

**AN INQUIRY ON THE LIKELY  
EFFECTS OF CORRUPTION ON  
THE FOREIGN DIRECT  
INVESTMENTS IN TURKEY**

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**A**bstract: There is no consensus in the literature about the direction of the impact of corruption on foreign direct investments. The aim of this paper is to explore the likely effects of corruption on the foreign direct investments in Turkey. For this purpose, the determinants of foreign direct investments inflows to Turkey from 19 countries over the period of 2002-2012 are examined by means of panel analysis through refining the “Gravity Model” by adding control variables and corruption indicators. The results indicate that the Turkish foreign direct investment inflows have both market and efficiency seeking patterns and corruption is a critical factor for the foreign direct investment inflows.

**Keywords:** Gravity, corruption, foreign direct investment, panel data analysis.

**TÜRKİYE'DE YOLSUZLUĞUN  
DOĞRUDAN YABANCI  
YATIRIMLAR ÜZERİNDEKİ  
OLASI ETKİLERİ ÜZERİNE  
BİR ARAŞTIRMA**

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**Ö**z: Yolsuzluğun doğrudan yabancı yatırımlar üzerindeki etkisinin yönü konusunda literatürde bir görüş birliği bulunmamaktadır. Çalışmanın amacı Türkiye'de yolsuzluğun doğrudan yabancı yatırımlar üzerindeki muhtemel etkilerinin araştırılmasıdır. Bu amaçla, panel analiz yöntemi kullanmak suretiyle 2002-2012 arasında 19 ülkeden Türkiye'ye yapılan doğrudan yabancı yatırımların nedenleri "Çekim Modeli"ne, kontrol değişkenleri ve yolsuzluk göstergeleri eklenmek suretiyle incelenmiştir. Çalışma sonuçları Türkiye'ye gelen doğrudan yabancı yatırımların pazar ve etkinlik arama niteliği bulunduğu ve yolsuzluğun doğrudan yabancı yatırımlar için belirleyici bir faktör olduğuna işaret etmektedir.

**Anahtar Sözcükler:** Çekim, yolsuzluk, doğrudan yabancı yatırım, panel veri analizi.

## INTRODUCTION

There are conflicting opinions about the likely effects of corruption<sup>1</sup> on Foreign Direct Investments (FDI). While the findings of a bulk of empirical studies reviewed in Section 1 of this paper conclude that the corruption negatively affects investment choices and hampers economic development, this view is not always adopted by theoretical scholars. Theoretically, Leff, 1964; Huntington, 1968; Lui, 1985; Shlerifer, Vishny, 1993; Aidt, 2003 have based their argument on the ability of civil servants to speed up bureaucratic processes.

This paper explores the direction of the likely relationship between corruption and FDI in the case of Turkey by establishing a "Gravity Model" based on the Newton's law of universal gravitation<sup>2</sup>, integrating control variables into the Model alongside with some prominent variables in attracting FDI, such as, country's economic size and its geographical distance. To the best knowledge of authors of this paper, this is the first attempt to analyse both the types of FDI and the corruption in Turkey by using relative corruption index values with respect to investor countries in a Gravity Model framework. Hence, the paper is expected to provide evidence to comment on the potential effects of the differences in corruption levels between the investor countries and Turkey on the FDI inflows.

The paper is organized as follows: Section 1 focuses on the theoretical and the empirical literature concerning the relationship between FDI and corruption. Section 2 presents brief information about the FDI inflows to Turkey over the period 2002-2012. Section 3 presents the data, methodology and empirical results. Finally, Section 4 concludes by commenting on the findings.

## 1. CORRUPTION AND FDI RELATIONSHIP: BRIEF LITERATURE REVIEW

As mentioned above, the controversy surrounding the theoretical and empirical results of the likely relationship between FDI and corruption has not been resolved, yet. Theoretically, the opponents of corruption argue that the corruption hampers economic development and has detrimental effects on investments. Contrary to the proponents of corruption who advocate corruption on the ground of its positive impacts to the economy, the opponents of corruption reject efficiency gains of corruption. For example, Myrdal (1968: 937) observes that selfish officials have incentives to delay their services to extract additional benefits and their ability to speed up the business process is limited under bureaucratic red tape. Bardhan (1997: 1327–1328) argues that secrecy and uncertainty in corrupt acts have adverse effects on both static and dynamic efficiencies. Similarly, Rose-Ackerman (1997: 45–46) states that aggravating economic

circumstances in countries with a low quality of governance would expand the level of corruption. Jain (2001: 92) concludes that current research has failed to support the efficiency gains argument for petty corruption cases since the growing efficiency arisen from the increased number of bribery transactions will not compensate for the distortions of corruption.

Meanwhile, the proponents of corruption claim that the corruption can act as a helping hand to foster FDI inflows in cases of strict regulations and other administrative controls (Leff, 1964: 8–14). Huntington (1968: 386) states that “the only thing worse than a society with a rigid, over-centralized, dishonest bureaucracy is one with a rigid, over-centralized, honest bureaucracy”. Dysfunctional bureaucracy is believed to be compensated by corrupt acts (Leff, 1964: 8-14). Lui (1985: 778) claims that bribes might be deemed a useful auctioning procedure when a queue is involved and officials are eager to speed up the service when bribery is allowed. Shleifer and Vishny (1993: 615) consider that the cost of corruption might be lower if various independent bureaucratic agents are not involved in the authorization process and companies might be eager to pay bribes when they can foresee and estimate their total costs. Aidt (2003: 634) also points out that corruption might introduce competition for government sources, with the result that services are provided more efficiently. In the relevant literature, the justification on the positive impacts of corruption on economy is labeled as “grease in the wheels” or “efficient grease” hypothesis (Meon, Sekkat, 2005: 70; Kaufmann, Wei, 1999: 2).

