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AN EVALATION OF THE EXPLANATORY POWER OF INDICATORS OF INSTITUTIONAL STRUCTURE ON ECONOMIC GROWTH: A COMPARATIVE ANALYSIS

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ABSTRACT

This paper investigates the relationship between institutional structure-economic growth in an economy. An important question which has been raised in literature is of which indicators represent the institutional structure. Therefore, the aim of this paper was to determine the performance of alternative indicators when adopted by different approaches to explain economic growth. The indexes used in the analyses of the study were those which have been calculated as indicators for the measurement of institutional structure. As the paper provides comparisons between 4 different indexes with separate analyses, the results can be considered to make an important contribution to the literature related to the relationships between institutions and economic growth. The findings of this paper demonstrated a significant and different result in respect of the relationship between organizational structure and economic growth and the significance of indexes.In comparison to the Heritage index,the relationship with economic growth of the organizational parameters represented in the Fraser index and the Freedom of the Press index were determined to be stronger in terms of both statistics and expected effect for all income groups. Within the context of these results, in the comparison of the Heritage and the Fraser Indexes, which measure economic freedom using different methods and parameters, it was established that the Fraser index stands out and provides more meaningful findings in terms of the relationship between developments.

Keywords: Institutional Economics, Economic Growth, Economic Freedom Index, PMG
JEL-Classification: C01, C31, E20

KURUMSAL YAPI TEMSİLCİLERİNİN EKONOMİK BÜYÜMEYİ AÇIKLAYICI GÜCÜNÜN TEST EDİLMESİ: KARŞILAŞTIRMALI ANALİZ

ÖZET

Bu çalışma, bir ekonomide kurumsal yapı ile ekonomik büyüme ilişkisini araştırır. Kurumsal yapının, hangi göstergelerce temsil edileceği ise önemli soru işaretlerinden biridir. Dolayısıyla bu çalışma ile literatürde farklı yaklaşımlarca benimsenen alternatif göstergelerin ekonomik büyümeyi açıklama performansının tespit edilmesi amaçlanmıştır. Bu nedenle, literatürde kurumsal yapıyı ölçmeye yönelik göstergeler olarak, uluslararası kuruluşlar tarafından hesaplanan indeksler temel alınmıştır. Çalışmanın, tek bir indekse bağlı kalmayarak, 4 farklı indeks için ayrı ayrı analizlerle bir karşılaştırma imkânı tanıması, kurumlar ile ekonomik büyüme ilişkisine yönelik literatüre önemli bir katkı

sunduğunu kanıtlar. Çalışmada kurumsal yapı ile ekonomik büyüme ilişkisi, Heritage (Ekonomik Özgürlükler İndeksi) ve FOTP (Basın Özgürlüğü) indekslerini içeren modellerin testi için 74 ülkenin 1995-2014 dönemi, Fraser (Dünya Ekonomik Özgürlükler İndeksi) ve WGI (Dünya Yönetişim Göstergeleri) indekslerini içeren modellerin testi için ise 113 ülkenin 2000-2014 dönemi verileri ile araştırılmıştır. Analize dayalı bulgular, ülkelerin gelişmişlik grupları itibariyle değerlendirilmiştir. Bulgular, literatürdeki tespitlerle karşılaştırmaya tabi tutulmuştur.
Anahtar Kelimeler: Kurumsal İktisat, Ekonomik Büyüme, Ekonomik Özgürlükler İndeksleri, PMG
JEL-Sınıflama: C01, C31, E20

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1. INTRODUCTION

The relationship between institutions and economic growth is accepted as a popular research subject by statisticians. Empirical research into this relationship has become much more intense in the last 30 years and there are many examples in literature that have demonstrated the relationship between institutions and economic growth for different countries and time periods.

This study conducted an investigation of the relationship between institutional structure and economic growth in an economy. Which indicators best represent institutional structure is an important question. Therefore, the aim of the study was to determine the performance of alternative indicators adopted by different approaches in literature in explaining economic growth. The indexes in literature calculated by international institutions were taken as the basis for indicators measuring institutional structure. By not depending on a single index, comparisons were made with separate analyses of 4 different indexes, thereby providing a significant contribution to the literature related to the relationship of institutions with economic growth.

In this study, the relationship between institutional structure and economic growth was investigated with the 1995-2014 data of 74 countries for a test of models including the Heritage (Index of Economic Freedom) and the Freedom of the Press (FOTP) Index, and the 2000-2014 data of 113 countries for a test of models including the Fraser (Economic Freedom of the World Index) and the Worldwide Governance Indicators (WGI) Index. The findings based on the analyses were evaluated according to the developmental stage of countries, then the findings were compared with previous findings determined in literature.

