

# **Institutions Matter: Evidence from Turkey**

Tamer Çetin<sup>a</sup>

Yildirim B. Çicen<sup>b</sup>

Kadir Y. Eryigit<sup>c</sup>

*<sup>a</sup> Northeastern University, USA*

*<sup>b</sup> Gumushane University, Turkey*

*<sup>c</sup> University of Otago, New Zealand*

## **Abstract**

This paper studies the institutions-economic performance nexus. For this aim, we first introduce a simple framework showing how to examine the interaction between institutions and economic performance from a different perspective. Then, using Johansen co-integration methodology with structural breaks, we empirically investigate the interaction between institutions and economic performance in Turkey. Co-integration analysis confirms the existence of a long-run relationship between institutions and economic performance in the presence of structural breaks. The estimate of structural breaks reveals the effect of important changes in institutional structure on investments and economic growth. The findings suggest that institutions matter for economic performance in Turkey, even though the institutional quality of the country is not satisfactory.

**Keywords:** Institutions, Transaction Costs, Credible Commitment, Investments, and Economic Growth

**JEL Classification:** D02, D23, O43

## 1. Introduction

Measuring the institutions-economic performance nexus is an arduous task. Even though North (1990; 107) clearly proclaims that “*we cannot measure institutions*”, researchers have extensively examined the relationship between institutions and economic performance. Since the Enlightenment, it has been argued that institutions strongly affect economic performance (Montesquieu, 1748; Smith, 1776; Hayek, 1960; Buchanan and Tullock, 1962; Olson, 1965; Demsetz, 1967; Acemoglu et al., 2001; 2002; 2006; North, 1981; 1990; Levy and Spiller, 1996; Djankov et al., 2003). While some studies have theoretically showed that institutions matter for economic performance (Demsetz, 1967; North, 1993; Besley, 1995; Acemoglu et al., 2001; Chang, 2011), some others have empirically investigated the importance of institutions on economic performance (Besley, 1995; Acemoglu et al., 2001; 2005b; Jensen, 2008)<sup>1</sup>. These studies affirm the presence of a close relationship between institutions and economic performance (de Soto, 1989; de Long and Shleifer, 1993; Besley, 1995; Easterly and Levine, 1997, 2003; Knack and Keefer, 1995; Acemoglu et al., 2001)<sup>2</sup>. However, the analysis of this interaction between institutions and economics performance has been controversial in a few ways. First, there is no consensus regarding how to measure the impact of institutions on economic performance, even though many different estimation methodologies have been employed to empirically investigate this interaction (Knack and Keefer, 1995; 1997; Acemoglu et al., 2005; Glaeser et al., 2004; Kovac and Spruk, 2016). Second, there is no agreement concerning how to proxy institutions because of the difficulties inherent in formulating institutional variables and collecting data regarding them (Clague,

---

<sup>1</sup> Among those studies, Besley (1995) and Acemoglu et al. (2001) proposed both theoretical and empirical approach on the relationship between institutions and economic performance.

<sup>2</sup> Some studies within empirical contribution have directly focused on the effect of institutions on economic growth and/or development (Knack and Keefer, 1995; Acemoglu et al., 2005b; Glaeser et al., 2004). Acemoglu et al. (2005b) analyzed the role of institutional change on economic growth and development during the rise of Europe between 1500 and 1820. Glaeser et al. (2004) examined the debate over whether institutions lead to economic growth, or whether, alternatively, growth causes institutional improvement with a special focus on the experiences of North and South Korea.

1993; Knack and Keefer, 1997). Third, the previous studies have generally studied the causality running from institutions to economic performance and have mostly neglected the important possibility that economic performance changes institutions (Glaeser et al., 2004; Chang, 2011). These controversial issues have led to crucial shortcomings in the analysis of interaction between institutions and economics performance.

In this paper, using the viewpoint of institutional and organizational economics, we introduce a new approach to analyze the effect of institutions on economic performance with a special focus on Turkey. In order to empirically investigate this effect, we first construct a linkage between some observable institutional variables such as transaction costs and credible commitment that proxy institutions and some economic indicators such as GDP and FDI that represent economic performance. In this sense, we accept that institutions influence economic performance through transaction costs and credible commitment. In our model, transaction costs and credible commitment are two main tools that reveal the quality of institutional structure of the country or the effect of institutions on economic performance. More specifically, we accept that institutional structure affects GDP through transaction costs and FDI through credible commitment. Then, using this framework, we measure the effect of institutions on economic performance through a country-level aggregate data. Also, we analyze the presence of causality running from economic performance to institutions. For this aim, we employ an innovative empirical methodology the so-called Johansen co-integration test with structural breaks (Johansen et al., 2000). This approach allows us to simultaneously estimate the long-term relationships between institutional factors and economics indicators (Johansen, 2005). By this estimation methodology, we simultaneously estimate two different equations that refer to the institutions-economic performance nexus. Co-integration analysis estimates the simultaneous relationships among the variables in both equations in the presence of structural breaks, which enable us to reveal the effect of remarkable structural, institutional

and economic changes such as crucial structural reforms, government types, the change in government structures, and economic crises on the variables used in the models to be estimated. Additionally, we estimate the causality running from economic performance to institutions, but not only the reverse. Thus, the empirical methodology used in this paper enables us to get rid of the traditional problems in the study of a time series data. As a matter of fact, using this empirical methodology, we can study all those simultaneous long-run relationships through country-level aggregate data.

The paper differs from the previous literature in a few ways. First, we construct a linkage showing how to analyze the relationship between institutions and economic performance in a theoretical base. Second, we introduce an innovative estimation methodology to investigate the institutions-economic performance nexus in an empirical base. Third, we bring new data from a developing country. In the literature, researchers have generally studied the institutions-economic performance nexus in developed countries (North and Thomas, 1973; Acemoglu et al., 2005b). The findings of the Turkish experience will introduce fresh evidence from a country outside of developed countries. We believe that the paper will make an important contribution to the literature on the institutions-economic performance nexus.

## **2. Institutions and Economic Performance**

The preceding neoclassical analysis neglected the role of institutions on economic performance. Institutional factors were taken given in this literature. Including institutions into its analysis, the subsequent literature has explored that the differences in economic performance across countries stem from institutional factors (Mathews, 1986; North, 1990; Williamson, 1985, 1996; Coase, 1998; Acemoglu and Robinson, 2006). This approach dominated by institutional and organizational economics has intensively initiated to investigate the relationship between institutions and economic performance. Using

institutional components such as property rights, transaction costs, credible commitment and contracts, it has concluded that institutions matter for economic performance, because they shape the incentives of key actors in the economy (North, 1990; 1993; Dixit, 1996; Knack and Keefer, 1997; Djankov et al., 2003; Acemoglu et al., 2005a; Acemoglu and Robinson, 2006; Kovac and Spruk, 2016).

However, there are disagreements in the analysis of institutions-economic performance nexus. First, even though many studies have used institutional variables such as the rule of law, the pervasiveness of corruption, and the risk of expropriation and contract repudiation that refer to institutional components to measure the effect of institutions, there is no consensus on what variables exactly represent institutions<sup>3</sup>. In the absence of exact measures, the first generation studies mostly used two common variables to proxy institutions (Knack and Keefer, 1997). While some used controversial variables such as military coups or revolutions, political assassinations and mortality rates as partial determinants of a country's steady-state level of income (Barro, 1991; DeLong and Summers, 1991; Acemoglu et al., 2001), some others employed the Gastil (1987) indices of political rights and civil liberties as an indicator of the security or quality of property rights<sup>4</sup>. Because of their drawbacks, the subsequent studies have employed various indices introduced by independence international organizations such as World Bank's Doing Business, the Index of Economic Freedom of Heritage Foundation, Political Risk Service (PRS) Group's Political, Economic and Financial Risk Ratings, Fraser Institute's Freedom Index and Freedom House (Knack and Keefer, 1997; Goes, 2016; Kovac and Spruk, 2016). Among others, Knack and Keefer (1997) use the rule of law, the risk of expropriation, and contract enforceability through several measures from three different sources to represent various dimensions of institutional quality or environment.

---

<sup>3</sup> This also makes this literature rather questionable in terms of its empirical problems. Please see Klick (2010) for more discussion about this problem.

<sup>4</sup> These measures have substantial shortcomings. Please see Knack and Keefer (1997) for a detailed discussion.

Defining transaction costs as the costs of the legal system, Kovac and Spruk (2016) employ the World Bank's Doing Business and the Heritage Foundation's Index of Economic Freedom to measure the formal and informal institutional transaction costs. Goetz (2016) uses Heritage Foundation's Index of Economic Freedom as a proxy for institutions to investigate the institutions-growth nexus. Using Political Risk Index of PRS Group, Busse and Hefeker (2007) investigate the relationship between FDI and institutions in developing countries.

Second, there is no consensus regarding how to measure the impact of institutions on economic performance, even though many different estimation methodologies have been employed to empirically investigate this interaction (Knack and Keefer, 1995; Acemoglu et al., 2005b; Glaeser et al., 2004; Kovac and Spruk, 2016). In general, researchers have measured the institutions-economic performance nexus in three ways: by using disaggregated data for the cross-country measurements of institutions such as the quality of government; by employing the country-level aggregate data; by building up comparative work that includes historical case studies (North, 1990; Aron, 2000; Acemoglu and Robinson, 2006).

Third, an important problem is how to define what institutions refer. Even though there is consensus about the definition of institutions, what institutions refer is still controversial. Various studies have used different approaches to represent institutions. Among others, Knack and Keefer (1997) used the term "institutional environment or quality" in their analysis on the institutions-economic performance nexus. Moreover, they defined legal, political and regulatory framework as institutional environment and employed various indicators such as the rule of law, the pervasiveness of corruption, and the risk of expropriation and contract repudiation to proxy institutional environment. Kovac and Spruk (2016) mostly refer to institutional framework, even though they use the terms such as institutional setting and/or environment. Similarly, Goetz (2016) uses institutions and institutional quality in the same

meaning. However, in these studies, there is an exact linkage between institutional environment or quality and institutional components used to refer to it.