Beside these theoretical discussions, there exist a considerable number of studies on the empirical side addressing the theoretical debate on the likely effects of corruption. Most of these studies, conclude that the corruption reduces investments and GDP growth. For example, Mauro (1995: 681) shows that the corruption reduces investment, hampering economic growth. In addition, particularly poor countries tend to have more corrupt, cumbersome bureaucracies and instable political environments as institutional inefficiency persists over time. Meon and Sekkat (2005: 83-91) present similar results, pointing out that the magnitude of the negative effect of corruption on investments and economic growth largely depend on quality of governance. In countries where the quality of governance is low, the deterioration of corruption increases. Campos *et al.* (1999: 1059–1067) accept the negative relationship between corruption and investment, but they also argue that the corruption has fewer negative impacts on investments when it is predictable. Kaufmann and Wei (1999: 15), using data from worldwide firm surveys, claim that paying bribes does not help firms to reduce the time wasted, but rather the opposite may occur. Alesina and Weder (1999: 1–20) argue that the private capital movements, including FDI, fall as the corruption increases. Wei (2000: 316–317) concludes that the negative effect of corruption on FDI is greater than the adverse effect of tax increases. Abed and Davoodi (2000: 14–15) suggest that corruption hampers

institutional quality and FDI inflows. Habib and Zurawicki (2001) and Lambsdorff (2003: 231) also observe that the negative effect of corruption on foreign investments is more significant than on local investments. Mathur and Singh (2007: 16–18) reveal that improvement in the corruption level in China adversely affects the FDI inflows to other countries in South Asia. Al Sadig (2009: 283–289) shows the negative effect of corruption on the FDI inflows and emphasizes the impact of institutions. The negative effects of corruption on FDI disappear when the rule of law and democracy variables proxying institutional quality are included.

On the contrary, the proponents of the positive effects of corruption on FDI argue otherwise, indicating that corruption may eliminate barriers on investment arising from the low quality of governance and high levels of regulation. Mendez and Sepulveda (2006: 88) find conditional support for such argument as they identify a non-linear relationship between corruption and growth. They show that corruption can be beneficial to some extent. However, it maximizes growth only for those countries which are politically free. Gazdar (2012: 11) finds that corruption accelerates economic growth in the Middle Eastern and Northern African countries when the quality of governance is low. Dreher and Gassebner (2013: 427) suggest that corruption facilitates firm entry in highly regulated economies and at the maximum level of regulation, corruption can indeed be beneficial. Kato and Sato (2014) also propose that bribery may facilitate investments in India. However, this interaction disappears once the manufacturing sector is deregulated.

Thus, corruption might be a mean of achieving certain benefits that may work to ease the official economy. It is suggested that targeting country corruption might be a stimulus for investors and banning foreign bribery has distortive effects on the market entry. In this regard, Hines (1995: 10–11) shows that the Foreign Corrupt Practices Act of 1977, which banned paying bribes in foreign country business, weakened the competitive power of United States (US) firms abroad. The rise in corruption levels of host countries is found to reduce the aircraft exports of US firms and had a detractive effect on 1977 US investment stock in the period 1978–1982. Egger and Winner (2005: 949) also conclude that a rise in the level of corruption increases the amount of FDI, but its effects become significant in the long term. Abotsi and Iyavarakul (2015: 265) find a non-linear relationship between corruption and FDI in Africa. They estimate the tolerable level of corruption to attract FDI, which is less than average.

Corruption also changes the distribution of inward FDI stocks in favour of more corrupt regions. Bellos and Subasat (2013: 154) show that the higher levels of corruption in the target countries are associated with the higher levels of FDI stock in the Latin American region. However, they also assert that this result cannot be adopted as a certain evidence of the efficiency gains of corruption.

Taking into consideration of all the studies mentioned above, it is clear that the debate between the proponents and the opponents of corruption has not clearly been settled yet. To sum up the findings of empirical studies with regard to the concerns raised in the theoretical studies, it can be said that the corruption may be detrimental in the cases of pervasive corruption and in the event of citizens’ and companies’ loss of trust in the integrity of the public sector. However, in the cases of strong centralized governments and highly regulated economies, the claims of efficiency gains for corruption might be supported. Consequently, the effects of corruption depend on its compensatory impacts on inefficiencies and country-specific circumstances.

### **1.1. Review of Literature on FDI and Corruption Relationship in Turkey**

The effect of corruption on FDI inflows has been analysed in various studies for Turkey. The majority of the findings support the opponents of corruption. In line with the broader literature, there are conflicting empirical findings for Turkey, as well.

Baldemir *et al.* (2005), Akan and Arslan (2007), Tosun *et al.* (2014) and Eren and Jimenez (2014) show a negative relationship between corruption and FDI. Among these studies, Baldemir *et al.* (2005) show that 7% of the variance in foreign investments per capita is explained by corruption and the corruption has a minor but significant adverse effect on investments. Akan and Arslan (2007: 200–206) reveal a negative effect of corruption on FDI inflows to Turkey in their causal analysis, and find unidirectional causality between corruption and FDI. Eren and Jimenez (2014: 95) find that the FDI flows to Turkey are higher when they come from countries with similar corruption levels as Turkey. Tosun *et al.* (2014: 255–256) reveal that corruption has distortive effects on FDI in Turkey, both in the short and the long term. However, a rise in political risk positively contributes to FDI inflows in the short term. Contrary to the above results, Sayek (2007: 120–121) concludes that in the Central and East European Countries region, including Turkey, foreign investors prefer countries which are more ridden by corruption.

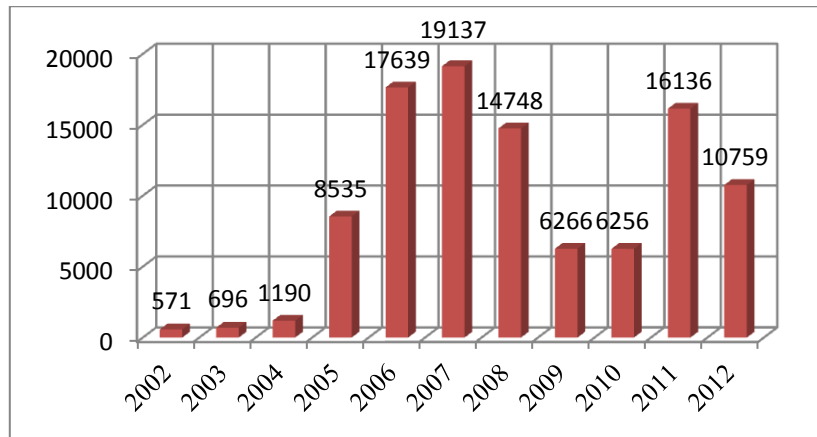
## **2. FDI INFLOWS AND PERCEIVED CORRUPTION LEVELS IN TURKEY**

### **2.1. FDI Inflows**

The FDI inflows to Turkey, which have been increasing since 2000 but have begun to decline in the recent years, reached up to US\$101.933 billion in aggregate over the period of 2002–2012 (Figure 1). Turkey's share of the global FDI inflows increased from 0.10% to almost 1% within this period (Ministry of Economy, 2013). The periods

in which FDI inflows accelerated coincide with the rapid growth of the Turkish economy and the membership negotiation period with the European Union (EU).

