# Changes in Foreign Direct Investment in Turkey during 1996–2017 due to Political Risk

## A CASE STUDY OF TURKEY

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Tiivistelmä – Referat – Abstract

The determinants of FDI have been a topic of interest in economics since the 1980s and this paper aims to contribute to this field. This study aims to measure how associated FDI is with the political risk as well as to see the extent of this relationship in Turkey in the years 1996–2017. The political risk is measured as a change in indexes that are provided by the World Bank, Freedom House, and Transparency International. These political indicators are Political Rights, Civil Liberties, the Corruption Perceptions Index, Regulatory Quality, Voice and Accountability, Rule of Law, Government Effectiveness, Control of Corruption, and Political Stability.

The earlier literature on FDI and political risks is mostly empirical and there has not been much theoretical research. Chakrabarti analyzed the past studies on FDI and its determinants in 2001 and found out that in the earlier research, almost every explanatory variable of FDI except the market size was sensitive to small changes in the conditioning information set, casting doubt on the robustness of the results. There have also been conducted studies that address political risk or equivalent concepts. The 2005 research of Busse and Hefeker had the same topic as this paper but their data consisted of many countries and they employed two different panel models. One was a fixed-effects panel analysis while the other utilized a generalized method of moments estimator.

I selected three model specifications for the time-series regression analysis. All three specifications have market size as a control variable and the other two also have the economy's growth rate and trade openness. The third has the inflation rate as the final control variable. The data have a small number of observations which limits the options available for the empirical part of the study. Out of the nine political indicators, Regulatory Quality is the only political indicator that is not associated with FDI, while the results on the Corruption Perceptions Index and Control of Corruption are inconclusive. The rest six are associated with FDI. The Rule of Law index has the highest estimated coefficient value of the World Bank indicators and the Political Rights index has the highest estimated coefficient value of the Freedom House's indicators.

Avainsanat – Nyckelord – Keywords

FDI, Institutions, Political Risk, Multinational Corporations

Ohjaaja tai ohjaajat – Handledare – Supervisor or supervisors

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Säilytyspaikka – Förvaringställe – Where deposited

Muita tietoja – Övriga uppgifter – Additional information

# Foreword

I wrote this paper to be my Master's Thesis, not only as a getaway from the university but also to learn something about econometrics and economic research. I am happy to say that I believe I achieved both of those aims. A few words are in order since without several people it is unlikely this piece of research would have ever been conducted and finished.

I thank my family for supporting me.

I thank my friend Jetro Anttonen for sort of peer-mentoring me through this.

I thank my friend Tia Oja for proofreading.

I thank my childhood friend Khoa Nguyen for making this look neat.

And I thank my thesis supervisor Markku Lanne for the good feedback and direction.

Also, all the friends I have made in the university are due thanks as well. Writing this thesis would not have felt such a special end to the studies had I not met many great people on the journey.

Veikko Walta

Helsinki, April 17, 2020

# Contents

# 1 Introduction

Foreign direct investment (FDI) flows are capital flows that are invested by companies abroad into the domestic economy. FDI is deemed to be an important source of capital for the less developed countries as direct investment implies there exists trust in the country's business climate that supports said business's long-term activity that is conducted there. Also, FDI flows are not easily hampered by temporal problems that a country might face since a company that has already invested itself somewhere is not inclined to change its location. However, on the flip side is that this kind of investment requires commitment from the multinational companies which forms a threshold for entry.

The will to lower this threshold has been considerable, and it has stimulated efforts for understanding FDI. After the start of the 80s, when many developing nations had a hard time accessing credit from abroad due to over-borrowing in the 70s, interest towards the determinants of FDI grew (Chakrabarti, 2001). Supposedly, this research has provided policy recommendations for attracting foreign money. A part of this research has focused on political risk and governance such as the paper of Alesina and Tabellini in 1989, "External debt, capital flight and political risk". All in all, while not the most prominent in the field of economic study, the FDI research has been a reasonably notable topic in the research of development economics. The major influences of this paper are the research of Chakrabarti (2001) and Busse and Hefeker (2005).

The determinants of FDI are still topical issues as is FDI's linkage to the political risk. There have been several countries that have distanced themselves from the rules-based order and leaned closer to authoritarianism. Most of these countries are not the most developed economies nor the least but somewhere in-between. It is interesting to see whether their FDI flows are affected by a change in political risks.

Turkey is one of the countries that can be currently described as authoritarian (Esen and Gumuscu, 2015). Turkey has not been that way for long though, as there have been more signs of pluralism in the 90s and the early 2000s than in recent years. For example, Turkey applied for membership of the European Union in 1987. The criteria of the EU membership can be boiled down to a competitive market economy and functioning liberal democratic system, and in the pursuit of the membership, Turkey needed to upgrade both of these fields. The accession eventually advanced and the actual negotiations for the membership started in 2005. Since then the negotiations have eventually

stalled. There has also been a shift in power from the parliament to the president after the failed coup attempt in 2016 (Butler et al. 2017) and many journalists have been jailed (Aldemir et al. 2018). One could argue that political risks have risen in Turkey. In this paper I want to examine the relationship this progress has to FDI.

Against this background of FDI study and Turkey's authoritarian development, the research questions of this paper are as follows: Firstly, how does political risk, as measured with a variety of indexes, affect or correlate with foreign direct investment? Secondly, do we see this relationship in Turkey during 1996-2017 using available data and time series regression and with what magnitude?

The study is organized as follows. In Section 2, the earlier literature concerning FDI and political risk is covered while in Section 3 the data and variables are examined. In Section 4 there are a description of the model selection, the regression results, and the details on the diagnostics checks followed by the interpretation of the results. Lastly, Section 5 concludes this piece of research.

# 2 Literature Review

When it comes to the scientific literature addressing the research questions, this survey can be divided into three parts. The first part focuses on the 2001 study of Chakrabarti that examines the determinants of FDI. The second part deals with the political risk and its estimation in various economic research papers. These two parts are more related to the first research question while the third part is more about covering the means to solve the second question. The third part depicts the paper of Busse and Hefeker (2005). They studied the relationship that political risks have with FDI, but they did so with a dataset of 83 developing nations, whereas this paper aims to look at the specifics of one country, Turkey. Nevertheless, their study offers a framework that can be imitated to a degree.

Studies referred to in this section are mostly from the late 1980s to the early 2000s. FDI and its flows were studied extensively during this period, likely because of the economic liberalization ongoing in many countries during those years.

## 2.1 FDI and its determinants, findings of Chakrabarti, 2001

Chakrabarti (2001) conducted a meta-analysis on previous research on the possible determinants of FDI. It is the first attempt at this and it utilizes a form of cross-country model. Chakrabarti used a variant of Extreme Bound Analysis to figure out whether the variables chosen in the earlier studies can stand up to little tweaks in the information set. He found out that all tested variables except GDP per capita were sensitive to small changes. He also showed that openness to trade is likely to correlate with FDI. This study is beneficial since answering the research questions stated above requires control variables and this sheds light on which variables are useful and which are not. Also, Chakrabarti collected a set of earlier research regarding the topic which also contributes towards this research paper.

According to Chakrabarti (2001) the literature addressing FDI flows states that many variables are affecting it. What is more, much of the literature provide even conflicting information. Some of the contradictory information can be explained with a great variety of empirical methods that were utilized. Also, the theoretical background of FDI is lacking as quite often in the earlier literature variables' influence on FDI is not based on any theoretical explanation. This is at least the case when considering the cross-country regressions on FDI.

There seems to be consensus on some of the variables, however. The size of a market in per capita terms has a clear positive effect on FDI among all the literature Chakrabarti (2001) surveyed. The level of taxation seems to have adverse linkage to FDI according to most of the literature, though some deem connections insignificant and one paper found a positive association. There is no consensus among researchers whatsoever when it comes to the effects of labor costs on FDI. The exchange rate has either a negative or insignificant association with FDI and both growth rate and openness to trade seem to have either a positive or insignificant relation to FDI according to previous findings. The latter two variables and country's market size are deemed quite important later as Busse and Hefeker (2005) used them as control variables in their regressions.

Chakrabarti (2001) uses a version of Extreme Bound Analysis (EBA) first used by Leamer (1983, 1985). EBA effectively tests the strength of variables' coefficients to changes in data. Chakrabarti's EBA model was:

$$Y = \alpha + \beta X + \gamma I + \delta Z + \varepsilon,$$

in which Y represents net FDI in a study, α is an intercept term, X stands for a variable that earlier literature deems reliable (some indicator of the market size, in fact), I is the variable that is to be studied in each EBA, and Zs are the more controversial variables used earlier. As stated earlier, Chakrabarti (2001) finds out that GDP is a major determinant of FDI, regardless of whether it is reported as the absolute size of the economy or in per-capita terms.

The I variables were not as clear cut. The I variables were wages, openness to trade, real exchange rates, tariffs, trade balance, the growth rate of the real GDP, and tax rate; effectively those variables that were under inspection among earlier studies. Chakrabarti (2001) discussed these inconclusive variables and states that often one would find a significant statistical relationship with FDI when one selectively chooses other explanatory variables. These variables could be determinants of FDI, though, but one should be cautious when thinking about using these.

The exchange rate provides a possible determinant of FDI that will be looked at later in this piece of research. Turkish lira has been depreciating with respect to US dollar roughly since 2011. Many scholars have inspected the relationship between exchange rates and FDI such as Froot and Stein (1991) as well as Blonigen and Feenstra (1996) and find it significant and negative. This is contested however since Edwards (1990) argues that the effect of the exchange rate to FDI is positive and

significant. There are theories on how exchange rates affect investment. One of them stresses that the relative wealth increases with the appreciating currency, thus attracting more investment from abroad.

## 2.2 Studies on Political Risk

The term "political risk" is quite general in its possible meanings and does not have any universal definition. It becomes apparent when going through the research that deals with related concepts. This highlights the need to define this topic well. Also, Busse and Hefeker (2005) note that not much research has been done on political risk and its effects on FDI.

However, there have been studies on political risk and similar concepts. The study of Brunetti and Weder (1998) was not about political risk but more broadly about institutional uncertainty and its relationship with investment in general. Wei (2000) studied the effects of corruption on FDI and found out that high levels of corruption scare away foreign direct investment. Busse (2004) researched whether or not multinational corporations prefer to operate in undemocratic countries. Turns out, they do not. Also, Jensen (2003) researched how democratic accountability affects FDI and found out that multinationals prefer to invest in democratic countries rather than authoritarian ones. The research of Krifa-Schneider and Matei (2010), a panel study, concentrated on business climate and political risk. These all studies deal with the sort of political risk and the variables these pieces of research use are similar to the ones this paper examines.

Some research papers treat political risk as more like "future policy risk". Alesina and Tabellini (1989) studied what kind of government coalitions choose policies that increase investment risk. Varying definitions can confuse. As terms like "institutional risk" or "geopolitical risk" are often effectively the same as the political risk like it is defined in this study, it is apparent that the aim of the researchers is broadly the same. The idea is to examine the structures of the economy to describe phenomena and give policymakers recommendations.