In this paper, we do not only examine the relationship between institutions and economic performance. Using the previous literature's terminology, but differing from it, we also introduce a different approach to solve these disagreements in the economic performance-institutions nexus. The aim is to make a new contribution to the relevant literature. For this aim, first of all, we construct a new linkage showing how to examine the interaction between institutions and economic performance. Second, we use this linkage to empirically investigate the institutions-economic performance nexus as a different perspective. Third, we also employ a different empirical approach as estimation methodology, which is rather convenient for the analysis of country-level aggregate data.

Figure 1 depicts the central thesis of the paper. Following the terminology of institutional and organizational economics, we accept that institutions affect economic performance through the linkage in the figure. In this model, while institutional structure refers to institutional components determined by institutions, investment and economic growth represent economic performance. We assume that the separation of powers reveals the main characteristics of institutional structure or the effect of institutions on the economy in a modern society, because the importance of institutional structure on economic performance stems from limited government under the separation of powers along with the construction of modern society (Buchanan and Tullock, 1962; North and Thomas, 1973; North, 1981 and 1990; Stasavage, 2002; Glaeser et al., 2004). The relevant literature clearly suggests that the political institutions of limited government under the separation of powers lead to the improvement in economic performance (Acemoglu et al., 2001, 2002 and 2005a; Easterly and Levine, 2003; Dollar and Kraay, 2003; Glaeser et al., 2004; Rodrik et al., 2004). In other words, the interaction among (political) institutions reveals the quality of institutions or

institutional structure. Accordingly, institutional structure through the interaction among institutions<sup>5</sup> sends two main signals to the agents of the economy about the quality of institutions in the country. We call those signals transaction costs and credible commitment in the standard institutional and organizational economics terminology, because the effect of institutions on investments and economic growth<sup>6</sup> in many studies is represented by institutional factors such as credible commitment and transaction costs. That is, we accept that the interaction among the political institutions of a country reveal transactions costs and credible commitment in institutional structure. Thus, transaction costs and credible commitment are institutional factors that determine economic growth and foreign direct investment (FDI), respectively.

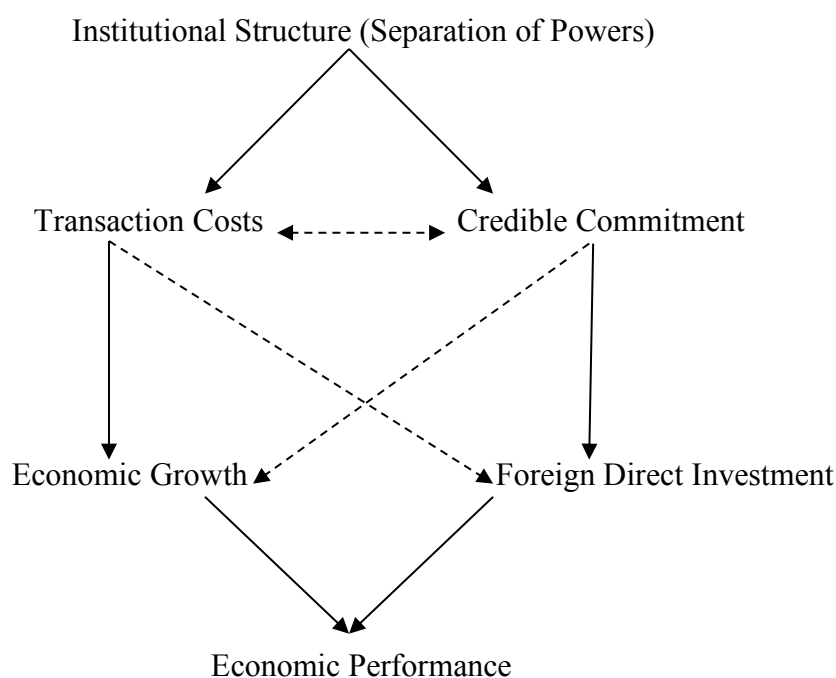


Figure 1. The interaction between institutional structure and economic performance

<sup>5</sup> Herein, following Levy and Spiller (1996), Epstein and O'Halloran (1997) we call those institutions political institutions such as legislature, executive, and judiciary under the separation of power.

<sup>6</sup> However, there is no clear distinction between investment and economic growth. In these studies, investments and economic growth are almost used in the same meaning to refer to economic performance. Acemoglu et al. (2005) express that *institutions matter for economic growth*. Gehlbach and Keefer (2011) state that [... *institutions... are necessary to stimulate investment and consequently growth*]. Frye (2004) expresses that [... *recent studies have linked secure property rights (as institution) to high rates of economic growth, investment...*]. Johnson et al. (2002) point out that as institutions [*less secure property rights correlated with lower aggregate investment and slower economic growth*].



Of course, while transaction costs could influence FDI, credible commitment would also affect economic growth. However, it is clear that the credibility of commitment from institutional structure directly or primarily affects FDI rather than economic growth (North and Weingast, 1989; Baron, 1995; Levy and Spiller, 1996; Frye, 2004; Spiller, 2013), while the effect of transaction costs on growth is larger than its impact on FDI (Acemoglu et al., 2005a; North, 1990). In particular, credible commitment encourages investments in industries including investments to capital assets with high fixed and sunk-costs (Levy and Spiller, 1994, 1996; Baron, 1995). On the other hand, as pointed out by North (1990), institutional structure with low transaction costs improves economic efficiency and thus positively affects economic growth. For that reason, in our model, we accept that transaction costs are institutional factor that determines economic growth, whereas credible commitment is the main institutional determinant of FDI.

Because we are interested in transactions costs stemming from institutional structure, following Kovac and Spruk (2016), we make distinction between economic and/or political transactions costs and define the concept of transaction costs used in this paper as non-market or institutional transaction costs. In other words, non-market or institutional transaction costs refer to the institutional dimensions of transaction costs or transaction costs in institutional structure. According to Furubotn and Richter (2005), institutional transaction costs have two dimensions. First, they are “*the costs of setting up, maintaining and changing a system’s formal and informal political organization*”. In this sense, institutional transaction costs include “*the costs associated with the establishment of the legal framework, the administrative structure, the military, the educational system, the judiciary, and so on*”. Second, institutional transaction costs are “*the costs of running a polity*”. In that sense, institutional transaction costs are the costs of measuring, monitoring, creating and enforcing compliance in institutional structure and the costs of running political institutions in the

political decision-making process. Accordingly, it is clear that the risk components in the formal and informal institutional structure of the country refer to institutional transaction costs. Because the dataset of political risk rating (PRR) of ICRG is the best index consistent with those risks in the formal and informal institutional structure, we employ PRR as a proxy for institutional transaction costs<sup>7</sup>. We accept that institutions affect economic growth through these risk components inherent in institutional structure.

Because the relevant literature has identified investments with the credibility of commitment from institutional structure (Levy and Spiller, 1994; 1996; Baron, 1995; Spiller, 2013), we analyze the effect of institutions on investment through credible commitment. As pointed out by Djankov et al. (2003), since the days of the Enlightenment, economists have agreed that good institutions<sup>8</sup> that secure property rights and enable people to keep the returns on their investment encourage people to invest in human or physical capital assets. They stress that government must secure investment from the expropriation by thieves, competitors, or tort-feasors through credible commitment guaranteed by institutions. The absence of credible commitment including secure property and contractual rights discourages investment (Olson, 1982; Dixit, 1996; Knack and Keefer, 1995; Weingast, 1997; Jensen, 2008). Investors would not engage in the most valuable activity in the economy, if they cannot rely on commitment from government officials regarding their capital assets and returns (Murphy et al., 1991; Knack and Keefer, 1997).

Because we aim to investigate the relationship between FDI and institutional structure, we take into consideration the indicators that measure the risk in the country where investment assets are subject to the expropriation of other parts. The previous studies have used various and separate factors such as the rule of law, the pervasiveness of corruption, and the risk of

---

<sup>7</sup> Please see more detailed information about the relationship between transaction costs and the PRR of ICRG in the section of the Definition of Variables and Data below.

<sup>8</sup> In fact, there is no consensus to define what good institutions are. In a general sense, good institutions are rules increasing market freedom and protecting private property rights most strongly (Chang, 2011).

expropriation and contract repudiation to represent institutional risk components on investments (Knack and Keefer, 1997). Among others, Frye (2004) directly used the term “credible commitment” to represent the effect of institutional structure on investments. Following this literature, we prefer to use credible commitment instead of different institutional components and employ the investment profile risk (IPR) of GRPS to represent credible commitment. IPR includes a mixture of the most important institutional components on investments such as Contract Viability/Expropriation, Profits Repatriation and Payment Delays. These institutional factors clearly refer to credible commitment in institutional structure and such a credible commitment is particularly vital for the long-lived investments such as FDI. If governments arbitrarily change policies and rules in the future to expropriate those assets, the long-lived investments will not be made in the long-term (Dixit, 1996; Jensen, 2008). We accept that institutions including a credible commitment by government lead to remarkable increase in investments, whereas institutional structures with low transaction costs positively influence economic growth, and vice versa. Consequently, in our model, we use the PRR and IPR of ICRG to proxy institutional transaction costs and credible commitment, respectively.

### **3. Estimation Strategy and Empirical Results**

An important component in the analysis of institutions is that each country has its own unique institutional structure and quality (North, 1990). As a matter of fact, institutions are the reason of why there are differences in economic performance across countries (Acemoglu et al., 2001; Acemoglu and Robinson, 2006). For that reason, it could be more useful to analyze the relationship between institutions and economic performance through country-specific data. However, there are some difficulties in the analysis of country level data. In this paper, we use an innovative empirical methodology, which allows both to take advantage of using a country-specific data and to get rid of difficulties stemming from it.

We mainly query the presence of relationship between institutions and economic performance to understand whether institutions matter for economic performance. In this sense;

(H1) our main hypothesis is that there is a long-term relationship between institutions and economic performance.