**Figure 1. FDI Inflows for Turkey: 2002–2012 (USD bn)**



**Source:** Central Bank of Turkey (2015).

Accordingly, Turkey demonstrated her commitment to meeting the Copenhagen economic criteria<sup>3</sup> by speeding up the privatization of state owned enterprises and removing obstacles against the EU-sourced FDI inflows in its National Program papers.<sup>4</sup> Thus, the negotiation process with the EU had a triggering effect on the FDI inflows in Turkey. In this regard, Law no. 4875 on Foreign Direct Investment was adopted in 2003<sup>5</sup> and Turkey commenced accession talks in 2005 with the decision of Council of EU.

As can be seen from Figure 1, after the commencement of negotiations, the FDI inflows increased seven times in 2005 with respect to the previous year. However, this upward trend stopped after 2008 during the global financial crisis. Note that the FDI inflows to Turkey predominantly originated from the EU countries and the US, making around 75% of the FDI over the period 2002–2012 coming from the developed countries. Naturally, any positive or negative development in the economic performance or political stability of these countries directly affected the FDI inflows to Turkey.

Apart from the global financial crisis, the instability in the EU negotiation process might have negative effects on this downward slope of FDI inflow since the Council blocked the talks on eight chapters in 2006. The main reason for the blocking of each chapter is the interaction with the Greek Cypriot Community clause.<sup>6</sup> Moreover, the privatization revenues have also diminished after 2008 and no privatization

transaction is recorded in 2010 and 2011. This is a notably important issue since almost 36% of the privatization transactions between 1989 and 2011 occurred through the FDI inflows (Privatization Authority, 2012, 51–53). These substantial changes in the sectoral distribution of FDI in Turkey can be seen in Table 1.

**Table 1. Sectoral Distribution of FDI in Turkey (USD bn)**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Agriculture</b>	0	0	4	5	6	9	41	48	81	32	43
<b>Industry</b>	166	447	343	908	2,988	5,037	5,187	3,887	2,887	8,037	5,479
<b>Services</b>	405	249	843	7,622	14,645	14,091	9,520	2,331	3,288	8,067	5,237
<b>Total</b>	571	696	1,190	8,535	17,639	19,137	14,748	6,266	6,256	16,136	10,759

As can be seen in Table 1, between 2002 and 2012 (except for 2003, 2009 and 2012), the services sector has attracted more FDI than any other sectors in the Turkish economy. The FDI inflows to the financial market have also begun to rise, especially following the commencement of negotiations with the EU in 2005. Although the FDI inflows in Turkey declined in aftermath of the global financial crisis, they began to rise after 2011. However, a more balanced structure in FDI for the industry and service sectors is observed following the crisis years. In particular, the development of e-commerce and the provision of government subsidies in the trade and health sectors have attracted interest from foreign investors.

## 2.2. Anti-Corruption Efforts and Perceived Corruption in Turkey

In the last 15 years, Turkey has improved her legal capacity to fight corruption. First of all, Turkey ratified the United Nations (UN), the Council of Europe and the OECD-based international anti-corruption conventions.<sup>7</sup> Beside these ratifications, Turkey has become a member of the Group of States against Corruption (GRECO) in 2004. In addition, an “Action Plan on Increasing Transparency and Enhancing Good Governance in the Public Sector” is adopted in 2002 and many legal arrangements have been enacted in the fields of ethics, transparency, public financial management, local governance, criminal law, money laundering and public inspection.<sup>8</sup>

In 2009, Turkey adopted a new National Anti-Corruption Strategy Plan (2010–2014) which encompasses policies to alleviate the effects of corruption and improve the implementation of law. The main components of the plan include measures for i) prevention, ii) suppression and iii) raising awareness of corruption.<sup>9</sup> For the implementation phase, the Council of Ministers published a decree and established the authorities of the strategy, which are the inter-ministerial commission and the executive board. Moreover, more than 20 working groups are set up.



Despite Turkey's legislative and practical efforts to eradicate the corruption, she has been criticized by some international organizations, primarily in relation to the implementation phase. For example, the OECD Phase 3 Report on the Implementing the OECD Anti-Bribery Convention criticizes the lack of any convictions for foreign bribery offences and enforcement against legal persons since the Convention's entry into force (OECD, 2014: 15–19). Again, GRECO (2006, 2008 and 2012) conclude that there are some drawbacks to Turkey's anti-corruption measures and makes some recommendations in its Joint Evaluation Report (2006) and Compliance Reports (2008, 2012). The most problematic areas are stated as the lack of specialized anti-corruption units, the extent of independence of the judiciary, the immunities system for members of the parliament and the financing of political parties.

Within the UN Convention against Corruption (UNCAC) perspective, Turkey is reviewed in 2015 in relation to chapters III and IV of UNCAC, which are "criminalization and law enforcement" and "international cooperation". The full report has not been published yet, but according to the Executive Summary, the reviewers recommend the government to expand the coverage of legislation and measures in some corruption-related offences, to strengthen the specialized institutions and to ease the mutual legal assistance procedures (UNODC, 2016: 9-12.)