2. LITERATURE REVIEW

Literature related to institutional structure and economic growth assumes that there are indirect factors with an effect on growth function in addition to the classic factors. The basic aim of these studies is related to the need to determine which elements to use as the institution-institutional structure parameter. However, it has not seemed to be possible to produce an incontrovertible institutional structure parameter and/or index. Several sub-parameters and indexes are able to represent the institution-institutional structure in specific measurements and aspects. The great number of sub-parameters raises the problem of resolving multiple effects on growth at different levels and aspects. This prevents the clear determination of the structure-growth relationship. Basically all these

limitations and problems are related to the specific institutional concept and are a natural result. Institutions classified as pragmatic and organic target all cases which are the result of human production and common activities with several elements which are different from each other such as language, state, justice system, social division of labour, finance and financial markets. Therefore, the essence of this concept includes multi-directional characteristics. Empirical literature on the relationship between institutional structure and growth is weighted towards panel data analyses. Thus, it has become possible to obtain information at both time period level and unit level. Furthermore, panel data analysis is preferred for reasons such as the ability to work with more data, and increasing the numbers of observations and degree of freedom. However, this method with data obtained by pooling the data of many countries containing different characteristics, has several risks in respect of reliability and the results. Empirical literature that has researched the institutional structure and growth relationship is seen to have been grouped with criteria such as the development of countries. It can be said that this literature intensified in the 1990s when new institutional economics came to the fore.

Institutional indicators in literature include many elements, primarily property rights, transparency, tax burden, public spending, labour freedom, monetary freedom, commercial freedom, investment freedom and financial freedom scores, public sector size, the justice system and property rights, strong currency, import-export freedom and regulations, and press freedom, freedom status (political and civil rights), accountability, political stability and the absence of violence-terrorism, the effectiveness of the administration, the quality of regulations, the rule of law, and economic performance in the context of competition with the prevention of corruption.

According to Haan and Clemens (1995), there is no strong correlation between deficiencies in political freedom and democracy and economic growth. Knack and Keefer (1995) stated that indicators of violence, politics and civil freedom were insufficient alone to show the quality of institutions protecting property rights. Accordingly, it was stated that institutions protecting property rights are very important for economic growth and investment performance. Similarly, Nelson and Singh (1998) found strong statistical evidence that political and civil freedoms are related to growth. Deficiencies in democracy and political freedoms severely inhibit the economic performance of countries. In contrast, Baum and Lake (2003) stated that democracy had no direct effect on growth. However, Makikane and Chitambra (2017) concluded that democracy was a significantly strong driver of economic growth. This was attributed to countries with strongly democratic institutions being able to benefit more from the effect of the spread of foreign capital.

Roll and Talbott (2001) stated that political rights, civil freedoms, property rights and press freedom created a positive effect on growth. Khalil, Ellaboudy and Denzau (2007) reported that the implementation of strong property rights, independent judiciary, interventions against corruption, press freedom, political rights and civil freedoms could provide more rapid growth. In studies by Benyishay and Betancourt (2010) and Umutlu, Yilmaz and Guneyli (2011) using the civil freedoms index, it was determined that the relationship between long-term growth and the indicators related to property rights was extremely strong. Similarly, Sarwar, Siddiqi and Butt (2013) reported that an improvement in property rights had a positive effect on economic growth. Leblang (1996) emphasised that growth was more rapid in countries where property rights were strong and economic growth was affected indirectly in the context of the protection of property rights in the political regime structure.
According to Nelson and Singh (1998), while economic freedoms create a positive effect on growth, the size of the public sector – public consumption affects it negatively. Roll and Talbott (2001) reported that variables related to the level and regulations of stock market activities on income have a strong effect on property rights. Of these, two are positive and two are negative. Public spending creates a positive effect on growth, while inflation and commercial obstacles have a negative effect. Dawson (2003) revealed that economic growth was provided by the level of general economic

freedom and changes in the freedoms. Feld and Voigt (2003) concluded that there was a positive relationship between an independent judiciary and growth.

Institutional quality and judicial indicators were emphasised as having a positive effect on growth by Grigorian and Martinez (2000). In addition, growth is affected by the nature of increasing the amount of investment in the economy, not only with the implementation of developed laws and regulations and decreased administrative obstacles, but also with the productivity of resource allocation. Siddiquia and Ahmed (2009) indicated a strong relationship between institutional quality and economic growth. Supporting this view, Bloch and Tang (2004) reported that there was a strong relationship between high technical advances and a strong institutional structure and between high technical advances and income level. Institutions can be said to be an important factor in the increase in living standards with effects on growth and income, and this can be realised through the channels of technical advances and changes.