This main hypothesis can be classified into 4 subhypotheses:

(H2) Credible commitment that refers to credibility in the institutional structure of the country is essential for the long-lived investments such as FDI;

(H3) Transaction costs are crucial for sustained economic growth;

(H4) Economic performance affects institutional change. While the increase in FDI leads to institutions with credible commitment, sustained economic growth causes an institutional structure with low transaction costs;

(H5) Political conditions that lead to structural changes or shocks affect economic performance. In particular, government structures as an important institutional component have an important influence on economic performance. While coalition governments lead to low performance in FDI and economic growth, the long-term sole-part governments bring about an improvement in economic performance.

### **3.1. Model**

All those four subhypotheses yield our main hypothesis: there is a strong relationship between institutions and economic performance. We now empirically investigate the presence of this relationship. To test all those hypotheses, we estimate models of the following form that specify economic performance as a function of the economic and institutional explanatory variables as in Eq. (1);

$$Y'_t = \begin{bmatrix} fdi_t & gdp_t & int_t & cc_t & ptc_t \end{bmatrix} \quad (1)$$

where  $Y'_t$  is a vector of endogenous variables which are  $gdp_t$  is national income,  $fdi_t$  is FDI,  $ptc_t$  is political, non-economical or institutional transaction costs, and  $cc_t$  is credible commitment. Undoubtedly, it is possible to include many different valid variables in the independent variables framework to account for economic performance. For instance, human capital is an important determinant of economic growth (Glaeser et al., 2004). Also, it is possible to proxy institutions through many different indicators. For instance, Acemoglu et al. (2001; 2002) used mortality and population density to proxy institutions. Because we investigate a long-run causality relationship between institutions and economic performance, we do not include all the variables that could be influential on economic performance in our estimation strategy. Accordingly, we utilize two simultaneous equations that include economic performance and its determinants. In Eq. (2), we estimate:

$$\begin{aligned} fdi_t &= \beta_{10} + \beta_{1,int} int_t + \beta_{1,cc} cc_t + \gamma_{11} gov_t + u_{1t} \\ gdp_t &= \beta_{20} + \beta_{2,fdi} fdi_t + \beta_{2,ptc} ptc_t + \gamma_{21} gov_t + u_{2t} \end{aligned} \quad (2)$$

where  $\beta_i (i = 1, 2)$  are long-run elasticities<sup>9</sup>,  $\gamma_i (i = 1, 2)$  are coefficients of dummies that represent the changes in government structures, and  $u_{it} (i = 1, 2)$  are error terms. Because the expectation that two cointegrating vectors are established in the system, at least two restrictions per cointegrating vector are required for the exact identification of the long-run relationships (Pesaran and Shin, 2002). To identify the long-run relationships for the model, we employed the restrictions below in terms of economic expectations as in Eq. (3):

$$\begin{bmatrix} \beta \\ \gamma \end{bmatrix}' = \begin{bmatrix} -1 & 0 & \beta_{1,int} & \beta_{1,cc} & 0 & \gamma_{1,1} \\ \beta_{1,fdi} & -1 & 0 & 0 & \beta_{1,ptc} & \gamma_{2,1} \end{bmatrix} \quad (3)$$

---

<sup>9</sup> All the variables are used in logarithmic form

In the restrictions matrix above, the first line of restrictions implies that GDP and non-economical transaction costs are set to zero in the first equation. The second required restriction is  $\beta_{1,gdp} = -1$ , which indicates that FDI is normalized. The second row normalizes GDP to negative one, e.g.  $\beta_{2,prc} = -1$ , with real interest rates and credible commitment are constrained to zero. By identifying the long-run equations correctly, these estimates can be interpreted as long-run elasticities (Johansen, 2005).

### ***3.1.1. Definition of the Variables and Data***

In this section, we introduce the detailed information about data and variables. Table 1 reports the description of variables, data sources and summary statistics. We employ the terms “credible commitment and transaction costs” to represent institutions. As discussed in detail above, it is possible to accept that there is relationship between the quality or efficiency of institutions and transaction costs (North, 1990, 27-54; Marinescu, 2012). Also, there is a close relationship between political institutions and credible commitment (Spiller and Tommasi, 2003). Following those relationships in our theoretical framework, we use some institutional indices to represent transaction costs and credible commitment. There are many different indices such as Fraser Institute, Heritage Foundation, Freedom House, World Bank, and Political Risk Service (PRS) Group that observe the country-specific institutional components. Researchers have mostly used the database of ICRG to analyze the institutions-economic performance nexus (Knack and Keefer, 1995; Busse and Hefeker, 2007). In particular, the PRR of ICRG is the most popular variable used to proxy institutions, as stated by Alesina and Weder (1999). Also, the database of ICRG is quarterly and covers a long-term time span, while others are mostly annual.

Table 1. The description of variables, sources and summary statistics

Variable	Description	Mean	SD	Min	Max	Observations
$PTC_t$	Institutional/Political Transaction Cost (PTC). Assessment of the stability in institutional structure. Values on a 0-52 scale. High points show low risk and low points show high risk. Source: ICRG	30.89	4.01	23	39	112
$CC_t$	Credible Commitment (CC). Assessment of institutional factors affecting the risk to investment. Values on a 0-12 scale. High points show low risk and low points show high risk. Source: ICRG	6.76	1.60	3	11	112
$INT_t$	Real Interest Rate. Occured by combining OECD overnight interest rates and Turkish interbank overnight interest rate. After deflated, rewritten in terms of real returns. Source: Bloomberg and CBRT	1.37	20.39	-28.67	159.45	112
$FDI_t$	Real FDI. Quarterly data is available after the post-1991: 4 period in USD. 1987-1991 annual data (in USD) is interpolated through Baxter method to attain quarterly data. Using CPI from FED, the real FDI values are obtained. Source: CBRT	745.35	890.93	-21	4602	112
$GDP_t$	Real Gross Domestic Product. After dividing the GDP in Turkish Liras to end-of-period exchange rates, it is deflated by CPI taken from FED. Source: CBRT	4.66	2.58	1.38	9.96	112

Even though this dataset includes different risk ratings, we use PRR to proxy institutional transaction costs, because we are interested in institution-based transaction costs. PRR consists of 11 different components to refer non-market transaction costs such as Government Stability, Socioeconomic Conditions, Internal Conflict, External Conflict, Corruption, Military in Politics, Religious Tensions, Law and Order, Ethnic Tensions, Democratic Accountability, and Bureaucracy Quality<sup>10</sup>. Note that PRR is assessment of the stability in institutional structure, as reported in Table 1. Because this definition of PRR refers to transaction costs from institutional components, we define the components of PRR as the institutional/political transaction costs of a country in the standard transaction costs arguments<sup>11</sup>. Moreover, it is possible to classify Government Stability, Law and Order, External and Internal Conflicts, Corruption, Military in Politics, Democratic Accountability and Bureaucracy Quality as transaction costs stemming from formal institutions and Socioeconomic Conditions, Religious Tensions and Ethnic Tensions as transaction costs coming from informal institutions. Thus, we accept PRR as the level of (institutional) transaction costs in our model.

Since a PRR of 0.0% to 25% indicates a Very High Risk; 26% to 31% High Risk; 32% to 36% Moderate Risk; 37% to 42% Low Risk; and 43% or more Very Low Risk, we accept PRR with very high risk as an institutional structure with a very high transaction costs and PRR with very low risk as institutional structure with a very low transaction costs, as shown in Table 2. In other words, if the level of PRR is below 25%, the quality of institutions is at the worst level due to institutional structure with the highest transaction costs. There is a negative relationship between the levels of transaction costs and PRR. While PRR increases,

---

<sup>10</sup> This dataset originally consists of 12 components including IPR. Because we use IPR that represents credible commitment to estimate the simultaneous relationships Eq. 2, we exclude IPR from the dataset of PRR.

<sup>11</sup> In order to better understand how it is possible to define these components as institutional transaction costs, see risk components and their definitions <http://www.prsgroup.com/wp-content/uploads/2012/11/icrgmethodology.pdf> [28.08.2015].



transaction costs decrease. In this case, we expect that institutional structure with high transaction costs lead to a decline in economic growth.

Table 2. The relationship between PRR and non-market transaction costs

Rates	PRR	Transaction Costs
0.0% - 25%	Very High Risk	Highest
26.0% - 31%	High Risk	High
32% - 36%	Moderate Risk	Moderate
37% - 42%	Low Risk	Low
> 42%	Very Low Risk	Lowest

Similarly, we define IPR as the level of credible commitment, because the definition of IPR according to the ICRG methodology of the RPS group is “*an assessment of factors affecting the risk to investment that are not covered by other political risk components*” in PRR. Accordingly, IPR consists of Contract Viability/Expropriation, Profits Repatriation and Payment Delays. All these components are consistent with the definition of credible commitment in the standard institutional economics literature. Because each indicator in the dataset representing IPR refers to an institutional commitment component stemming from the institutional structure of the country for investors, we define IPR as credible commitment.

Accordingly, the risk rating representing investment profile varies from a minimum score of 0 points to a maximum score of 12 points, as reported in Table 3. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk. The scores between 9 and 12 represent investment profile with very

low risk, whereas the scores between 5 and 8 refer to investment profile with moderate risk. Investment profile with very high risk is represented by the rates between 0 and 4. Accordingly, we accept these three different risk groups as the lowest, moderate and highest levels of credible commitment, respectively, as seen in Table 3. While investment profile at very high risk refers to institutional structure with the lowest credible commitment, the levels of investment profile at moderate and very low risk represent institutional structures with the moderate and highest credible commitment, respectively.

Table 3. The relationship between investment profile and credible commitment

Rates	IPR	Credible Commitment
0 - 4	Very High Risk	Lowest Credibility
5-8	Moderate Risk	Moderate Credibility
9-12	Very Low Risk	Highest Credibility

Accordingly, Figure 2 depicts the levels of transaction costs and credible commitment stemming from institutional structure in Turkey. While transaction costs are mostly at moderate risk levels in 1992-1993 and 2004-2005, it represents the higher levels of transaction costs for other years. While the figure suggests that transaction costs only reach to the low level with 70.5% in the end of 2004 in Turkey, it never declines low and lowest levels in the other periods. This suggests that institutional structure or environment in Turkey has not led to the low-level transaction costs over the last three decade. On the other hand, the level of credible commitment reaches its highest level in 2000 because Turkey carried out a

constitutional amendment in 1999 that allows international arbitration for foreign investors<sup>12</sup>.