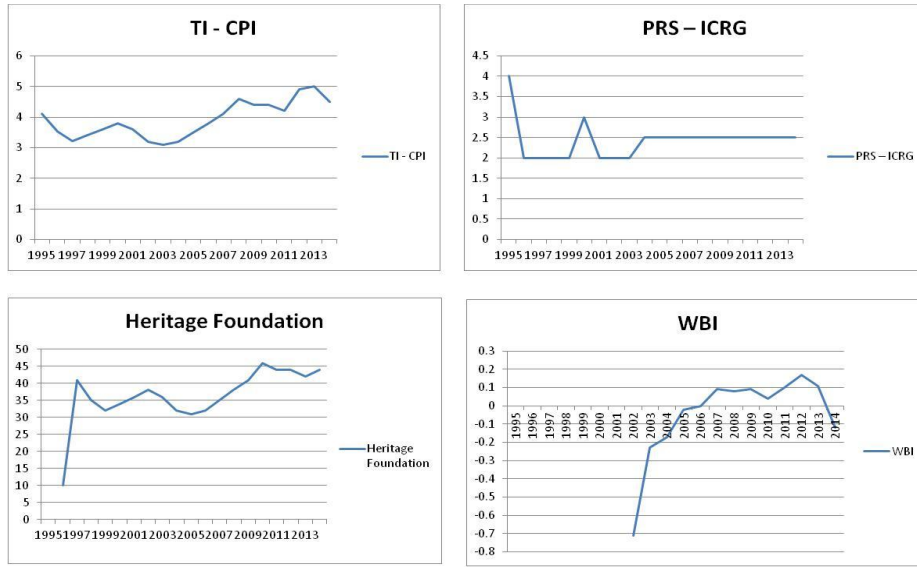
The European Commission has also reviewed the anti-corruption measures in Turkey and published its views in Progress Reports. The most vulnerable areas mentioned in the reports are in line with the reviews of OECD, GRECO and UNCAC. There have been criticisms regarding the implementation of anti-corruption strategy, the lack of legislation in relation to conflicts of interest, the asset declaration and the inadequacy of judicial statistics (EU, 2010: 15-77; 2011: 19-85; 2012: 17-71; 2013: 8–12, 47; 2014: 14, 44–48; 2015: 5–19, 59–61).

The World Economic Forum's Global Competitiveness Report 2014–2015, which regards corruption and excessive bureaucracy as negative indicators for institutional quality (World Economic Forum, 2014: 6), sees inefficient government bureaucracy as the most problematic factor for doing business and regards corruption as the ninth such perceived factor for Turkey (World Economic Forum, 2014: 368). In the IFC Enterprise Survey (2013: 9), it is stated that 18.4% of firms are required to pay unofficial payments to get things done. However, this ratio is lower than the average for East and Central Europe.

In addition to the findings of the aforementioned reports, the corruption level in Turkey is also assessed by various international organizations publishing control of corruption indices. Turkey's control of corruption index scores according to the Transparency International (TI), the International Country Risk Guide (ICRG), the

Heritage Foundation and the World Bank Institute (WBI) are presented in Figure 2. These corruption indices are widely used in empirical studies and the correlations between various measures tend to be high. This provides support for the coherence and reliability of estimations (Jain, 2001: 77).

**Figure 2. Control of Corruption Indices in Turkey**



**Notes:** Minimum and maximum values are 0 and 10 for TI; 0–6 for ICRG, 0–100 for the Heritage Foundation and -2.5–2.5 for the WBI. High values represent low corruption.

In Figure 2, Turkey seems to be a mid-level corrupt country. It is observed that Turkey's corruption index rates gradually develop after 2002 and this period also goes in hand with the ratification of anti-corruption conventions, the GRECO membership and the commencement of the EU negotiation process. Although, Turkey is promoted to the level of less corrupt countries during this phase, following the global financial crisis and after 2011, except for the ICRG, the index rates have declined.

Based on these developments, the following section considers the relationship between corruption and FDI in Turkey empirically.

### 3. EMPIRICAL ANALYSIS

#### 3.1. Gravity Model

The Gravity Model, based on Newton's Law of Universal Gravitation, first came to the fore with Tinbergen's (1962) study for the purpose of assessing bilateral trade flows. Accordingly, the trade volume among countries was found to be directly related to the production and inversely related to the square of the distance between them. Linnemann (1966: 234) analysed the conventional gravity model by adding population variables. Jeon and Stone (1999), Frenkel *et al.* (2004) and Dabla-Norris *et al.* (2010) benefit from the Gravity Model in determining the explanatory variables of FDI.

The original gravity equation is presented as:

$$T_{ij} = A \frac{Y_i^{\beta_1} Y_j^{\beta_2}}{D_{ij}^{\beta_3}} \quad (1)$$

where  $T_{ij}$  is the trade flow from source country  $i$  to destination country  $j$ .  $Y_i^{\beta_1}$  and  $Y_j^{\beta_2}$  represent the GDP of both countries,  $D_{ij}$  is the distance between them. According to the equation (1), the trade volume between these two countries is directly related to their GDP levels and inversely related to the distance between them.

For the purpose of generating the Gravity Model for FDI inflows and taking the population factor into account, the  $(P_i, P_j)$  and  $X_{ij}$  variables are inserted in equation (1). Thus the new model is:

$$FDI_{ij} = A \frac{Y_i^{\beta_1} Y_j^{\beta_2} P_i^{\beta_3} P_j^{\beta_4}}{D_{ij}^{\beta_5}} X_{ij}^r \quad (2)$$

where  $(P_i, P_j)$  represent the population of source (investor) and destination (for our case Turkey) countries, respectively, and  $X_{ij}$  denotes other explanatory variables.

By taking the natural logarithm of both sides, the equation below is obtained:

$$\ln FDI_{ij} = \ln A + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln P_i + \beta_4 \ln P_j + \beta_5 \ln D_{ij} + r \ln X_{ij} \quad (3)$$

In the equation (3), all of the  $\beta$  parameters indicate the elasticity of their respective variables to the FDI inflows to Turkey. Likewise, the  $r$  parameter represents the elasticity of other explanatory variables.

For this study, the corporate tax rates, privatization revenue and corruption series are included as other explanatory variables. In addition, the dummy variables for the EU negotiation process, the global financial crisis, the existence of bilateral investment treaties (BITs) and religious–national historical ties are employed, as well.

### 3.2. Source of Data and Methodology

The FDI series are obtained from the Central Bank of Turkey (CBT) Balance of Payments publication for the period of 2002–2012, and a balanced panel is formed for the purpose of analysing the determinants of FDI inflows to Turkey and the effect of corruption on attracting FDI. In this respect, the source countries with FDI inflows to Turkey with an annual average of US\$50 million and above are included into estimation. These are; Austria, Azerbaijan, Belgium, the Czech Republic, France, Germany, Greece, Italy, Japan, Kazakhstan, the Netherlands, Portugal, Russia, Saudi Arabia, Spain, Switzerland, the United Arab Emirates (UAE), the United Kingdom (UK) and the US. Only Luxembourg and Kuwait are excluded as they have outlier values due to their relatively low populations. The FDI volume within the scope of estimation is approximately equal to 86% of total inflows.

