

CHAPTER 1

A STUDY ON INSTITUTIONAL QUALITY INDEX IN DEVELOPED COUNTRIES: THE CASE OF G-7 COUNTRIES¹

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INTRODUCTION

Institutions are made up of human-designed constraints that built economic, political, and social interactivity. Institutions comprise formal rules (laws, constitutions, property rights) and informal restrictions (sanctions, taboos, rules of behavior and customs). Throughout history, institutions have been designed by human to minimize uncertainty in exchange and create order (North, 1991), while the good quality of the institutions encourages creativity, economic growth and development, institutions with bad quality create an environment that negatively affects the economic course (Butkiewicz and Yanikkaya, 2006).

As a concept, institutional quality is handled in a broad scope that includes many political, economic or social elements such as individual rights, property rights, freedom of the press, freedom of expression, freedom of business, and government regulations. According to Krause (2009), the concept of institutional quality is both formal or informal rules of a game that supports greater integration and cooperation among individuals in the society and enables them to achieve their own goals without interfering with others' livelihoods. According to Rodrik (2004), there is widespread consensus among economists that the quality of institutions is the key to welfare models prevailing around the world. Developed countries are countries where property rights are secure, the rule of law is effective, private incentives are compatible with social goals, monetary and fiscal policies are based on strong macroeconomic institutions, political rights and civil liberties are strong. On the other hand, poor countries, stand out as countries where these reg-

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ulations do not exist or are formless. Of course, high-quality institutions are the result of economic prosperity, and possibly the cause of such situations. Indeed, Hall and Jones (1999), Rodrik et al. (2002), Acemoğlu et al. (2002), examined the positive effect of institutional quality on economic performance in their studies.

The institutional quality index can be calculated by using legal, political, economic and social variables. In this context, Kunčič (2012) calculated the components by dividing the components into three groups as legal, economic and political by applying factor analysis. However, it is aimed to calculate the institutional quality index of the G-7 countries (Germany, Italy, Canada, France, Japan, USA and the UK), which constitute the seven largest global economies for the period 2000-2018 by using the Nagar and Basu (2002) methodology in this study. While establishing the institutional quality index for these countries, principal components method is applied and the components used in the study are collected under three factors: economic, social and political. Finally, a comparison is made for the countries considered by evaluating the index results obtained.

LITERATURE

When the literature on institutional quality is examined, it is observed that the literature on the calculation of the institutional quality index is limited, but mostly the relation of institutional quality with macroeconomic variables is observed. In this respect, it is expected that this study will make a contribution to related literature.

Basu and Das (2011) calculated the institutional quality index of 88 developing countries from 1995 to 2007 by using the principal component analysis method and by using a total of 23 economic, political and social components divided into three groups.

Kunčič (2012) divided more than 30 components into three groups as legal, political and economic variables in his study, in which he calculated an institutional quality index with factor analysis, and created an institutional quality index covering 197 countries and regions from 1990-2010.

Asghar, Qureshi, and Nadeem (2015) investigated the relationship between economic growth and institutional quality using panel data method for the period 1990-2013 for 13 emerging economies of Asia. The institutional quality index was created by using the principal component analysis in their study. It was concluded that institutional quality has a positive effect on economic growth.

Nifo and Vecchione (2015) measured the institutional quality index of Italian

provinces for the period 2004-2008 and evaluated variables such as voice and accountability, political stability, rule of law, the absence of violence and government effectiveness, terrorism, corruption and regulatory quality as governance quality. They applied the methods of normalization, correlation of weights and summation of index.

On the other hand, it is seen that there are many studies examining the relationship between macroeconomic variables and institutional quality rather than calculating institutional quality. So that Butkiewicz and Yanikkaya (2006) investigated the effect of institutional quality on growth by estimating cross-country regressions for a panel of 100 developed and developing countries for the period 1970-1999. They concluded that the components of rule of law and democracy support growth and democratic institutions were particularly important for developing countries.

Teles (2007) investigated the relationship between institutional quality and growth through the endogenous growth model by including institutional dimensions such as democracy, bureaucracy, income inequality and judicial corruption. In his study, he concluded that there is a strong relationship between the variables.