In general, credible commitment is higher in the post-1999 period than the pre-1999 term.

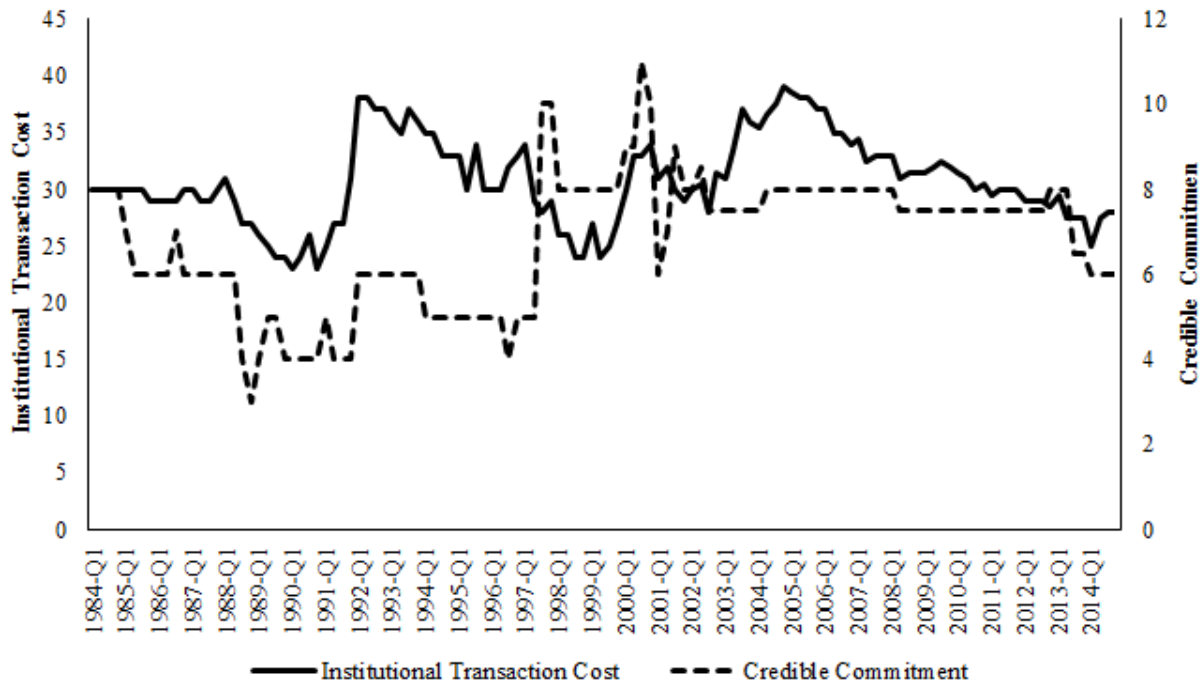


Figure 2. Credible commitment and institutional transaction costs

We use quarterly data, which cover the period between 1987:1 and 2014:4 for all the variables. Dataset for institutional transaction costs and credible commitment are obtained from ICRG. Data on GDP are taken from the Central Bank of the Republic of Turkey. By using Consumer Price Index (CPI) taken from FED, real GDP is obtained. We used the current exchange rate to calculate GDP in USA dollars (USD). Data on the real effective exchange rates are obtained from the Central Bank of the Republic of Turkey (CBRT).

Data on FDI are obtained from the CBRT and in USD. These data are available quarterly for post-1991:4 period. We interpolate annual data between 1987 and 1991 through Baxter method to attain quarterly data. Using the CPI from FED, the real FDI values are obtained.

<sup>12</sup> This suggests that our definition of credible commitment is clearly consistent with the Investment Profile index of ICRG. International arbitration under constitutional guarantee is clearly and strongly credible commitment especially for foreign investors. As depicted in Figure 2, because constitutional amendment led to a sharp hike in investment profile, it is possible to define investment profile as credible commitment.

Data on interest rates are obtained from OECD and CBRT. We used interbank over night interest rates from CBRT for the 1990-2014 period and overnight interest rates from OECD for the 1986-2004. Because the correlation between two series is over 90%, we merged series to obtain a complete dataset for interest rates. To control the validity of this dataset, we compared it with the annual saving deposit interest rates from the Development Bank of Turkey. Correlation is 84%. Using this interest rate series and CPI from the CBRT, we obtained the real interest rates. All the variables are used in logarithmic form.

### ***3.1.2. Econometric Methodology***

In order to test our hypotheses, Eq. (2) will be estimated by cointegration with structural breaks approach (Johansen et al., 2000). There are three main reasons for using this methodology. First, the Johansen cointegration approach enables us to simultaneously estimate the long-run relationships between institutions and economic performance. Second, using this approach, we can also investigate the effect of economic performance on institutions, but not only the effect of institutions on economic performance. Third, the estimate of structural breaks allows analyzing the impact of substantial changes such as the changes in government structure on the interaction between economic performance and institutions. Thus, this empirical approach ensures to overcome the problems of studying a national level data as in this paper. Before running the cointegration tests, non-stationarities of the time series data in the presence of structural breaks should be examined. Using the Lee and Strazicich (2003, 2004) approach, we carry out the unit root test with structural breaks, because Johansen et al. (2000) take into consideration the structural breaks.

Given the non-stationarity of the variables, we run cointegration analysis to investigate the presence of long-run relationship(s) among them. However, since Johansen (1988) cointegration procedure was not applicable in the existence of structural breaks in time series

data, we use an alternative cointegration test proposed by Johansen et al. (2000), which is a slight modification of Vector Error Correction Model (VECM)-based cointegration analysis. Given that  $Y_t$  is a  $p$  dimensional vector of  $I(1)$  processes with  $r$  cointegrating relationships, the VECM, which was proposed by Johansen et al. (2000), can be written as in Eq. (4):

$$\Delta Y_t = \alpha \begin{bmatrix} \beta \\ \gamma \end{bmatrix}' \begin{bmatrix} Y_{t-1} \\ tE_t \end{bmatrix} + \mu E_t + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \sum_{i=1}^k \sum_{j=2}^q \Psi_{j,i} D_{j,t-i} + \sum_{m=1}^d \Phi_m W_{m,t} + \varepsilon_t \quad (4)$$

where,  $\Delta$  is the first difference operator;  $k$  is lag length;  $E_t = [E_{1t} \ E_{2t} \ \dots \ E_{qt}]'$  is a vector of  $q$  dummy variables with  $E_{j,t} = 1$  for  $T_{j-1} + k \leq t \leq T_j$  ( $j=1, \dots, q$ ) and zero otherwise and the first  $k$  observation of  $E_{j,t}$  is set to zero;  $E_{j,t}$  is the effective sample of the  $j$ -th period.  $D_{j,t-i}$  is an indicator dummy variable for the  $i$ -th observation in the  $j$ -th period—that is  $D_{j,t-i} = 1$  if  $t = T_{j-1+i}$  ( $j=2, \dots, q$ ,  $t=\dots, -1, 0, 1, \dots$ ) and zero otherwise. Intervention dummies,  $W_{m,t}$  ( $m=1, \dots, d$ ), are included to render the residuals well-behaved, following Hendry and Mizon (1993). The  $\beta$  is the cointegrating vector, and represents the long-run relationship. And  $\alpha$  is a vector representing the speeds of adjustment toward the long-run equilibrium.  $\gamma = [\gamma_1 \ \gamma_2 \ \dots \ \gamma_q]$  is a matrix of  $(p \times q)$  dimensional long-run trend parameters. The short-run parameters are  $\mu$  of order  $(p \times q)$ ,  $\Gamma_i$  of order  $(p \times p)$  for  $i=1, \dots, k$ ,  $\Psi_{j,i}$  of order  $(q \times 1)$  for  $j=2, \dots, q$  and  $i=1, \dots, k$ , and  $\Phi_m$  of order  $(q \times 1)$  for  $m=1, \dots, d$ . The innovations  $\varepsilon_t$  are assumed to be independently and identically distributed with zero mean and symmetric and positive definite variance-covariance matrix  $\Omega$ —that is  $\varepsilon_t \sim iid(0, \Omega)$ . Eq. (5), which is a linear trend model in which the trend and level of cointegration

relationship shows a difference from period to period, is called as  $H_l(r)$ . The likelihood ratio test against  $H_l(p)$  alternative  $r$  cointegration relationship  $H_l(r)$  hypothesis is:

$$LR\{H_l(r)|H_l(p)\} = -T \sum_{i=r+1}^p \ln(1 - \hat{\lambda}_i) \quad (5)$$

where,  $\hat{\lambda}_i$  are squared sample canonical correlations and  $1 \geq \hat{\lambda}_1 \geq \dots \geq \hat{\lambda}_p \geq 0$ . In a cointegration relationship, there is no linear trend, but if only a breaking level exists, the model given in equation (3) can be transformed as in Johansen et al. (2000) and called as  $H_c(r)$ . The critical values for  $H_l(r)$  and  $H_c(r)$  models are derived from  $\Gamma$  - distribution, as proposed in Johansen et al. (2000). Given the cointegration rank further restrictions on the VECM can be tested by likelihood ratio (LR) testing. Harris and Sollis (2003) took these tests in hand within a standard framework. In this study,  $LR$  tests are extended for the models that are proposed by Johansen et al. (2000) as in Dawson and Sanjuan (2005).