In this study, the World Bank population series (World Development Indicators) are used as indicators of market size. As a proxy of efficiency, the labour productivity data (GDP per person employed) provided by the US Conference Board (2015) are used rather than GDP series due to their high correlation with population series. The privatization revenues are obtained from the Privatization Administration of Turkey and the corporate tax rates are obtained from KPMG (2014). As corruption indicators, the corruption indices published by the Political Risk Services Group, the ICRG, TI, the Heritage Foundation and the WBI Worldwide Governance Indicators (WGI) are used.<sup>10</sup>

Considering the stationary properties of the series, the series are reorganized by removing some outliers from the data set and taking the 1st difference of non-stationary series. For some variables, the derivatives of natural logarithms are taken after introducing a weighting between source and destination countries. Moreover, the natural logarithms of productivity, population and distance series, which constitute the basic gravity variables, are adopted. For the tax and corruption indices, the natural logarithms of the ratios obtained by dividing Turkey's value by source countries' values are used as the other explanatory variables.

Then, the impact of Turkey's relative tax rates and corruption level on FDI inflows is analysed, i.e.  $\ln(\text{corruption}_{\text{Turkey}}/\text{corruption}_{\text{x country}})$ . The natural logarithms of the variables are taken to set up a double log model as the coefficients on the natural logarithm scale can directly be interpreted as proportional differences. The variables,

their definitions, sources and expected signs are given in Table 2, the descriptive statistics with respect to the values of these variables can be seen in Table 3.

**Table 2. Definition and Expected Signs for Variables**

Variable	Definition	Source	Expected Sign
LNFDITR	FDI inflow to Turkey from source countries	CBT	Dependent Variable
LNGDPPE	Natural logarithm of productivity per employee (GDP per employee) in source countries	Conference Board Total Economy Data	+
LNTRGDPPE	Natural logarithm of productivity per employee in Turkey	Conference Board	+
LNPOP	Natural logarithm of population in source countries	WDI	+/-
DLNTRPOP	First derivative of natural logarithm of Turkey's population	WDI	+
LNDISTANCE	Natural logarithm of distance between Turkey and source countries	Distance between capital cities (km)	-
LNWTAX	Relative corporate tax rate level (the natural logarithm of the ratio of Turkey's corporate tax rates to source countries' rates)	KPGM	-
LNTRPRV	Privatization proceeds of Turkey	Privatization Administration	+
CRISIS	Global Economic Crisis (2009: 1, remaining years 0)	Dummy Variable	-
EUNEG	Turkey-EU negotiation years (2002-2004: 0, 2005-2012: 1)	Dummy Variable	+
HISTORY	Existence of religious and/or racial historical relationships (Turkish states and Islamic countries)	Dummy Variable	+
BIT	Existence of Bilateral Investment Treaty (BIT)	Dummy Variable	+
LNWICRGCOR	Relative corruption level (the natural logarithm of the ratio of Turkey's corruption score to source countries' scores)	PRS Group (2012)	+
LNWTICPI	Relative corruption level (the natural logarithm of the ratio of Turkey's corruption score to source countries' scores)	Transparency International	+
LNWHERITAGE	Relative corruption level (the natural logarithm of the ratio of Turkey's corruption score to source countries' scores)	Heritage Foundation	+
LNWWBI	Relative corruption level (the natural logarithm of the ratio of Turkey's corruption score to source countries' scores)	World Bank Worldwide Governance Indicators	+

**Note:** Higher scores represent lower corruption levels.

**Table 3. Descriptive Statistics for Variables**

	# Obs.	Mean	Median	Maximum	Minimum	Std. Dev.
LOGFDITR	190	4.25	4.68	8.60	0.00	2.48
LOGGDPPE	190	10.47	10.63	11.15	8.81	0.43
LOGTRGDPPE	190	10.23	10.27	10.31	10.00	0.09
LOGPOP	190	17.10	16.62	19.56	15.03	1.16
DLOGTRPOP	190	0.01	0.01	0.01	0.01	0.00
LOGDISTANCE	190	7.82	7.82	9.08	6.71	0.54
LOGWTAX	190	-0.25	-0.22	1.10	-1.01	0.31
LOGTRPRV	190	21.66	21.84	22.83	19.05	1.08
LOGWTICPI	190	-0.33	-0.46	0.88	-1.05	0.47
LOGWICRGCOR	190	-0.23	-0.34	0.51	-0.69	0.41
LOGWHERITAGE	190	-0.39	-0.54	0.88	-1.05	0.48
LOGWWBI	190	-0.23	-0.37	0.65	-0.71	0.38

The potential multicollinearity problem is tested through the variance inflation factor method.<sup>11</sup> To avoid the problem of endogeneity, one-period lagged values of explanatory variables are used. Low levels of correlation between the explanatory variables and the error terms are identified in all equations. Thus, the assumptions of unbiasedness in the least squares estimators are maintained.<sup>12</sup> In addition, to take the natural logarithms of the variables, the zero (0) values are replaced with one (1) and negative values in the WBI (WGI) corruption index are rescaled.<sup>13</sup> Error terms are normally distributed in all models within the framework of Jarque-Bera normality statistics.

The gravity equations are estimated using “random effects” modelling as the fixed effects modelling of panel data econometrics is not appropriate for gravity regressions since it eliminates time-invariant variables such as the distance and the dummy variables (Dougherty, 2011: 518, 525). The Hausman test results also support the use of panel data random effects model.

Panel data models involving different countries may also face the heteroscedasticity problem. To resolve heteroscedasticity problem, the random effects model is weighted with the Swamy Arora estimator and the estimated or feasible generalized least squares method is used. White’s cross-section coefficient covariance method is also applied in estimations to obtain heteroscedasticity-consistent robust standard errors. In addition, whether the equations have autocorrelation problem is checked by using the Durbin–Watson (DW) statistic and problematic models are reported discretely.