Often FDI and other investment studies employ panel or cross-section regressions as their methods. When political risk is studied, it is plugged into the specification as the variable of interest. For example, a panel analysis was utilized by Brunetti and Weder (1998). Their data sample contained 60 countries and the time period was 1974–1989. The specification of Brunetti and Weder was modeled after studies that concentrate on growth and investment. It was the following model:

$$Invest = \alpha_0 + \alpha_1\, GDPbase + \alpha_2\, Secbase + \alpha_3\, Govaver + \alpha_4\, Tradaver + \alpha_5\, Inst + \varepsilon.$$

The dependent variable *Invest* was the average rate of investment in their study period while *GDPbase* referred to real market size in per capita terms. *Secbase* is an interesting choice since it was enrolment ratio into secondary education which they used to measure human capital in a given year. *Govaver* stood for government expenditure as a ratio of GDP, and *Tradaver*, was the sum of exports and imports as a share of market size, indicating openness to trade. *Govaver* was the only variable expected to have a negative relationship with investment. Lastly, *Inst* was the variable of interest, institutional uncertainty which covers many issues such as government instability and policy uncertainty. The model is not the same as the ones utilized in this study below, yet it bears some resemblance. Brunetti and Weder's study concluded that factors such as disregard for the rule of law, a high degree of corruption and a great volatility in the exchange rate of country's currency have the most adverse association with investment while there were other variables associated as well such as violent social change.

Busse (2004) employed similar methods as Brunetti and Weder (1998) when trying to answer whether undemocratic countries attract more FDI than democratic ones. His model explaining FDI included real market size, growth rate of the economy, and trade openness as control variables. The variable of interest was a democracy variable that was composed of the indexes of Freedom House, the Political Rights index and the Civil Liberties index. His panel study had dataset in which there were 69 countries covering years from 1972 to 2001

While panel studies appear to be most common, there have also been studies other kinds of empirical studies on political risk. Some studies focus on bilateral FDI flows that utilize a gravity model. Frenkel et al. (2004) did one such study focusing on emerging economies hosting investments from the five largest developed economies at the time. They included characteristics of the investing country as push factors and features of the host country as pull factors. Political risk, or lack thereof, was essentially a pull factor.

## 2.3 The Paper of Busse and Hefeker, 2005

Busse and Hefeker had a very similar research topic but their data addressed multiple economies. They tried to estimate the impact of political risks on FDI flows of 83 developing countries during the years 1984-2003. They used 12 different variables for political risks and found out that some indicators were better than others. These results were obtained by employing two different

empirical methods on panel analysis. The first one was a country fixed-effects model and the other included the Arellano-Bond generalized method of moments estimator (Arellano and Bond, 1991).

The variables Busse and Hefeker chose to represent political risk were provided by the Political Risk Services Group to International Country Risk Guide from which the data were collected. The twelve indicators were for government stability, socio-economic pressures, investment profile of a country, internal conflict, external conflict, corruption, military influence on government, religious tensions, law and order, ethnic tensions, democratic accountability and quality of bureaucracy. These variables were given a value on a scale from 0 to 12 so that higher values represented less risk. Busse and Hefeker note that these indicators not only encompass political risk but also describe the strength of a country's institutions. Some of them are also related to each other and Busse and Hefeker provide a correlation matrix for the variable correlation.

Busse and Hefeker proceeded to build a model as a cross-country regression analysis with FDI net inflows per capita in US dollars as a dependent variable (*FDI*). They used averages of the years 1984-2003 for this benchmark regression. In the regression, they had four control variables they believed to be major determinants in changes in FDI: Gross National Income (*GNI*), the real growth rate of GNI (*GROWTH*), openness to trade (*TRADE*) and the GDP deflator (*INFLATION*). Some of these control variables are likely to have an endogeneity problem, a fact that does not escape Busse and Hefeker as they later move on to a model that is estimated with a GMM. As discussed above, along with market size, growth rate and openness to trade were chosen as control variables as earlier research paints them as likeliest ones to be major determinants.

The GDP deflator was also chosen to stand for inflation. Busse and Hefeker saw a low inflation rate as an indicator of a sound economic policy and thus use it as a proxy. While effective and predictable macroeconomic policy probably attracts the multinational firms, employing inflation as its measure is problematic for a variety of reasons, even though the researchers in question agree that it is indeed a "rough" measure.

When it comes to inflation's association with FDI, the research literature is torn. On one hand, when studying bilateral FDI flows, Frenkel et al. (2004, p. 297) did not find inflation to be attracting force for FDI. On the other hand, inflation is used often as a control variable in similar studies, as is the case with Krifa-Schneider and Matei (2010, p. 58) who found out that inflation is a statistically significant determinant of FDI in a panel study on political risk.

In the regression model there was also a dummy variable to control regional characteristics as the fifth variable. The regional characteristics are based on the World Bank's 2005 classification of regions and they are used in the regression because some regions are likely to weigh on the investment decision. The sixth variable was one of the twelve indicators for political risk, denoted as *POLITICAL*. The political risk indicators were added on regression one at a time to avoid multicollinearity.

The regression was thus:

$$log\ FDI_i = \beta_0 + \beta_1\ log\ GNI_i + \beta_2\ GROWTH_i + \beta_3\ log\ TRADE_i + \beta_4\ log\ INFLATION_i + \beta_5\ log\ REGIONAL_i + \beta_6\ POLITICAL_i + e_i.$$

Busse and Hefeker found out that *GNI*, *GROWTH* and *TRADE* all had positive and statistically significant coefficient at least at the 5 percent level influence on *FDI*. *INFLATION* had also positive relation yet insignificant.

More interesting however, is that while the estimated coefficients of the political risk indicators were each positive, only four were statistically significant at the 10 percent level except the one for the bureaucracy quality which was significant at the 5 percent level. The other three were democratic accountability, government stability and law and order. According to earlier research, all these variables except government stability were found to be associated with *FDI* (Busse and Hefeker, 2005, pp. 10). Busse and Hefeker discuss this and ponder whether the time framing of this approach might lead to such rather insignificant results. After all, looking at the average of all variables between the years 1984 and 2003 will leave out different events that have happened during that period. They bring up Brazil which around 1990 had high inflation that lowered by the end of the decade to levels more akin to those of the developed world. The same problem with the time period could be present with some of the political risks. Thus, they moved on to use a cross-section time-series analysis.

For the country fixed-effects time-series model Busse and Hefeker add five 4-year averages spanning the years 1983 to 2003. They speculate that for small developing economies which were numerous in their data, the FDI flows vary greatly from year to year and thus the benchmark regression gave fallacious results. By adding the 4-year time periods they could get more specific

results for more specific time periods. Also, logarithmic *FDI* can give misleading results when the flows are negative.

The regression model Busse and Hefeker came up with was similar to the one before:

$$log\ FDI_{it} = \beta_0 + \beta_1\ log\ GNI_{it} + \beta_2\ GROWTH_{it} + \beta_3\ log\ TRADE_{it} + \beta_4\ log\ INFLATION_{it} + \beta_5\ POLITICAL_{it} + e_{it}.$$

They left out regional dummies and each variable was not only for a country but also for a period *t*.

This time each of the control variables was both positive and significant and for the political variables only corruption, military influence in politics, and religious tensions were not significantly associated with *FDI*. Busse and Hefeker noted that stronger socio-economic conditions were adversely associated with *FDI*. They conclude that this has more to do with country-specific factors as they vary greatly from country to country and that its sub-variables that form the variable in question are unlikely to affect FDI flows. Out of the remaining significant indicators government stability, investment profile, law and order and democratic accountability had the largest coefficients. Apart from the investment profile they were also the significant ones in the earlier regression.

When it comes to Turkey, this democratic accountability is one indicator that has likely deteriorated in recent years. These results of Busse and Hefeker imply that FDI flows might be lower for Turkey because of a possible decline in political liberties. Also, earlier literature supports this claim (Busse, 2004; Jensen, 2003). Busse and Hefeker also found out that higher ethnic tensions tend to scare away the investments. Turkey has had ethnic tensions with its largest minority, the Kurds, and they have been increasing since the July 2016 coup attempt (see the report by *Council on Foreign Relations*). This might also affect possible ethnic tension rating as well as FDI flows due to increased instability.

This fixed-effects model has some drawbacks. Out of simplicity Busse and Hefeker had to assume that all the variables were exogenous, even though some variables such as trade openness are clearly affected by FDI flows. The researchers also worried about the autocorrelation of the error terms and the Durbin-Watson *d* statistic indicates this at the positive first-order level with a value of 1.37. They sought to correct these problems by adding the Arellano and Bond (1991) generalized method of moments estimator (GMM). This way, the endogeneity problem could be solved by using lagged levels of differenced explanatory variables as instruments for estimating the model with the method of Arellano and Bond (1991). Also, the autocorrelated error term would be addressed with

the lagged dependent variable. This meant that the specification was changed into a dynamic panel model. Busse and Hefeker noted that the earlier investment flows may affect the investment decisions of multinational corporations at the current period so theoretically this should be a sound method.

The model with the GMM estimator is built so that it is no longer a fixed-effects model. The equation Busse and Hefeker produced was

$$\Delta log\ FDI_{it} = \beta_0 + \beta_1\, \Delta log\ FDI_{it-1} + \beta_2\, \Delta log\ GNI_{it} + \beta_3\, \Delta GROWTH_{it} + \beta_4\, \Delta log\ \Delta TRADE_{it} + \beta_5\, \Delta log\ INFLATION_{it} + \beta_6\, \Delta POLITICAL_{it} + \Delta e_{it}.$$

According to the Sargan test, the instrument was appropriate for use, and according to the regression statistics no autocorrelation at the second-order level was found. Thus, the assumptions behind the GMM of Arellano and Bond (1991) were met. By using this equation it was discovered that *FDI* of the earlier period is the leading control variable as *GNI* and *INFLATION* become insignificant and others are only significant at the higher 10 percent level. For the political risks this dynamic panel analysis shows that all have expected sign and significant indicators are government stability, investment profile, internal conflict, law and order, ethnic tensions, and democratic accountability.

All in all, the 2005 paper of Busse and Hefeker concludes that in each of their models and among the twelve indicators of political risk, corruption, military in politics and religious tensions were ones that they could not statistically link to FDI, and the effects of socio-economic conditions remained negligible. The strongest indicators were law and order and government stability.

# 3 Data

Most of the research data of this study are from the World Bank and was downloaded via theglobaleconomy.org. The research requires 1996-2017 data of foreign direct investment to Turkey, real GDP in per-capita terms, growth rate, and trade openness. The latter three are used as control variables as all of them were linked to FDI in some way. The data for these variables are from the World Bank.

There are also nine indicators that each measure some aspect of governance or political management of a country. The changes in these indicators over time imply an increase or a decrease in political risks. The World Bank also provided the bulk of the indicators used for this piece of research. These are called the Worldwide Governance Indicators and there are six of them: Regulatory Quality, Voice and Accountability, Rule of Law, Government Effectiveness, Control of Corruption, and Political Stability. American research institute Freedom House provides two indicators, Political Rights and Civil Liberties. From Transparency International there is one indicator, the Corruption Perceptions Index.