## 3.2. Results

### 3.2.1. Structural Breaks

In order to test the (non)stationary properties of the series in the presence of structural breaks, we employed the LM unit root tests developed by Lee and Strazicich (2003; 2004). The variables are not stationary in their levels and include structural breaks. Table 4 reports the results. A general finding is that break times are the periods including the changes in government form and economic crises in Turkey. This result is consistent with our main hypothesis, because it confirms the presence of a relationship between institutions and economic performance in Turkey. While institutional components such as transaction costs and credible commitment stemming from the institutional structure of Turkey lead to the changes in FDI and GDP representing economic performance, political setting appears to be

an important deterministic institutional component on economic performance. In particular, the political conflict periods bring about a clear deterioration in FDI and GDP and thus the biggest economic crises of Turkey in 2000 and 2001. Note that the loose political setting also leads to a relapse in institutional factors. Structural breaks clearly suggest that transaction costs increase and credible commitment relapses in the periods of political conflict such as the coalition periods of 1990s. This means that the deterioration in political setting negatively affects institutional components and thus economic performance. However, it is difficult to say that the changes in economic performance affect institutions through structural breaks.

Table 4. Lee and Strazicich (2003, 2004) unit root test results

<i>Series</i>	<i>Model</i>	<i>Lag</i>	<i>Breaks Times</i>	$\lambda$	<i>t-statistics</i>	<i>Critical Value*</i>
$fdi_t$	C	2	1991:3	0.2	-4.91	-5.74
			2005:3	0.6		
$gdp_t$	C	3	1993:3	0.2	-4.88	-5.74
			2001:1	0.6		
$int_t$	C	3	1993:4	0.2	-5.58	-5.74
			2000:4	0.6		
$cc_t$	C	2	1997:1	0.4	-4.99	-5.67
			2000:1	0.6		
$ptc_t$	C	1	1991:3	0.2	-4.91	-5.74
			2001:3	0.6		

\*Critical values at the 5% significance level were obtained from the Lee and Strazicich test.

On the other hand, in order to reach more realistic and plausible results, we separately analyze structural breaks for each variable. The following figures depict structural breaks for all the variables. Using these figures, we can explain the institutions-economic performance nexus through the changes in those variables and interactions among them. Figure 3 demonstrates that the model estimates the break pairs 1991:3 and 2005:3 as structural breaks in FDI, which can be associated with the changes in government structures in 1991 and 2002. Note that the first structural break occurs in 1991:3 and the trend showing an increase in FDI until this time goes down after this break time and remains constant throughout the 1990s. We infer that the main reason for this structural break representing the decline in FDI is clearly the presence of coalition governments that dominate political setting in Turkey from 1991 to the end of 2002. It is well known that the political conditions within this period led to a loose political setting in Turkey (Çetin and Yilmaz, 2010). There were eleven short-lived governments between 1991 and 2002. Because those governments consist of political parties with the different political views, governments could not implement any significant policy proposal due to conflicting opinions and beliefs. This unstable political structure naturally led to non-credible institutional environment and impeded FDI in Turkey during the 1990s<sup>13</sup>.

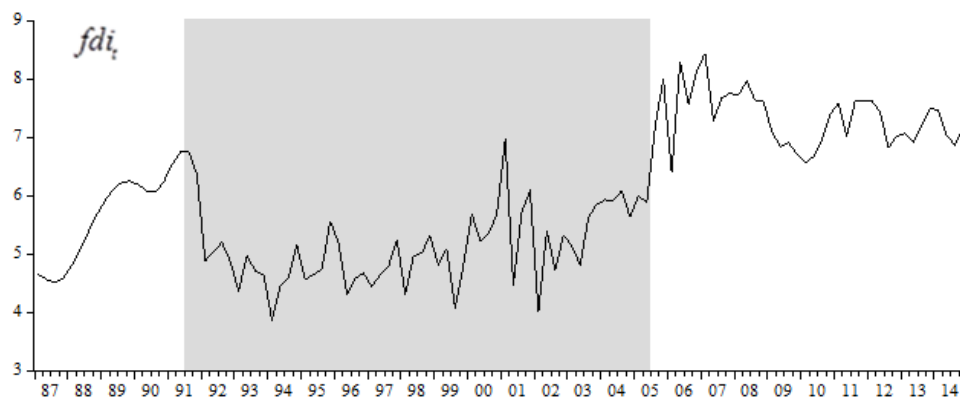


Figure 3. Structural breaks in FDI

<sup>13</sup> Please see Çetin (2010) and Çetin and Yilmaz (2010) for more detailed discussion about the relationship between institutional setting in the 1990s and economic performance.



On the other hand, the second structural break in FDI in 2005:3 is also consistent with the change in the political institutional setting of Turkey. Even though this effect occurs in a certain lag, we estimate that the presence of the sole party government in the post-2002 period leads to a remarkable increase in FDI. This increase in FDI starts in 2005, because the AKP government starts to generate effective policies such as the privatization of public-owned assets in the infrastructure industries after this time. Government that enacted many different laws in the beginning of the 2000s introduced privatization, deregulation and competition policies into infrastructure industries such as electricity, natural gas, telecommunications, airlines, maritime, and railways (Çetin and Oguz, 2011; Çetin, 2014). All those developments triggered the flow of FDI to Turkey. Our model estimates all these changes as significant structural breaks statistically and economically.

As depicted in Figure 4, the model estimates 1993:3 and 2005:3 as structural breaks for GDP. Note that those structural breaks in GDP are very similar to FDI. This finding clearly suggests that the economic crises of 1994 and 2001 are the main reasons for structural breaks in GDP. However, these breaks are also with regard to government structures, because both crises are the aftermath of bad governance of coalition governments in the 1990s. Conversely, GDP in the pre- and post-coalition terms consistently increases. However, note that the model does not estimate the sharp change in GDP in 2009 as structural break. This means that this change is statistically not a significant change. We estimate that this is because the change in GDP stems from an external shock such as the global economic crisis of 2009, but not an internal institutional/structural factor. Also, note that this finding is consistent with structural breaks for FDI. The findings regarding structural breaks in GDP and FDI suggest that the political institutional setting affects economic performance in Turkey.

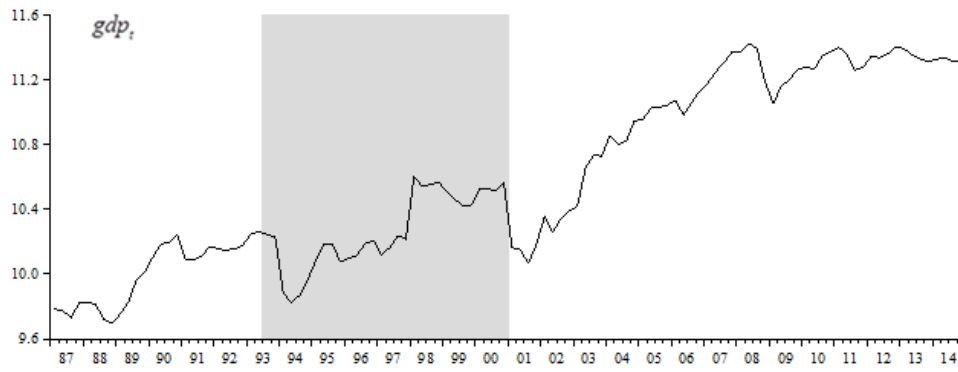


Figure 4. Structural breaks in GDP

Structural breaks regarding real interest rates are estimated as 1993:4 and 2000:4, as illustrated in Figure 5. Interest rates are also associated with the economic crises of 1994 and 2001. Structural breaks suggest that interest rates are another important indicator of economic crises, because the model estimates the pre-crisis dates as structural breaks for interest rates. However, note that both structural breaks are the aftermath of bad governance in political setting. This is compatible with the trend of interest rates in the post-2001 economic crisis period. During the post-2001 economic crisis term including the stable-sole party governments of the AKP, interest rates are stable and constant, as seen in Figure 5. As a result, interest rates are associated with economic conjuncture and institutional structure. Again, institutional setting impacts on economic performance because institutional structure is influential on interest rates as an economic indicator that affects FDI.

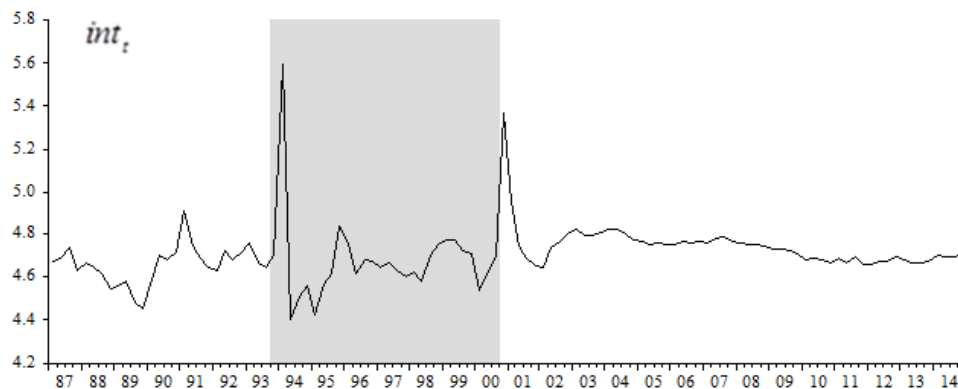


Figure 5. Structural breaks in real interest rates

In our model, structural breaks for transaction costs and credible commitment directly represent the remarkable structural changes in institutional structure. Figure 6 illustrates that the model estimates the break pair 1991:3 and 2001:3 as structural breaks in transaction costs. This finding strongly confirms the presence of a strong relationship between institutional structure and transaction costs. While transaction costs increase along with the first structural breaks, they start to decline along with the second break. This means that transaction costs that have an increasing trend during the 1990s including coalition governments and the unstable political environment start to follow a declining trend after the sole party government in 2001. As mentioned before, when the level of PRR declines, transaction costs increase. Accordingly, as seen in Figure 6, transaction costs in Turkey reach the highest levels in 1992, 1994 and 2002. These dates are completely consistent with the political setting or institutional structure of Turkey. While the reason for high transaction costs in 1992 is the transition to coalition governments from the sole party government in the 1980s, the dramatic increase in transaction costs in 1994 and 2001 is clearly related to the economic crises of 1994 and 2001.

