorn and Ramaswamy (1997) and (1999) de-industrialization is not a country-specific phenomenon but a common trend in all countries that experience economic development.

Kang and Lee (2011) who analyzed the effect of FDI on de-industrialization, represent that de-industrialization varies from country to country depending upon the level and speed of development. It may be a natural phenomenon that is followed by industrial structural reform but its varying pace can raise various policy issues. For instance, when de-industrialization speeds up, the manufacturing sector’s productivity will increase faster compared with the service sector, which leaves little time for establishing new policies and transferring surplus manpower from the manufacturing sector to other industries, including services. In this case, structural issues arise in employment and this may restrain growth potential, thereby causing economic and social crises.

The paper consists of 4 sections. Section 2 presents the empirical literature related with the relationship between FDI and industrialization. Section 3 provides econometric model and findings. In this section is examined data set, panel unit root tests and model and panel analysis results. Finally, several conclusions are presented in Section 4.

2. EMPIRICAL LITERATURE

In the empirical literature, there are many studies that investigated the effect of FDI on economic growth. Despite the fact that the effect of FDI on economic growth has been widely studied, there are still questions concerning the real effects of FDI, and also concerning the necessary conditions and the channels through which FDI leads to host country economic growth. In the empirical literature some of the studies are as follows:

Alfaro (2003) analyze the effect of FDI on sectoral growth in OECD countries for the time period from 1981-1999. An empirical analysis using cross-country data for the period 1981-1999 shows that total FDI causes an ambiguous effect on growth. FDI in the primary sector, however, is negative. Evidence from the service sector is ambiguous.

Li and Liu (2005) investigate whether FDI affects economic growth based on a panel of data for 84 countries over the period 1970-1999. Both single equation and simultaneous equation system techniques are applied to examine this relationship. A significant endogenous relationship between FDI and economic growth is identified from the mid-1980s onwards. FDI not only directly promotes economic growth by itself but also indirectly does so via its interaction terms. The interaction of FDI with human capital exerts a strong positive effect on economic growth in developing countries, while that of FDI with the technology gap has a significant negative impact.

Khaliq and Noy (2007) examine the effect of FDI on economic growth using detailed sectoral data for FDI inflows to Indonesia over the period 1997-2006. In the aggregate level, FDI is observed to have a positive effect on economic growth. However, when examining diffé-
rent impacts across sectors, estimation results show that the composition of FDI matters for its effect on economic growth with very few sectors showing positive impact of FDI and one sector even showing a robust negative impact of FDI inflows (mining and quarrying).

Kök and Ersoy (2009) investigate the best determinants of FDI in developing countries. They use panel of data (FMOLS-fully modified OLS) and cross-section SUR (seemingly unrelated regression) methods for 24 developing countries, over the period 1983-2005 for FMOLS and 1976-2005 for cross-section SUR. The interaction of FDI with some FDI determinants have a strong positive effect on economic progress in developing countries, while the interaction of FDI with the total debt service/GDP and inflation have a negative impact. The most important determinant of FDI is the communication variable.

Koojaroenprasit (2012) examines the relationship between FDI and economic growth the case of South Korea for the time period from 1980-2009 with annual time series data. This study finds that there is a strong and positive impact of FDI on South Korean economic growth. Furthermore, the study indicates that human capital, employment and export also have a positive and significant impact, while domestic investment has no a significant impact on South Korean economic growth.

Djordjevic, Zoran and Bogdan (2015) analyzes the impact of on the economic growth of Croatia using the model of linear regression in the period from 1999 to 2014. According to study results, there are very few positive effects of foreign investments in Croatia, and therefore economic performance do not change nor do it get better. The revenues from direct foreign investments have mostly been used to settle financial debts.

Apart from these studies, the study analyzed by Vo and Batten (2006) supports the view that FDI has a stronger positive impact on economic growth in countries with a higher level of education attainment, openness to international trade and stock market development, and a lower rate of population growth and lower level of risk. Borenszteian, Gregorio and Lee (1998) find that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. However, the higher productivity of FDI holds only when the host country has a minimum threshold stock of human capital. Thus, FDI contributes to economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host economy. Katerina, John and Athanasios (2004) indicate that FDI does not exhibit any significant relationship with economic growth for the transition countries.

