# The factors that affect on foreign direct investments in Turkey (sectoral comparisons)

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**Abstract.** *This study focused on the concept of foreign direct investment (FDI) and examined economic, political, and investment climate-related factors influential on foreign direct investment decisions. To this end, what could be done to increase foreign direct investments on a sectorial basis was investigated through examining the factors influential on foreign direct investments in general and on a sectorial basis. In this context, analyses were made by using the annual data from the 1995 to 2012 period. The variables thought to be capable of influencing foreign direct investments in general and/or on a sectorial basis were classified, thereby creating 4 different regression models. Based on the regression analyses made, it can be said that not the same economic effects prevail in the sectors receiving foreign direct investment in Turkey, and political stability is influential on foreign direct investment, contrary to expectations.*

**Keywords:** Unit Root, Sectoral Foreign Direct Investments, Economic and Political Factors.

**JEL Classification:** C13, C33, P33.

## 1. Introduction

This study mainly aimed at determining the factors influential on foreign direct investments (FDIs) in Turkey and revealing whether such factors varied by sectors[1]. Foreign direct investment reflects a company's lasting interest in a particular country, possession of a domestic enterprise belonging to such country, and the importance it attaches to such country (UNCTAD, 1999). One of the important characteristics that distinguish foreign direct investment from other investment types is lasting interest. That refers to a long-term commitment between an investor and the investment he makes. Emir and Kurtaran (2005) defines foreign direct investments as follows: a company extends its production to other countries from the country where it is headquartered and sets up a new company alone or together with partners there or acquires an existing domestic company and makes such company affiliated to it. According to Karluk (1984), foreign direct investments are the investments that are made by companies located in a country in companies situated in another country through acquiring a company there or providing founding capital for a newly founded company or increasing the capital of an existing company and that bring along technology, business administration knowledge, and investor's power of control.

One of the most important effects of foreign direct investments is its impact on the economic growth of the host company. Naturally, this effect is more important for developing countries. This is because; foreign direct investments increase economic development and growth. In addition, as an investment or acquisition takes place, an increase occurs in the equity of the host company, and the existing resources are used more efficiently (Moosa, 2002). When the ratio of foreign direct investment increases, it may keep economy under control through seizing main sectors, thereby disrupting economic integrity. That may endanger the economic and political independence of the country. This is because; "it may cause a failure in following an independent industrialization policy as a result of elimination of freedom of implementing monetary, fiscal, and foreign trade policies for specific purposes" (Seyidoğlu, 2001).

Foreign direct investments & technology is one of the important and critical matters of debate in the foreign direct investment literature. This is because; technology transfer has been one of the predominant matters within the context of multinational companies and the contributions of such companies to developing countries. It is believed that technology is a vital resource for economic growth, accumulation of capital, trade, changes in organizational relations, the training of the current personnel, and administrative knowledge. In addition, advancement in technology contributes to accumulation of capital and productivity in the host country. The reason is the monopolistic advantage to be provided by the new technology in production and the following stages. Additionally, multinational companies and their branches can be engaged in information flow and increase externality. Some advantages of technology are the training of employees to give technical support to customers and suppliers and the conduct of administrative practices (Moosa, 2002).

Regardless of the development level of a country, one of the important problems experienced in country development or sustainable development is lack of enough accumulation of capital or lack of sustainable capital needed for sustainable growth. Therefore, capital transfer between countries has gained momentum as a result of increased interaction between countries due to globalization. According to Erdilek (2006), the following three elements need to be achieved for any country to be globalized: (a) international trade, (b) labor mobility, (c) capital movement. The degree to what the above-mentioned three elements have been achieved indicates the level of globalization of a country. The said elements support one another. Labor mobility is more difficult than the other two. In other words, international trade and capital movement are easier. Capital transfer is divided into two: foreign direct investments and financial investments. Financial investments can act more rapidly than foreign direct investments. This is because; they (financial investments) do not stay in the countries they arrive in for a long time. Financial investments and foreign direct investments are much more important for such developing countries which have not reached an adequate level of savings in terms of capital markets and industry as Turkey. According to Koyuncu and Çınar (2009), foreign trade and foreign direct investment activities increased in Turkey as a result of liberalization starting after the 1980s. Such increase gained speed especially in the 2000s.

Any company which intends to penetrate into a market outside the borders of its country has a couple of options: producing goods in its own country and exporting them; making a license agreement or being engaged in a strategic merger with a company in the country in which it is to invest; penetrating into such country through direct investment (Batmaz and Tunca, 2005). Therefore, in general, foreign direct investments may get into a country in five different ways: (a) Intercompany mergers and acquisitions; (b) Investments through privatization; (c) Affiliated company based on joint venture and full ownership; (d) Strategic mergers; and/or (e) License and authorization agreements.

Turkey received a total of 91.8 billion USD foreign direct investments between 2002 and 2011. The said period also witnessed approximately 35.6 billion USD privatization. Turkey received nearly 4.2 billion USD foreign direct investments via privatization. Turkey received no foreign direct investment via privatization in 2002, 2003, 2007, and 2010. About 3.17% of the foreign direct investments received by Turkey in 2004 (1.54 billion USD) were made via privatization; about 18.31% of the foreign direct investments received by Turkey in 2005 (8.19 billion USD) were made via privatization; about 10.24% of the foreign direct investments received by Turkey in 2006 (17.26 billion USD) were made via privatization; about 3.68% of the foreign direct investments received by Turkey in 2008 (16.57 billion USD) were made via privatization; about 3.49% of the foreign direct investments received by Turkey in 2009 (6.63 billion USD) were made via privatization; and about 0.28% of the foreign direct investments received by Turkey in 2011 (14.05 billion USD) were made via privatization.

## 2. Literature review

Tarı and Bıdırdı (2009) employed Johansen's multiple cointegration method to examine the 1990-2006 period in order to find the determinants of foreign direct investments in Turkey. They used gross domestic product, labor cost, inflation, and openness ratio as explanatory variables. They concluded that the foreign direct investments in Turkey were influenced by gross domestic product and openness ratio positively and were influenced by labor cost and inflation ratio negatively.

Kurtaran (2007) focused on the 1980-2006 period in order to examine the degree to what economic and political factors influenced the foreign direct investments in Turkey and the direction of such influences. He employed the multiple regression model and concluded that the most important factors influential on the movement of foreign direct investments were openness ratio, incentives, and operating conditions.

Altıntaş (2009) focused on the 1996-2007 period and examined the long-term relationship between foreign direct investment flow in Turkey and foreign trade (export and import) through the VAR method and the Granger causality test. Based on the analysis results, a positive long-term relationship was detected between foreign direct investment and export and important in single-variable models, and a positive long-term relationship was found between foreign direct investment and import in the multivariate model. In another study, the dynamic panel data analysis method was employed for the 1995-2007 period in order to determine the factors influential on foreign direct investment flows in the European Union countries. Based on the analysis results, it was realized that there was a positive and significant relationship between foreign direct investment and gross domestic product used as a market size indicator, openness ratio, and per capita consumption of electricity. In addition, it was found out that balance of payments deficit affected foreign direct investments negatively (Zeren and Ergun, 2010).

Vergil and Çeştepe (2006) employed the gravity model and time-series analysis in order to determine how the foreign direct investments received by Turkey were affected by real exchange rate, economic instability, and openness. A significant and positive relationship was found between foreign direct investments and reel exchange rate and openness. It was also determined that economic instability affected foreign direct investments negatively.