Lastly, even though an important increase occurs in transaction costs after 2008, the model does not estimate this change as a significant structural break. However, this change in transaction costs is also consistent with institutional developments in Turkey. In particular, governmental problems led to conflict in the political and social spheres after 2011 (Çetin, 2014; Çetin et al., 2016). The biggest corruption investigation in Turkey began in December 2013 and it led to a strong conflict among the political institutions of Turkey such as judiciary, legislature and executive. Additionally, internal and external conflicts such as the terror activities of PKK and extremist Islamic groups, the external war in Syria and the refugee move to Turkey also triggered this sharp increase in transaction costs. All those developments are definitely consistent with the components of PRR in our definition of transaction costs. What is important here is that the model estimates the remarkable changes

in government structures and economic sphere as structural breaks (1991:3 and 2001:3) for transaction costs. This suggests that there is a strong relationship between institutional structure, transaction costs and economic performance.



Figure 6. Structural breaks in institutional transaction costs

Figure 7 depicts that the model estimates 1997:1 and 2000:1 as structural breaks for credible commitment. This finding does not seem significant, because credible commitment is higher in the 1990s compared to the 1980s and the 2000s including the sole party governments. We estimate that this is because of the Customs Union Agreement signed between the European Union and Turkey in 1996 and a constitutional amendment carried out in 1999 that allows international arbitration for foreign investors. In spite of coalition governments and the unstable political structure during the 1990s, these developments positively affected credible commitment. As a matter of fact, the model estimates the effect of the Customs Union Agreement in 1996 as a structural break, which leads to an increase in credible commitment. On the other hand, the model estimates the effect of negative developments such as the economic crisis of 2001 as structural break for credible commitment in 2000:1. However, note that credible commitment has been remarkably high during the sole party governments of the 2000s compared to the period between 1987 and 1997. Lastly, note that there is a considerable decline in credible commitment after 2012, even though the model does not estimate this decline as a structural break. This decline in

credible commitment is most probably because of the ongoing political clashes in the institutional structure of Turkey for a few years<sup>14</sup>.

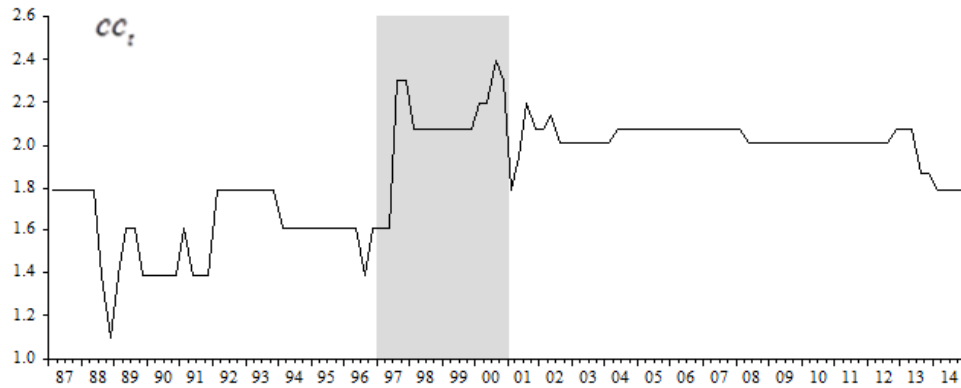


Figure 7. Structural breaks in credible commitment

### 3.2.2. Co-integration Analysis

After we investigated the stationarity properties of the series with structural breaks, we examined whether there is a long-term causality relationship among the variables by Johansen co-integration procedure (Johansen et al., 2000) that takes into consideration the break dates. Because the model estimates the break dates 1991:3-2005:3 as endogenous break pair, we report the trace statistics results for those break dates in Table 5<sup>15</sup>. The results from trace statistics test confirm the presence of two co-integrating vectors ( $r=2$ ) for each break pair. Because this means that there is a long-run causality relationship running from institutions to economic performance, this finding confirms *H1*.

<sup>14</sup> Please see Çetin et al. (2016) for other credible commitment problems stemming from the AKP government's recent pragmatic policies on the dependence of independent regulatory agencies in Turkey.

<sup>15</sup> Because the residuals are normally distributed, we do not employ intervention dummies.

Table 5. Trace statistics for endogenous break pair 1991:3-2005:3\*

<i>Break Pairs</i>	$H_0 (H_1)$	<i>Model</i> $H_l(r)$
1991:3 – 2005:3	$r = 0 (r \geq 1)$	250.49 (135.64)
	$r = 1 (r \geq 2)$	135.50 (101.94)
	$r = 2 (r \geq 3)$	58.64 (72.31)
	$r = 3 (r \geq 4)$	26.65 (46.53)
	$r = 4 (r \geq 5)$	9.29 (24.11)

\* Critical values in parentheses at the 95% confidence level can be approximated by  $\Gamma$ -distribution, as explained in Johansen et al. (2000).

We include the break dates 1991:4 and 2002:4 as exogenous breaks to estimate the effect of government structure as an institutional component on economic performance, because those dates represent the transition periods to the coalition and sole party governments in Turkey, respectively. Table 6 reports the trace statistics for the break pair 1991:4 and 2002:4<sup>16</sup>. Because both structural breaks appear as broken level and trend, we accept model  $H_1 \square r \square$  that allows level and trend breaks and rejects model  $H_0 \square r \square$ . The model estimates lag length as  $k=3$  for pairs of structural breaks. Because the results from trace statistics test confirm the presence of two co-integrating vectors ( $r=2$ ) for each break pair, there is a long-term causal relationship from institutions to FDI and GDP for this model as well. This finding also affirms  $H1$ .

<sup>16</sup> Because the residuals are normally distributed, we do not employ intervention dummies.

Table 6. Trace statistics for exogenous break pair 1991:4-2002:4\*

<i>Break Pairs</i>	$H_0 (H_1)$	<i>Model</i> $H_l(r)$
1991:4 – 2002:4	$r = 0 (r \geq 1)$	193.73 (136.42)
	$r = 1 (r \geq 2)$	115.86 (102.78)
	$r = 2 (r \geq 3)$	64.86 (73.11)
	$r = 3 (r \geq 4)$	36.67 (47.17)
	$r = 4 (r \geq 5)$	12.17 (24.35)

\* Critical values in parentheses at the 95% confidence level can be approximated by  $\Gamma$ -distribution, as explained in Johansen et al. (2000).

Tables 7 and 8 report the LR-statistics results from the VECM restriction tests for break pairs estimated in trace statistics. While Table 7 reports the results for endogenous breaks, Table 8 shows the results for structural breaks representing the changes in government structures as exogenous breaks. The lower panels of tables show the long-term test results for identified equations above. All the variables remain in the co-integration space. Weak exogeneity tests suggest that while GDP and FDI are exogenous, the other variables are endogenous. LR-statistics results confirm that structural breaks are significant. As a general finding, the results suggest that there is no a long run causality relationship running from economic performance to institutions in Turkey, because the values for  $\chi^2_{(2)}$  in Tables 7 and 8 confirm that institutional variables cannot be identified as dependent variables.

As reported in Tables 7 and 8, break dates are economically and statistically significant structural breaks. This suggests that government structures as an institutional determinant impact on economic performance. There is a long-term relationship running from government structure to economic performance, because the model estimates the presence of co-

integration in case of structural breaks as exogenous breaks. While coalition governments negatively impact on FDI and GDP, the sole party governments have a positive effect on economic performance. This finding is consistent with the results from unit root test and the analysis of structural breaks in Table 4. The changes in government structure affect structural breaks for all the variables, but also not only FDI and GDP. That is, evidence from the analysis of structural breaks and the identification test results with structural breaks as both exogenous and endogenous breaks suggests that government structure in Turkey affects both institutional components such as credible commitment and institutional transaction costs and economic factors such as FDI, GDP, and interest rates. This is clear evidence confirming *H5*. There is a strong long-term relationship between institutions and economic performance in Turkey.



Table 7. Identified long-run and adjustment coefficients matrices and identification test result for endogenous breaks 1991:3 and 2005:3\*

<i>Individual exclusion</i>	$H_0$	<i>LR-statistics</i>	<i>Weak exogeneity</i>			$H_0$	<i>LR- statistics</i>	<i>Structural break</i>			$H_0$	<i>LR- statistics</i>
$fdi_t$	$\beta_{fdi} = 0$	43.975 (0.000)	$fdi_t$	$\alpha_{fdi} = 0$			45.346 (0.000)	1991:3	$\gamma_1 = \gamma_2$		16.495 (0.000)	
$gdp_t$	$\beta_{gdp} = 0$	64.881 (0.000)	$gdp_t$	$\alpha_{gdp} = 0$			16.549 (0.000)					
$int_t$	$\beta_{int} = 0$	21.775 (0.001)	$int_t$	$\alpha_{int} = 0$			2.721 (0.257)					
$cc_t$	$\beta_{cc} = 0$	57.775 (0.000)	$cc_t$	$\alpha_{cc} = 0$			1.918 (0.383)	2005:3	$\gamma_2 = \gamma_3$		15.705 (0.003)	
$ptc_t$	$\beta_{ptc} = 0$	68.486 (0.000)	$ptc_t$	$\alpha_{ptc} = 0$			3.233 (0.256)					
<i>Identified equations</i>		$\beta_{fdi}$	$\beta_{gdp}$	$\beta_{int}$	$\beta_{cc}$	$\beta_{ptc}$	$\gamma_1$	$\gamma_2$	$\gamma_3$	$\alpha_{fdi}$	$\alpha_{gdp}$	$\chi^2_{(2)}$
<i>FDI</i>		1	0	-0.588	0.277	0	0.149	0.025	-0.016	-0.609	–	5.306
<i>GDP</i>		0.791	1	0	0	0.505	0.018	0.018	0.009	–	-0.139	(0.071)

Note: *p-values* are in parentheses. Additionally, multivariate normality test statistics for skewness, kurtosis and joint are 0.327 (*p-value*= 0.849); 0.897 (*p-value*= 0.639) and 1.224 (0.874) respectively. These results imply that because of the model is normally distributed; there is no need intervention dummy in the VECM.