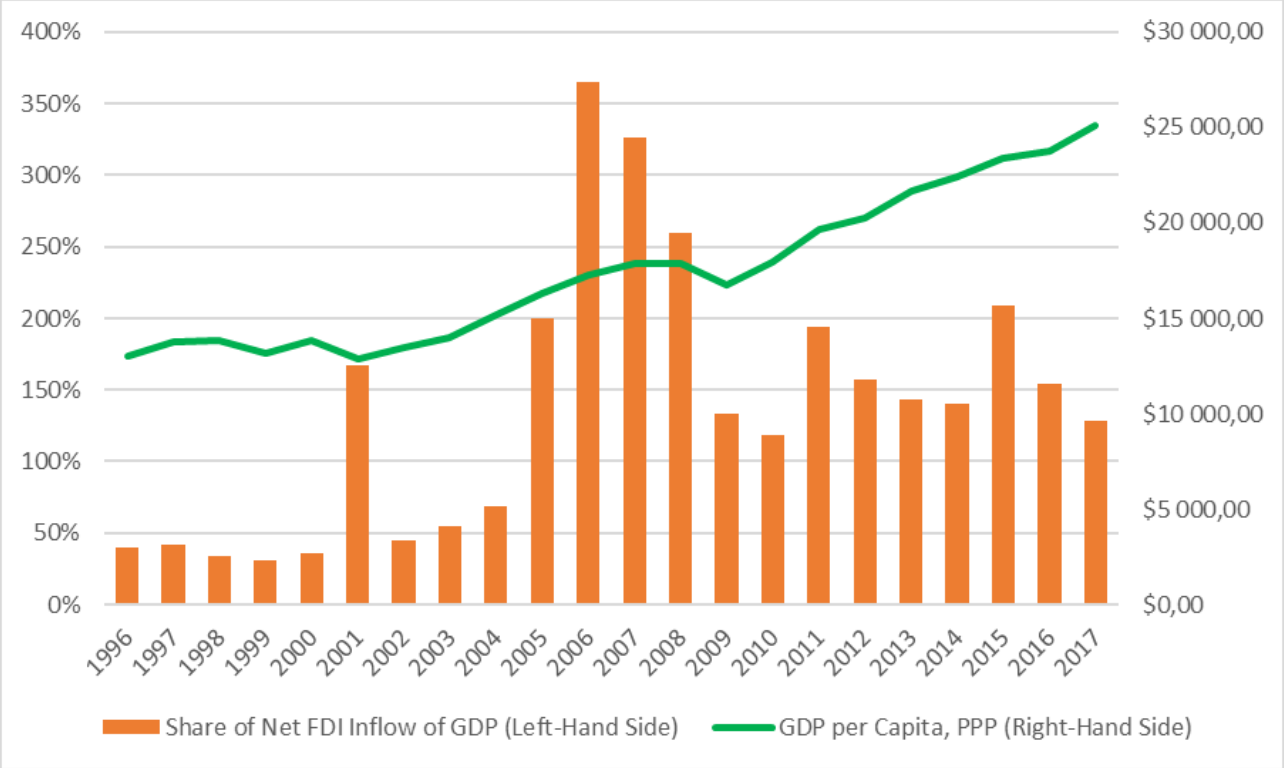
Foreign direct investment is the dependent variable in this study and the net inflow of investment is measured as a percentage share of Turkey's GDP in 2018 American dollars. Not all capital inflow is measured in this variable as some of it is other forms of investment such as the portfolio investment, for example. Foreign direct investment is a kind of investment that businesses in one country make into other countries. The business has to own at least a tenth of the voting stock in shares of the target business for its investment to be classified as FDI, according to the World Bank (see The World Bank's DataBank on FDI).

## 3.1 The Control Variables

The size of an economy is an important determinant of FDI. The rationale is quite simple: the bigger the economy, the more profitable investments as there is more spendable wealth in the country. For this piece of research, the GDP per capita figure at purchasing power parity was used. Using the per-capita figures gives a rough picture of the average income of the country's residents. From the multinationals' point of view, the higher GDP per capita implies more high-income consumers and thus, a more lucrative market. Estimating at the purchasing power parity gives a more accurate picture of the standard of living than measuring in nominal values as PPP figures are cleaned from any transaction costs that skew the numbers. The figures are in 2011 international US dollars. Figure

1 depicts the per-capita size of the economy and the dependent variable of the study, the share of the net FDI inflow of the GDP.

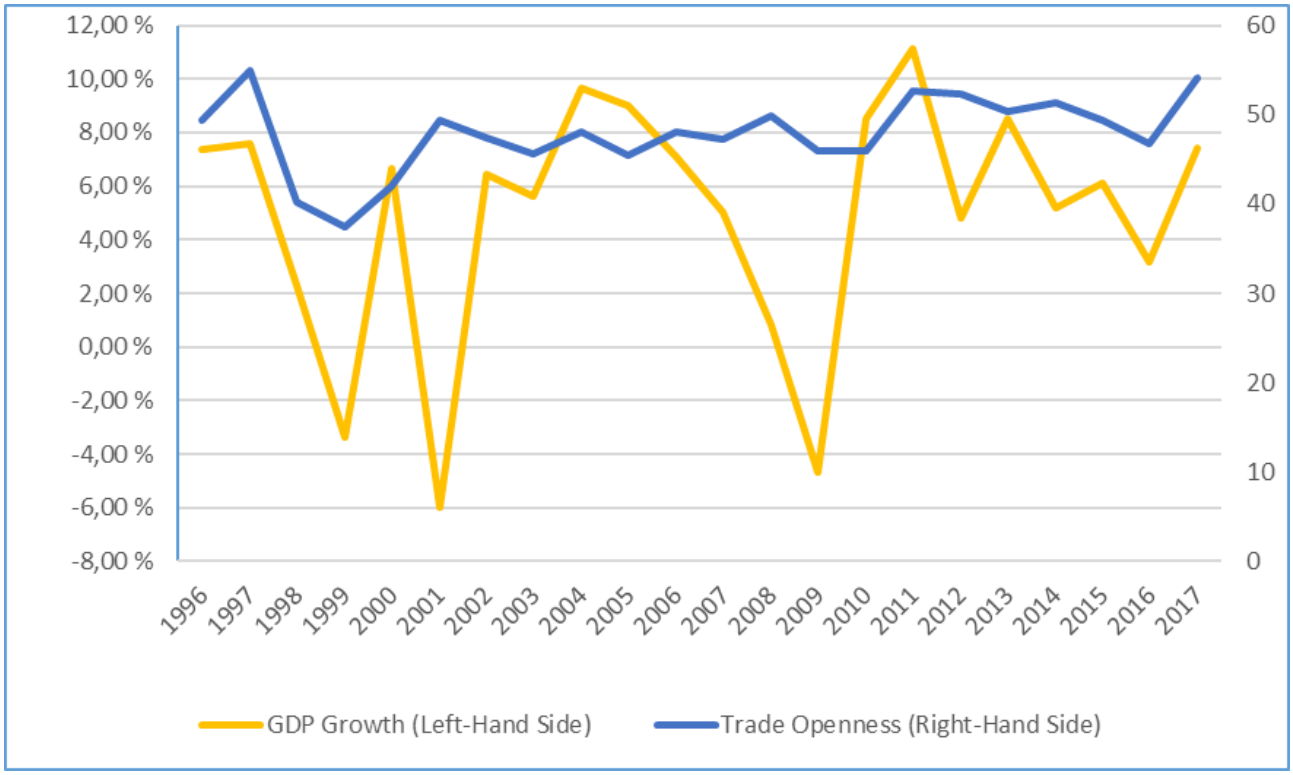
**FIGURE 1: THE SHARE OF NET FDI INFLOW OF GDP AND GDP PER CAPITA AT THE PURCHASING POWER PARITY OVER TIME**




The economy's growth rate is often considered to be a variable that is positively related to FDI (Chakrabarti, 2001). This makes sense as if the size of the economy is almost always considered to be the most important determinant, then the growth rate of the economy should carry some weight as well. One could say that growth figures capture expectations about the future economy. The GDP growth rate is stated simply as a percentage of the increase in the country's GDP. The data are in 2010 US dollars.

Trade openness is the share of the country's exports and imports of the GDP in a given year. The idea behind this variable is that the openness of an economy manifests in the trade that has already been realized, that is, exports and imports. Like GDP per capita and GDP growth rate, Busse and Hefeker (2005) chose openness to trade to be their third control variable, and according to Chakrabarti (2001), trade openness is deemed to have either positive or insignificant relation to FDI. The GDP growth and the trade openness in the years 1996-2017 can be seen in Figure 2.

**FIGURE 2: THE GDP GROWTH AND THE TRADE OPENNESS OVER TIME**




Each mentioned control variable above is expected to be positively correlated with the FDI. There is probably also some endogeneity bias in the control variables. For example, GDP growth might be caused by a variable that is not present in the model that also affects the error term, i.e. the omitted-variable bias.

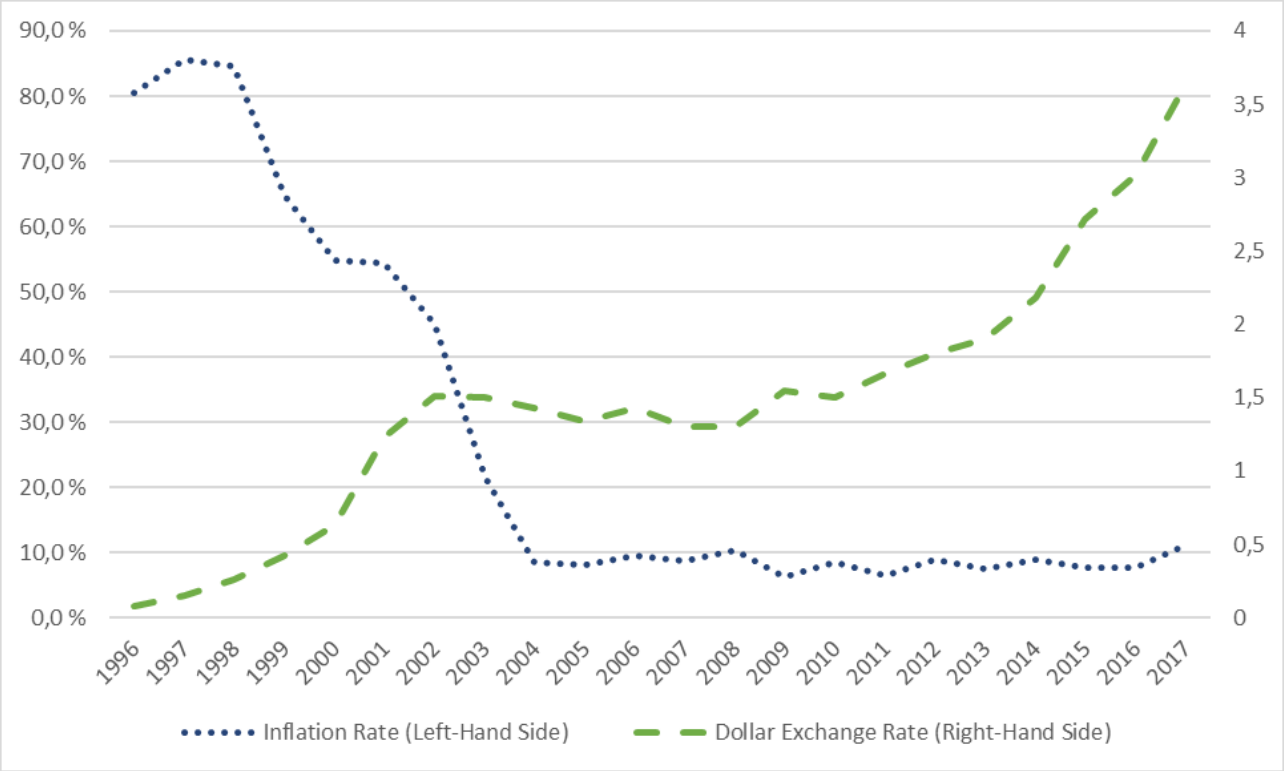
Two additional control variables will be tested to determine whether they will make the model specification better. The first of these is the inflation that was also used by Busse and Hefeker (2005) in their study. It is usually measured as a percentage change in the Consumer Price Index (CPI) and will also be used as such in this paper. Busse and Hefeker interpreted it as an indicator for macroeconomic performance while also conceding that it is a vague measure for it. Inflation is a variable that is likely to be negatively correlated with FDI as high inflation rapidly diminishes the value of investments over time, lowering the desire for investing in high inflation countries.