3. DATA, METHOD AND MODEL

To investigate the relationship between institutional structure and economic growth, different models were formed with indexes representing institutional structure. The data of 74 countries from the period 1995-2014 were used to test the models (2 models/ 2 submodels) formed on the basis of the Heritage (Index of Economic Freedom) and the Freedom of the Press (FOTP) Index. In addition, the 2000-2014 data of 113 countries were used to test the models (2 models / 2 submodels) formed on the basis of the Fraser (Economic Freedom of the World Index) and the Worldwide Governance Indicators (WGI) Index.

For each model, the countries were analysed according to the level of development. This grouping of the countries in development levels was based on the criteria of the World Bank classification. In terms of income per capita, countries with ≤1005 USD are classified as low income group countries, 1006-3955 USD as average income group countries, 3956-12235 USD as above-average income group countries and ≥12236 USD as high income group countries (1).

In the selection of the time periods in the analysis, the starting years were determinants in the index calculations. In this context, the period 1995-2014 was used for the models containing the Heritage and FOTP indexes, and the period of 2000-2014 for the models containing the Fraser and WGI indexes. Taking data integrity into consideration, which is important for panel data analysis, countries with missing data were not included in the analysis.

Indexing methods based on different parameters are used to be able to measure power in respect of the institutional structure of a country. Using these indexes, it is attempted to determine the effect of institutional structures from an economic growth perspective. Indexes that deal with institutional structure in similar and/or different contexts were used in the study. The power of these indexes to explain the institutional stucture -growth relationship was tested. Taking a broad range of institutional structure into consideration in the selection of the index, parameters were selected which included both economic and socio-political factors together. For the dependent variables used in the econometric analysis;

- From the World Bank database, real GDP (million USD/2011) data calculated with the production method based on purchasing power parity,

For control variables used in the econometric analysis;

- With the data of the employment rate (population aged 15+ years),

- Capital stock data (capital stock compared to purchasing power parity - million USD/2011),

obtained from the Groningen University Penn World Table database. These data were transformed logarithmically and corrected as panel data. The institutional structure variables used in the econometric analysis were obtained using the main and sub-components of the Index of Economic Freedom (Heritage), the Economic Freedom of the World Index (Fraser), the Press Freedom Index (Freedomhouse) and the Worldwide Governance Indicators (WGI) Index:

- Property rights, transparency, tax burden, public spending, employment freedom, financial freedom, commercial freedom, investment freedom; The Index of Economic Freedom (Heritage) (http://www.heritage.org/index/),

- The size of the public sector, the judicial system and property rights, strong currency, import-export freedom and regulations; Economic Freedom of the World (Fraser) (https://www.fraserinstitute.org/economic-freedom/dataset),

- Press freedom scores (FOTP) (Freedomhouse) (https://freedomhouse.org/report/table-country-scores-fotp-2017),

- Political stability, the absence of violence and terrorism, and the prevention of corruption; Worldwide Governance Indicators (WGI) (http://info.worldbank.org/governance/wgi/#home).

To eliminate the problem of heterogeneity between countries and strengthen the analyses, the data set used in the analysis was classified into 3 groups as high-income, average income and low-income groups. As there were insufficient countries in the low-income group, these were combined for analysis as a low-average income group, which constituted a limitation.

Table 1. Variables used in the Models

Abbreviation	Explanation
lncapitalstock	Capital stock (logarithmic)
lnemp	Employment (logarithmic)
hrtg.gen.score.	Heritage General score
press.freedom	Press freedom score
Hrtg. property rights	Heritage property rights
hrtg.state transparency.	Heritage transparency of the state
hrtg.tax burden	Heritage tax burden
hrtg.public spending	Heritage public spending
hrtg.employment freedom	Heritage employment freedom
hrtg.monetary freedom	Heritage monetary freedom
hrtg.commercial freedom.	Heritage commercial freedom
hrtg.investment freedom.	Heritage investment freedom
hrtg.financial freedom.	Heritage Financial freedom
fraser.general score	Fraser General score
fraser.size of public sector	Fraser size of the public sector
fraser.strong currency	Fraser strong currency
fraser.foreign trade freedom	Fraser foreign trade freedom
fraser.judicial system-property rights	Fraser judicial system-property rights
fraser.regulations	Fraser regulations
wgi.political stability-absence of violence and terrorism	WGI political stability- absence of violence and terrorism
wgi.prevention of corruption	WGI prevention of corruption

The models used in this study to examine the relationship between the institutional structure indicators of different indexes and economic growth were formed from the Cobb-Douglas production function. In the econometric models, the institutional structure indicators of different indexes were added to function.