In the empirical literature, there are a limited number of studies that investigated the effect of FDI on industrialization. The studies shown the direct correlation between FDI and industrialization are follows:

Hossain (2007) analyzes the relationship between FDI and industrialization for the period 1975-2003 by using Granger Causality Test, Co-Integrated Test and Regression Analysis in Bangladesh. The study results show that FDI, foreign aid, export values and growth of GDP have a positive impact on industrialization. The impacts of FDI, foreign aid and growth of GDP are not statistically significant, but the impacts of export values, per capita GDP are statistically significant.

Samouel and Aram (2014) examine the effect of FDI on industrialization for the period 1970-2012 with Panel Data Analysis in 35 African Countries. According to study results, financial development, governance and labor market regulation have significant effects on industry. Exchange rate appreciation is detrimental to the industrialization process. Financial and institutional factors are the main determinants of industrialization in the northern and eastern countries. FDI do not have an important effect on industrialization for many Africa Regions.

Zhang (2014) investigates whether FDI affects industrialization based on Panel and Cross Section Analysis for 31 Chinese regions in the 1970-1999 period. The analysis results present that
FDI has a large positive effect in China’s industrial performance; such effects are much greater low-tech manufacturing than medium and high-tech industries.

Guı-Dıby and Renard (2015) analyze the correlation between FDI and industrialization for 49 African Countries for the period 1980-2009 benefiting from Panel Data Analysis. According to the study results, FDI inflows don’t have an important effect countries’ industrialization, while other variables, such as the size of the market, the financial sector and international trade are a significant effect.

Apart from these studies, Athukorala and Menon (1996) analyze the effect export-oriented FDI on industrialization with statistical data for Malaysia economy. According to authors export-oriented FDI has brought significant returns to Malaysia principally because the general economic climate has been favorable for the internationalization of production for a considerable period of time.

Kang and Lee (2011) examine the effect of FDI on de-industrialization by using Dynamic Panel Data Analysis in Korea economy. According to analysis results, highly the FDI outflows have a negative and statistically significant effect, while FDI inflows have a positive and statistically significant effect countries’ de-industrialization. Namely, the increase FDI inflows, which plays an important role in de-industrialization; replace manufacturing industries that are shifting abroad; and expand the service industry as well as industries that produce equipment and materials. Unlike the past, the attraction of FDI that is based on the employment and capital inflow of the manufacturing industry is not favorable to the Korean economy. Thus, investment must be directed to industries that produce value-added products and technology-intensive industries, to which foreign companies and their investments can be attracted.

Assadzadeh and Pourqoly (2013) investigate the effect of FDI on institutional quality and poverty in the case of MENA Countries for 2000-2009 with panel data analysis. The Human Development Index is used as an indicator of poverty reduction in this study. The findings show that the FDI and appropriate institutional quality have significant positive effects on reducing poverty and increasing welfare.

Lı (2012) investigates the relationship between China’s FDI, industrialization and economic growth from 1980 to 2011 through establish multiple regression econometric model. The results show that: First, the foreign direct investment has a significant effect on economic growth; second, industrialization is negatively related to economic growth; third, in the long run, the proportion of the secondary industry output value accounting for real gross domestic product (GDP) makes a negative contribution to economic growth. According to author, governments should devote their efforts to developing the tertiary industry, meantime, to attract more FDI to China, should encourage more domestic investment, ensure political stability and make guided openness of the economy the watchword in this era of global liberalization to trade and FDI policies in order to make FDI growth enhancing and economic growth in China.

3. ECONOMETRIC MODEL AND FINDINGS
In this part of the study, initially, information regarding the data set used is provided. Then, panel unit root tests that determine whether the series are stagnant or not are carried out, and findings gathered from panel data analysis are evaluated.