Daly and Zhang (2010) examined how the foreign direct investment flow in China was affected by gross domestic product, foreign exchange rate, trading volume (export and import), and average labor cost. To this end, they tested the data covering the 1980-2009 periods through the regression method. Based on the analysis results, it was seen that the yuan affected foreign direct investment flow positively, but export and import affected it negatively. Labor cost, on the other hand, affected foreign direct investment negatively in the 1980-2008 period, but affected it positively in the 1992-2008 period (especially in terms of textile sector).

Uwubanmwen and Ajao (2012) examined foreign exchange rate, interest rate, inflation, GDP, and openness in order to determine the effects of foreign direct investments received by Nigeria in the 1970-2009 period. They employed the vector error correction model (VECM) and Granger causality analysis and determined a long-term relationship between foreign direct investments and gross domestic product. They also determined that foreign direct investment did not have a significant influence on Nigeria in terms of growth and economic development in the above-mentioned period.

Brandl, Strohmer and Traxler (2013) addressed 15 sectors and sectoral effects to examine the foreign direct investments made by the USA in the European Union countries. The study employed the time series analysis and concluded that labor cost had a restrictive effect on foreign direct investments, but market size did not have any significant effect on such investments. Furthermore, the researchers said that unionization affected foreign direct investments in textile sector negatively, and that resulted from the fact that investors wanted to keep labor costs at the lowest level for the experienced labor and at the highest level in the service sector.

Al-Sadig (2013) focused on 91 developing countries in order to investigate the effects of foreign direct investments on the host country private sector. The study analyzed the 1970-2000 period and grouped the countries by level of income. It was determined that the foreign direct investments made in countries that were rich in human resources but had low levels of income had a positive effect on private sectors.

Lamine and Yang (2010) investigated the effects of the foreign direct investments in the Republic of Guinea on economic growth. The study employed the Granger causality analysis and tested the foreign direct investments belonging to the 1987-2009 period. Based on the analysis results, it was found that the existing foreign direct investment flow had a low effect on economic growth; employment had a key role in attracting foreign direct investments; and educational level had an additive effect on economic growth and foreign direct investments.

Javed, Sial, Awan and Sher (2011) focused on the 1973-2009 period and examined how gross domestic product and foreign direct investments affected employment in Pakistan. They employed the unit root test and the cointegration test and found out that gross domestic product and foreign direct investments had positive effects on employment. However, they also determined that domestic investments influenced employment negatively in Pakistan.

Koojaroenprasit (2012) focused on the 1980-2009 period and addressed the variables of employment, human capital, and domestic investment in order to determine the economic effects of the foreign direct investments received by South Korea. The time series analysis was made in the study which concluded that foreign direct investments had a positive and strong influence on economic growth. Furthermore, it was seen that while human capital, employment, and export had a positive effect, domestic investments did not have any significant effect.

Besides the above-mentioned studies, many other studies have been conducted in relation to foreign direct investments. The frequently used variables in these studies are *gross domestic product* (Erçakır, 2004; Zeren and Ergun, 2010; Bahar, 2010; Erdal and Tatoğlu, 2002; Ayaydın, 2010; Şimşek and Behdioğlu, 2006; Açıkalın, Gül and Yaşar, 2006; Kar and Tatlısöz, 2008; Lebe and Başar, 2008; Daly and Zhang, 2010; Liu, Daly and Varua, 2012; Uwubanmwen and Ajao, 2012; Naguib, 2012; Brandal, Strohmer and Traxler, 2013; Al-sadig, 2013; Lamine and Yang, 2010; Shaori, Hong and Shuken, 2012; Javed, Sial, Awan and Sher, 2011; Hoang, Wiboanchutikula and Tubtimtong, 2010; Alavinasab, 2013; Saqib, Masnoor and Rafique, 2013; Onu, 2012), *corporate tax* (Erçakır, 2004), *bribery* (Erçakır, 2004), energy (Erçakır, 2004; Zeren and Ergun, 2010; Kar and Tatlısöz, 2008), *openness* (Zeren and Ergun, 2010; Vergil and Çeştepe, 2006; Erdal and Tatoğlu, 2002; Kar and Tatlısöz, 2008; Uwubanmwen and Ajao, 2012; Al-sadig, 2013; Lamine and Yang, 2010), *labor-employment* (Şimşek and Behdioğlu, 2006; Kar and Tatlısöz, 2008; Bahar, 2010; Naguib, 2012; Lamine and Yang, 2010; Javed, Sial, Awan and Sher, 2011; Hoang, Wiboanchutikula and Tubtimtong, 2010), *real exchange rate* (Bahar, 2010; Vergil and Çeştepe, 2006; Erdal and Tatoğlu, 2002; Kar and Tatlısöz, 2008; Uwubanmwen and Ajao, 2012), *instability* (Vergil and Çeştepe, 2006; Erdal and Tatoğlu, 2002), *infrastructure* (Liu, Daly and Varua, 2012; Erdal and Tatoğlu, 2002; Alavinasab, 2013), *interest rate* (Erdal and Tatoğlu, 2002; Lebe and Başar, 2008; Uwubanmwen and Ajao, 2012), *wages* (Açıkalın, Gül and Yaşar, 2006, Brandal, Strohmer and Traxler, 2013; Daly and Zhang, 2010; Liu, Daly and Varua, 2012; Brandal, Strohmer and Traxler, 2013), *investment incentives* (Kar and Tatlısöz, 2008), *foreign trade* (Daly and Zhang, 2010; Naguib, 2012; Al-sadig, 2013; Saqib, Masnoor and Rafique, 2013), *inflation* (Uwubanmwen and Ajao, 2012; Saqib, Masnoor and Rafique, 2013), *external debt* (Naguib, 2012; Saqib, Masnoor and Rafique, 2013), *unionization* (Brandal, Strohmer and Traxler, 2013). In the present study, four different models were created based on some of the above-mentioned variables.


## 3. Analysis and results

The analysis aimed to reveal the factors influential on the foreign direct investments in Turkey and whether or not such factors varied by sectoral foreign direct investments. To this end, the data covering the 1995-2012 period were used. The study searched the variables influential on the foreign direct investments received by 6 six sectors in Turkey between 1995 and 2012. In regard to the foreign direct investments (FDIs) received by sectors in Turkey, the following variables were used: gross domestic product(GDP), export (EXP), import (IMP), bribery and corruption index (BCI), political stability dummy variable (PS), wages (W), infrastructure expenses (INFRA), corporate tax (CT), real effective foreign exchange rate (FER), inflation (INF), and interest (INT). Table 1 demonstrates the channels from which the dataset related to the above-mentioned variables was obtained.