The relationship betweeen institutional structure and economic growth was analysed on the basis of 8 different models, comprising 4 main and 4 sub-models. In the first model formed on the basis of the Heritage Economic Freedoms Index and the Press Freedom Index, the general effect of the indexes was investigated together with control variables. From this it was possible to see the effects of economic variables and institutional structure variables separately. For several subscores to be analysed in the other two sub-models, indicators including legal regulations, transparency and the size and regulations of the public sector in economic life were classified in one group, and parameters showing market freedoms in another group.

The models and sub-models used in the analysis were as follows:

Model 1

$lngdpout_{i,t} = \alpha_0+\beta_1 hrtg.gen.score_{i,t}+\beta_2 lncapitalstock_{i,t}+\beta_3 lnemp_{i,t}$

Model 1.1.

$lngdpout_{i,t} = \alpha_0+\beta_1 hrtg.property\ rights\ .{}_{i,t}+\beta_2 hrtg.state\ transparency.{}_{i,t}+\beta_3 hrtg.tax\ burden.{}_{i,t}+\beta_4 hrtg.public\ spending.{}_{i,t}+\beta_5 hrtg.employment\ freedom.{}_{i,t}$

Model 1.2.

$lngdpout_{i,t} = \alpha_0+\beta_1 hrtg.currency\ freedom.{}_{i,t}+\beta_2 hrtg.commercial\ freedom.{}_{i,t}+\beta_3 hrtg.investmnt\ freedom.{}_{i,t}+\beta_4 hrtg.financial\ freedom.{}_{i,t}$

Model 2.

$lngdpout_{i,t} = \alpha_0+\beta_1 press.freedom_{i,t}+\beta_2 lncapitalstock_{i,t}+\beta_3 lnemp_{i,t}$

In the models including the Fraser Economic Freedoms Index and the WGI, both the general effect of the index and the effect of the sub-components were investigated together with economic parameters. From this it was possible to see the effects of economic variables and institutional structure variables separately. In the sub-models based on the Fraser index, the institutional structure parameters were modelled to differentiate economics and administration-politics-judiciary. The models and sub-models were formed as follows:

Model 3

$lngdpout_{i,t} = \alpha_0+\beta_1 fraser.econ._{i,t}+\beta_2 lncapitalstock_{i,t}+\beta_3 lnemp_{i,t}$

Model 3.1.

$lngdpout_{i,t}=\alpha_0+\beta_1 fraser.size\ of\ public\ sector._{i,t}+\beta_2 fraser.strong\ currency\ _{i,t}+\beta_3 fraser.import\text{-}export\ freedom._{i,t}+\beta_4 lncapitalstock_{i,t}+\beta_5 lnemp_{i,t}$

Model 3.2.

$lngdpout_{i,t}= \alpha_0+\beta_1 fraser.judicial\ system\ property\ rights._{i,t}+\beta_2 fraser.regulations._{i,t}+\beta_3 lncapitalstock_{i,t}+\beta_4 lnemp_{i,t}$

Model 4.

$lngdpout_{i,t} = \alpha_0+ \alpha_0+\beta_1 wgi.political\ stability,\ absence\ of\ violence\ and\ terrrorism._{i,t}+\beta_2 wgi.corruption._{i,t}+\beta_3 lncapitalstock_{i,t}+\beta_4 lnemp_{i,t}$

4. RESULTS

The results obtained from analysis of the models explaining the structure, as shown in the section above, can be stated as follows:

First stability of the series was examined with unit root tests of the different panels developed. These tests were classified as first and second generation. The first-generation panel unit root tests can be applied when there is no correlation between horizontal section units and are based on the Dickey Fuller (1979) and the Augmented Dickey Fuller (ADF) test approach. Frequently used first-generation unit root tests included the Levin and Lin (1992), Harris and Tzavalis (1999), Breitung (2000), Im, Pesaran and Shin (1997), Maddala-Wu (1999), Hadri (2000), Choi (2001), Levin, Lin and Chu (2002), Im, Pesaran and Shin (1997, 2003) tests.

In contrast to the first-generation tests, the second-generation panel unit root tests are applied when there is horizontal section dependence between section units, and were developed to eliminate deviation in the possible finite sample characteristics which could emerge in this relationship. Stability analysis was made on the basis of cross-sectional dependence. The Pesaran CD test (2004) is one of the tests frequently used for this. In literature, the most commonly used second-generation panel unit root tests are the Moon and Perron (2003), Bai and Ng (2004), Phillips and Sul (2003), Pesaran (2003), and Chang and Park (2003) tests. In this study, first, the first-generation panel unit root test, the ADF-Fisher test (Maddala-Wu) was applied. In this test, the ADF unit root applied to all the section units is calculated based on "p" probability values. The test procedure is applied to all the data of the groups for each country. The stability of the data was examined taking both the level and the first differences into consideration. For all the data where the individual effect and the trend values were different, the test was repeated taking the first differences. According to the results of the ADF-Fisher test (Maddala-Wu), stability was provided for all the data related to the variables used in the panel data analysis and it was concluded that there was no unit root.