Table 8. Identified long-run and adjustment coefficients matrices and identification test result for exogenous breaks \*

<i>Individual exclusion</i>	$H_0$	<i>LR-statistics</i>	<i>Weak exogeneity</i>			$H_0$	<i>LR- statistics</i>	<i>Structural break</i>		$H_0$	<i>LR- statistics</i>
$fdi_t$	$\beta_{fdi} = 0$	33.212 (0.000)	$fdi_t$	$\alpha_{fdi} = 0$	31.809 (0.000)	1991:4	$\gamma_1 = \gamma_2$			$\gamma_1 = \gamma_2$	22.739 (0.000)
$gdp_t$	$\beta_{gdp} = 0$	36.663 (0.000)	$gdp_t$	$\alpha_{gdp} = 0$	20.959 (0.000)						
$int_t$	$\beta_{int} = 0$	37.775 (0.000)	$int_t$	$\alpha_{int} = 0$	5.741 (0.057)						
$cc_t$	$\beta_{cc} = 0$	23.963 (0.000)	$cc_t$	$\alpha_{cc} = 0$	3.014 (0.108)	2002:4	$\gamma_2 = \gamma_3$			$\gamma_2 = \gamma_3$	16.518 (0.000)
$ptc_t$	$\beta_{ptc} = 0$	43.739 (0.000)	$ptc_t$	$\alpha_{ptc} = 0$	2.784 (0.249)						
<i>Identified equations</i>	$\beta_{fdi}$	$\beta_{gdp}$	$\beta_{int}$	$\beta_{cc}$	$\beta_{ptc}$	$\gamma_1$	$\gamma_2$	$\gamma_3$	$\alpha_{fdi}$	$\alpha_{gdp}$	$\chi^2_{(2)}$
<i>FDI</i>	1	0	-0.219	0.285	0	0.178	0.013	0.001	-0.443	–	3.078
<i>GDP</i>	0.739	1	0	0	0.575	-0.074	-0.013	0.003	–	-0.215	(0.519)

Note: *p-values* are in parentheses. Additionally, multivariate normality test statistics for skewness, kurtosis and joint are 0.472 (*p-value*= 0.789); 0.901 (*p-value*= 0.637) and 4.767 (0.092) respectively. These results imply that because of the model is normally distributed; there is no need intervention dummy in the VECM.

More importantly, estimation of identified equations suggests that the long-term equilibrium relationship between dependent variables representing economic performance and independent variables is significant and as expected. Because all the variables are used in logarithmic form, those coefficients that estimate the long-run equations or relationships with structural breaks can be interpreted as long-term elasticities. Accordingly, whereas  $\beta_{int}$  and  $\beta_{cc}$  represent the long-term interest rates and credible commitment elasticities of FDI,  $\beta_{fdi}$  and  $\beta_{ptc}$  refer to the long-term FDI and transaction costs elasticities of GDP. In other words, while coefficients  $\beta_{int}$  and  $\beta_{cc}$  refer to the sensitivity of FDI to interest rates and credible commitment, coefficients  $\beta_{fdi}$  and  $\beta_{ptc}$  represent the sensitivity of GDP to FDI and transaction costs. In two models, the long-term credible commitment elasticities of FDI are 0.277 and 0.285, respectively. The results affirm *H2*. There is a long-term relationship between credible commitment and FDI. When other variables are constant, a 10% rise at the level of credible commitment will lead to 2.77% and 2.85% increase in FDI, respectively. There are two main results of this finding. First, the finding confirms that institutions affect economic performance in Turkey, because institutional structure with the high credible commitment clearly leads to the increase in investment, while institutional environment with the low credible commitment brings about a low FDI flow. We can infer that when the level of credible commitment or the quality of institutions rises, economic performance increases, or vice versa. Second, Turkey can easily attract FDI, when it accomplishes structural and institutional reforms, which will lead to a recovery in the quality of institutional structure, and hence credible commitment. This finding is rather important for a developing country such as Turkey, because the level of credible commitment in Turkey has not been at a satisfactory level for a long time due to institutional constraints, as depicted in Figure 2, compared to the values in Table 3. Note that credible commitment in Turkey has been at the moderate level

since 2002, even though the only party governments of AKP have been in force and have initiated remarkable deregulation and privatization policies at the same period. Also, note that FDI has considerably increased over the last decade, as seen in Figure 3. Clearly, the improvement in institutional structure has led to the increase in FDI. As a result, the findings regarding the relationship between credible commitment and FDI suggest that Turkey can attract more investment by improving the quality of institutions, because credible commitment is not still at highest level due to the shortcomings in institutional and structural reforms.

According to the results from two models, the long-term interest elasticities of FDI are -0.588 and -0.219. The results are statistically and economically significant. There is a clear long-term relationship between interest rates and FDI in Turkey. The findings suggest that a 10% decrease in interest rates will bring about 5.58% and 2.19% increase in FDI as per two different models, respectively. Note that the sensitivity of FDI to interest rates and credible commitment in the long-term is rather similar in Turkey, even though its sensitivity to interest in the model with endogenous breaks is higher than the other model. This finding suggests that the effect of institutions on economic performance is as important as the economic determinants of FDI, because the effect of institutional and economic indicators on FDI is close to each other.

The models estimate the similar relationships between GDP and its institutional and economic determinants. The long-term elasticities of transaction costs with regard to GDP are 0.505 and 0.575, respectively. The results confirm *H3*. This finding also confirms that institutions affect GDP in the long run in Turkey. A 10% decrease (increase) at the level of transaction costs leads to 5.05% and 5.75% increase (decrease) in GDP, respectively. This finding also includes two important results. First, whereas an institutional structure with the higher transaction costs leads to the low economic performance, an institutional environment

with the less transaction costs gives rise to a high economic performance. This means that institutions matter for economic performance in the long run in Turkey. Second, Turkey can ensure a considerable increase in GDP by decreasing institutional transaction costs. Note that institutional transaction costs have never been at the lowest level in Turkey, as seen in Figure 2, compared to the values in Table 2. Conversely, they only reached the low level two times in 1992 and 2005. However, transaction costs have been at the moderate level on average since 2002 and GDP has reached the highest level in Turkey only during this period in the last three decades. The findings from cointegration test and structural breaks are consistent with each other. While the long-term elasticities of transaction costs with regard to GDP in both models confirm the presence of a long run relationship between GDP and transaction costs, structural breaks in GDP and institutional transaction costs corroborate this finding, because the model estimates 2001:1 and 2001:3 as structural breaks for GDP and transaction costs, respectively, as reported in Table 4. After 2001, whereas transaction costs decline, GDP increases, as shown in Figures 4 and 6. Clearly, if Turkey draws down institutional transaction costs, it can generate more income.

Additionally, the long-run elasticities of FDI with respect to GDP are 0.791 and 0.739, respectively. This finding suggests that a 10% rise in FDI leads to a 7.91% and 7.39% in GDP. The models clearly confirm the presence of long-run causality relationship between FDI and GDP in Turkey, as expected. However, this finding indirectly corroborates the effect of institutions on economic performance. Note that one of the determinants of FDI in the first equation to be estimated in our model specification is credible commitment and this institutional variable significantly affects FDI. In the second equation, because FDI that institutions affected influences GDP, this finding also refers to the effect of institutions on economic performance. As a whole, these findings also confirm our main hypothesis *H1*. There is a long-term relationship between institutions and economic performance running

from institutions to economic performance. However, our findings do not suggest the presence of a long run relationship running from economic performance to institutions in Turkey. We do not find evidence that confirms *H4*.

## **Conclusion**

Using a country-level aggregate data, we have empirically investigated whether institutions matter for economic performance in Turkey. We employed transaction costs and credible commitment as two main tools to explain the effect of institutions on economic performance. Using these tools, we first constructed a simple framework clarifying how to link between institutions and economic performance to study the institutions-economic performance nexus in a more practical way. We then developed an innovative estimation methodology to empirically investigate the long-term simultaneous relationships between institutional components and economic factors. Empirical approach in the paper allows us to examine a mutual interaction between institutions and economic performance, but not only a relationship running from institutions to economic performance. While our theoretical insights enable to better understand the institutions-economic performance through a useful linkage, evidence presented in the paper affirms the main hypothesis of the paper and our expectations. Clearly, the results suggest that our approach is useful and convenient particularly to examine a country-level data and thus to better understand the institutions-economic performance nexus.

Regarding Turkey, the findings from the Johansen co-integration analysis confirm the presence of long run causal relationship between institutions and economics performance. While the increase in non-economic transactions costs stemming from institutional structure lead to the decrease in GDP, a decline in transaction costs causes the increase in GDP. Whereas FDI rises when credible commitment increases, FDI declines as credible commitment decreases. However, the results only confirm the presence of a relationship

running from institutions to economic performance, but not from economic performance to institutions in Turkey. On the other hand, the estimate of structural breaks presents more interesting findings. First, the models estimate that the changes in government structure clearly affect FDI, GDP and interest rates. While the transition to coalition governments negatively influences those economic indicators, the transition to the sole party governments has a positive effect on them. Second, the change in the political institutional structure also affects transaction costs and credible commitment as institutional indicators. In general, transaction costs increase and credible commitment declines in the period of coalition governments, while transaction costs declines and credible commitment increases under the sole party governments. Whereas a stable political institutional structure positively affects institutional components, a fragmented and loose political setting leads to the deterioration in institutional structure. Overall, the findings from the analysis of structural breaks are consistent with the findings from co-integration analysis. Both co-integration analysis and structural breaks confirm that institutional structure affects both institutional and economic components. Institutions matter for economic performance in Turkey.

## References

Acemoglu, D. and J. Robinson. 2006. *Why Nations Fail: The Origins of Power, Prosperity and Poverty*, Profile Books, USA.

Acemoglu, D., S. Johnson and J. A. Robinson. 2005a. Institutions as a Fundamental Cause of Long-Run Growth, In *Handbook of Economic Growth*, Edited by P. Aghion and S. N. Durlauf, ch.6, 385-472.

Acemoglu, D., S. Johnson and J. A. Robinson. 2005b. The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth *American economic review*, 95(3), 546-579.