**Table 1.** *Data sources*

| Variable | Data Source |
|---|---|
| Foreign direct investments (By sectors) | Organisation for Economic Cooperation and Development (OECD) http://stats.oecd.org |
| Gross domestic product | Central Bank of the Republic of Turkey (CBRT) http://evds.tcmb.gov.tr/cbt.html |
| Import | Turkish Statistical Institute (TURKSTAT) http://tuikapp.tuik.gov.tr/disticaretapp/menu.zul |
| Export | Turkish Statistical Institute (TURKSTAT) http://tuikapp.tuik.gov.tr/disticaretapp/menu.zul |
| Real effective foreign exchange rate | Central Bank of the Republic of Turkey (CBRT) http://evds.tcmb.gov.tr/cbt.html |
| Bribery and corruption index | Transparency International (TI) http://www.transparency.org/country |
| Infrastructure expenses | International Transport Forum (ITF) http://stats.oecd.org |
| Inflation | Central Bank of the Republic of Turkey (CBRT) http://evds.tcmb.gov.tr/cbt.html |
| Interest rates | Central Bank of the Republic of Turkey (CBRT) http://evds.tcmb.gov.tr/cbt.html |
| Corporate tax | Organisation for Economic Cooperation and Development (OECD) http://stats.oecd.org |
| Wages | Turkish Statistical Institute (TURKSTAT) http://tuikapp.tuik.gov.tr/sanayidagitimapp/istihdamWet.zul |

## 3.1. Regression models

For the regression analysis, foreign direct investments were taken as the dependent variable while other variables were taken as independent variables. 4 different regression models were created by grouping independent variables in different ways. Thus, the first model employed the variables of gross domestic product, export, import, bribery and corruption index, and political stability:

$$ln(FDI)_t = \alpha_0 + \alpha_1 \ln(GDP)_t + \alpha_2 \ln(EXP)_t + \alpha_3 \ln(IMP)_t + \alpha_4 PS_t + \alpha_5 BCI_t + \varepsilon_{1t}$$

Model (2) was created by adding wages, infrastructure expenses, and corporate tax to the Model (1).

$$ln(FDI)_t = \beta_0 + \beta_1 \ln(GDP)_t + \beta_2 \ln(EXP)_t + \beta_3 \ln(IMP)_t + \beta_4 PS_t + \beta_5 BCI_t \\ + \beta_6 W_t + \beta_7 \ln(INFRA)_t + \beta_8 \ln(CT)_t + \varepsilon_{2t}$$

Model (3) was created by adding real effective foreign exchange rate, inflation rate, and interest rates on deposits to the Model (1).

$$ln(FDI)_t = \gamma_0 + \gamma_1 \ln(GDP)_t + \gamma_2 \ln(EXP)_t + \gamma_3 \ln(IMP)_t + \gamma_4 PS_t + \gamma_5 BCI_t \\ + \gamma_6 FER_t + \gamma_7 \ln(INF)_t + \gamma_8 \ln(INT)_t + \varepsilon_{3t}$$

Finally, Model (4) was created by adding all the independent variables.

$$ln(FDI)_t = \xi_0 + \xi_1 \ln (GDP)_t + \xi_2 \ln (EXP)_t + \xi_3 \ln (IMP)_t + \xi_4 PS_t + \xi_5 BCI_t + \xi_6 W_t$$
$$+ \xi_7 \ln (INFRA)_t + \xi_8 \ln (CT)_t + \xi_9 FER_t + \xi_{10} \ln(INF)_t$$
$$+ \xi_{11} \ln(INT)_t + \varepsilon_{4t}$$

Every model was analyzed separately for the sectorial distribution of foreign direct investments and for total foreign direct investments received by Turkey. The first variable that may affect foreign direct investment flows is gross domestic product, which shows the economic size of a country. A steadily increasing gross domestic product indicates the economic stability and market potential of a country. Since those who invest in a growing economy are likely to produce income thanks to such growth, a positive investment expectation arises in regard to this variable (Kar and Tatlısöz, 2008). Another variable is real effective foreign exchange rate. It has been reported in many studies that real effective foreign exchange rate is a critical determinant for foreign direct investments. It is stated that foreign investors are less likely to invest in the countries that are weak in terms of foreign exchange rate. Thus, a negative investment expectation arises in regard to this variable (Chakrabarti, 2001).

Another independent variable is inflation. Rise in inflation in a country indicates that macroeconomic stability has been disrupted, and government fails or acts unwillingly to control the balance of payments and regulate the money supply. Therefore, a negative investment expectation arises in regard to this variable (Çeştepe and Mıstaçoğlu, 2010). Bribery and corruption is another variable under examination. The higher the bribery and corruption coefficient is, the more likely it is for the host country to receive foreign direct investments. The lower the bribery and corruption coefficient is, the less likely it is for the host country to receive foreign direct investments. For that reason, a negative investment expectation arises in regard to this variable. The ratio of corporate tax in gross domestic product has been addressed as an independent variable, too. The higher the corporate tax ratio in the host country is, the less likely it is for the host country to receive foreign direct investments. In brief, high corporate tax ratio has an inhibiting effect on foreign direct investments. Therefore, a negative investment expectation arises in regard to this variable (Erçakar, 2004).

Another variable focused on as an independent variable is infrastructure expenses and transport costs. Infrastructure is an important determinant for foreign direct investments. The countries with good infrastructure conditions attract more foreign direct investments in comparison to others. Thus, a positive investment expectation arises in regard to this variable (Berköz and Türk, 2007). The seventh independent variable is labor wages. In the present study, minimum wage was taken as indication for this variable. Labor costs are very important for export-based establishments and foreign direct investments in labor-intensive industries. Companies engaged in labor-intensive production are more likely to make investment in the regions where labor is low-cost in order to make higher profit. Thus, a positive investment expectation arises in regard to this variable (Kurtaran, 2007).

Interest rates were also treated as an independent variable in the present study. Rise in interest rates makes private sector investments more expensive and thus reduces them. Accordingly, economic growth is affected negatively. Moreover, increase in interest rates influences decisions about foreign direct investments negatively for the host country (Lebe and Başar, 2008). Import and export values were among the independent variables of the study, too. The literature shows that these two variables are important determinants for foreign direct investments. In general, high import and export values indicate export potential and the existence of a dynamic and sound economy and make the host country attractive for foreign direct investments (Chakrabarti, 2001).

Whether foreign direct investments are made through building new facilities from scratch or are made through acquisitions, they are directly affected by the political stability of the host country. Since multinational companies believe that they may make higher profit in countries with a high political stability, they will increase their investments in such countries. When the foreign direct investments received by such countries increase, the prices of the products manufactured in these countries will fall, thereby leading to a more competitive environment both in the domestic market of the host country and in the international markets. Thus, more foreign direct investments will be received by the host country. In this sense, a positive investment expectation arises in regard to this variable (Chakrabarti, 2003).

## 3.2. Unit root analysis and findings

The test of stationarity was administered to the variables. In this way, non-stationary variables were made stationary. Then regression analyses were made in order to determine the factors influential on foreign direct investments. For the stationarity test, the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (P-P) methods were used.

For the time series analyses, whether or not the variables were stationary was tested in the first place. To this end, the Augmented Dickey-Fuller unit root test was conducted for each variable. It was found out that the level values of the variables involved unit root for trend and non-trend models. Thus, to make the variables stationary, the first differences of time series were taken, and the series were subjected to the test of stationarity. It was determined that some variables were stationary in the first differences (Table 2). Besides the ADF unit root test, the Phillips-Perron unit root test was conducted in order to correct and make stationary the error terms of the series. The results are given in Table 3. The Phillips-Perron test, which does not include restrictive assumptions in the matter of error terms and has been developed to control high-degree correlation, is a unit root test that complements the Augmented Dickey-Fuller test. In the Phillips-Perron test, the delayed values of dependent variables enough for eliminating autocorrelation are not included in the model. Instead, the model is adapted with the Newey-West estimator. In this test, the series is considered stationary when the test statistic (in absolute value) is bigger than the critical values tabulated by MacKinnon (Mucuk and Demirsel, 2009).