Valeriani and Peluso (2011) examined the effect of institutional quality on growth for the period 1950-2009 by using panel data analysis for 181 developed and developing countries. They used civil liberties, checks and balance and quality of government parameters as institutional quality variables in their model and they found that institutional quality had a positive effect on economic growth.

Ji, Magnus, and Wang (2014) analyzed the relationship between institutional quality, resource abundance, and growth in the 1990-2008 period by analyzing panel data for China. Institutional quality was measured by confidence in the courts in their model. They found that the abundance of resources had a positive effect on provincial-level economic growth in China for the period 1990-2008, which was non-linearly dependent on institutional quality (trust in the courts).

Lau, Choong and Eng (2014) investigated the existence of long-term relationships between economic growth, institutional quality, carbon dioxide emissions and exports in Malaysia by applying the ARDL boundary test to test the cointegration relationship for the period 1984-2008. Institutional quality was calculated by law and order parameter in their model. They found that good institutional quality was important in controlling carbon dioxide emissions in the economic development process.

Lehne, Mo, and Plekhanov (2014) analyzed some factors such as the rule of law

and control of corruption that determine the quality of economic institutions using the multi-country example in their study. They found that economic and democratic institutions were closely related, but the relationship was more U-shaped than linear. In addition, the study concluded that economic institutions tended to be better in countries with greater degree of openness and without significant natural resources.

Nawaz, Iqbal, and Khan (2014) firstly created a theoretical model involving the role of institutions in supporting economic growth. Secondly, they measured the effect of institutions on growth in selected Asian economies in the period of 1996-2012 by using both dynamic and static panel system Generalized Moments Method (GMM) technique with fixed effects. They used six World Bank Governance Indicators as institutional quality parameters and they found that institutions were indeed significant in determining long-term growth.

Dong and Zang (2016) investigated the relationship between economic performance and institutional quality, accumulated social capital for each Chinese province by using the ratio of elites studying abroad, marketing index as institutional quality, and per capita income variables for the period 1847-1949. They observed that historically accumulated social capital had a strong and significant impact on economic performance, improving existing social capital and institutional quality.

CALCULATION OF INSTITUTIONAL QUALITY INDEX

According to Nifo and Vecchione (2015), as the concept of institution is complex, possible institutional quality measures are generally based on the weighted average of the indicators of social, political and macroeconomic variables. (e.g. good or bad definition of property rights, degree of corruption, probationary periods, the administrative capacity of regional and local governments, market competition, waste management, barriers to market entry, tax evasion, the shadow economy, donation of economic and social infrastructures, etc.). According to Basu and Das (2011), it is difficult to measure the institutional quality index directly. Because it is a hidden variable.

In this study, the institutional quality index is obtained by following the methodology of Nagar and Basu (2002). The variables to be used according to this methodology is shown in the function below. The Y variable is assumed as hidden variable and external variables such as X_1, X_2, \dots, X_k determine the Y variable linearly. This linear relationship is shown in the equation below.

$$Y = \alpha + \beta_1 X_1 + \dots + \beta_k X_k + \varepsilon \quad (1)$$

X_1, X_2, \dots, X_k is the series of variables that allows us to catch Y. If the total change in Y is largely explained by the change in variables, this indicates that the variance of the error term is smaller than the total variance of the latent variable Y.

$$X_k = \left[\frac{X_k - \min X_k}{\max X_k - \min X_k} \right] \quad (2)$$

First, all variables are transformed using the above equation. Then, transformed variables of the institutional quality index are calculated as a weighted sum. Here, the relevant weights are derived from the principal component analysis. Therefore, the highest weight is assigned to the first fundamental component, and the first fundamental component has the largest share of the total change in all indicator variables. Likewise, the second major component is given the second largest weight and the second main component has the second-highest share. In this way, a certain weight has been assigned to all variables (Basu, 2011).