**Table 4. Estimation Results for Various Models**

Dep. Variable	Model 1				Model 2				Model 3			
	A	B	C	D	A	B	C	D	A	B	C	D
<b>LNFDITR</b>												
<b>Constant Term</b>	-97.17*** (-13.56)	-145.97*** (-10.50)	-28.61 (-6.22)	-26.55*** (-2.99)	-85.22*** (-3.17)	-71.50*** (-2.62)	-58.27* (-1.79)	-86.17*** (3.07)	-144.46** (-10.48)	-140.21*** (-9.62)	-108.54*** (-4.84)	142.07*** (-9.49)
<b>LNGDPPE</b>	2.54*** (3.52)	2.81*** (3.07)	2.82*** (3.28)	2.85*** (2.68)	2.45*** (2.97)	1.55 (1.49)	1.87* (1.95)	2.12** (2.34)	2.14** (2.45)	1.81* (1.87)	1.55* (1.67)	1.85** (2.27)
<b>LNTRGDPPE</b>	7.95*** (9.94)	11.54*** (8.17)			6.18** (2.52)	6.31** (2.22)	4.65 (1.55)	6.70** (2.32)	12.02*** (9.06)	12.25*** (12.67)	9.91*** (6.08)	12.17*** (9.59)
<b>LNPOP</b>		0.23 (0.91)	0.22 (0.94)	0.29 (1.05)	0.23 (1.01)	0.40* (1.70)	0.35 (1.44)	0.31 (1.27)	0.28 (1.09)	0.40 (1.44)	0.42* (1.87)	0.39 (1.60)
<b>DLNTRPOP</b>		673.64** (2.51)	-41.16 (-0.16)	101.82 (0.39)	543.82* (1.82)	-6.59 (-0.27)	44.47 (0.13)	390.89 (1.55)	724.65*** (2.91)	400.77 (1.10)	-26.15 (-0.56)	562.93* (1.90)
<b>LNDISTANCE</b>	-0.80 (-1.52)	-1.23*** (-3.14)	-1.43*** (-3.91)	-1.53*** (-3.77)	-1.48*** (-4.01)	-1.68*** (-5.17)	-1.62*** (-5.04)	-1.52*** (-4.09)	-1.39*** (-3.53)	-1.52*** (-3.65)	-1.55*** (-4.60)	-1.48*** (-3.64)
<b>LNTRPRV</b>			0.52*** (4.90)	0.26*** (3.63)								
<b>LNWTAX</b>			-0.88** (-2.50)	-1.18** (-2.48)	-1.07** (-2.58)	-0.83** (-2.20)	-0.98** (-2.51)	-0.92** (-2.13)				
<b>EUNEG</b>				1.49*** (8.97)	1.21*** (3.20)	1.07** (2.41)	1.17** (2.45)	1.13** (2.58)				
<b>CRISIS</b>				-0.65*** (-4.13)	-0.49*** (-3.21)	-0.45** (-2.38)	-0.65*** (-4.53)	-0.54*** (-3.76)				
<b>HISTORY</b>				0.28 (0.60)								
<b>BIT</b>				-0.45 (0.72)								
<b>LNWICRCOR</b>					-0.53 (-0.80)				-1.17** (-2.02)			
<b>LNWTICPI</b>						-1.50** (-2.47)				-1.30** (-1.96)		
<b>LNWHERITAGE</b>							-1.11** (-2.11)				-1.58** (-2.33)	
<b>LNWWBI</b>								-0.98 (-1.30)				-1.53** (-2.27)
<b>R Square</b>	0.36	0.30	0.30	0.33	0.33	0.34	0.34	0.34	0.31	0.31	0.32	0.31
<b>DW Statistics</b>	1.68	1.83	1.81	1.84	1.81	1.85	1.87	1.83	1.81	1.83	1.84	1.82
<b>JB Statistics</b>	1.30	0.22	0.01	0.43	0.40	0.35	0.13	0.37	0.62	0.30	0.29	0.22

### 3.3. Empirical Results

3 models are developed with 12 equations to analyse the impact of each added variable as shown in Table 4. The first model focuses on the determinants of FDI by estimating the impact of each added variable. The second and third models evaluate the effects of corruption.

#### 3.3.1. Determinants of Turkish FDI Inflows

Model (1A) is generated in line with the original Tinbergen Gravity Model approach. Accordingly, it seems that the GDP per employee variables of Turkey and source countries, which are used as productivity indicators as a proxy for efficiency, have a highly significant impact on the attraction of foreign FDI. The distance variable shows a negative impact on FDI inflows, as expected, but it is marginally insignificant. However, as the DW statistics remain between the lower and upper critical values, no firm opinion can be reached through this equation.<sup>14</sup>

In relation to Model (1B), population variables are included for both Turkey and source countries to obtain the gravity equation used in the subsequent analysis. The estimation of the equation indicates that the productivity variables of both Turkey and source countries have a high level of influence on FDI inflows at 1% significance level. The effect of Turkey's increase in productivity on the FDI inflows is estimated as approximately four times that of source countries. The upward trend in the marginal population growth of Turkey seems to have an impact on FDI attraction at the 5% significance level. Moreover, the geographical proximity between Turkey and source countries is identified as another source of FDI attraction at the 1% significance level. However, no significant relationship is found between the source countries' increase in population and the FDI inflows to Turkey.

UNCTAD (2006: 158–163) categorizes FDI investments as market-seeking, efficiency-seeking, resource-seeking and created asset-seeking FDI. Assuming that labour production is a proxy of efficiency and undertaking a general evaluation in the framework of Model (1), it is considered that the Turkey's FDI inflows have both market- and efficiency-seeking FDI characteristics. Turkey has attracted FDI within the concept of increase in market-wide and labour productivity. The increases in production among source countries also have a significant impact on FDI inflows to Turkey. This is an expected result, especially for the investments originating from the developed countries.

FDI originating from developing countries is generally attributed as a market-seeking FDI, predominantly related to the manufacturing of inferior goods. Since an increase in the income in foreign markets is expected to reduce the demand for these



commodities, investors regard domestic and foreign markets as substitutes for each other. For developed countries, as capital accumulation increases with GDP growth, new markets are sought for investments and preference for shifting production chains to more efficient countries is observed<sup>15</sup> (UNCTAD, 2006: 156–157). In the case of Turkey, the developed countries, such as the Netherlands, Germany, UK and US are taking the lead in FDI inflows to Turkey, widely focusing on the sectors with high income elasticity of demand, such as finance, energy, and trade.