3.1. Data Set
In this study, the effect of FDI on industrialization was tested in 19 upper-middle-income developing countries for the 2000-2013 period. The variables tested in this study are selected benefiting previous empirical literature. These are:
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Dependent Variable

As indicators of a country’s industrialization two indicators are used in literature. According to Chandra (1992), UNIDO (2015) these indicators are the value added of the manufacturing sector as share of the GDP and the share of employment in the manufacturing sector in total employment. The value added of the manufacturing sector as a percentage of the GDP (IND) is used to analyze the effect of FDI on industrialization as dependent variable.

Independent Variables

The independent variables in the study are as follows: exports of goods and services as share of GDP (EXP), imports of goods and services as share of GDP (IMP), gross capital formation as share of GDP (INV), foreign direct investment in net inflows as share of GDP (FDI), the value added of the agricultural sector as share of GDP (AGR), GDP per capita in current U.S. dollar (GDP). All variables are extracted from World Development Indicators Database-WDI-of the World Bank (2016).

The countries focused on in this study were chosen from among upper-middle-income developing countries according to, depending on the obtainability data, by taking into consideration the classification of the countries according to the income groups of the World Bank (World Bank, 2015). The 19 countries analyzed are shown in Table 1.

<table>
<thead>
<tr>
<th>Developing Countries</th>
<th>Upper Middle-Income Countries</th>
<th>Per Capita GDP $4.126 to $12.735</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey</td>
<td>Jordan</td>
<td></td>
</tr>
<tr>
<td>Tunisia</td>
<td>Belize</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>Brazil</td>
<td></td>
</tr>
<tr>
<td>Botswana</td>
<td>China</td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td>Costa Rica</td>
<td></td>
</tr>
<tr>
<td>Ecuador</td>
<td>Mexico</td>
<td></td>
</tr>
<tr>
<td>Gabon</td>
<td>St. Lucia</td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td>Panama</td>
<td></td>
</tr>
<tr>
<td>Mauritius</td>
<td>South Africa</td>
<td></td>
</tr>
<tr>
<td>Dominica</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.2. Panel Unit Root Tests

In order to obtain significant correlations between the variables used in the analysis, the series need to be stagnant or homogeneous at the same degree. In order to observe whether the data were stagnant, panel unit root tests were carried out. Panel is generally heterogeneous and panel unit root tests should take this heterogeneity into account. If unit root is detected in the data, the problem of spurious regression occurs in the panel data analysis as well. Table 2 reveals the unit root analysis results of the variables used in the analysis for intercept and trend.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>METHODS</th>
<th>Levin, Lin &amp; Chu t</th>
<th>Im, Peseran and Shin W-Stat</th>
<th>ADF-Fisher Chi-Square</th>
<th>PP-Fisher Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>IND</td>
<td></td>
<td>-2.29067**</td>
<td>1.38125</td>
<td>30.9128</td>
<td>38.6112</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0110)</td>
<td>(0.9164)</td>
<td>(0.7858)</td>
<td>(0.4419)</td>
</tr>
<tr>
<td>FDI</td>
<td></td>
<td>-7.59204*</td>
<td>-4.09352*</td>
<td>78.6909*</td>
<td>88.3360*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0001)</td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

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As indicated in Table 2, according to Levin, Lin and Chu t-test results, all variables were found to be stagnant in their own levels. Additionally, according to Im, Pesaran and Shin W-stat test results, the FDI, EXP, IMP and AGR variables were stagnant. ADF - Fisher Chi-square, PP - Fisher Chi-square test results respectively FDI, EXP and AGR variables and FDI, EXP, IMP, AGR and GDP variables were stagnant in their own levels.

3.3. Model and Panel Analysis Results

In the study, the model which tested the effect of FDI on industrialization was estimated in 19 upper-middle-income developing countries. OLS, RE and FE methods were used for estimations of the model. After that, the most appropriate method for the data set used in the study was identified, and finally, the results were evaluated statistically.

The model to be estimated was as follows:

\[
IND_{it} = \alpha + b_1 FDI_{it} + b_2 EXP_{it} + b_3 IMP_{it} + b_4 INV_{it} + b_5 AGR_{it} + b_6 GDP_{it} + e_{it}
\]

For the model, OLS, FE and RE model results achieved through panel data analysis carried out with all independent variables are presented in Table 3.