DATA SET

In this study, G-7 countries are selected as the seven largest global economies. These countries are the great powers that make up the majority of global production and lead the global economy. In addition, the fact that these countries are democratic and have high living standards has been effective in the selection of these countries as the sample group. While calculating the institutional quality index of the G-7 countries, the variables are calculated by dividing them into three groups as economic, social and political. As seen in Table 1, the main economic institutional quality components consist of regulatory quality, corruption, rule of law, judicial independence, government effectiveness, integrity of the judicial system, and property rights. Social factor components are composed of empowerment rights, freedom of expression, freedom of religion, freedom of association and ethnic tension, while political factors are composed of components such as institutionalized democracy, democracy level and regulation of participation. In the study, the period of 2000-2018 is used because the data for most of the variables related to institutional quality are generally available for the year 2000 and later and cannot be reached after 2018. In addition, principal components method is performed by using SPSS Statistic-22 package program, and then each country's institutional quality score is calculated by using the Nagar and Basu (2002) methodology.

Table 1. Variables and Sources Used in Calculation of Institutional Quality Index

Variables	Descriptives	Source
Economic	Government Effectiveness	WGI
	Regulatory Quality	WGI
	Control of Corruption	WGI
	Rule of Law	WGI
	Judicial independence	Fraser Institute
	Integrity of the legal system	Fraser Institute
	Protection of property rights	Fraser Institute
Social	Empowerment Rights Index	CIRI
	Freedom of Religion	CIRI
	Freedom of Assembly and Association	The Qog Institute
	Freedom of Speech	The Qog Institute
	Ethnic Tension	ICRG
Political	Institutionalized Democracy	Polity IV
	Level of Democracy	The Qog Institute
	Regulation of Participation	Polity IV

FINDINGS

Factor analysis is applied while establishing the institutional quality index of G-7 countries, and the components used in the study were collected as economic, social and political under three factors. Factor analysis can be expressed as a multivariate statistic that aims to find and explore a few meaningful new variables (dimensions, factors) by bringing together many related variables (Büyüköztürk, 2002). It deals with the issue of examining the interrelationships between variables and then explaining these variables in terms of common, fundamental factors (Muca et al., 2013). In this context, it is tried to be explained by Kaiser-Meyer-Olkin (KMO) and Barlett test whether the data obtained from countries to determine the existence of a relationship between variables are suitable for factor analysis. In addition, the reliability coefficients (Cronbach's Alpha) are calculated for the three factors determined as a result of the factor analysis.

Table 2. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,728
Bartlett's Test of Sphericity	Approx. Chi-Square	1117,956
	df	105
	Sig.	,000

Field (2000) states that the value of 0.50 should be the lower limit for the Kaiser-Meyer-Olkin test and that the data set cannot be factored for $KMO \leq 0.50$. Table 2 shows that Kaiser-Meyer-Olkin Measure of Sampling Adequacy value is 0,728 and Bartlett's Test of Sphericity is 0.00. If $KMO > 0.6$ and Bartlett sig < 0.05 , these values show that the sample size is suitable for factor analysis.

Table 3. Principal Component Analysis For Total Variance Explained

Component	Initial Eigenvalues					
	Total	% of Variance	Cumulative %			
1	5,962	39,748	39,748			
2	2,579	17,195	56,943			
3	1,987	13,243	70,186			
4	1,218	8,118	78,305			
5	,901	6,004	84,308			
6	,783	5,218	89,526			
7	,478	3,189	92,715			
8	,311	2,076	94,791			
9	,236	1,575	96,366			
10	,184	1,225	97,590			
11	,177	1,178	98,769			
12	,061	,409	99,178			
13	,052	,345	99,523			
14	,040	,264	99,787			
15	,032	,213	100,000			
	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,962	39,748	39,748	5,952	39,677	39,677
2	2,579	17,195	56,943	2,547	16,983	56,660
3	1,987	13,243	70,186	2,029	13,527	70,186

The principal component (PCA) method is a summary of factor analysis. Because both methods results and interpretations are similar, but their mathematical models are different (Muca et al., 2013). In this study, principal component analysis is selected while applying factor analysis. Table 3 shows that the eigenvalue of the first factor (economic institutional quality) is 5,962% and the explained variance ratio is 39,748%. It is seen that the eigenvalue of the second factor (social institutional quality) is 2,579% and the explained variance ratio is 17,195%, and the eigenvalue of the third factor (political institutional quality) is 1,987% and the explained variance ratio is 13,243%. Factors with eigenvalues statistics greater than 1 are considered significant (Hayton et al, 2004), so since the eigenvalues statistics of three factors are greater than 1, they are considered significant.