The same data set was then assessed with the second-generation panel unit root test, the Pesaran CADF test (cross-sectionally augmented Dickey Fuller). This test accepts the assumption that the series comprising the panel data contain an identical component and "recommends a single factor model defined by heterogeneous factor loads that are valid in cross-sectional dependence". By

applying the procedure associated with this test in its entirety, the stability of all the data related to all the variables is examined, taking both the level and first differences into consideration. For all the data where the individual effect and the trend values were different, the test was repeated taking the first differences. According to the results of the Pesaran CADF test, stability was provided for all the data related to the variables used in the panel data analysis and it was concluded that there was no unit root. Therefore, it can be said that there was stability in the first difference of the series used in the analysis.
The first-generation and second-generation panel unit root test results are shown below in the established models and country groups. To be able to estimate the relationship to unstable heterogenous panels where the number of group and time series observations was large the Pooled Mean Group (PMG) estimation method was used. This method which helps to estimate unstable dynamic panels, where the parameters are heterogenous between the groups, was first applied by Pesaran, Shin and Smith (1977). The method is able to provide parameter estimations in both the short and long term.

The PMG method allows for changes from unit to unit for coefficient and error variations in the short term, but accepts homogeneity for all units in respect of long-term coefficients. The PMG method has advantages over the Mean Group (MG), which is another estimation model developed for the ARDL model. The MG estimation method does not allow units forming the panel of certain parmeters to be the same. This problem can be overcome with the PMG method. At the point of obtaining PMG predictions, the maximum probability approach is adopted based on the assumption that error terms show normal distribution. In this context, long-term parameters and the intensified logarithmic probability function of error correction coefficients for each group are maximised. After obtaining long-term indicators, the short-term indicators error correction coefficients forming the panel were estimated from the Least Squares Regressions for each country. Thus in contrast to MG estimation, the PMG method is revealed as an approach allowing heterogenity in the short term and homogeneity in the long term in the parameters. In this study, predictions were made for country groups of the strength and direction of the potential short and long-term relationships between economic growth and parameters representing institutional structure. However, since independent variables are formed from the parameters representing the institutional structure and their effects on growth are predicted to be long-term, the short-term effects were ignored.

According to the econometric analysis results, the strongest example for all income groups for the relationship between economic growth and indexes representing institutional structure, was determined to be the Fraser index. The relationship between economic growth and the FOTP index was significant for all income groups. In the analysis of the sub-scores of the Heritage index, the relationship of the institutional structure parameters with growth, the results were observed to be significnt and consistent.
The relationship was examined between economic growth and the scores of property rights, transparency, employment freedom, monetary freedom, commercial freedom, financial freedom and investment freedom, which are the sub-parameters of the Heritage index. These relationships are presented in Table 2. When evaluated in respect of income groups, the most significant results were seen in the high income group compared to the low/below average income group. These results are consistent with those of Nelson and Singh (1998), which rejected the claims that under-developed countries which are less democratic grow more rapidly and stated that economic freedoms created a positive effect on growth.

The results of the above-average income group were less significant compared to the other income groups, and showed a weak, negative correlation. At this point, lack of institutional structure and differentiation of parameters affecting growth in transitional economies compared with other economies can lead to the effects of these structures functioning in the opposite direction to growth.

This result in respect of developed countries is consistent with the findings of Gökalp and Baldemir (2006), who found a negative correlation between economic growth and freedom, accountability, rule of law and regulations for developed countries.