**Table 2.** *The results of the Augmented Dickey-Fuller stationary analysis for level values*

| Variables | Level Values I(0) | | First Difference Values I(1) | |
|---|---|---|---|---|
| | **Non-Trend Model** | **Trend Model** | **Non-Trend Model** | **Trend Model** |
| | **t-statistic** | **t-statistic** | **t-statistic** | **t-statistic** |
| ln(AM) | -0.670 | -2.010 | -1.688 | -1.705 |
| ln(MFG) | -0.788 | -2.509 | -2.918 | -2.836 |
| ln(WRT) | -2.161 | -2.201 | -1.941 | -1.871 |
| ln(TCS) | -1.848 | -1.495 | -2.563 | -2.258 |
| ln(FIREA) | -0.802 | -2.134 | -2.041 | -1.936 |
| ln(OS) | -1.043 | -3.499 | -3.556 | -3.307 |
| ln(TFI) | -1.020 | -1.949 | -2.502 | -2.401 |
| ln(GDP) | 0.225 | -2.854 | -2.448 | -2.406 |
| FER | -2.698 | -2.683 | -1.756 | -1.627 |
| ln(INF) | -0.728 | -1.627 | -2.116 | -2.084 |
| BCI | -0.228 | -1.279 | -2.975 | -4.694 |
| ln(CT) | -1.165 | -1.826 | -1.472 | -1.083 |
| W | -1.162 | -2.263 | -2.580 | -2.588 |
| ln(INFRA) | -0.463 | -2.517 | -2.060 | -1.951 |
| ln(IMP) | 0.013 | -2.249 | -1.925 | -1.856 |
| ln(EXP) | -0.170 | -2.255 | -1.803 | -1.698 |
| ln(INT) | 0.671 | -2.316 | -4.030 | -4.585 |

**Note:** For the non-trend model, t-values were taken as -3.750, -3.000, and -2.630 for the significance levels of 1%, 5%, and 10% respectively. For the trend-model, t-values were taken as 4.380, -3.600, and -3.240 for the significance levels of 1%, 5%, and 10% respectively.

According to these results, FER did not include unit root at 10% level in the non-trend model and was stationary. In addition, it was determined that OS did not include unit root at 5% level in the trend model and was stationary. According to the results of the stationarity analysis made for the first differences, MFG, OS, BCI, and INTEREST did not include unit root at 10%, 5%, 10%, and 1% levels respectively in the non-trend model and were stationary. In the trend model, BCI and INTEREST did not include unit root at 1% level in the first differences and were stationary. On the other hand, it was observed that other variables included unit root in the first differences and were non-stationary. Since the results were not consistent with the assumptions of the Augmented Dickey-Fuller unit root test, the Phillips-Perron unit root test was conducted for level values in order to correct the error terms of the series. The results are summarized in Table 3.

**Table 3.** *The results of the Phillips-Perron stationary analysis for level values*

| Variables | Level Values I(0) | | First Difference Values I(1) | |
|---|---|---|---|---|
| | Non-Trend Model | Trend Model | Non-Trend Model | Trend Model |
| | t-statistic | t-statistic | t-statistic | t-statistic |
| ln(AM) | -1.234 | -1.918 | -4.055 | -3.926 |
| ln(MFG) | -1.088 | -2.696 | -4.594 | -4.500 |
| ln(WRT) | -2.844 | -2.822 | -6.343 | -6.190 |
| ln(TCS) | -2.232 | -2.598 | -4.789 | -4.835 |
| ln(FIREA) | -1.353 | -2.444 | -5.358 | -5.157 |
| ln(OS) | -0.987 | -4.122 | -6.816 | -6.345 |
| ln(TFI) | -1.135 | -2.260 | -3.216 | -3.059 |
| ln(GDP) | -0.308 | -2.171 | -3.874 | -3.770 |
| FER | -3.071 | -2.916 | -5.876 | -5.887 |
| ln(INF) | -0.730 | -1.838 | -3.193 | -3.024 |
| BCI | -0.812 | -2.361 | -2.692 | -2.884 |
| ln(CT) | -3.380 | -2.951 | -3.862 | -3.934 |
| W | -1.725 | -2.843 | -5.829 | -5.629 |
| ln(INFRA) | -0.802 | -2.073 | -4.687 | -4.527 |
| ln(IMP) | -0.326 | -2.119 | -4.499 | -4.408 |
| ln(EXP) | -0.103 | -1.904 | -3.162 | -3.047 |
| ln(INT) | -0.386 | -2.256 | -4.469 | -4.402 |

**Note:** For the non-trend model, t-values were taken as -3.750, -3.000, and -2.630 for the significance levels of 1%, 5%, and 10% respectively. For the trend-model, t-values were taken as 4.380, -3.600, and -3.240 for the significance levels of 1%, 5%, and 10% respectively.

According to the results in the Table 3, in the non-trend model, WRT, FER, and CT did not include unit root at 10%, 5%, and 5% levels respectively and were stationary. In the trend model, OS did not include unit root at 5% level and was stationary. According to the results of the analysis made for the first differences, in the non-trend model, INF, EXP, and TFI did not include unit root at 5% level in the first differences; BCI did not include unit root at 10% level in the first differences; all other variables did not include unit root at 1% level in the first differences; and all such variables were stationary. On the other hand, in the trend model, TFI, INF, BCI, and EXP were found to be non-stationary. In addition, it was found that AM, GDP, and CT did not include unit root at 5% level and were stationary. All other variables were detected to be stationary at 1% level.

## 3.3. Regression analysis results

Regression analysis was made in order to reveal the factors influential on foreign direct investments in each sub-sector through four different models. Errors of estimation must not involve autocorrelation; variances must be equal; variables must be suitable for normal distribution; and there must be no multicollinearity between independent variables so that the models created in regression analyses yield meaningful results. Whether or not the variables had a normal distribution was checked. Based on the results, the natural logarithms of the variables not having normal distribution were taken, and they were

transformed. The variance inflation factor (VIF) was used for testing the multicollinearity problem and supporting the results of the regression models. Another method employed in determining the multicollinearity problem is the tolerance (1/VIF) values of variables (Doğan, 2013). High VIF values are considered to indicate that the model is problematic or independent variables have multicollinearity. Although there is no firm consensus regarding the required exact VIF value or the highest VIF value allowing variables to be included in the model, it is generally thought that there is no multicollinearity problem in a model if VIF < 10. The removal of an independent variable or variables with a VIF value higher than 10 from the model may make the statistically insignificant results of the original model significant (Gujarati, 2004). Since the VIF value of the variable of import (IMP) was higher than 10 in the entire sample in the Model (4) according to the results of the regression analyses conducted, it was removed from the model.

According to the Model (1) results, gross domestic product had a significant and positive effect on total foreign direct investments at 5% significance level (t=3.07, p<0.05). In addition, while export had a significant and positive effect at 5% significance level (t=2.68, p<0.05), import had a significant but negative effect at 5% significance level (t=-2.73, p<0.05). According to the Model (2) results, gross domestic product had a significant and positive effect at 1% significance level (t=5.08, p<0.01). Export had a significant and positive effect at 5% significance level (t=2.99, p<0.05). Moreover, wages had a significant but negative effect at 5% significance level (t=-2.47, p<0.05), and infrastructure had a significant but negative effect at 5% significance level (t=-2.49, p<0.05).