<table>
<thead>
<tr>
<th>Variables</th>
<th>OLS</th>
<th>RE</th>
<th>FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>3.363948</td>
<td>11.3468*</td>
<td>11.45182*</td>
</tr>
<tr>
<td></td>
<td>(2.944541)</td>
<td>(2.283748)</td>
<td>(1.343546)</td>
</tr>
<tr>
<td>FDI</td>
<td>-0.799662*</td>
<td>0.020199</td>
<td>0.022317</td>
</tr>
<tr>
<td></td>
<td>(0.149845)</td>
<td>(0.030165)</td>
<td>(0.030191)</td>
</tr>
<tr>
<td>EXP</td>
<td>0.021494</td>
<td>0.140070*</td>
<td>0.139668*</td>
</tr>
<tr>
<td></td>
<td>(0.041582)</td>
<td>(0.021338)</td>
<td>(0.021599)</td>
</tr>
<tr>
<td>IMP</td>
<td>0.031476</td>
<td>-0.054529**</td>
<td>-0.049497**</td>
</tr>
<tr>
<td></td>
<td>(0.047302)</td>
<td>(0.023802)</td>
<td>(0.024170)</td>
</tr>
<tr>
<td>INV</td>
<td>0.609253*</td>
<td>0.127866*</td>
<td>0.116242*</td>
</tr>
<tr>
<td></td>
<td>(0.079242)</td>
<td>(0.039788)</td>
<td>(0.040349)</td>
</tr>
<tr>
<td>AGR</td>
<td>0.557418*</td>
<td>0.129631***</td>
<td>0.118848</td>
</tr>
<tr>
<td></td>
<td>(0.133908)</td>
<td>(0.077968)</td>
<td>(0.078895)</td>
</tr>
<tr>
<td>GDP</td>
<td>-0.000806*</td>
<td>-0.000496*</td>
<td>-0.000491*</td>
</tr>
<tr>
<td></td>
<td>(0.000206)</td>
<td>(0.000051)</td>
<td>(0.000051)</td>
</tr>
<tr>
<td>R²</td>
<td>0.3528</td>
<td>0.4652</td>
<td>0.4655</td>
</tr>
<tr>
<td>F Statistics</td>
<td>23.53*</td>
<td>34.79*</td>
<td>34.98*</td>
</tr>
</tbody>
</table>
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<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hausman Test</td>
<td>10.9012***</td>
</tr>
<tr>
<td>Breusch-Pagan LM Test</td>
<td>1283.65*</td>
</tr>
<tr>
<td>The Number of Observations</td>
<td>266</td>
</tr>
<tr>
<td>The Number Of Countries</td>
<td>19</td>
</tr>
</tbody>
</table>

*, ** and *** statistically significant at the 1%, 5%, and 10% levels, respectively. The numbers in parentheses indicate standard errors.

As seen in Table 3, according to the results of the OLS Model, the FDI, INV, AGR and GDP variables are statistically significant at the 1%. While FDI and GDP variables have a negative effect, AGR and INV variables have a positive effect on industrialization in terms of the period and countries discussed. On the other hand, the EXP and IMP variables are statistically meaningless.

According to Breusch-Pagan LM test results carried out in order to make a choice between the OLS and RE Models, the test statistics (1283.65) are found to be statistically significant at the 1% level, and the null hypothesis is denied. Hence, for the data set, it was more appropriate to apply the RE Model rather than the OLS Model. According to RE test results, the EXP and INV variables are statistically significant at the 1% level and have a positive effect on industrialization. The EXP variable affects industrialization to a greater extent compared to the INV variable. The GDP and IMP variables are statistically significant at the 5% and 10% level respectively and have a negative effect on industrialization. The AGR variable is statistically significant at the 10% level and has a positive effect on industrialization. On the other hand, the FDI variable has a positive effect on industrialization, but is statistically meaningless for these countries and period.