Results related to the negative relationship of property rights, investment freedom and economic freedoms with economic growth in developing countries are consistent with the results of Tunçsiper and Biçen (2014), who reported similar findings from countries with an increasing market economy. The negative relationship determined in the current study between economic growth and property rights and the investment freedom index was revealed when there was no significant relationship found between economic growth and the economic freedom index. That different relationships were determined in respect of the country groups in the analyses was consistent with the findings reported by Arslan (2007) and Artan and Hayaloğlu (2013). These studies support the conclusion that institutional structure affected growth more in developed countries and indicators representing institutional structure created an effect on growth at different levels in the context of country groups with different levels of development. Pitlik (2002) reported that it was not the level of economic freedom that was important in economic growth, but the volatility of these freedoms, and in this context, increased volatility will have a negative effect on economic growth, and this can be seen to be the reason for different effects and results at different levels of development. This was supported in another evaluation with the findings of Yıldırım (2010) that an improvement in economic freedom scores in countries with low technology levels has a negative effect on growth. However far a country is from the technology border, then an increase in economic freedoms reduces the rate of growth to that extent. However, the effects of economic freedoms are high in countries close to the technology border. In the second sub-model of Model 2, the result that investment and financial freedoms created a negative effect on economic growth in developing countries was consistent with the findings of Blanco (2013). This is because financial development and improvement in the investment environment in the long term created a positive effect only in the high income group and the same effect did not emerge in low income groups, supporting the findings that financial development affected economic growth negatively. Similarly, Aydin, Ak and Altıntaş (2014) indicated that the effect on economic growth of expansion of the area of financial freedoms was negative in respect of the surrounding countries. This shows that interventions at the point of financial freedoms should be managed simultaneously with other structural and institutional transformation processes and applications.

The tax burden score as one of the sub-parameters of the Heritage general index increases to the same extent that the tax rate and burden are low. In this context, when considered as an indicator of economic freedoms in the scope of the Heritage index, there can be expected to be a positive correlation between tax burden score and economic growth. According to the PMG analysis results, the relationship between tax burden score and economic growth for all income groups was found to be both the expected indicator and statistically significant. The strength of the relationship was much greater in high income group countries. The correlation between public spending and economic growth was similarly determined to be statistically significant. However, in respect of being an expected indicator, the relationship in the above average income group was negative. Public spending increases proportional to GDP, and in other words, with a fall in public spending value for Heritage, a fall in economic growth is expected. However, in the above average income group, a fall in public spending increased growth. This result undoubtedly has a consistent aspect within itself. The reasons for the emergence of the opposite result to the expected indicator for the above-average income group, can be seen in points such as the driving force of public spending for the growth of transitional economies, and the need for large amounts of public spending for investment in the infrastructure required for growth, and the importance of public purchases for the deepening of the private sector. Alexiou (2009) supported these results in a study testing the relationship between public spending and

growth in 7 countries in South-east Europe with a transitional economy in the period 1995-2005. The results showed that public spending had a positive effect on growth. In findings specific to the economy of Turkey in the category of developing countries (above-average income level group), Uzay (2002) and Oktayer and Susam (2008) also indicated a positive relationship between public spending and growth. Işık (2016) reported a statistically significant positive effect on economic growth of public spending and investment freedom indexes in developed countries, thereby supporting the findings in the sub-models of Model 2.

Table 2. The PMG results of the Parameters of the Heritage Economic Freedoms Index used in Model 1 and the sub-models

	Dependent variable (lngdpout)	Model 1			Model 1.1			Model 1.2		
		Above-average income	High income	Low/below-average income	Above-average income	High income	Low/below-average income	Above-average income	High income	Low/below-average income
Model 1	lncapitalstock	0.597*** (0.018)	0.167*** (0.011)	0.924*** (0.142)						
	lnemp	0.102* (0.064)	0.159* (0.107)	0.395 (0.367)						
	hrtg.gen.score.	-0.019*** (0.001)	0.0003 (0.0007)	-0.093*** (0.026)						
Model 1.1	hrtg. property rights				-0.023*** (0.002)	0.067*** (0.026)	0.018* (0.009)			
	hrtg.state transparency.				0.021*** (0.002)	-0.022* (0.015)	0.008 (0.010)			
	hrtg.tax burden				0.059*** (0.006)	0.148*** (0.030)	0.067*** (0.010)			
	hrtg.public spending				-0.005** (0.002)	0.050*** (0.019)	0.020*** (0.006)			
	hrtg.employment freedom				-0.011*** (0.003)	0.200*** (0.059)	0.049*** (0.008)			
Model 1.2	hrtg.monetary freedom							0.014*** (0.003)	0.118*** (0.035)	0.043*** (0.013)
	hrtg.commercial freedom.							0.021*** (0.002)	0.248*** (0.056)	0.026*** (0.003)
	hrtg.financial freedom.							-0.007** (0.003)	0.010* (0.007)	0.045*** (0.012)
	hrtg.investment freedom.							0.022*** (0.002)	0.042*** (0.017)	0.053*** (0.012)

Statistical significance: *10%, **5%, ***1%
Values in parentheses indicate standard error.