**Table 4.** *Regression analysis results for the total foreign direct investments received by Turkey.*

| Variables | Model (1) Coefficient (t-statistic) VIF | | Model (2) Coefficient (t-statistic) VIF | | Model (3) Coefficient (t-statistic) VIF | | Model (4) Coefficient (t-statistic) VIF | |
|---|---|---|---|---|---|---|---|---|
| $\Delta$ln(GDP) | 12.31(3.07)** | 3.26 | 16.02(5.08)* | 3.69 | 11.02(2.43)** | 3.97 | 12.21(3.48)** | 3.82 |
| $\Delta$ln(IMP) | -4.306(-2.73)** | 5.44 | -2.153(-1.52) | 8.06 | -2.799(-1.48) | 7.47 | | |
| $\Delta$ln(EXP) | 4.697(2.68)** | 2.49 | 5.821(2.99)** | 5.63 | 2.878(1.30) | 3.82 | 3.558(1.83) | 4.73 |
| PS | -0.329(-1.05) | 1.24 | -0.448(-1.46) | 2.14 | 1-0.533(-1.49) | 1.52 | -0.946(-2.43)*** | 2.91 |
| $\Delta$BCI | -0.0180(-0.37) | 1.35 | 0.0311(0.81) | 1.59 | 0.0417(0.67) | 2.15 | 0.0859(2.09)*** | 1.51 |
| $\Delta$W | - | | -0.00499(-2.47)** | 3.20 | | | -0.00434(-1.74) | 4.05 |
| $\Delta$ln(INFRA) | - | | -0.879(-2.49)** | 4.69 | | | -0.895(-2.31)*** | 4.74 |
| $\Delta$ln(CT) | - | | 2.421(0.81) | 2.29 | | | -2.871(-0.69) | 3.75 |
| $\Delta$FER | - | | - | | -0.0190(-1.21) | 2.30 | -0.0182(-1.18) | 3.62 |
| $\Delta$ln(INF) | - | | - | | 0.117(0.25) | 1.13 | 0.409(1.02) | 1.35 |
| $\Delta$ln(INT) | - | | - | | -0.387(-1.13) | 1.28 | -0.452(-1.27) | 2.21 |
| Constant | -0.546(-1.69) | | -0.856(-2.40)** | | -0.333(-0.92) | | -0.115(-0.25) | |
| R² value | 0.581 | | 0.834 | | 0.682 | | 0.851 | |
| Adjusted R² | 0.390 | | 0.668 | | 0.364 | | 0.603 | |
| AIC | 32.99 | | 23.26 | | 34.30 | | 25.38 | |
| BIC | 37.99 | | 30.76 | | 41.80 | | 34.54 | |
| F-Value | 3.050 | | 5.018 | | 2.144 | | 3.434 | |

**Note:** For p-values, *, **, and *** refer to the statistical significance levels of 1%, 5%, and 10% respectively.

According to the Model (3) results, gross domestic product had a significant and positive effect at 5% significance level (t=2.43, p<0.05). According to the Model (4) results, gross domestic product had a significant and positive effect at 5% significance level (t=3.48, p<0.05). In addition, political stability had a significant but negative effect at 10% significance level (t=-2.43, p<0.1), and corruption had a significant and positive effect at 10% significance level (t=2.09, p<0.1). Infrastructure, on the other and, was found to have a significant but negative effect at 10% level (t=-2.31, p<0.1).

According to the Model (1), Model (2), Model (3), and Model (4) results, the power of the independent variables used in these models to explain foreign direct investments increased as the variables were added to the Model (1). The power of economic variables to explain foreign direct investments ( $R^2$ ) was found to be 58.1% in the Model (1), 83.4% in the Model (2), 68.2% in the Model (3), and 85.1% in the Model (4). In accordance with the research results, the results of the regression analyses conducted for each sector were tabulated separated. They are given in Table 5 to Table 10.

As is seen in Table 5, the analyses made for the Agriculture and Mining sector showed that no model and no variable had any effect. That is, no factor was found to be influential on the foreign direct investments received by this sector. The investors of this sector made investments without considering the variables included in the model. They invested because of the variables not included in the model.

The results of the regression analysis made for the manufacturing sector are given in Table 6. According to the Model (1) results, export had a significant and positive effect on the foreign direct investments received by the manufacturing sector at 1% significance level (t=3.22, p<0.01). In addition, import had a significant but negative effect at 5% significance level (t=-2.54, p<0.05). On the other hand, according to the Model (2) results, export had a significant and positive effect at 5% significance level (t=2.70, p<0.05), and import had a significant but negative effect at 10% significance level (t=-1.92, p<0.1).

According to the Model (3) results, gross domestic product had a significant and positive effect at 5% significance level (t=2.32, p<0.05), and export had a significant and positive effect at 5% significance level (t=2.39, p<0.05). However, import had a significant but negative effect at 10% significance level (t=-1.96, p<0.1). Foreign exchange rate had a significant but negative effect on the foreign direct investments received by the manufacturing sector at 5% significance level (t=-2.76, p<0.05). Inflation had a significant and positive effect at 5% significance level (t=2.38, p<0.05). According to the Model (4) results, inflation had a significant and positive effect on the foreign direct investments received by the manufacturing sector at 10% significance level (t=1.99, p<0.1).

**Table 5.** *Regression analysis results for the agriculture and mining sector.*

| Variables | Model (1) Coefficient(t-statistic) | VIF | Model (2) Coefficient(t-statistic) | VIF | Model (3) Coefficient(t-statistic) | VIF | Model (4) Coefficient(t-statistic) | VIF |
|---|---|---|---|---|---|---|---|---|
| $\Delta\ln(GDP)$ | 3.668(0.46) | 3.26 | -0.831(-0.10) | 3.69 | 9.936(1.14) | 3.97 | 1.757(0.21) | 3.82 |
| $\Delta\ln(IMP)$ | 0.200(0.06) | 5.44 | -2.011(-0.52) | 8.06 | -0.873(-0.24) | 7.47 | - | |
| $\Delta\ln(EXP)$ | 0.308(0.09) | 2.49 | -2.297(-0.43) | 5.63 | 0.590(0.14) | 3.82 | -5.634(-1.24) | 4.73 |
| PS | 0.568(0.90) | 1.24 | 0.580(0.69) | 2.14 | 0.491(0.71) | 1.52 | 0.356(0.39) | 2.91 |
| $\Delta BCI$ | -0.0588(-0.61) | 1.35 | -0.119(-1.12) | 1.59 | -0.109(-0.91) | 2.15 | -0.0803(-0.84) | 1.51 |
| $\Delta W$ | - | | 0.00493(0.89) | 3.20 | - | | 0.00500(0.86) | 4.05 |
| $\Delta\ln(INFRA)$ | - | | 1.258(1.30) | 4.69 | - | | 1.383(1.53) | 4.74 |
| $\Delta\ln(CT)$ | - | | -5.169(-0.63) | 2.29 | - | | -2.946(-0.30) | 3.75 |
| $\Delta FER$ | - | | - | | -0.00630(-0.21) | 2.30 | -0.0307(-0.85) | 3.62 |
| $\Delta\ln(INF)$ | - | | - | | -1.372(-1.53) | 1.13 | -1.434(-1.54) | 1.35 |
| $\Delta\ln(INT)$ | - | | - | | 0.672(1.02) | 1.28 | 0.342(0.41) | 2.21 |
| Constant | -0.474(-0.74) | | 0.129(0.13) | | -0.865(-1.24) | | -0.0176(-0.02) | |
| $R^2$ value | 0.186 | | 0.388 | | 0.423 | | 0.605 | |
| Adjusted $R^2$ | -0.183 | | -0.223 | | -0.154 | | -0.052 | |
| AIC | 56.45 | | 57.60 | | 56.61 | | 54.15 | |
| BIC | 61.45 | | 65.10 | | 64.11 | | 63.32 | |
| F-Value | 0.504 | | 0.635 | | 0.733 | | 0.920 | |