Then, the variables for privatization revenues and corporate tax rates are included in Models 1C and Model 1D. Due to the high correlation between Turkey's privatization and productivity values, the productivity variable is excluded from the aforementioned models to avoid the multicollinearity problem. Four dummy variables showing the years of the negotiation process, the global financial crisis, countries with which Turkey has historical and religious ties and BITs are added to Model 1D, respectively.

The results show that, firstly, the privatization process has positive impacts on the Turkish FDI inflows, as expected. Secondly, the relatively low corporate tax rates in comparison to those of the FDI source countries are found to have a triggering effect on FDI inflows to Turkey. Thirdly, the tax considerations serve as an important factor in investing in Turkey, which is a result that is in line with the findings of OECD (2007: 12). Lastly, there is a reverse relationship between the tax burden and FDI inflows.

The effects of the dummy variables are as follows; First of all, the EU negotiation process is found to have positive impacts on the FDI inflows. This result is consistent with the findings of Sayek (2007: 132). Secondly, as expected, the global financial crisis negatively affects FDI flows to Turkey. Thirdly, the history dummy, which shows the possible impacts of religious and racial factors on the FDI inflows to Turkey, have no significant effect. Finally, the dummy variable for Turkey's BITs, shows the same results like history dummy.

To sum up, the Turkish FDI inflows resemble both market- and efficiency-seeking investment characteristics and they are strongly affected by the government policies and the external conditions, as well as the corporate tax rates and the global crisis. It is also noticed that the accession negotiations with the EU have positive effects on the FDI inflows to Turkey after 2005.

### **3.3.2. Corruption and FDI Relationship**

By Model 2 and Model 3, whether corruption has impacts on FDI inflows to Turkey and the positive or negative effects of corruption on FDI inflows are evaluated.

As mentioned above, the FDI flows to Turkey have increased since 2005 in comparison to previous years, and this period corresponds to Turkey’s negotiation process with the EU. In spite of the legislative and practical improvements in anti-corruption efforts, Turkey has remained a country of mid-level of corruption during the years of negotiation to accede to the EU according to the TI, ICRG, Heritage Foundation and WBI corruption indices and GRECO (2006, 2008, 2012), IFC (2013), OECD (2014), World Economic Forum (2014), UNODC (2016) and European Commission (2010–2015) reports.

To assess the effects of corruption, the variables derived from the ICRG, TI, Heritage Foundation and WBI indices are added to the gravity equations separately. These variables are generated by taking the natural logarithm of the ratio of Turkey's corruption value to the source countries' values. Thus, it is intended to comment on the impacts of Turkey's relative corruption level on the FDI inflows.

Model 2 is obtained by adding corruption variables to Model (1). Tax, negotiation and crisis variables are also included, but the privatization variable is excluded from the equation due to multicollinearity concerns.

According to the results of Models 2A and Model 2D, which include the ICRG and WBI indices, respectively, Turkey's relative corruption level seems to have no significant effect on the FDI. When using the TI and the Heritage Foundation indices separately in Models 2B and Model 2C, it is found that Turkey's relative corruption values have significant impacts on the FDI inflows at the 5% significance level.<sup>16</sup>

Observing the levels of significance of the different corruption indices, it is striking that all relative corruption variables take negative sign. This means that when the Turkey's relative level of corruption decreases (increases), the FDI inflows decrease (increase). Additionally, the difference between the corruption levels of Turkey and the FDI-originating countries has significant effects on investment attraction.

To analyse these different results, the differences in the methodology of each corruption index are taken into consideration.<sup>17</sup> Notice that all indices used in this study are perception-based composite indicators. They are concerned with the corruption perceptions of respondents and also the anti-corruption efforts of countries. However, the main difference between the TI Corruption Perception Index and the other indexes is the scope of estimation, as the former only focuses on the corruption in the public sector (Rohwer, 2009, 50). The Heritage Foundation freedom of corruption index rather focuses on the public sector corruption as it is primarily derived from the Corruption Perception Index (Heritage Foundation, 2015).

With regard to the estimations, as significant negative corruption variables in Model 2B and Model 2C are obtained from the TI and Heritage Foundation indices, which are more inclined to measure corruption in the public sector, it can be claimed that investors might be more sensitive to the relative corruption levels in the public sector and misuse these to avoid bureaucratic inefficiencies as stated in the IFC (2013) and World Economic Forum (2014) surveys.

To verify the results obtained, Model 3 is constructed by estimating the gravity equation in Model 1B including the current values of corruption variables. Note that all corruption indicators reach 5% significance level when their current values are used instead of their lagged values. This result can be explained by the attitudes of investors who probably take into consideration the current levels of corruption rather than its levels in previous years.

To sum up, despite the improvements in the anti-corruption measures and the gradual progress reflected in the corruption indices, it must be noted that the current level of corruption might be a stimulus for FDI entrance.

What factors may lay behind this result? One answer may be that the differences in the corruption levels of FDI source countries and Turkey might have impacts on FDI entrance.

Another possible answer is the loss of momentum in the EU negotiation process. As can be seen in the results of the models, the EU negotiation process and relative corruption levels are among the factors influencing the attraction of FDI to Turkey. Despite the reforms undertaken to fulfil the Copenhagen Economic Criteria in terms of privatization and foreign investments, Turkey has only partially been able to harmonize her legislation and practices with the EU acquis on anti-corruption measures since she has faced some obstacles, such as Southern Greek Cyprus Clause, in the negotiation process.

As mentioned above, the lack of implementation of anti-corruption efforts has also been criticized in the EU and other institutions' reports. However, being a country sustaining negotiations with the EU has positive effects for the FDI attraction, even though the dynamism of discussions has been lost in Turkey. In all, 18 negotiation chapters are blocked by the EU member states, the vetoed chapters including Chapter 23 "Judiciary and Fundamental Rights" and Chapter 24 "Justice, Freedom and Security", address the rule of law and anti-corruption measures.

## CONCLUSION

This study aims to identify the likely relationship between corruption and FDI in Turkey by analysing the determinants of FDI, which also enables to assess the types of FDI inflows to Turkey in line with the UNCTAD classification.