Table 4. Principal Component Analysis for Rotated Component Matrix

Factor 1: Economic IQI			
Government Effectiveness	,931		
Regulatory Quality	,868		
Rule of Law	,960		
Control of Corruption	,969		
Judicial Independence	,949		
Integrity of the Legal System	,909		
Protection of Property Rights	,737		
Factor 2: Social IQI			
Empowerment Rights Index		,828	
Freedom of Religion		,730	
Freedom of Assembly and Association		,491	
Freedom of Speech		,727	
Ethnic Tension		,653	
Factor 3: Political IQI			
Institutionalized Democracy			,929
Level of Democracy			,572
Regulation of Participation			,850

As a result of the applied principal component analysis, the components were collected in three factors. Büyüköztürk (2010) states that it would be sufficient for the factor load value to be .70 and above. In this context, it reveals that the data come from multivariate normal distribution and that there is a sufficient relationship between variables for factor analysis. The values in the rotated component

matrix are shown in the Table 4. It is seen that factor load values range from .73 to .93 for the first factor, between .49 and .82 for the second factor, and between .57 and .92 for the third factor. When all the factor load values are examined in terms of magnitude, they can be described from good to excellent except for two items (Freedom of assembly and association and level of democracy).

Table 5. Reliability Statistics		
	Cronbach's Alpha	N of Items
Economic IQI	,952	7
Social IQI	,724	5
Political IQI	,714	3
Total	,747	15

Cronbach's Alpha value, which is the reliability coefficient, is between 0 and 1. As can be seen in Table 5, Cronbach's Alpha value for economic institutional quality is 0,952, 0,724 for social institutional quality and 0,714 for political institutional quality and total Cronbach's Alpha value is 0,747. As a matter of fact, Cronbach's Alpha and Kaiser-Meyer-Olkin values higher than 0.70 indicate that there is no negative situation affecting the reliability of the analysis and it is a very reliable situation for the factors.

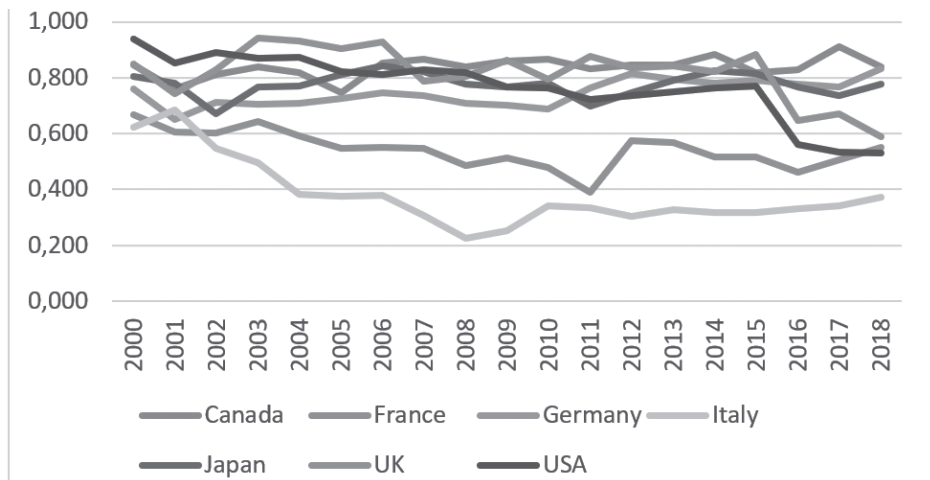


Figure 1. Institutional Quality Index Values of G-7 Countries by Years

When the institutional quality index calculated as a result of the principal components analysis is evaluated, it is seen in Figure 1 that the institutional quali-