**Note:** For p-values, *, **, and *** refer to the statistical significance levels of 1%, 5%, and 10% respectively.

**Table 6.** *Regression analysis results for the manufacturing sector.*

| Variables | Model (1) Coefficient(t-statistic) | VIF | Model (2) Coefficient(t-statistic) | VIF | Model (3) Coefficient(t-statistic) | VIF | Model (4) Coefficient(t-statistic) | VIF |
|---|---|---|---|---|---|---|---|---|
| $\Delta\ln(GDP)$ | 7.009(1.57) | 3.26 | 8.622(1.85) | 3.69 | 7.438(2.32)** | 3.97 | 6.469(1.73) | 3.82 |
| $\Delta\ln(IMP)$ | -4.457(-2.54)** | 5.44 | -4.024(-1.92)*** | 8.06 | -2.621(-1.96)*** | 7.47 | - | |
| $\Delta\ln(EXP)$ | 6.265(3.22)* | 2.49 | 7.758(2.70)** | 5.63 | 3.755(2.39)** | 3.82 | 3.615(1.74) | 4.73 |
| PS | -0.129(-0.37) | 1.24 | 0.178(0.39) | 2.14 | -0.246(-0.97) | 1.52 | -0.329(-0.79) | 2.91 |
| $\Delta BCI$ | -0.0230(-0.43) | 1.35 | 0.00854(0.15) | 1.59 | 0.0331(0.75) | 2.15 | 0.0776(1.77) | 1.51 |
| $\Delta W$ | - | | -0.00116(-0.39) | 3.20 | - | | -0.00244(-0.92) | 4.05 |
| $\Delta\ln(INFRA)$ | - | | -0.462(-0.89) | 4.69 | - | | -0.550(-1.33) | 4.74 |
| $\Delta\ln(CT)$ | - | | 6.829(1.55) | 2.29 | - | | 1.593(0.36) | 3.75 |
| $\Delta FER$ | - | | - | | -0.0306(-2.76)** | 2.30 | -0.0303(-1.83) | 3.62 |
| $\Delta\ln(INF)$ | - | | - | | 0.782(2.38)** | 1.13 | 0.850(1.99)*** | 1.35 |
| $\Delta\ln(INT)$ | - | | - | | 0.271(1.12) | 1.28 | 0.310(0.82) | 2.21 |
| Constant | -0.475(-1.33) | | -1.079(-2.05)*** | | -0.184(-0.71) | | -0.198(-0.41) | |
| $R^2$ value | 0.510 | | 0.656 | | 0.849 | | 0.839 | |
| Adjusted $R^2$ | 0.287 | | 0.312 | | 0.697 | | 0.570 | |
| AIC | 36.53 | | 36.51 | | 22.55 | | 27.63 | |
| BIC | 41.53 | | 44.01 | | 30.05 | | 36.80 | |
| F-Value | 2.289 | | 1.907 | | 5.611 | | 3.122 | |

**Note:** For p-values, *, **, and *** refer to the statistical significance levels of 1%, 5%, and 10% respectively.

**Table 7.** *Regression analysis results for the wholesale and retail trade sector.*

| Variables | Model (1) Coefficient(t-statistic) VIF | | Model (2) Coefficient(t-statistic) VIF | | Model (3) Coefficient(t-statistic) VIF | | Model (4) Coefficient(t-statistic) VIF | |
|---|---|---|---|---|---|---|---|---|
| $\Delta\ln(GDP)$ | 10.82(1.40) | 3.26 | 8.531(1.62) | 3.69 | 8.763(0.95) | 3.97 | 4.590(1.18) | 3.82 |
| $\Delta\ln(IMP)$ | -3.327(-1.10) | 5.44 | -1.835(-0.77) | 8.06 | -3.732(-0.97) | 7.47 | - | |
| $\Delta\ln(EXP)$ | 5.114(1.52) | 2.49 | -5.208(-1.60) | 5.63 | 6.094(1.35) | 3.82 | -6.096(-2.83)** | 4.73 |
| PS | -0.416(-0.69) | 1.24 | -0.959(-1.87)*** | 2.14 | -0.170(-0.23) | 1.52 | -1.205(-2.80)** | 2.91 |
| $\Delta BCI$ | 0.0119(0.13) | 1.35 | -0.00520(-0.08) | 1.59 | -0.00674(-0.05) | 2.15 | 0.0237(0.52) | 1.51 |
| $\Delta W$ | - | | -0.00554(-1.64) | 3.20 | - | | -0.00672(-2.44)*** | 4.05 |
| $\Delta\ln(INFRA)$ | - | | 2.155(3.65)* | 4.69 | - | | 2.001(4.67)* | 4.74 |
| $\Delta\ln(CT)$ | - | | -12.43(-2.49)** | 2.29 | - | | -17.65(-3.82)* | 3.75 |
| $\Delta FER$ | - | | - | | 0.0140(0.44) | 2.30 | 0.000753(0.04) | 3.62 |
| $\Delta\ln(INF)$ | - | | - | | 1.029(1.09) | 1.13 | 1.416(3.20)** | 1.35 |
| $\Delta\ln(INT)$ | - | | - | | 0.180(0.26) | 1.28 | -0.114(-0.29) | 2.21 |
| Constant | -0.730(-1.18) | | 0.757(1.27) | | -0.627(-0.85) | | 1.500(2.97)** | |
| $R^2$ value | 0.323 | | 0.796 | | 0.420 | | 0.921 | |
| Adjusted $R^2$ | 0.015 | | 0.593 | | -0.159 | | 0.788 | |
| AIC | 55.18 | | 40.75 | | 58.54 | | 28.76 | |
| BIC | 60.18 | | 48.25 | | 66.04 | | 37.92 | |
| F-Value | 1.048 | | 3.911 | | 0.725 | | 6.950 | |

**Note:** For p-values, *, **, and *** refer to the statistical significance levels of 1%, 5%, and 10% respectively.

The results of the regression analysis made for the wholesale and retail trade sector are given in Table 7. According to the analysis results, no variable included in the Model (1) or Model (3) had any effect on the foreign direct investments received by the wholesale and retail trade sector. According to the Model (2) results, political stability had a significant but negative effect at 10% significance level (t=-1.87, p<0.1). Infrastructure had a significant and positive effect at 1% significance level (t=3.65, p<0.01). Tax, on the other hand, had a significant but negative effect at 5% significance level (t=-2.49, p<0.05).

According to the Model (4) results, export had a significant but negative effect at 5% significance level (t=-2.83, p<0.05). Moreover, political stability had a significant but negative effect at 5% significance level (t=-2.80, p<0.05). While wages had a significant but negative effect at 10% significance level (t=-2.44, p<0.1), infrastructure had a significant and positive effect at 1% significance level (t=4.67, p<0.01). Furthermore, while tax had a significant but negative effect at 1% significance level (t=-3.82, p<0.01), inflation had a significant and positive effect at 5% significance level (t=3.20, p<0.05).

The results of the regression analysis made for the transportation, communication, and storage services sector are given in Table 8. According to the analysis results, no variable included in the Model (2) had any effect on the foreign direct investments received by the transportation, communication, and storage services sector. According to the Model (1) results, gross domestic product had a significant and positive effect at 5% significance

level (t=2.69, p<0.05). In addition, export had a significant and positive effect at 5% significance level (t=2.46, p<0.05). However, import had a significant but negative effect at 5% significance level (t=-3.24, p<0.05).