The relationships between press freedoms and economic growth are shown in Table 3 and were seen to be significant for all income groups. Although a negative correlation was obtained from the model, a fall in the press freedom score in the index system expresses an advanced press freedom status. In this respect a negative correlation between growth and press freedom scores is expected. In literature, the relationship between press freedom and economic growth has been established to be predominant indirectly. Press freedom emerges in the context of the means of preventing corruption (Shen and Williamson, 2005), increasing civil society participation, and activating channels to inform the public on decision-making processes and the successful implementation of these decisions with political decisions. Easy and reliable access to information, the prevention of censorship and consequently the provision of press freedom strengthens the control over management of the public and is the force increasing economic growth-oriented effects such as investment and production (Göktan, 2009).

In this context, when the effects of press freedom on growth are considered from the starting point of preventing corruption, they can be seen to be positive. By having a positive effect on the investment environment and freedom, an increase in growth is triggered when press freedom increases. In this respect, the findings of Model 2 are consistent with those of Lederman et al (2005), who determined that press freedom was a determining factor in obtaining a low level of corruption and the results of Lehkonen and Heimonen (2015) that press freedom was effective on stock returns. The findings of Model 2 support the argument of Leeson (2008) that there may not be true information shown about the economic policies and their implementation in a country without a free press and this is a factor preventing the flow of information to investors intending to invest in the country and consequently economic growth is negatively affected. The findings of the model are also consistent with those of Barro (1991), Alesina, Özler, Roubini and Swagel (1996), Nkurunziza and Bates (2003), and

Zablotsky (1994), which stated that restrictions on press freedom caused a reduction in political participation and political confusion, and the negative effect on the investment environment could decrease economic growth. Finally, the findings of Model 2 were also supported by the results of a study by Alam and Shah (2013), which examined the relationship between press freedom in the long term and economic growth and direct foreign investment.

Table 3. The PMG results of the Parameters of the Press Freedoms Index used in Model 2

	Dependent variable (lngdpout)	Model 2		
		Above-average income	High income	Low/below-average income
Model 2	lncapitalstock	0.347***	0.175***	0.848***
		(0.013)	(0.107)	(0.094)
	lnemp	0.442***	0.271***	0.749*
		(0.072)	(0.097)	(0.535)
	press.freedom	-0.007***	-0.001*	-0.008***
		(0.001)	(0.001)	(0.002)

Statistical significance: *10%, **5%, ***1%.
Values in parentheses indicate standard error.

The results of Model 3, which tested the relationship between the Fraser Index and economic growth, were significant for all income groups in respect of statistical significance and the expected indicators (+). The results of the model are shown in Table 4. According to these results, the effect of the change in the Fraser Index score on growth was determined to be greatest in the above-average income group followed by the low/below-average income group and the high income group. These results were consistent with those of studies by Ken Farr et al (1998), Scully (2002), Bengoa and Sanchez-Rables (2003), Yıldırım (2010), Haan and Sturn (2000), Wu and Davis (1999), Carlsson and Lundström (2002) and Dawson (1998), all of which used the Fraser Index and analysed the relationship between economic freedoms and growth. In the models established with the sub-parameters of the Fraser Index (Model 3.1, Model 3.2).

- The relationship of growth with the parameter of the size of the public sector was significant for all income groups in respect of statistical significance and the expected indicators (+).
- The relationship of strong currency with growth was significant only for the low/below-average income group in respect of statistical significance and the expected indicators (+). For the other income groups, this relationship was statistically significant, but the expected indicators were not obtained.
- The relationship of the parameter of foreign trade freedom with growth was significant for the above-average and high income groups in respect of statistical significance and the expected indicators (+). For the low/below-average income group, this relationship was statistically significant, but the expected indicators were not obtained.
- The relationship of the parameter of the judicial system and property rights with growth was significant for the above-average and high income groups in respect of statistical significance and the expected indicators (+). For the low/below-average income group, this relationship was statistically significant, but the expected indicators were not obtained.
- The relationship of the parameter of regulations with growth was significant only for the above-average income group in respect of statistical significance and the expected indicators (+). For the low/below-average income group, this relationship was statistically significant, and for the high-income group the expected indicators were significant.

In the Fraser Index, a negative relationship was determined between commercial freedom and growth for the low/below-average income countries, but not for the above-average and high-income groups. This finding shows the negative effects at the first stages of growth based on competition. Similarly, the judicial system-property rights and regulations were determined to have negative effects on growth in low/below-average income countries but not in the above-average and high-income groups. This suggests that it is still too early for private sector regulations in low-income group countries and the public sector market should be deepened by regulation. The abandonment of foreign trade protective policies and the freeing of foreign trade in low/below average income group countries and those which do not have a strong economic structure can cause severe external problems and expose domestic industries to ruthless competitive pressure. This can have negative effects, both in respect of external growth and in deterring local production.