The second additional control variable is the dollar exchange rate. The figures are the exchange rates in the given year. The rationale is that a weaker currency does not attract capital as much as a strong currency does. Also, the American dollar is widely used for international transactions so the dollar exchange rate may hold some explanatory power over foreign direct investment. The exchange rate is likely negatively correlated with FDI, as in the earlier literature it has had either

negative or insignificant significance on FDI (Chakrabarti, 2001). Both the exchange rate and the inflation exclude each other in the specifications because of two reasons: firstly, both would likely affect each other a great deal, and secondly, the number of control variables would be quite high even if only one were in the specification.

In Figure 3 there are depicted the time series of the GDP growth percentage and the Turkish inflation rate. The simultaneous high inflation and the low exchange rate in the late 90s to the early 2000s are linked to the crawling peg exchange regime of the time (Görmez and Yılmaz, 2007).

**FIGURE 3: THE DOLLAR EXCHANGE RATE OF THE TURKISH LIRA AND THE INFLATION RATE OVER TIME**




## 3.2 The Political Indicators

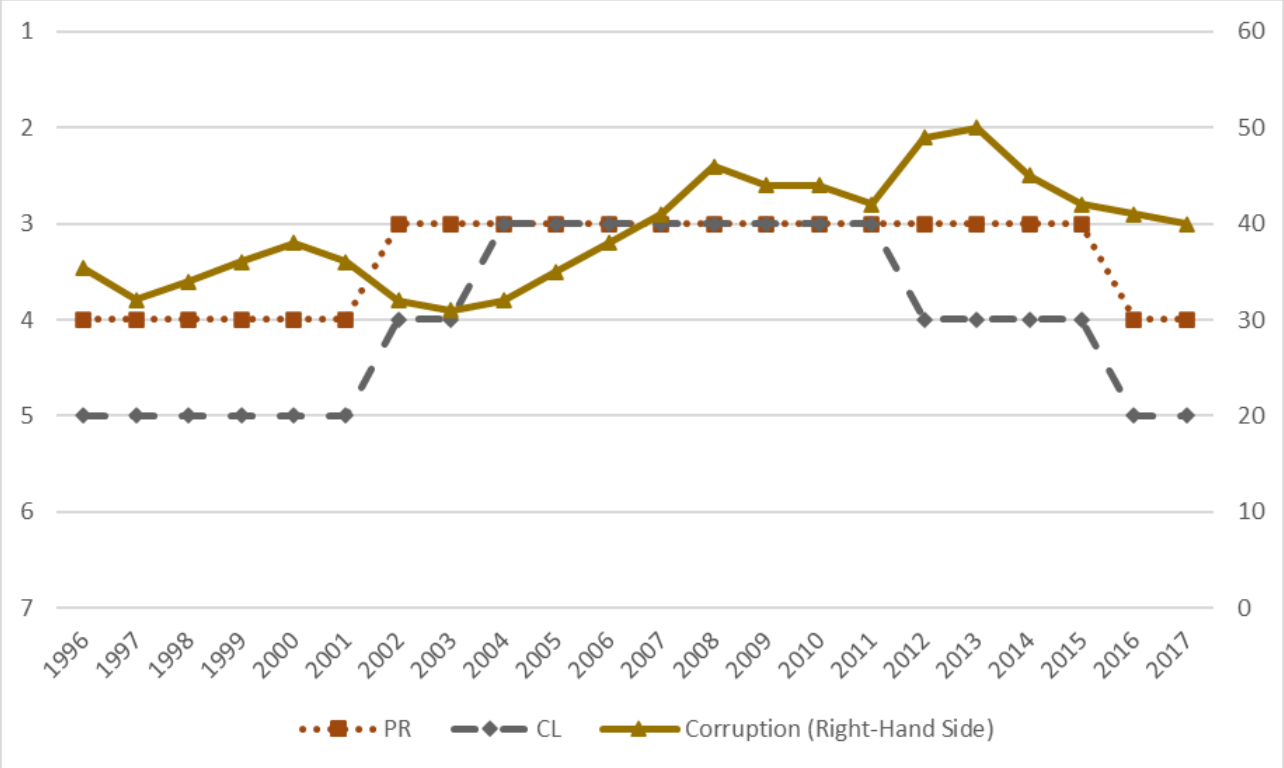
Some of the political indicators are overlapping with each other to a degree, especially the ones that are from different sources. For instance, the Civil Liberties index by Freedom House tries to capture measures of the rule of law, freedom of expression, and association rights (Freedom House's website), all of which are also covered by some of the World Bank's Governance Indicators such as the Rule of Law index or the Voice and Accountability index. This is not a problem. In fact, to a degree, similar results from the regressions of two variables that try to depict the same concepts bolster the validity of both indicators. These indicators are the following:

- Freedom House's Political Rights index, denoted as *PR*, depicts the electoral process, pluralism, participation, and country's governments' functioning. It takes values between 1 and 7, with 1 indicating strong political rights and 7 weak.
- The other indicator by Freedom House, the Civil Liberties index, *CL*, vies to capture the measures for free speech, the rule of law, personal liberty and the freedom of assembly. Like Political Rights index, it takes values between 1 for strong liberties and 7 for weak.
- Transparency International provides Corruptions Perceptions index, *Corruption*. It aims to measure perceived corruption in the public sector by combining information from a variety of independent sources. It takes values between 0 and 100, 100 being no corruption of any kind in the public sector.
- The World Bank's Control of Corruption index, *Controlcorruption*, tries to provide a picture similar to the Corruptions Perceptions index. Notions like how the public sector is used for rent-seeking and other forms of misuse are the focus of this index. It takes values between -2.50 to 2.50, the higher the value the stronger the institutions.
- The World Bank's Government Effectiveness index, *GE*, focuses on the quality of public policy and its implementation. The valuation is between -2.50 and 2.50.
- The World Bank's Political Stability index, *PS*, measures the absence of violence, terrorism, and other kinds of coercion that might destabilize the government. This index takes values between -2.50 and 2.50.
- The World Bank's Regulatory Quality index, *RQ*, measures how the public sector can regulate the private sector with sound policies. The index takes values between -2.50 and 2.50.
- The World Bank's Rule of Law index, *RoI*, measures how much government's subjects can trust it to dish out justice, i.e. uphold property rights and enforce contracts, and keep level playing field. Takes values between -2.50 and 2.50.
- The World Bank's Voice and Accountability index, *Vaa*, is about citizens' ability to participate in the government's decision-making process and the government's responsibility to carry out that delegated will. The index takes values between -2.50 and 2.50.

The indexes of Freedom House and Transparency International can be seen in Figure 4 and the Governance Indicators in Figure 5. It can be seen in both pictures that there is a modest downward trend in each indicator after around 2011. Most of the indexes also take lower values in the 90s and display an upward trend to their peaks around 2005 and 2006. The general outline

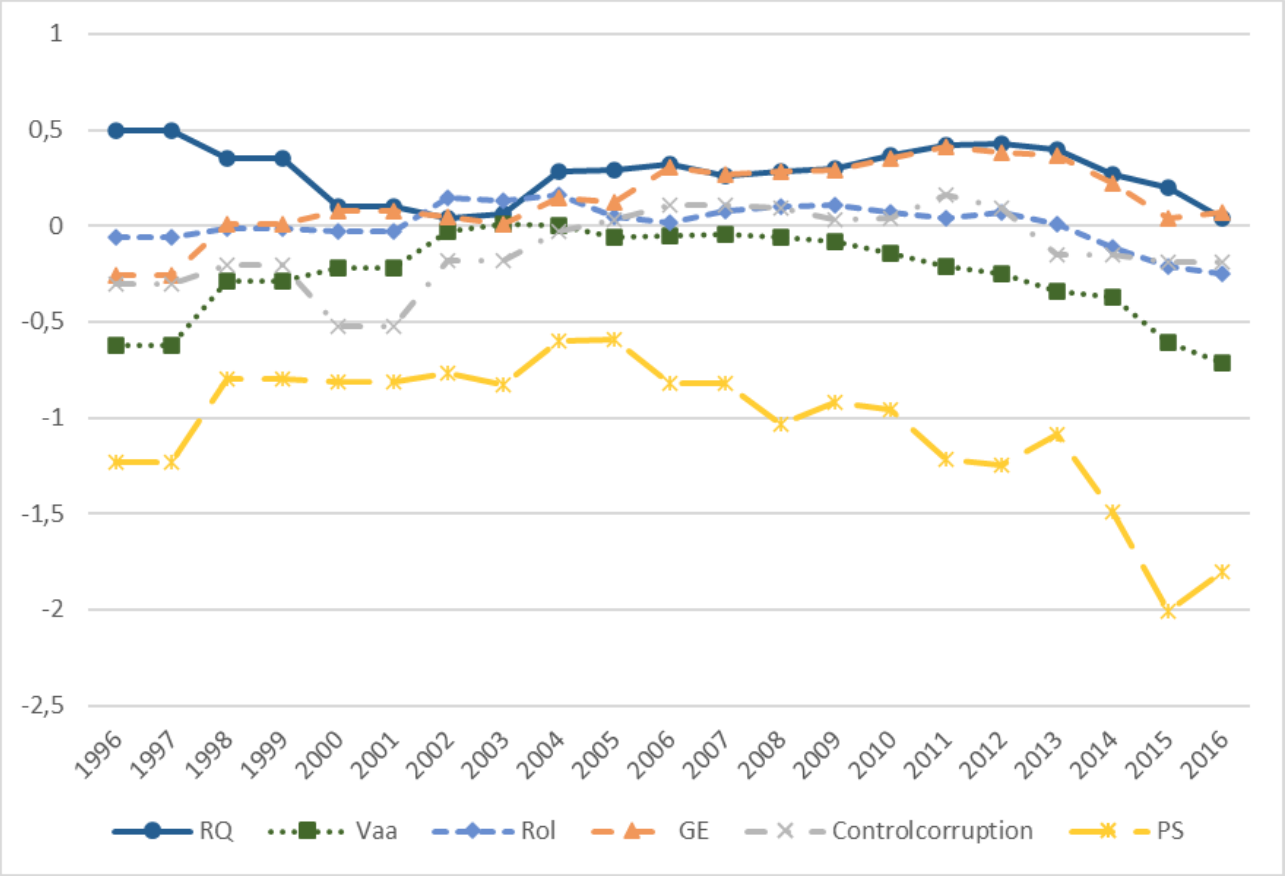
of the indicators supports the claim that there has been progress on democracy and other institutions around the turn of the millennium which has been reversed in the 2010s.