The Hausman Test was applied so as to make a choice between the FE and RE Models. According to the test results, the test statistics (10.9012) are statistically significant at the 10% level, the null hypothesis is denied, and the FE Model was found to be appropriate. According to the analysis results, it could be maintained that the most appropriate model for our data set was the FE Model and the results of the FE Model and the RE Model are very similar.

According to the results of the FE Model, while the EXP and INV variable are statistically significant at the 1% level and have a positive effect on industrialization, GDP and IMP variables are statistically significant at the 5% and 10% level respectively and have a negative effect on industrialization. Furthermore, the FDI and AGR variables have a positive effect on industrialization, but are statistically meaningless. Based on the results of the FE Model, it could be maintained that the most effective variable on industrialization is EXP and the positive effect of the EXP variable on industrialization is greater than that of the INV variable.

4. CONCLUSION

In this study, the effect of FDI on industrialization was investigated for 19 upper-middle-income developing countries for the 2000-2013 period by using OLS, RE and FE Models. According to the OLS estimation results, the FDI, INV, AGR and GDP variables are statistically significant. While the INV and AGR variables have a positive effect, the FDI and GDP variables have a negative effect on industrialization in developing countries. RE estimation results are as follows: the EXP, IMP, INV, AGR and GDP variables are statistically significant. While the EXP, INV, AGR variables have a positive effect, the GDP and IMP variables have a negative effect on countries’ industrialization. The FDI variable has a positive effect on industrialization, but is not statistically significant.

According to FE Model which is the most appropriate model for our data, the EXP, IMP, INV and GDP variables are statistically significant. The EXP and INV variables affect positively, but the IMP and GDP variables affect negatively developing countries’ industrialization. Also the FDI and AGR variables have a positive effect on industrialization, but are not statistically significant.
In this study, excluding GDP variable, the signs of all the variables are consistent with theoretical expectation. In my opinion, the negative sign of GDP variable, in other words, the cause of its creating a negative impact on industrialization of developing countries, can be explained with Middle Income Trap (MIT), which is valid for developing countries.

According to Koçak and Bulut (2014) MIT phenomenon was first brought up by Gill and Kaharas, specialists in the World Bank, in a report called “An East Asian Renaissance: Ideas for Economic Growth” published by the World Bank in 2007. In this report, it is revealed that middle income countries perform slower growth performance comparing with rich or poor countries. It is stated in another report called “Avoiding Middle-Income Growth Traps” published by the World Bank in 2012 that most of the fast growing countries, since 1950, reached at middle level of income but few of them achieved to get high income country by having additional leap forward, as for most of other countries got jammed at a level of income called MIT.

Alçın and Güner (2015) explain that MIT is a valid term for developing countries. MIT in respect to per capital income, can be summarized as countries’, reached at middle level of income, inability to go beyond this level, getting stuck in there and inability to switch to group of high level of income. Giving weight to policies such as increasing total factor productivity, increasing added value in service sector, domestication of investment, strengthening education and human capital, increasing research and development activities, is necessary for countries to dispose of MIT.

The countries, investigated in the analysis, are in the upper-middle income developing countries according to World Bank country classification. According to MIT phenomenon, as per capital income of these countries cannot exceed a certain level, these countries are either in the MIT or has this potential. So increase in per capital income of these countries will be insufficient for industrialization. It will be necessary for these countries focus on domestic investment, production of high-tech goods and export rather than foreign capital, to get rid of this trap. According to results of the study, FDI has a positive effect on countries’ industrialization, but is not statistically significant and the variables which have most effect on industrialization respectively are export and domestic investment variables. So the results obtained are consistent with MIT.

Results of analysis are generally consistent with studies of Gui-Diby and Renard (2015), Samouel and Aram (2014) and Hossain (2007). FDI has no an important effect on industrialization of countries in these studies.

In further studies, results could be evaluated again by using the Generalized Method of Moments (GMM) Model, which also takes into account the dynamic effects of the series in panel data analysis. In addition, based on the country classification system of some international organizations, the analysis results could be compared in terms of the effect of FDI on industrialization in the developing countries and developed countries.

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