In terms of the determinants of FDI, the results provide support for the supposition that the FDI inflows to the Turkish economy arise together with progress in labour productivity in both investor economies and Turkey. In addition, the originating countries' distance from Turkey, the government policies aimed at privatization, the corporate taxes and the EU negotiation process are found to have positive effects on the FDI inflows. During the global crisis period, the volume of FDI has decreased. Considering the fact that the FDI inflows are predominantly canalized to the sectors, such as, finance, trade and energy, where the income elasticity of demand is rather higher, the investments in the Turkish economy could be evaluated as “market- and efficiency-seeking FDI”.

With regard to the likely effects of corruption, although the significance of corruption variables varies across different models, a unidirectional relationship between the level of corruption and the FDI inflows is identified, which is in line with the findings of Hines (1995), Egger and Winner (2005), Sayek (2007), Bellos and Subasat (2013), Abotsi and Iyavarakul (2015). This result may be attributed to the fact that the FDI inflows continue with the perceived corruption level or the corruption potentially provide a stimulus to circumvent regulatory obstacles, which means support for the validity of the “greasing the wheels” or “efficient grease” hypothesis as suggested by Leff (1964), Huntington (1968), Lui (1985), Shleifer and Vishny (1993), Aidt (2003). However, an additional study should be undertaken to measure the efficiency gains of corruption to verify the hypothesis. It is also found that the variation in corruption levels between the countries has effects on the FDI inflows such that the marginal progress in the corruption indices in source countries should also be taken into account.

Another finding of this study is the positive effect of the EU negotiation process on the FDI inflows to Turkey. It can be claimed that the loss of momentum in the negotiation process has had adverse impacts on the level of relative corruption in Turkey.

## NOTLAR

<sup>1</sup> There is no consensus on the definition of corruption. Some authors attribute corruption only to public sector (Bhagwati, 1982; Krueger, 1974; OECD, 2008; Shleifer, Vishny, 1993; Transparency International, 2000; World Bank, 1997), while others argue that there may also be corruption in private sector (Coase, 1979; Tanzi, 1998). Despite such arguments, the corruption is usually defined as the misuse of public power for private gain.

<sup>2</sup> According to the law of universal gravitation, any two bodies in the universe attract each other with a force that is directly proportional to the product of their masses and inversely proportional to the square of distance between them. In economics, the model is widely used to assess trade and investment flows between countries.

<sup>3</sup> Copenhagen Economic Criteria: a functioning market economy and the capacity to cope with competition and market forces.

<sup>4</sup> Turkey's *National Programmes for the Adoption of the Acquis* were published in 2001, 2003 and 2008 respectively. All of them include targets for speeding up privatization and removing bureaucratic obstacles.

<sup>5</sup> Thanks to the new law, the obligations for obtaining the approval of Treasury and bringing a minimum of US\$50,000 in capital to establish a company or become an affiliate of an existing company have been removed.

<sup>6</sup> The temporary blockage of all negotiation chapters has been enacted on the condition that Turkey applies an additional protocol to the Ankara Association Agreement to the Greek Cypriot Community as required by the Council decision in 2006. The Council also decided to freeze talks on 8 chapters. Moreover, France and Greek Cypriot Authority announced their blockage of additional 10 chapters.

<sup>7</sup> OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions (ratified in 2000); the Council of Europe Criminal Law Convention on Corruption (ratified in 2004); the Council of Europe Civil Law Convention on Corruption (ratified in 2003); the United Nations Convention against Transnational Organized Crime (ratified in 2003); the United Nations Convention against Corruption (ratified in 2006).

<sup>8</sup> Enacted laws include Law no. 4982 on Access to Information (2003), Law on Public Financial Management and Control, No. 5018 (2003), Law on Public Procurement, No. 4734 (2003), Law on the Establishment of the Public Servants' Ethics Board, No. 5176 (2004), Law No. 5216 on Efforts on Fighting Corruption and Improving Governance in Local Government (2004), Banking Law, No. 5411 (2004), Turkish Criminal Code, No. 5237 (2005), Criminal Procedure Code, No. 5271 (2005), Law on Prevention of Laundering Proceeds of Crime No. 5549 (2006), new Court of Accounts Law (2010) and Law on Public Inspection (Ombudsman) No. 6328 (2012).

<sup>9</sup> The Plan consists of 18 preventive measures, 3 measures on imposing sanctions and 7 measures on raising awareness. More than 20 working groups have also been established.

<sup>10</sup> As the WBI control of corruption index scores range between the intervals -2.5 to +2.5, the index is rescaled to the 0-5 interval for the purpose of obtaining logarithms of negative values.

<sup>11</sup> In the selection of variables used in the models, the correlation levels between the series are noted and highly correlated variables are not used in the same equation. Correlation and variance inflation factor estimations can be provided upon request.

<sup>12</sup> For the unbiasedness relationship between OLS estimators and error terms, see Asteriou (2006).

<sup>13</sup> The natural logarithm of 1 will be 0, such that the estimation results will not be affected by this amendment.

<sup>14</sup> After adding the population variables in subsequent equations, the DW statistic extends the critical values.

<sup>15</sup> For FDI’s originating from developing countries, “push factors” are effective. Accordingly, if investing in the domestic market is not attractive for any reason (cost of funds, lack of incentives, etc.), investors will move their production abroad. For FDI’s towards developed countries, “pull factors” come to the forefront. For developed country markets, the transaction volumes, level of integration with other markets and quality of production factors attract FDI.

<sup>16</sup> When the current values of corruption indices are used instead of the lagged values, all the corruption variables are found to be negatively related to FDI inflows at least at the 5% significance level. However, to avoid the risk of endogeneity, one-period lagged values are used in all explanatory variables.

<sup>17</sup> The ICRG Index is estimated as a component of political risk and it represents corruption as a key dimension in estimating broader levels of governance. It relies on expert opinion. The WBI Worldwide Governance Indicators represent six factors affecting governance, one of which is control of corruption. It mostly benefits from ICRG political risk components and WBI weights other available sources to create its own indices. The TI Corruption Perception Index is a composite index survey which represents corruption perception levels among public officials and politicians. It reflects opinions from around the world about the country. The Heritage Foundation’s Freedom from Corruption index is a component of economic freedom and is primarily derived from TI index.

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