**FIGURE 4: THE INDEXES OF FREEDOM HOUSE AND THE CORRUPTION PERCEPTIONS INDEX OVER TIME**




Notes: The left-hand scale for *PR* and *CL* is inverted due to the indicators' inverted valuation.

**FIGURE 5: THE WORLD BANK'S GOVERNANCE INDICATORS OVER TIME**




The data for the World Bank's Governance Indicators were collected annually except for the early years when data collection and publishing proceeded every other year. Kauffman et al. (2003, p.4) used data of the two years to form values for even-numbered years 1998, 2000, and 2002. This is the reason for using the value of the next year for years 1997, 1999, and 2001.

The overlap of the political indicators with each other can be seen in the correlation matrix, in Table 1 below. Variables *PR* and *CL* are negatively correlated with other political variables and are positively correlated with each other because for them the lower values imply stronger institutions while the rest of the indicators work the other way around. Variables targeting corruption, *Controlcorruption* and *Corruption*, correlate reasonably well with each other at 0.70. *RQ* has a relatively low correlation with every other variable across the board. Curiously, *PS* and *Corruption* as well as *Vaa* and *RQ* have a negative correlation with each other. No variable beyond these seem to have an unexpected correlation with any other indicator. Despite this, the political indicators can be expected to be positively correlated with FDI except *PR* and *CL* which should be negatively correlated with the political variables.

**TABLE 1: THE CORRELATION MATRIX OF THE POLITICAL INDICATORS**

| | PR | CL | Corruption | RQ | Vaa | RoI | GE | Control-corruption | PS |
|---|---|---|---|---|---|---|---|---|---|
| PR | 1 | | | | | | | | |
| CL | 0.89 | 1 | | | | | | | |
| Corruption | -0.37 | -0.29 | 1 | | | | | | |
| RQ | -0.02 | -0.01 | 0.39 | 1 | | | | | |
| Vaa | -0.68 | -0.76 | 0.05 | -0.23 | 1 | | | | |
| RoI | -0.70 | -0.74 | 0.06 | 0.14 | 0.80 | 1 | | | |
| GE | -0.73 | -0.62 | 0.81 | 0.11 | 0.46 | 0.39 | 1 | | |
| Controlcorruption | -0.56 | -0.64 | 0.70 | 0.34 | 0.43 | 0.43 | 0.67 | 1 | |
| PS | -0.41 | -0.51 | -0.27 | 0.01 | 0.76 | 0.78 | 0.11 | 0.07 | 1 |

Notes: The correlation values are calculated from the averages of the research period 1996–2017.

One noteworthy point about the data is the small number of observations as only a single country is subject to study, and the annual data cover the years from 1996 to 2017. That means 22 observations per variable. This means that empirical methods used need be as robust as they can be.

# 4 Empirical Results

In this section the method, the model and results are addressed. The method used to conduct the study resembles that of Busse and Hefeker (2005) except that instead of a panel study, I chose linear time series regression as only one country is studied, Turkey. Like Busse and Hefeker however, the regression is run separately for each different political indicator to avoid multicollinearity. The change in the different indexes is interpreted as a change in the risk of the country which multinationals take into account when making investment decisions.

While the method is quite simple, the model selection is rather detailed as Chakrabarti (2001) noted that in the earlier research the rationale for the control variables is often insufficient. Furthermore, the data that are utilized for this study are very limited with only 22 observations per variable. The limited dataset does not only necessitate even more rigorous justification for the model selection but it also highlights the need for proper and sound diagnostics that help get robust results.

## 4.1 The Model Selection

As discussed in the literature review section, there are some ways to construct a model for estimating the relationship of a variable with FDI. Also, the limited number of observations has to be taken into account when selecting the model. For instance, that there are not too many variables in the model that diminish the model usefulness. Market size, economic growth, and trade openness are often selected as the control variables in the literature focusing on FDI. As such the benchmark specification or the plain specification would be

$$log\ FDI_t = \beta_0 + \beta_1\ log\ GDP_t + \beta_2\ GROWTH_t + \beta_3\ log\ TRADE_t + \beta_4\ POLITICAL_t + e_t.$$

In the equation, lower case $t$ denotes the time period of the observation and the $FDI_t$ is the dependent variable, the foreign direct investment as a share of net capital inflow of GDP to the country in a given year. Next, $\beta_0$ is the intercept, and $GDP_t$ refers to GDP per capita at the purchasing power parity. $GROWTH_t$ stands for economic growth as a percentage of GDP, and $TRADE_t$ is the openness to trade. $POLITICAL_t$ is one of the variables for the political indicators presented above. All political indicators are not added into the specification at once to avoid both multicollinearity and overly long model. Finally, for the error term there is $e_t$. Like the earlier studies of this field (Busse and Hefeker 2005, p. 9), a natural logarithm is taken of each variable except $GROWTH_t$ and $POLITICAL_t$. $GROWTH_t$ has some negative values that might affect adversely to results if the

logarithm is used, so the $GROWTH_t$ is left plain. In their study, Busse and Hefeker left their growth variable unlogarithmized for the same reason as well.

Whether to use either inflation or USD exchange rate as an additional control variable or to forgo the fourth control variable was given a lot of thought. Stable and low inflation implies less risk and better macroeconomic policy, both of which make the business environment better and invite foreign capital. A strong exchange rate against the dollar indicates that the returns are higher with the invested capital, attracting foreign corporations. However, adding either of these additional control variables would make the model more complex and possibly erode its explanatory power.

To gain insight into these additional control variables for the regression, it is good to see how they correlate with the political variables. Table 2 gives the specifics. When looking at the numbers, it has to be taken into account that *PR* and *CL* are valued in the reverse order, so that positive correlation means that the concepts are inversely correlated and vice versa. For the exchange rate there is quite a range in both signs and correlation coefficient magnitude. Four political variables are negatively correlated (*PR* and *CL* not taken into account) with the exchange rate while the rest are positive, and the absolute values range from 0.13 to 0.55. With the inflation the correlation is much clearer, since only *RQ* and *PS* are positively correlated with it and their coefficients are relatively small, 0.15 and 0.03, respectively. The coefficients of inversely correlated variables range from 0.34 to 0.80 in their absolute value so the relationship is relatively strong between these variables.

**TABLE 2: THE CORRELATION OF THE EXCHANGE RATE AND THE INFLATION WITH THE POLITICAL INDICATORS**

| | Exchange rate | Inflation |
|---|---|---|
| PR | -0.26 | 0.74 |
| CL | -0.13 | 0.71 |
| Corruption | 0.44 | -0.58 |
| RQ | -0.31 | 0.15 |
| Vaa | -0.24 | -0.38 |
| Rol | -0.29 | -0.34 |
| GE | 0.49 | -0.80 |
| Controlcorruption | 0.15 | -0.62 |
| PS | -0.55 | 0.03 |

The takeaway here is that inflation probably depicts a similar phenomenon as the most political indicators do. It might be problematic to put it into the specification since inflation might contain much of the same information as the political variables. The exchange rate on the other hand, is not problematic in this regard. However, the inconsistency is unnerving.

To select the most accurate specification, Akaike and Bayesian information criteria will be used to compare the models. These information criteria will point which specifications lose more information due to their specification than others, and thus they are useful tools for the model selection.

To use the information criteria, the models have to be formed. Let the inflation specification be

$$log\ FDI_t = \beta_0 + \beta_1\ log\ GDP_t + \beta_2\ GROWTH_t + \beta_3\ log\ TRADE_t + \beta_4\ log\ INFLATION_t + \beta_5\ POLITICAL_t + e_t,$$

and the exchange rate specification be

$$log\ FDI_t = \beta_0 + \beta_1\ log\ GDP_t + \beta_2\ GROWTH_t + \beta_3\ log\ TRADE_t + \beta_4\ log\ EXRATE_t + \beta_5\ POLITICAL_t + e_t.$$

Naturally, $INFLATION_t$ and $EXRATE_t$ stand for the inflation rate and the dollar exchange rate, respectively. A logarithm is taken of the additional control variable in both specifications. Otherwise these specifications are the same as the plain specification.

It has to be emphasized that there is a very limited dataset in use which means that avoiding overfitting the model. Turkey is a single country with its own characteristics. This is why even a simpler model with fewer control variables than three might also be a good choice, at least for comparison. Earlier literature (Chakrabarti, 2001) even suggested that only market size per capita was the only truly conclusive determinant of FDI. That is why the fourth specification is picked in which there is only $GDP_t$ as the sole control variable. The stub specification is as follows:

$$log\ FDI_t = \beta_0 + \beta_1\ log\ GDP_t + \beta_2\ POLITICAL_t + e_t.$$

In Table 3 can be seen the information criteria results. The lower the scores, the less information is lost due to the model specification. While several models give lower scores in the other specifications, such as *CL* and *Vaa* in the plain specification, the inflation specification scores the lowest average scores of all models in both AIC and BIC. The average scores are 35.42 in AIC and 43.06 in BIC. For the other specifications, the results are not as clear-cut.

**TABLE 3: THE AKAIKE AND BAYESIAN INFORMATION CRITERIA RESULTS**

| The specification | The plain | | The exchange rate | | The inflation | | The stub | |
|---|---|---|---|---|---|---|---|---|
| The political indicators | AIC | BIC | AIC | BIC | AIC | BIC | AIC | BIC |
| PR | 40.30 | 46.84 | 42.02 | 49.66 | 36.85 | 44.49 | 41.26 | 45.62 |
| CL | 31.52 | 38.07 | 33.40 | 41.04 | 33.52 | 41.16 | 35.53 | 39.89 |
| Corruption | 47.69 | 54.23 | 45.29 | 52.93 | 36.81 | 44.45 | 45.72 | 50.09 |
| RQ | 48.34 | 54.89 | 45.96 | 53.60 | 36.39 | 44.03 | 46.79 | 51.15 |
| Vaa | 33.57 | 40.11 | 35.39 | 43.03 | 34.91 | 42.54 | 35.73 | 40.10 |
| Rol | 40.83 | 47.38 | 42.22 | 49.86 | 36.70 | 44.34 | 42.13 | 46.50 |
| GE | 41.99 | 48.53 | 42.97 | 50.61 | 36.61 | 44.24 | 40.19 | 44.56 |
| Controlcorruption | 42.74 | 49.29 | 37.85 | 45.48 | 36.45 | 44.09 | 43.28 | 47.64 |
| PS | 30.80 | 37.35 | 32.77 | 40.41 | 30.55 | 38.18 | 35.41 | 39.78 |

If the average information criteria scores between all models are examined, the exchange rate specification is likely to be the most information losing specification among the four. It scores 39.76 in AIC which is the third-highest score among all specifications, and 47.40 in BIC which is the highest score. Moreover, the earlier literature indicated that it has an inconclusive relationship with FDI (Chakrabarti, 2001). For these reasons, the exchange rate specification is not analyzed in this study.

The stub specification's average scores are 40.67 in AIC and 45.04 in BIC. Its average AIC score is the highest. However, the plain specification scores 39.75 and 46.30 on average in AIC and BIC, respectively. So the stub specification's average AIC is not far behind with the difference of 0.92 in the scores. With the low number of observations in the data it might be a good idea to have a specification that is unlikely to be overfitted for comparison. Also, it can be tested later if the control variables that the plain specification contains but the stub specification lacks, are excessive.