Table 4. The PMG results of the Parameters of the Fraser Economic Freedoms Index used in Model 3 and sub-models

	Dependent variable (lngdpout)	Model 3			Model 3.1			Model 3.2		
		Above-average inc	High incon	Low/below-average inco	Above-average income	High income	Low/below-average income	Above-average income	High income	Low/below-average income
Model 3	lncapitalstock	1.053***	0.569***	0.732***	0.461***	0.577***	0.551***	1.050***	0.617***	0.781***
		(0.076)	(0.011)	(0.020)	(0.021)	(0.013)	(0.009)	(0.086)	(0.008)	(0.007)
	lnemp	-0.453**	0.447***	0.251***	0.812***	0.441***	0.140***	-0.333*	0.510***	0.333***
		(0.198)	(0.043)	(0.065)	(0.045)	(0.025)	(0.026)	(0.194)	(0.033)	(0.031)
	fraser.general score.	0.178***	0.023*	0.071***						
		(0.020)	(0.013)	(0.025)						
Model 3.1	fraser.size of public sector				0.061***	0.020***	0.015***			
					(0.006)	(0.004)	(0.003)			
	fraser.strong currency				-0.024***	-0.007*	0.059***			
					(0.007)	(0.005)	(0.006)			
	fraser.foreign trade freed				0.113***	0.021**	-0.016***			
					(0.021)	(0.010)	(0.006)			
Model 3.2	fraser.judicial system-property rights							0.056**	0.043***	-0.039***
								(0.026)	(0.006)	(0.004)
	fraser.regulations							0.007***	0.005	-0.018***
								(0.021)	(0.006)	(0.007)

Statistical significance: *10%, **5%, ***1%
Values in parentheses indicate standard error.

The relationship between growth and the WGI values of political stability, absence of violence and terrorism and the prevention of corruption was statistically significant for all income groups. However, this relationship was only in the expected direction for the above-average income group. The detailed results are shown in Table 5. According to these results, the relationship was statistically significant but was negative in respect of the expected indicators in the high income group and the low/below-average income groups.

That the relationship between growth and political stability, absence of violence and terrorism and the prevention of corruption was significant in both direction and effect in the above-average income group could be attributed to the fact of there being more countries in this group with foreign capital input and that they were newly developing. This exposes these countries to fragile economic structures and external effects. In the absence of market depth, there is a predisposition to speculative effects. Situations such as impaired political stability, the spread of violent events and increased corruption can cause a reduction in foreign investment and financial opportunities for these countries, thereby negatively affecting growth. The effect of these parameters can be felt more strongly than in other income group countries. These findings are consistent with those of Emera and Chiu (2016), and Kartal and Öztürk (2017).

Table 5. The PMG results of the Parameters of the WGI Index used in Model 4

		Model 4		
	Dependent variable (lngdpout)	**Above-average income**	**High income**	**Low/below-average income**
Model 4	lncapitalstock	0.729*** (0.028)	0.372*** (0.006)	0.647*** (0.034)
	lnemp	0.878*** (0.097)	0.471*** (0.032)	-0.261*** (0.095)
	wgi.political stability-absence of violence and terrorism	0.027*** (0.009)	-0.047*** (0.013)	-0.243*** (0.024)
	wgi.prevention of corruption	0.113*** (0.029)	-0.119*** (0.014)	-0.321*** (0.036)

Statistical significance: *10%, **5%, ***1%.
Values in parentheses indicate standard error.

5. CONCLUSION

The relationship between institutional structure and economic growth was investigated in this study with the aim of evaluating the comparative performance of variables representing institutional structure. The study can be considered to make an important contribution to the literature of the relationship between institutions and economic growth, as comparisons were made with separate analyses of 4 different indexes, based on the indexes used to represent institutional structure. The analyses made in the study yielded significant findings related to the relationship between institutional structure and economic growth. Compared to the Heritage Index, the relationship with economic growth of the general scores of the parameters of the Fraser Index and the Freedom of the Press Index was seen to be stronger for all income groups both statistically and in respect of the expected effect.

In the framework of these findings, of the indexes measuring different methods and parameters of economic freedoms, the Fraser Index was seen to come to the fore providing more significant findings in respect of the relationship with economic growth. In conclusion, it must be said that analyses in this area of indexing approaches using advanced econometric methods and richer data sets would provide more robust results and be able to involve more factors. Nevertheless, this study has revealed initial indications of findings obtained with modelling alternatives and data sets. In addition, the results of this study demonstrated the explanatory power of different indexes in the relationship between institutional structure and growth, and was able to make comparisons between these.

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