According to the Model (3) results, gross domestic product had a significant and positive effect at 1% significance level (t=10.08, p<0.01). In addition, export had a significant and positive effect at 5% significance level (t=3.00, p<0.05). On the other hand, import had a significant but negative effect at 1% significance level (t=-6.73, p<0.01). Likewise, foreign exchange rate had a significant but negative effect at 1% significance level (t=-6.90, p<0.01). Inflation had a significant but negative effect at 1% significance level (t=-8.14, p<0.01), and interest had a significant but negative effect at 5% significance level (t=-2.12, p<0.05).

According to the Model (4) results, while gross domestic product had a significant and positive effect at 10% significance level (t=2.96, p<0.1), political stability had a significant but negative effect at 5% significance level (t=-4.14, p<0.05). In addition, while corruption had a significant and positive effect at 10% significance level (t=2.54, p<0.1), foreign exchange rate had a significant but negative effect at 1% significance level (t=-6.35, p<0.01). Interest had a significant but negative effect at 10% significance level (t=-3.16, p<0.1).

**Table 8.** *Regression analysis results for the transportation, communication, and storage services sector*

| Variables | Model (1) Coefficient(t-statistic) | VIF | Model (2) Coefficient(t-statistic) | VIF | Model (3) Coefficient(t-statistic) | VIF | Model (4) Coefficient(t-statistic) | VIF |
|---|---|---|---|---|---|---|---|---|
| Δln(GDP) | 62.32(2.69)** | 4.39 | 8.931(0.34) | 2.03 | 60.47(10.08)* | 5.25 | 31.01(2.96)*** | 3.19 |
| Δln(IMP) | -26.25(-3.24)** | 5.52 | - | | -16.55(-6.73)* | 9.04 | - | |
| Δln(EXP) | 21.76(2.46)** | 2.54 | 10.18(0.52) | 4.51 | 8.639(3.00)** | 4.80 | -2.488(-0.38) | 5.08 |
| PS | -3.211(-1.55) | 1.34 | -2.208(-0.56) | 1.74 | -3.971(-7.97)* | 1.38 | -5.969(-4.14)** | 2.30 |
| ΔBCI | -0.467(-1.25) | 1.61 | 0.0844(0.13) | 1.73 | -0.0694(-0.66) | 2.24 | 0.561(2.54)*** | 1.99 |
| ΔW | - | | - | | - | | - | |
| Δln(INFRA) | - | | -2.050(-0.47) | 5.45 | - | | -1.728(-1.24) | 5.55 |
| Δln(CT) | - | | 10.60(0.32) | 1.61 | - | | -36.70(-2.24) | 3.81 |
| ΔFER | - | | - | | -0.143(-6.90)* | 2.89 | -0.264(-6.35)* | 2.32 |
| Δln(INF) | - | | - | | -4.519(-8.14)* | 1.11 | -2.159(-1.41) | 1.68 |
| Δln(INT) | - | | - | | -1.817(-3.47)** | 1.20 | -4.539(-3.16)*** | 1.79 |
| Constant | -0.574(-0.32) | | 0.392(0.09) | | -0.936(-2.12) | | 2.446(1.55) | |
| R² value | 0.643 | | 0.149 | | 0.989 | | 0.957 | |
| Adjusted R² | 0.388 | | -0.703 | | 0.966 | | 0.828 | |
| AIC | 66.91 | | 80.21 | | 28.18 | | 47.41 | |
| BIC | 70.29 | | 84.17 | | 33.26 | | 53.06 | |
| F-Value | 2.524 | | 0.175 | | 43.24 | | 7.411 | |

**Note:** For p-values, *, **, and *** refer to the statistical significance levels of 1%, 5%, and 10% respectively.

**Table 9.** *Regression analysis results for the financial intermediaries and real estate activities sector*

| Variables | Model (1) Coefficient(t-statistic) | VIF | Model (2) Coefficient(t-statistic) | VIF | Model (3) Coefficient(t-statistic) | VIF | Model (4) Coefficient(t-statistic) | VIF |
|---|---|---|---|---|---|---|---|---|
| Δln(GDP) | 9.466(0.79) | 3.26 | 11.82(0.95) | 3.69 | 7.766(0.68) | 3.97 | 14.29(1.41) | 3.82 |
| Δln(IMP) | 3.754(0.79) | 5.44 | 5.080(0.91) | 8.06 | -2.136(-0.45) | 7.47 | - | |
| Δln(EXP) | -1.746(-0.33) | 2.49 | 2.076(0.27) | 5.63 | 6.605(1.17) | 3.82 | 11.30(2.01)*** | 4.73 |
| PS | 0.423(0.45) | 1.24 | -0.676(-0.56) | 2.14 | 1.408(1.56) | 1.52 | 0.909(0.81) | 2.91 |
| ΔBCI | -0.127(-0.88) | 1.35 | -0.148(-0.98) | 1.59 | -0.345(-2.19)*** | 2.15 | -0.318(-2.69)** | 1.51 |
| ΔW | - | | -0.000851(-0.11) | 3.20 | - | | -0.00724(-1.01) | 4.05 |
| Δln(INFRA) | - | | -1.445(-1.04) | 4.69 | - | | -1.812(-1.62) | 4.74 |
| Δln(CT) | - | | -14.16(-1.21) | 2.29 | - | | -3.479(-0.29) | 3.75 |
| ΔFER | - | | - | | 0.0993(2.50)** | 2.30 | 0.112(2.51)** | 3.62 |
| Δln(INF) | - | | - | | 0.701(0.60) | 1.13 | 1.137(0.98) | 1.35 |
| Δln(INT) | - | | - | | 0.763(0.88) | 1.28 | 0.795(0.78) | 2.21 |
| Constant | -0.773(-0.80) | | -0.00352(-0.00) | | -1.353(-1.47) | | -1.489(-1.13) | |
| R² value | 0.454 | | 0.628 | | 0.702 | | 0.820 | |
| Adjusted R² | 0.206 | | 0.255 | | 0.404 | | 0.520 | |
| AIC | 70.24 | | 69.74 | | 65.94 | | 61.39 | |
| BIC | 75.24 | | 77.24 | | 73.44 | | 70.56 | |
| F-Value | 1.829 | | 1.685 | | 2.358 | | 2.731 | |

**Note:** For p-values, *, **, and *** refer to the statistical significance levels of 1%, 5%, and 10% respectively

The results of the regression analysis made for the financial intermediaries and real estate activities sector are given in Table 9. According to the analysis results, no variable included in the Model (1) or Model (2) had any effect on the foreign direct investments received by the financial intermediaries and real estate activities sector. According to the Model (3) results, corruption had a significant but negative effect at 10% significance level (t=-2.19, p<0.1). On the other hand, foreign exchange rate had a significant and positive effect at 5% significance level (t=2.50, p<0.05).

According to the Model (4) results, export had a significant and positive effect at 10% significance level (t=2.01, p<0.1). In addition, foreign exchange rate had a significant and positive effect at 5% significance level (t=2.51, p<0.05). On the other hand, corruption had a significant but negative effect at 5% significance level (t=-2.69, p<0.05).

The results of the regression analysis made for the other services (electricity, gas, and water; construction; and hotels and restaurants) sector are given in Table 10. According to the analysis results, no variable included in the Model (1) or Model (2) had any effect on the foreign direct investments received by the other services sector. According to the Model (3) results, interest had a significant but negative effect at 10% significance level (t=-1.96, p<0.1). According to the Model (4) results, interest had a significant but negative effect at 10% significance level.

In this study, the factors influential on the sectors receiving foreign direct investments in Turkey and how such sectors were influenced were examined. The factors influential on foreign direct investments were searched by taking into consideration political stability. The results of the regression analyses made on the sample are summarized in Table 11 as positive (+), negative (-), and insignificant (0).