It was decided to study the results of the three specifications: the plain, the inflation, and the stub. The literature review above makes it clear that there are many determinants for FDI. Many variables affect it but there is no coherent theory on FDI's determining variables. Also, the data do not have many observations. As such the best way to approach the truth is to look at many methods and models and see where they point, even though the methods chosen for this study are limited to a literature review and a time series regression analysis. The research questions of this study can be

best answered looking at the wider picture and that is why comparing estimates given by multiple models works better than choosing only one.

## 4.2 The Results

The regression results of the plain specification can be seen in Table 4. We can see that all the political indicators in the plain specification models have the expected sign (negative for *PR* and *CL* because of inverted scoring, positive for the rest) except *RQ*. All coefficients of the political indicators except for those of *RQ*, *Corruption*, and *Controlcorruption* are significant at the 5 percent level and *Controlcorruption* is significant at the 10 percent level. Statistical significance and sign in the coefficients of the control variables alternate strongly between variables and models. *GDP* is positive in all and significant in every model at least at the 10 percent level while intercept is negative and significant at least at the 5 percent level in every model.

Interestingly, *GROWTH* shows a negative sign in every regression while *TRADE* is positive in each. *GROWTH* is possibly negative because *FDI* figure used here describes the share of net FDI inflow of GDP. Higher growth may not translate into an increased GDP share of net FDI inflows. The coefficients of *GROWTH* and *TRADE* are both significant in five out of nine models at least at the 10 percent level. *GROWTH* is notably significant at the 0.1 percent level in *PR* and the 5 percent in *PS*, while *TRADE* is significant at the 5 percent level in *RQ*. Otherwise, the control variables except *GDP* do not seem to be important in determining the *FDI*, with almost half of the models containing insignificant coefficients.

**TABLE 4: THE REGRESSION RESULTS OF THE PLAIN SPECIFICATION**

| Political risk variable | Dependent variable: log *FDI* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Political Rights | Civil Liberties | Corruption Perceptions | Regulatory Quality | Voice and Accountability | Rule of Law | Government Effectiveness | Control of Corruption | Political Stability |
| | *PR* | *CL* | *Corruption* | *RQ* | *Vaa* | *RoI* | *GE* | *Control-corruption* | *PS* |
| Intercept | -21.41 ** (6.47) | -22.99 *** (3.49) | -23.58 * (10.47) | -27.86 ** (9.43) | -32.92 *** (3.79) | -32.84 *** (6.21) | -17.40 * (6.49) | -22.31 * (8.29) | -42.28 *** (7.22) |
| log *GDP* | 1.66 *** (0.32) | 1.72 *** (0.34) | 1.50 . (0.85) | 2.04 * (0.92) | 2.58 *** (0.37) | 2.38 *** (0.43) | 1.04 *** (0.20) | 1.30 . (0.65) | 3.46 *** (0.57) |
| *GROWTH* | -0.05 *** (0.03) | -0.06 (0.03) | -0.03 (0.03) | -0.04 . (0.02) | -0.05 . (0.03) | -0.05 . (0.03) | -0.03 (0.02) | -0.04 (0.03) | -0.05 * (0.02) |
| log *TRADE* | 2.03 (1.30) | 2.22 . (1.06) | 2.10 (1.29) | 2.14 * (0.88) | 2.20 . (1.14) | 2.58 . (1.39) | 1.87 (1.36) | 2.62 (1.99) | 2.70 . (1.36) |
| log *POLITICAL* | -0.69 * (0.25) | -0.50 ** (0.14) | 0.03 (0.01) | -0.11 (0.93) | 1.87 ** (0.48) | 2.90 ** (0.79) | 1.88 ** (0.63) | 1.62 . (0.85) | 1.46 ** (0.46) |
| $R^2$ | 0.63 | 0.75 | 0.49 | 0.47 | 0.73 | 0.62 | 0.60 | 0.59 | 0.76 |
| No. of obs. | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |

Notes: Standard errors, reported in parentheses, are based on Andrews's (1991) correction for heteroskedasticity and autocorrelation, see section 4.3 for more details; '***' significant at the 0.1 percent level; '**' significant at the 1 percent level; '*' significant at the 5 percent level; '.' significant at the 10 percent level.

The regression results are shown in Table 5 for the stub specification. The sign is expected for all political indicators except for *RQ*, and all are significant at least at the 10 percent level except *RQ* and *Controlcorruption*. *GDP* is positive in each one and significant at least at the 5 percent level whereas intercepts are negative and significant at least at the 5 percent level in every model. For the coefficients of the political indicators, all except those of *RQ* and *Controlcorruption* are significant at least at the 10 percent level.

**TABLE 5: THE REGRESSION RESULTS OF THE STUB SPECIFICATION**

| Political risk variable | Dependent variable: log *FDI* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Political Rights | Civil Liberties | Corruption Perceptions | Regulatory Quality | Voice and Accountability | Rule of Law | Government Effectiveness | Control of Corruption | Political Stability |
| | *PR* | *CL* | *Corruption* | *RQ* | *Vaa* | *RoI* | *GE* | *Control-corruption* | *PS* |
| Intercept | -15.74 ** (4.46) | -16.56 *** (4.02) | -17.08 * (6.32) | -22.11 ** (7.49) | -26.14 *** (4.15) | -24.95 *** (4.74) | -11.88 *** (2.31) | -16.08 ** (5.54) | -33.26 *** (6.257) |
| log *GDP* | 1.83 *** (0.42) | 1.89 *** (0.42) | 1.62 * (0.67) | 2.29 ** (0.79) | 2.73 *** (0.43) | 2.57 *** (0.49) | 1.20 *** (0.23) | 1.67 ** (0.55) | 3.56 *** (0.64) |
| log *POLITICAL* | -0.61 . (0.32) | -0.45 ** (0.14) | 0.03 . (0.02) | -0.31 (1.10) | 1.77 ** (0.47) | 2.48 * (0.94) | 2.02 ** (0.56) | 1.40 (1.13) | 1.31 ** (0.34) |
| R^2 | 0.54 | 0.65 | 0.44 | 0.40 | 0.64 | 0.52 | 0.56 | 0.50 | 0.65 |
| No. of obs. | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |

Notes: Standard errors, reported in parentheses, are based on Andrews's (1991) correction for heteroskedasticity and autocorrelation, see section 4.3 for more details; '***' significant at the 0.1 percent level; '**' significant at the 1 percent level; '*' significant at the 5 percent level; '.' significant at the 10 percent level.

No model with the inflation specification gives any significance even at the 10 percent level to any political indicator as can be seen in Table 6. Of the political indicators, only *RoI* does not have the expected sign. The intercepts and *GROWTH* have negative signs while *TRADE* has positive signs in every model. Curiously, *GDP* has the expected sign only in *Vaa*, *PR*, and *PS*. The intercepts besides *CL* are insignificant in every model. The coefficient of *GROWTH* is significant only in *CL* at the 10 percent level and in *PS* at the 5 percent level while *TRADE* is significant at the 5 percent level in every model except *CL* in which it is significant at the 10 percent level. *INFLATION* is significant at least at the 10 percent level in every model except *CL*, *Vaa*, and *PS* models. The sign of *INFLATION* is negative as expected in every model.

**TABLE 6: THE REGRESSION RESULTS OF THE INFLATION SPECIFICATION**

| Political risk variable | Dependent variable: log *FDI* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Political Rights | Civil Liberties | Corruption Perceptions | Regulatory Quality | Voice and Accountability | Rule of Law | Government Effectiveness | Control of Corruption | Political Stability |
| | *PR* | *CL* | *Corruption* | *RQ* | *Vaa* | *RoI* | *GE* | *Control-corruption* | *PS* |
| Intercept | -5.74 (8.31) | -22.43 * (10.26) | -4.97 (7.04) | -4.98 (8.05) | -22.44 (16.28) | -1.42 (15.46) | -5.62 (8.15) | -6.47 (8.10) | -28.20 (16.90) |
| log *GDP* | -0.16 (0.91) | 1.66 (1.36) | -0.266 (0.59) | -0.31 (0.73) | 1.52 (1.61) | -0.57 (1.45) | -0.17 (0.73) | -0.14 (0.77) | 2.06 (1.65) |
| *GROWTH* | -0.04 (0.03) | -0.06 . (0.03) | -0.04 (0.02) | -0.04 (0.03) | -0.05 (0.03) | -0.04 (0.03) | -0.04 (0.03) | -0.04 (0.03) | -0.05 * (0.02) |
| log *TRADE* | 2.44 * (1.09) | 2.22 . (1.18) | 2.43 * (1.03) | 2.60 * (1.11) | 2.30 * (1.06) | 2.40 * (0.97) | 2.36 * (1.03) | 2.53 * (1.11) | 2.67 * (1.13) |
| log *INFLATION* | -0.62 * (0.24) | -0.02 (0.37) | -0.62 ** (0.20) | -0.65 ** (0.19) | -0.25 (0.35) | -0.71 . (0.34) | -0.56 * (0.25) | -0.561 * (0.20) | -0.28 (0.26) |
| log *POLITICAL* | -0.01 (0.27) | -0.48 (0.31) | 0.01 (0.02) | 0.43 (0.67) | 1.24 (1.02) | -0.60 (1.23) | 0.39 (0.66) | 0.42 (0.75) | 1.04 (0.72) |
| $R^2$ | 0.71 | 0.75 | 0.71 | 0.72 | 0.74 | 0.72 | 0.72 | 0.72 | 0.79 |
| No. of obs. | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |

Notes: Standard errors, reported in parentheses, are based on Andrews's (1991) correction for heteroskedasticity and autocorrelation, see section 4.3 for more details; '***' significant at the 0.1 percent level; '**' significant at the 1 percent level; '*' significant at the 5 percent level; '.' significant at the 10 percent level.

## 4.3 Robustness and Diagnostics

To check whether or not the error terms of the models are autocorrelated, the Breusch-Godfrey test is employed on the regressions. Its null hypothesis is that there is no autocorrelation up to the specified order. As such there is a tendency that a lower order of lags results in lower values, supposedly indicating an increased likelihood of autocorrelation. Due to a small sample size only a limited number of lags can be reasonably used in the test. In this piece of research, five lags are considered to be the highest order of lags in the test results to be examined. In the interpretation of the results, more weight will be put on the higher order of lags, like four and five, than lower, such as one and two. Also, it has to be noted that since the models used are predictive, some autocorrelation can be expected.

Looking at the test results in Table 7, all the political indicators in the plain specification uphold the null hypothesis at the 5 percent significance level with five lags. However, if the results are examined at every order of lags, the error terms of certain models seem to be surely less likely to be autocorrelated while some other indicators are more likely to be serially correlated. *PS*, for example, gets relatively high p-values across the board while *Corruption* and *RQ* both maintain the null hypothesis only at the fifth order of lags, which casts doubt on their supposed lack of autocorrelation. Only five indicators uphold the null hypothesis at the third order of lags: *PR*, *Vaa*, *GE*, *Controlcorruption,* and *PS*.