Acemoglu, D., S. Johnson and J. A. Robinson. 2002. Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution. *Quarterly Journal of Economics*, 117 (4), 1231-1294.

Acemoglu, D., S. Johnson and J. A. Robinson. 2001. The Colonial Origins of Comparative Development: An Empirical Investigation, *American Economic Review*, 91 (5), 1369-1401.

Alesina, A. and B. Weder. 1999. Do Corrupt Governments Receive Less Foreign Aid? *NBER Working Papers*, No.7108.

Aron, J. 2000. Growth and Institutions: A Review of the Evidence. *The World Bank Research Observer*. 15 (1), 99-135.

Baron, D. P. 1995. Economics and Politics of Regulation: Perspectives, Agenda and Approaches, *Modern Political Economy: Old Topics, New Directions*. eds. J. S. Banks and E. A. Hanushek. Cambridge University Press, 10-62.

Barro, R. J. 1991. Economic Growth in a Cross Section of Countries, *The Quarterly Journal of Economics*, 106 (2). 407-443.

Besley, T. 1995. Property Rights and Investment Incentives: Theory and Evidence from Ghana. *Journal of Political Economy*, 103, 903-937.

Buchanan, J. and G. Tullock. 1962. *The Calculus of Consent: Logical Foundations of Constitutional Democracy*, Univ. of Michigan Press, Ann Arbor, MI.

Busse, M. and C. Hefeker. 2007. Political Risk, Institutions and Foreign Direct Investment, *European Journal of Political Economy*, 23 (2), 397-415.



Çetin, T. 2014. Structural and Regulatory Reform in Turkey: Lessons from Public Utilities, *Utilities Policy*, 31, 94-106.

Çetin, T. 2010. The Role of Institutions over Economic Change in Turkey, *Understanding the Process of Economic Change in Turkey: An Institutional Approach*, eds. T. Çetin and F. Yılmaz. Nova Science Publishers, New York, 21-39.

Çetin, T., M. Z. Sobaci and M. Nargelecekenler 2016. Independence and Accountability of Independent Regulatory Agencies: The Case of Turkey, *European Journal of Law and Economics*, 41, 601-620.

Çetin, T. and F. Oğuz. 2011. *The Political Economy of Regulation in Turkey*, Springer, New York.

Çetin, T. and F. Yılmaz. 2010. *Understanding the Process of Economic Change in Turkey: An Institutional Approach*, Nova Science Publishers, New York.

Çiçen, Y. B. 2015. *Institutional Foundations of Economic Performance in Turkey: A New Institutional Economics Perspective*, Ph.D. Dissertation, Yildiz Technical University, Istanbul, Turkey.

Chang, H.-J. 2011. Institutions and Economic Development: Theory, Policy and History, *Journal of Institutional Economics*, 7 (4), 473-498.

Clague, C. 1993. Rule Obedience, Organizational Loyalty, and Economic Development, *Journal of Institutional and Theoretical Economics*, 149 (2), 393-414.

Coase, R. 1998. The New Institutional Economics, *The American Economic Review*, 88 (2), 72-74.

De Long, J. B. and A. Shleifer. 1993. Princes and Merchants: European City Growth before the Industrial Revolution. *Journal of Law and Economics*, 36, 671-702.

De Long, J. B. and L. H. Summers. 1991. Equipment Investment and Economic Growth. *The Quarterly Journal of Economics*, 106 (2), 445-502.

De Soto, H. 1989. *The Other Path*. Harper and Row, New York.

Demsetz, H. 1967. Towards a Theory of Property Rights. *American Economic Review* 57, 347-359.

Dixit, A. K. 1996. *The Making of Economic Policy: A Transaction-Cost Politics*, MIT Press.

Djankov, S., R., La Porta, F. Lopez-de-Silanes, and A. Shleifer. 2003. The New Comparative Economics, *Journal of Comparative Economics*, 31 (4), 595-619.

Dollar, D. and A. Kraay. 2003. Institutions, Trade and Growth, *Journal of Monetary Economics*, 50 (1), 133-162.

Easterly, W. and R. Levine. 2003. Tropics Germs and Crops: How Endowments Influence Economic Development. *Journal of Monetary Economics*, 50, 3-39.

Easterly, W. and R. Levine. 1997. Africa's Growth Tragedy: Policies and Ethnic Divisions. *Quarterly Journal of Economics*, 112, 1203-1250.

Epstein, D. and S. O'Halloran, 1997. *Delegating Powers: A Transaction Cost Politics Approach to Policy Making under Separate Powers*, Cambridge university Press.

Frye, T. 2004. Credible Commitment and Property Rights: Evidence from Russia, *The American Political Science Review*; 98 (3), 453-466.

Furubotn, E. G. and R. Richter. 2005. *Institutions and Economic Theory: The Contribution of the New Institutional Economics*. Ann Arbor: The University of Michigan Press.

Gehlbach, S. and P. Keefer. 2011. Investment without Democracy: Ruling-Party Institutionalization and Credible Commitment in Autocracies, *Journal of Comparative Economics*, 39, 123-139.

Glaeser, D., R. La Porta, F. L. De Silanes and A. Shleifer. 2004. Do Institutions Cause Growth?, *Journal of Economic Growth*, 9, 271-303.

Hayek, F. A. 1960. *The Constitution of Liberty*. Gateway Editions, South Bend, IN.

Hendry, D. F. and G. E. Mizon. 1993. Evaluating Dynamic Econometric Models by Encompassing the VAR. In: Phillips, P.C.P. (Ed.), *Models, Methods and Applications of Econometrics*. Basil Blackwell, Oxford, pp. 272-300.

Jensen, N. 2008. Political Risk, Democratic Institutions, and Foreign Direct Investment, *The Journal of Politics*, 70(4), 1040-1052.

Johansen, S. 2005. The Interpretation of Cointegrating Coefficients in the Cointegrated Vector Autoregressive Model, *Oxford Bulletin of Economics and Statistics*, 67(1), 93-104.

Johansen, S. 1988. Statistical Analysis of Cointegration Vectors. *Journal of Economic Dynamics and Control*, 12, 231-254.

Johansen, S., R. Mosconi and B. Nielsen 2000. Cointegration Analysis in the Presence of Structural Breaks in the Deterministic Trend, *Econometrics Journal*, 3, 216-249.

Johnson, S., J. McMillan and C. Woodruff. 2002. Property Rights and Finance, *The American Economic Review*, 92, 5, 1335-1356.

Klick, J. 2010. The Perils of Empirical Work on Institutions, *Journal of Institutional and Theoretical Economics*, 166 (1), 166-170.

Knack, S. and P. Keefer. 1997. Does Social Capital Have an Economic Payoff? A Cross-Country Investigation, *The Quarterly Journal of Economics*, 112 (4), 1251-1288

Knack, S. and P. Keefer. 1995. Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures. *Economics and Politics*, 7, 207-227.

Kovac, M. M and R. Spruk. 2016. Institutional Development, Transaction Costs and Economic Growth: Evidence from a Cross-Country Investigation. *Journal of Institutional Economics*, 12, 129-159.

Lee, J. and M. C. Strazicich. 2004. Minimum LM Unit Root Test with One Structural Break. *Appalachian State University, Department of Economics: Working Paper Series*. No.04-17.

Lee, J. and M. C. Strazicich. 2003. Minimum Lagrange Multiplier Unit Root Test with Two Structural Breaks. *Review of Economics and Statistics*. 85(4), 1082-1089.

Levy, B. and P. T. Spiller. 1996. *Regulations, Institutions, and Commitment: Comparative Studies of Telecommunications*. New York: Cambridge University Press.

Levy, B. and P. T. Spiller. 1994. The Institutional Foundations of Regulatory Commitment: A Comparative Analysis of Telecommunications Regulation, *Journal of Law, Economics and Organization*, 10 (2), 201-246.

Marinescu, C. 2012. Transaction Costs and Institutions' Efficiency: A Critical Approach, *American Journal of Economics and Sociology*, 71 (2), 254-276.

Montesquieu, M. de S., 1748. *The Spirit of Laws*. Fred B. Rothman, Littleton, CO.

Murphy, K. M, A. Shleifer and R. Vishny, 1991. The Allocation of Talent: Implications for Growth, *Quarterly Journal of Economics*, 106 (2), 503-530.

North, D. C. 1993. Institutions and Credible Commitment, *Journal of Institutional and Theoretical Economics*. 149(1), 11-23.

North, D. C. 1990. *Institutions, Institutional Change, and Economic Performance*, Cambridge: Cambridge University Press.

North, D. C. and B. R. Weingast 1989 Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England, *The Journal of Economic History*, 49, 803-832.

North, D. C. 1981. *Structure and Change in Economic History*. New York: Norton and Co.

North, D. C., and R. P. Thomas. 1973. *The Rise of the Western World: A New Economic History*. Cambridge: Cambridge University Press.

Olson, M. 1965. *The Logic of Collective Action*. Harvard Univ. Press, Cambridge.

Olson, M. 1982. *The Rise and Decline of Nations*. Yale Univ. Press, New Haven.

Rodrik, D., A. Subramanian and F. Trebbi 2004. Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development, *Journal of Economic Growth*, 9, 131-165.

Smith, A. 1776. *An Inquiry into the Nature and Causes of the Wealth of Nations*. University of Chicago Press, Chicago.

Spiller, P. T. 2013. Transaction Cost Regulation, *Journal of Economic Behavior and Organization*, 89, 232-242.

Spiller, P. T. and M. Tommasi. 2003. The Institutional Foundations of Public Policy: A Transactions Approach with Application to Argentina. *Journal of Law, Economics and Organization*. 19 (2), 281-306.

Stasavage, D. 2002. Credible Commitment in Early Modern Europe: North and Weingast Revisited, *Journal of Law, Economics and Organization*, 18 (1), 155-186.

Weingast, B. R. 1997. The Political Foundations of Democracy and the Rule of Law, *The American Political Science Review*, 91 (2), 245-263.

Williamson, O. 1985. *The Economic Institutions of Capitalism*. New York, Free Press.

Williamson, O. 1996. *The Mechanisms of Governance*. New York, Oxford University Press.