**Table 10.** *Regression analysis results for the other services (electricity, gas, and water; construction; and hotels and restaurants) sector.*

| Variables | Model (1) Coefficient(t-statistic) VIF | | Model (2) Coefficient(t-statistic) VIF | | Model (3) Coefficient(t-statistic) VIF | | Model (4) Coefficient(t-statistic) VIF | |
|---|---|---|---|---|---|---|---|---|
| $\Delta\ln(GDP)$ | 6.978(0.87) | 3.26 | 8.723(0.89) | 3.69 | -0.202(-0.02) | 3.97 | -0.146(-0.02) | 3.82 |
| $\Delta\ln(IMP)$ | -1.371(-0.44) | 5.44 | -0.156(-0.04) | 8.06 | -0.397(-0.12) | 7.47 | - | |
| $\Delta\ln(EXP)$ | -0.315(-0.09) | 2.49 | -0.509(-0.08) | 5.63 | -0.360(-0.09) | 3.82 | -0.324(-0.07) | 4.73 |
| PS | -0.191(-0.30) | 1.24 | -0.280(-0.29) | 2.14 | -0.238(-0.37) | 1.52 | -0.959(-1.02) | 2.91 |
| $\Delta BCI$ | 0.0794(0.83) | 1.35 | 0.104(0.87) | 1.59 | 0.138(1.23) | 2.15 | 0.155(1.56) | 1.51 |
| $\Delta W$ | - | | -0.00299(-0.48) | 3.20 | - | | 0.000486(0.08) | 4.05 |
| $\Delta\ln(INFRA)$ | - | | -0.289(-0.26) | 4.69 | - | | -0.289(-0.31) | 4.74 |
| $\Delta\ln(CT)$ | - | | 0.523(0.06) | 2.29 | - | | -9.637(-0.96) | 3.75 |
| $\Delta FER$ | - | | - | | 0.0113(0.40) | 2.30 | -0.00363(-0.10) | 3.62 |
| $\Delta\ln(INF)$ | - | | - | | 0.667(0.79) | 1.13 | 1.107(1.15) | 1.35 |
| $\Delta\ln(INT)$ | - | | - | | -1.215(-1.96)*** | 1.28 | -1.670(-1.96)*** | 2.21 |
| Constant | -0.0622(-0.10) | | -0.126(-0.11) | | 0.257(0.39) | | 1.027(0.93) | |
| $R^2$ value | 0.175 | | 0.205 | | 0.480 | | 0.571 | |
| Adjusted $R^2$ | -0.200 | | -0.591 | | -0.041 | | -0.143 | |
| AIC | 56.38 | | 61.75 | | 54.54 | | 55.25 | |
| BIC | 61.38 | | 69.25 | | 62.04 | | 64.41 | |
| F-Value | 0.466 | | 0.257 | | 0.922 | | 0.799 | |

**Note:** For p-values, *, **, and *** refer to the statistical significance levels of 1%, 5%, and 10% respectively.

**Table 11.** *The summary of the analysis results*

| Variables | AM | | | | MFG | | | | WRT | | | | TCS | | | | FIREA | | | | OS | | | | TFI | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| GDP | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | 0 | 0 | 0 | 0 | + | 0 | + | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + | + | + |
| IMP | 0 | 0 | 0 | 0 | - | - | - | x | 0 | 0 | 0 | x | - | x | - | x | 0 | 0 | 0 | x | 0 | 0 | 0 | x | - | 0 | 0 | x |
| EXP | 0 | 0 | 0 | 0 | + | + | + | 0 | 0 | 0 | 0 | - | + | 0 | + | 0 | 0 | 0 | 0 | + | 0 | 0 | 0 | 0 | + | + | 0 | 0 |
| PS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| BCI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | 0 | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| W | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | x | - | x | x | x | x | x | 0 | x | 0 | x | 0 | x | 0 | x | - | x | 0 |
| INFRA | x | 0 | x | 0 | x | 0 | x | 0 | x | + | x | + | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | x | - | x | - |
| CT | x | 0 | x | 0 | x | 0 | x | 0 | x | - | x | - | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 | x | 0 |
| FER | x | x | 0 | 0 | x | x | - | 0 | x | x | 0 | 0 | x | x | - | - | x | x | + | + | x | x | 0 | 0 | x | x | 0 | 0 |
| INF | x | x | 0 | 0 | x | x | + | + | x | x | 0 | + | x | x | - | 0 | x | x | 0 | 0 | x | x | 0 | 0 | x | x | 0 | 0 |
| INTEREST | x | x | 0 | 0 | x | x | 0 | 0 | x | x | 0 | 0 | x | x | - | - | x | x | 0 | 0 | x | x | - | - | x | x | 0 | 0 |

## 4. Conclusion

The examination of the foreign direct investments received by Turkey in the 1995-2012 period by sectors shows that the financial intermediaries and real estate activities sector came first and was followed by the manufacturing sector. Acquisitions and mergers taking place in the banking segment made a big contribution to the investments received by this sector. On the other hand, developments in the sub-sectors of textile and food increased the foreign direct investments received by the manufacturing sector.

The present study investigated the factors influential on the total foreign direct investments received by Turkey and on sectoral foreign investments. Gross domestic product, export, import, bribery and corruption index, wages, infrastructure expenses, real effective foreign exchange rate, inflation rate, and real interest rate were used in the regression analyses aimed at determining the economic factors and whether or not such factors varied by sectors. Moreover, all such economic influences were examined by taking into consideration political stability thought to be introduced by the single-party government period.

The regression analyses indicated that there was a positive relationship between the total foreign direct investments received by the sectors in Turkey and gross domestic product, export, and bribery and corruption index, but there was a negative relationship between the total foreign direct investments received by the sectors in Turkey and import, political stability, and infrastructure expenses. In addition, it was seen that the political stability introduced by the single-party government period had a negative effect on the sectors of wholesale and retail trade and transportation, communication, and storage services. The findings of the present study were quite consistent with the related literature. Gross domestic product and political stability had the same kind of relationship with the total foreign direct investments received by Turkey and the foreign direct investments received by individual sectors. On the other hand, it was seen that some economic factors did not affect the total foreign direct investments received by Turkey and the foreign direct investments received by individual sectors in the same way. While export had a positive effect on the total foreign direct investments, it had a negative effect on the wholesale and retail trade sector. Likewise, while bribery and corruption index had a positive effect on the total foreign direct investments, it had a negative effect on the financial intermediaries and real estate activities sector. This may be because; the amounts of foreign direct investments, the factors influential on decisions about foreign direct investment and the effects of foreign direct investments on the national economy vary from sector to sector.

Turkey needs clear and explicit sectoral regulations and arrangements for an appropriate economic climate for foreign direct investments. In addition, political, economic, and social environments should be arranged by paying regard to the interests of sectors. Sectoral needs should be taken into account when making decisions for infrastructure investments. To attract more foreign investments and obtain positive effects from such investments, Turkey should do long-term sectoral planning by keeping in mind that these

investments do not leave the country in the short-term. Furthermore, the bureaucratic procedures to be confronted by sectors should be minimized; more transparent policies should be implemented; and evaluations on the effects of foreign direct investments on economy should remember that there may be sectoral differences.

## Note

[1] Agriculture and fishery, mining and quarrying (AM), manufacturing (MFG), wholesale and retail trade (WRT), transportation, communications, and storage services (TCS), financial intermediaries and real estate activities (FIREA), and other services (OS) (electricity, gas, and water; construction; and hotels and restaurants)

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