**TABLE 7: THE BREUSCH-GODFREY TEST RESULTS FOR THE PLAIN SPECIFICATION**

| | P-value | | | | |
|---|---|---|---|---|---|
| The order of lags | 1 | 2 | 3 | 4 | 5 |
| *PR* | 0.045 | 0.067 | 0.118 | 0.205 | 0.239 |
| *CL* | 0.220 | 0.158 | 0.031 | 0.048 | 0.065 |
| *Corruption* | 0.003 | 0.011 | 0.028 | 0.048 | 0.088 |
| *RQ* | 0.002 | 0.007 | 0.020 | 0.039 | 0.072 |
| *Vaa* | 0.108 | 0.042 | 0.096 | 0.164 | 0.257 |
| *Rol* | 0.020 | 0.012 | 0.028 | 0.056 | 0.099 |
| *GE* | 0.016 | 0.050 | 0.112 | 0.189 | 0.293 |
| *Controlcorruption* | 0.021 | 0.039 | 0.068 | 0.128 | 0.207 |
| *PS* | 0.437 | 0.470 | 0.678 | 0.786 | 0.837 |

In general, the p-values are higher with each additional order of lags, with the exception of *CL*, as can be seen in Table 7. The case of *CL* in the Breusch-Godfrey test for the plain specification is a curious one. When looking at lag orders at ascending order, *CL* is at its highest at the first-order, then drops to its lowest value at the order three, then rises a little, getting over the 5 percent significance at the order five. It could be that the index in question is autocorrelated at the range of three last years, thus explaining why the third-order gives the lowest value.

When checking for autocorrelation with the Breusch-Godfrey test, results indicate that there is unlikely to be remarkable autocorrelation. As can be seen in Table 8, at the fourth and fifth orders of lags no indicator is below the 10 percent level in significance, and at three lags there is *CL* and at

two there are *Corruption* and *RQ* that are below the 10 percent level. At the first-order *Corruption*, *RQ*, and *GE* are below the 0.1 level. Otherwise, there are no traces of autocorrelation.

**TABLE 8: THE BREUSCH-GODFREY TEST RESULTS FOR THE STUB SPECIFICATION**

| | P-value | | | | |
|---|---|---|---|---|---|
| The order of lags | 1 | 2 | 3 | 4 | 5 |
| PR | 0.266 | 0.492 | 0.449 | 0.607 | 0.734 |
| CL | 0.751 | 0.616 | 0.081 | 0.112 | 0.182 |
| Corruption | 0.018 | 0.059 | 0.128 | 0.166 | 0.250 |
| RQ | 0.016 | 0.055 | 0.116 | 0.158 | 0.251 |
| Vaa | 0.478 | 0.236 | 0.318 | 0.471 | 0.491 |
| Rol | 0.107 | 0.114 | 0.166 | 0.275 | 0.391 |
| GE | 0.084 | 0.214 | 0.379 | 0.544 | 0.650 |
| Controlcorruption | 0.129 | 0.258 | 0.438 | 0.501 | 0.645 |
| PS | 0.643 | 0.502 | 0.661 | 0.809 | 0.901 |

With the inflation specification almost every political indicator upholds the null hypothesis at the 5 percent level of significance in the Breusch-Godfrey test at every order of lags as can be seen in Table 9. Only *CL* at the orders three and four as well as *Vaa* at the second-order are below 0.05. Otherwise the inflation specification seems not to be autocorrelated.

**TABLE 9: THE BREUSCH-GODFREY TEST RESULTS FOR THE INFLATION SPECIFICATION**

| | P-value | | | | |
|---|---|---|---|---|---|
| The order of lags | 1 | 2 | 3 | 4 | 5 |
| *PR* | 0.109 | 0.074 | 0.056 | 0.103 | 0.149 |
| *CL* | 0.185 | 0.148 | 0.030 | 0.047 | 0.062 |
| *Corruption* | 0.117 | 0.068 | 0.059 | 0.109 | 0.169 |
| *RQ* | 0.143 | 0.121 | 0.077 | 0.137 | 0.171 |
| *Vaa* | 0.097 | 0.036 | 0.070 | 0.124 | 0.203 |
| *Rol* | 0.145 | 0.096 | 0.069 | 0.116 | 0.163 |
| *GE* | 0.106 | 0.081 | 0.077 | 0.140 | 0.196 |
| *Controlcorruption* | 0.136 | 0.057 | 0.063 | 0.112 | 0.177 |
| *PS* | 0.324 | 0.209 | 0.200 | 0.309 | 0.349 |

To find traces of possible heteroskedasticity, the Breusch-Pagan test is used. The Breusch-Pagan test tests conditional heteroskedasticity with the null hypothesis being that there is no heteroskedasticity. The Breusch-Pagan test assumes that there would be linear heteroskedasticity. As such it does not take nonlinear heteroskedasticity into account.

According to the Breusch-Pagan test, there seems to be little to no linear heteroskedasticity as can be seen in Table 10. No value in the plain or stub specification is below 5 percent level and in the inflation specification only value below 5 percent level threshold is *Rol*. In the inflation specification the p-values seem to be generally lower than in the plain or the stub specification. All in all, the possibility of linear heteroskedasticity can be eliminated from all indicators except from the inflation specification *Rol*. This does not mean however, that there would not be heteroskedasticity at all.

**TABLE 10: THE BREUSCH-PAGAN TEST RESULTS FOR THE PLAIN, INFLATION AND STUB SPECIFICATIONS**

| | The plain specification | | | The inflation specification | | | The stub specification | | |
|---|---|---|---|---|---|---|---|---|---|
| | BP | df | p-value | BP | df | p-value | BP | df | p-value |
| *PR* | 3.75 | 4 | 0.44 | 9.48 | 5 | 0.09 | 2.36 | 2 | 0.31 |
| *CL* | 8.94 | 4 | 0.06 | 10.05 | 5 | 0.07 | 2.42 | 2 | 0.30 |
| *Corruption* | 0.72 | 4 | 0.95 | 10.24 | 5 | 0.07 | 1.10 | 2 | 0.58 |
| *RQ* | 0.41 | 4 | 0.98 | 9.49 | 5 | 0.09 | 0.70 | 2 | 0.71 |
| *Vaa* | 4.09 | 4 | 0.39 | 6.77 | 5 | 0.24 | 4.00 | 2 | 0.14 |
| *Rol* | 1.34 | 4 | 0.85 | 11.88 | 5 | 0.04 | 1.67 | 2 | 0.43 |
| *GE* | 1.00 | 4 | 0.91 | 9.34 | 5 | 0.10 | 1.81 | 2 | 0.40 |
| *Controlcorruption* | 3.18 | 4 | 0.53 | 9.75 | 5 | 0.08 | 3.62 | 2 | 0.16 |
| *PS* | 3.29 | 4 | 0.51 | 5.24 | 5 | 0.39 | 2.46 | 2 | 0.29 |

To be sure that neither heteroskedasticity nor autocorrelation does not compromise the interpretation of the results, it was decided to use standard errors that are both heteroskedasticity and autocorrelation consistent (HAC) in the regression. This way there is little doubt about the heteroskedasticity and autocorrelation. These standard errors were computed using R with the sandwich package that provides the function vcovHAC that was used with default settings (Zeileis 2004). The method is presented by Andrews (1991) and it involves a Quadratic Spectral kernel and the bandwidth selection that happens automatically using an AR(1) approximation. The small

sample size is indeed something that must be taken into account when tampering with the standard errors but the effect of the HAC standard errors on the results should not be too distorting.

To be sure that the HAC standard errors do not distort the results too much, the regression results of the plain and the specification without the modified standard errors can be seen in Table 11 and Table 12, respectively. As can be seen in the tables, the significance of the coefficients remains largely the same in both specifications with some exceptions. For example, in the plain specification, *CL*, *Vaa*, and *PS* are significant at the 0.1 percent level instead of 1 percent, and Controlcorruption is significant at the 5 percent level instead of the 10 percent level. Meanwhile, in the stub specification, the normal standard errors make *PR* significant at the 5 percent level instead of the earlier 10 percent, and *Corruption* loses significance. *Controlcorruption* gains significance at the 10 percent level with the normal standard errors. There were some other changes as well but these are the most notable. The most important differences are those that concern those indicators whose coefficients change significance past or to the 10 percent level, namely *Corruption* and *Controlcorruption*. These models should be approached with caution when analyzing. Otherwise, any changes in the level of significance do not matter in the interpretation, provided that the coefficient remains significant.

**TABLE 11: THE REGRESSION RESULTS OF THE PLAIN SPECIFICATION WITH DEFAULT STANDARD ERRORS**

| Political risk variable | Dependent variable: log *FDI* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Political Rights | Civil Liberties | Corruption Perceptions | Regulatory Quality | Voice and Accountability | Rule of Law | Government Effectiveness | Control of Corruption | Political Stability |
| | *PR* | *CL* | *Corruption* | *RQ* | *Vaa* | *RoI* | *GE* | *Control-corruption* | *PS* |
| Intercept | -21.41 ** (6.58) | -22.99 *** (5.15) | -23.58 * (9.38) | -27.86 ** (7.38) | -32.92 *** (5.42) | -32.84 *** (6.50) | -17.40 * (7.75) | -22.31 ** (6.96) | -42.28 *** (5.87) |
| log *GDP* | 1.66 * (0.61) | 1.72 ** (0.49) | 1.50 (1.01) | 2.04 * (0.73) | 2.58 *** (0.53) | 2.38 ** (0.62) | 1.04 (0.74) | 1.30 . (0.71) | 3.46 *** (0.57) |
| *GROWTH* | -0.05 . (0.03) | -0.06 * (0.02) | -0.03 (0.03) | -0.04 (0.03) | -0.05 . (0.02) | -0.05 . (0.03) | -0.03 (0.03) | -0.04 (0.03) | -0.05 * (0.02) |
| log *TRADE* | 2.03 (1.47) | 2.22 . (1.20) | 2.10 (1.74) | 2.14 (1.79) | 2.20 . (1.26) | 2.58 (1.49) | 1.87 (1.53) | 2.62 (1.56) | 2.70 * (1.19) |
| log *POLITICAL* | -0.69 * (0.25) | -0.50 *** (0.11) | 0.03 (0.04) | -0.11 (0.97) | 1.87 *** (0.46) | 2.90 * (1.10) | 1.88 * (0.79) | 1.62 * (0.73) | 1.46 *** (0.32) |
| $R^2$ | 0.63 | 0.75 | 0.49 | 0.47 | 0.73 | 0.62 | 0.60 | 0.59 | 0.76 |
| No. of obs. | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |

Notes: '***' significant at 0.1 percent level; '**' significant at 1 percent level; '*' significant at 5 percent level; '.' significant at 10 percent level.

**TABLE 12: THE REGRESSION RESULTS OF THE STUB SPECIFICATION WITH DEFAULT STANDARD ERRORS**

| Political risk variable | Dependent variable: log *FDI* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Political Rights | Civil Liberties | Corruption Perceptions | Regulatory Quality | Voice and Accountability | Rule of Law | Government Effectiveness | Control of Corruption | Political Stability |
| | *PR* | *CL* | *Corruption* | *RQ* | *Vaa* | *RoI* | *GE* | *Control-corruption* | *PS* |
| Intercept | -15.74 * (5.99) | -16.56 ** (4.96) | -17.08 * (7.62) | -22.11 ** (6.11) | -26.14 *** (4.89) | -24.95 *** (5.66) | -11.88 . (6.52) | -16.08 * (6.47) | -33.26 *** (5.65) |
| log *GDP* | 1.83 ** (0.58) | 1.89 ** (0.50) | 1.62 . (0.87) | 2.29 ** (0.63) | 2.73 *** (0.50) | 2.57 *** (0.58) | 1.20 . (0.68) | 1.67 * (0.66) | 3.56 *** (0.60) |
| log *POLITICAL* | -0.61 * (0.26) | -0.45 ** (0.12) | 0.03 (0.03) | -0.31 (0.95) | 1.77 ** (0.50) | 2.48 * (1.15) | 2.02 * (0.77) | 1.40 . (0.76) | 1.31 ** (0.36) |
| R^2 | 0.54 | 0.65 | 0.44 | 0.40 | 0.64 | 0.52 | 0.56 | 0.50 | 0.65 |
| No. of obs. | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |

Notes: '***' significant at 0.1 percent level; '**' significant at 1 percent level; '*' significant at 5 percent level; '.' significant at 10 percent level.