ty index values of the G-7 countries have started to differ from each other over the years, especially in the early 2000s. Among these countries, it can be stated that Germany, Japan, the United Kingdom and the USA displayed good performances in terms of institutional quality even if their index values fluctuate starting from 2001 until 2015. However, it is seen that the institutional quality index values of Italy are in a decreasing trend from 2001 to 2008 and France from 2001 to 2011. The reason why these countries differ negatively from others is that they perform weaker, especially in the components of economic institutional quality. Another notable element in Figure 1 is that the United Kingdom and USA have experienced sharp declines in their institutional quality index values since 2015, It can be stated that the reason for this is the weakening of the elements that make up the level of democracy in these countries. However, it can be observed that Germany, Japan, Italy and France's institutional quality index values have increased in recent years.

Table 6. Institutional Quality Index Scores of G-7 Countries

	2015	2016	2017	2018
Canada	0,819	0,830	0,912	0,840
France	0,518	0,462	0,507	0,553
Germany	0,791	0,776	0,768	0,833
Italy	0,317	0,333	0,341	0,373
Japan	0,815	0,768	0,735	0,779
UK	0,884	0,645	0,673	0,590
USA	0,770	0,563	0,534	0,532

Source: Calculated by the author by applying Basu and Das (2002) methodology.

Table 6 shows the institutional quality index scores of the G-7 countries for the period 2015-2018. A high institutional quality score indicates a high institutional quality in these countries (Basu and Das, 2011). Accordingly, when the last four years are examined, it is stated that the countries with the highest institutional quality are Canada, Germany and Japan, respectively, while the country with the lowest institutional quality performance among these countries is Italy. In countries with high institutional quality, the establishment of the rule of law and the independence of the judiciary, the protection of property rights, the low level of corruption and the high level of democracy are striking factors. Compared to

other countries, Italy shows weak performance, especially in components such as rule of law, judicial independence, control of corruption, government effectiveness, integrity of the legal system and integrity of property rights. For this reason, Italy is considered to have the lowest institutional quality scores among the G-7 countries.

CONCLUSION

Institutional quality is a concept that can be handled in a very broad framework that includes social factors such as economic freedom, corruption, freedom of investment, commercial freedom, government effectiveness, rule of law, property rights, political score, democratic accountability, political competition, political participation, freedom of religion and belief, freedom of association, freedom of expression, freedom of domestic or international travel. These factors are important parameters for obtaining information about the economic, social and political structures of the countries as a whole. These parameters, which express institutional quality, are generally considered to be important factors affecting the economic performance of countries.

In this study, the institutional quality index of the G-7 countries, which constitute the seven largest global economies, are calculated using the Nagar and Basu (2002) methodology and then a cross-country comparison is made. When the index results are evaluated, it can be stated that among these countries, Germany, Japan, the United Kingdom and the USA performed well from 2001 until 2015. But, it is seen that the institutional quality index values of Italy were in a decreasing trend from 2001 to 2008 and France from 2001 to 2011. It can be stated that the reason why these countries differ negatively from others is their weak performance, especially in economic institutional quality components. On the other hand, it can be said that the values of the Institutional Quality Index have fallen sharply since 2015 in UK and USA due to weakening elements that determine the level of democracy. However, there has been an increase in the institutional quality index values of Germany, Japan, Italy and France in recent years. In addition, when the last four years are examined, it is seen that the countries with the highest institutional quality is Canada, while the country with the lowest institutional quality performance among these countries is Italy. In countries with higher institutional qualities, what stands out, in general, is the establishment of the rule of law and judicial independence, protection of property rights, low corruption rates and a high level of democracy. In this context, it can be said that Italy's lowest institutional quality values among these countries are due to components such as rule of law, government effectiveness, independence of the judiciary, control of

corruption, integrity of the legal system and integrity of property rights.

Making cross-country institutional quality comparisons can be taken as a reference for policymakers. On the other hand, due to the relationship between institutional quality and economic performance or welfare level, policies to strengthen institutional quality should not be abandoned. In addition, making a similar analysis for other developed, developing, or underdeveloped countries or country groups such as the G-7 and making comparisons between these countries will contribute positively to related literature.

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