## 4.4 Interpretation

To start with, I reject the inflation specification as the specification to examine in this study. The problem with the inflation specification is that it cannot be said much about *FDI*'s connection to the control variables or the political variables with its results. No coefficient of the political variables is statistically significant in that specification. Out of the control variables, however, *INFLATION* is significant in six models out of nine. It is possible that the inflation figures contain most of the relevant information since in the models of the plain and the stub specification many control variables and political indicators are significant. Also, many variables correlated reasonably well with inflation as can be seen in Table 2 which bolsters this conclusion. In evaluating *FDI* with this dataset, inflation does not seem to be a useful control variable because of this. To gain insight into the political variables' relationship with *FDI* with this dataset, one should rather focus on the inflation-excluding models.

When comparing the two remaining specifications, the results are quite consistent in both the plain and the stub specification. All political indicators except *RQ* have the expected sign in both specifications. The coefficients are of similar magnitude between the plain and the stub

specification, with the largest difference in coefficient size being in *RoI* that has 0.42 differential. The absolute values of the coefficients of the political variables are in the same order of magnitude in both specifications. *RQ* is not significant in either of the specifications. The most remarkable difference between the specifications is that *Corruption* is not significant in the plain specification while it is significant in the stub at the 10 percent level, and *Controlcorruption* is not significant in the stub specification while it is significant in the plain at the 10 percent level. Every other political indicator besides *RQ*, *Corruption*, and *Controlcorruption* is significant in both specifications at least at the 10 percent level.

However, the results are not identical and that makes further comparison tricky. It would help out, if it could be concluded which specification is better for each model. The stub specification omits two of the control variables mainly due to a small amount of data, but the underwhelming significance of these control variables in the plain specification indicates that there is also merit to the stub specification due to its composition. To put it short, those control variables might be excessive. There are six models in which a coefficient of at least one variable is not significant even at the 10 percent level. For these models, it would be beneficial to test whether or not the insignificant variables could be dropped off from the plain specification. If yes, this would bolster the reasoning of the stub specification over the plain specification in this study.

To check whether *GROWTH* and *TRADE* are jointly significantly different from zero, i.e. that they could be reliably removed from the model without making the model more inaccurate, an F-test is conducted on the coefficients of the variables that are deemed insignificant in the plain specification. The null hypothesis is that the control variables that were not significant at least at the 10 percent level are equal to zero. The level of significance for the F-test is considered to be at the 10 percent due to the small dataset. Six models have variables whose coefficients are not significant at the 10 percent level.

As can be seen in Table 13, the results from the F-test indicate that two out of six plain specification models likely have their coefficients of the control variables equal to something else than zero. This would mean that the control variables in those models should not be removed and there is no need to try a shorter specification for them. However, four models – *Corruption*, *RQ*, *GE,* and *Controlcorruption* – scored higher than 0.1 in the F-test so for them, the null hypothesis cannot be rejected.

**TABLE 13: THE F-TEST RESULTS OF THE INSIGNIFICANT CONTROL VARIABLES OF THE PLAIN SPECIFICATION**

| The plain specification | | F-test statistics | | | |
|---|---|---|---|---|---|
| Variable/statistic | The hypothesis | Res. Df | Df | F | Pr(>F) |
| PR | β3 = 0 | 17 | 1 | 3.19 | 0.08 . |
| CL | β2 = 0 | 17 | 1 | 3.19 | 0.08 . |
| Corruption | β2 = β3 = β4 = 0 | 17 | 3 | 1.04 | 0.28 |
| RQ | β4 = 0 | 17 | 1 | 0.02 | 0.89 |
| GE | β2 = β3 = 0 | 17 | 2 | 1.52 | 0.25 |
| Controlcorruption | β2 = β3 = 0 | 17 | 2 | 1.67 | 0.22 |

Notes: Significance codes: '***' significant at 0.1 percent level; '**' significant at 1 percent level; '*' significant at 5 percent level; '.' significant at 10 percent level.

I do not reject plain specification, however. The earlier literature deemed that growth rate and trade openness hold some explanatory power over FDI. For the variables for which the F-test rejected the null hypothesis – *Corruption*, *RQ*, *GE,* and *Controlcorruption* – it would be fitting to weigh the stub specification more in analysis while for the others the plain specification's results should carry more weight. Moreover, the information criteria scores for *Corruption*, *RQ,* and *GE* are lower for the stub specification, indicating less information loss. However, both information criteria results of *Controlcorruption* are lower for the plain specification than for the stub specification. For that model, the judgment should be based on an approach that takes both specifications equally into the account but otherwise I divide the analysis of the results into two based on the F-test results.

Out of the models whose results are to be examined with the plain specification, the variable most associated with the *FDI* change appears to be *Rol*, Rule of Law. Its coefficient was 2.90 in the plain specification. This seems to bolster economists' common argument that clearly defined property rights are important for economic activity since Rule of Law attempts to capture degree and coverage of the property rights enforcement. Busse and Hefeker (2005) also found out that their variables that describe similar areas of institutions, Investment Profile and Law and Order, were reasonably related to *FDI* as well across all their models.

Continuing the analysis on the models for which the F-test does not suggest using the stub specification, another strongly associated variable is *Vaa* with its coefficient being 1.88. *PS* is moderately associated with a coefficient of 1.46. Interestingly, *PS* tries to capture the absence of violence in a state, and Busse and Hefeker (2005) found out that indicators targeting similar

phenomena were remarkably relevant determinants of FDI. While *PS* is statistically significant at least at the 1 percent level, its coefficient is not the largest when comparing the World Bank indicators.

The coefficients of *PR* and *CL* which were constructed by Freedom House might be lower than those of the significant World Bank variables because they worked on a bit different scale, from 7 to 1, instead of from -2.50 to 2.50. The coefficient of *PR* is significant at the 5 percent level while *CL* is significant at the 1 percent level in the plain specification. However, *PR* seems to hold more sway over *FDI* than *CL* with coefficients being -0.69 and -0.50, respectively.

Of the models that are examined with the stub specification, *GE* has the highest coefficient of 2.02 that is significant at the 1 percent level. It was also significant in the plain specification which adds certainty to the conclusion. The coefficient of *RQ*, on the other hand, is not significant in either stub or plain specification. It is also the only variable in both specifications that does not have the expected sign. Hence, it can be relatively safely concluded that *RQ* is not associated with *FDI*. The *RQ* index likely captures changes that are not associated with other indicators and that those changes are not likely related to *FDI*. The fact that *RQ* has a relatively low correlation with the other political indicators (Table 1) reinforces this conclusion.

The indexes measuring corruption in the government, *Corruption* and *Controlcorruption*, are an interesting case. They have both insignificant coefficients depending on the specification that is examined. Also, they are the ones that were most affected by the choice of standard errors. Moreover, they have a reasonably high correlation of 0.70 (Table 1) with each other and both measure similar metrics according to their descriptions. These issues cast doubt on the viability of both models. I deem that the results of both models cannot be held conclusive as I believe it would be too bold to say anything about the relationship these models have with *FDI*.

It is interesting to speculate on how to research this topic so that possible causality would be found. It is unknown how FDI flows affect political variables. If it were proven that the political indicators are independent of the FDI flows, it would carry this line of thought a long way. However, this could prove to be next to impossible.

# 5 Conclusion

There has been extensive study of the FDI flows in the past. The aim of this paper is to contribute to this in two ways. Firstly, to look at whether there is an association between FDI flows and political risk using different indicators to look at many different areas of political risk. Secondly, to see the magnitude of these relationships between FDI and many political variables in Turkey in years 1996-2017. To research these, a time-series regression was performed. The main difficulty of the study was the low number of observations which complicated model selection, diagnostics, and interpretation.

In a setting of limited data, three models were selected. The first of them used real GDP per capita, GDP growth percentage, and trade openness as control variables and the second omitted the latter two control variables. The third one included the inflation as the fourth control variable along with growth rate and trade openness. The dollar exchange rate was considered for the fourth specification but that specification was discarded due to high information loss. All of these variables had been used in the earlier FDI studies and market size, growth rate, and trade openness had been utilized often. Nine political indicators were inserted separately to the specifications to avoid multicollinearity.

The specification including inflation yielded results that were underwhelming in their absence of statistical significance in the coefficients of the political variables. It is suspected that there is already internalized possible risk information in the inflation rate that was of interest in the political variables. A combination of information criteria and an F-test targeted at bolstering rationale for omitting two control variables were used to decide which of the specifications was better suited for analyzing the results of different models containing distinct political indicators.

Out of the nine political indicators, the variable targeting Regulatory Quality is the only insignificant determinant of FDI in this study. The political variables that address corruption, the Corruption Perceptions Index and the Control of Corruption index, are deemed inconclusive due to inconsistent results between the specifications and the choice of standard errors. As such, no conclusion is made regarding their relationship with FDI in Turkey. Out of the World Bank indexes, the Rule of Law index has the highest coefficient of 2.90, indicating that it is most associated with the FDI. Out of the indexes of Freedom House, with the coefficient of -0.69 the Political Rights index is more associated with FDI than the Civil Liberties index. Political Rights, Civil Liberties, Voice and Accountability, Rule

of Law, Government Effectiveness, and Political Stability are all significant indexes related to net FDI inflows to Turkey.

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## Appendix: Descriptive Statistics of Variables, 1996–2017

| Variable | Observations | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| PR | 22 | 336 | 0.48 | 3 | 4 |
| CL | 22 | 4.00 | 0.85 | 3 | 5 |
| Corruption | 22 | 39.25 | 5.50 | 31 | 35.4 |
| RQ | 22* | 0.27 | 0.14 | 0.04 | 0.5 |
| Vaa | 22* | −0.24 | 0.22 | −0.71 | −0.13 |
| Rol | 22* | 0.00 | 0.11 | −0.25 | −0.06 |
| GE | 22* | 0.13 | 0.19 | −0.26 | −0.08 |
| Controlcorruption | 22* | −0.12 | 0.19 | −0.52 | −0.15 |
| PS | 22* | −1.05 | 0.35 | −2.01 | −1.23 |
| FDI | 22 | 1.38 | 0.92 | 0.31 | 0.42 |
| GDP | 22 | 17432.95 | 3828.75 | 12842.36 | 13776.06 |
| GROWTH | 22 | 4.92 | 4.47 | −5.96 | 7.58 |
| TRADE | 22 | 47.92 | 4.18 | 37.4 | 54.97 |
| EXRATE | 22 | 1.48 | 0.87 | 0.08 | 0.15 |
| INFLATION | 22 | 27.75 | 28.40 | 6.3 | 85.7 |

Notes: The Worldwide Governance Indicators of the World Bank were collected every other year during 1996–2002 so the actual number of observations is 19 for these indicators. For the purposes of this research the number is 22 as the value of the next year is used for years 1997, 1999, and 2001.