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BOOK OF CONFERENCE PROCEEDINGS AND ABSTRACTS

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Mahmut ZORTUK

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CONTENTS

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PREFACE

We sincerely hope that the contributors and attendees of ICEBSS'2021 will find presented studies enlightening, useful and of interest. The aim of ICEBSS is to bring researchers from different disciplines together and inspire them to collaborate.

On behalf of the organization committee, I thank all the authors who have shared their precious works, all reviewers for their valuable contributions and members of the committee for their never ending supports and advices.

We hope that ICEBSS will reinforce interdisciplinary and international collaboration and hearten information exchange between various fields.

October 2021
Prof. Dr. Mahmut ZORTUK
Coordinator of ICEBSS

ANALYSIS OF THE RELATIONSHIP BETWEEN TURKEY'S ELECTRICITY CONSUMPTION AND MACROECONOMIC INDICATORS*

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Abstract

With the development of technology, energy has become an effective and important factor in both production and input costs and in all areas of life. The sources of energy are basically divided into two as non-renewable and renewable. There are great differences between countries in terms of the distribution of energy resources. Some countries are energy exporters, and some are importers. Turkey is one of the energy importing countries, and energy expenditures constitute the weight of the high current account deficit, especially in recent years. In this study, the relationship between electricity consumption and various macroeconomic indicators was investigated. In this context, whether electricity consumption and macroeconomic variables act together in the long run was tested with the Johansen cointegration test. As a result of the analysis, it is observed that electricity consumption and stock market index, current account deficit, foreign exchange rate, inflation rate, interest rate, unemployment rate and public expenditures move together in the long run. In the second stage of the study, the causality between electricity consumption and macroeconomic indicators was investigated with the Granger causality test. Bidirectional Granger causality has been determined between electricity consumption and current account balance. In addition, one-way Granger causality was determined between foreign exchange rate and electricity consumption and between electricity consumption and stock market index. On the other hand, Granger causality relationship could not be determined between inflation rate, interest rate, GDP, unemployment rate, public expenditures and electricity consumption.

Keywords: Electricity Consumption, Current Account Deficit, Inflation Rate, GDP, Unemployment Rate, Public Expenditures, Interest Rate, Foreign Exchange Rate.

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1. INTRODUCTION

One of the biggest items among the production costs is energy and the most important factors that affects energy prices are energy resources of countries. Energy resources are divided into two categories called non-renewable (fossil) and renewable (alternative). Non – renewable energy sources comprised as a result of the fossilization of organic-based resources in a certain geological time and/or period. These resources are fossil based (charcoal, petroleum and natural gas) and nuclear energy (uranium and thorium). Renewable energy sources are gathered from energy flow which exists in natural life process and continues constantly. These are solar, wind, hydraulic (water), tide (wave), geothermal (hot water and steam), biomass (vegetable waste) and hydrogen (heat) (Koç et al., 2018: 87).

Having energy resources is extremely important for the economic development, welfare of individuals and political relations with other countries on a global scale, as well as providing the energy production that countries need. The fact that the resources needed for energy production are not homogeneous in the world, that non-renewable energy is dominant in the use of these resources, and that these resources are limited, put countries in the position of energy importers and exporters. Insufficient petrol reserves, being lack of natural gas sources and inadequate energy production from other sources makes Turkey one of the energy importer countries. Substantial amount of current deficit that increased especially in recent years, comprised of energy expenditures. Countries want to know whether the energy they buy by paying high prices contributes to economic growth. The economic performances of the countries are measured by economic growth and increment in real gross domestic product per capita at economic growth. However, economy also has other macro variables. The main ones are stock market index, current account balance, inflation rate, interest rate, unemployment rate and public expenditures. Each of these variables affects economic growth or gives notions about economic growth. In this study, a research conducted on whether the energy consumption affects economic growth and macroeconomic indicators related with economic growth. In this context, firstly related literature is examined, then information about method is given and results of analysis are evaluated.

2. LITERATURE REVIEW

When the relevant international literature is examined, there are many empirical studies in the literature on the relationship between energy consumption and growth. Since earth conditions change rapidly on global scale, economic reflections of energy consumption are become center of attention for all countries of the world. While there are large number of studies on investigating whether there is a casual relationship between energy consumption and growth, the first study in this context done by Kraft and Kraft (1978). The relationship between energy consumption and growth was examined using the data of the US economy

1947-1974 and it was determined that there was a causal relationship from economic growth to energy consumption. Hondroyiannis et.al (2002) tried to enlighten the relation between energy consumption and economic growth through using vector error correction model with data of 1960 – 1996. Empirical findings revealed that the discussed variables were cointegrated in the long term and that energy consumption had an important role in determining economic growth. Paul and Bhattacharya (2004) studied on casual connection between energy consumption and economic growth through Engle-Granger cointegration and standard Granger causality test for India. The data related with period of 1950 – 1996 showed that variables were in two-way interaction. Akinlo (2008) examined relationship between energy consumption and economic growth through using boundary test and Granger causality test for 11 countries which are located in sub-Saharan Africa. Boundary test showed cointegrated relationship for 7 countries (Cote D'Ivoire, Gambia, Ghana, Cameroon, Senegal, Sudan and Zimbabwe) while Granger causality test showed bidirectional relationship between energy consumption and economic growth. In Sudan and Zimbabwe, Granger causes of economic growth and energy consumption, while no causal relationship was found in Cameroon and Cote D'Ivoire. Odhiambo (2009) analyzed the relationship between economic growth and energy consumption for Tanzania with the help of 1971-2006 data. Long term variables act together according to boundary test results, while Granger tests showed unidirectional connection from energy consumption to economic growth. It is seen that studies on the relationship between energy consumption and economic growth, which are also of great importance for the Turkish economy, accelerated especially in the 2000s. Şengül and Tuncer (2006) examined causality relation among industrial energy consumption, real energy price index and GDP with using annual data belong to Turkey's 1960 – 2000 period. In the causality tests, the VAR method based on the study of Toda and Yamamoto (1995) was used. In conclusion, unidirectional relation from industrial energy consumption to GDP, bidirectional relation between real energy price and GDP and unidirectional causality relation from real energy price index to industrial energy consumption was found. Ulusoy (2006) examined bidirectional interaction between energy demand and economic growth through using Granger causality test. In order to identify this interaction, the relation between sectoral consumption and economic growth was discussed on the basis of oil, electricity and natural gas. The results obtained showed that all kinds of energy sources did not grow directly, but by increasing the share of investments in national product. At the same time, it was found that economic growth also increased energy consumption. Jobert and Karanfil (2007) analyzed the relationship between energy consumption and income in Turkey using 1960-2003 data, both in general and on the basis of industrial sector. As a result of Johansen cointegration test, no long-term relationship was found for both between real gross domestic product and energy consumption, and between industrial added-value and industrial energy consumption. Karagöl et.al (2007) analyzed the relationship between economic growth and electricity consumption for the period of 1974 – 2004 by boundary test. A cointegrated relationship was

detected among the series, and while a positive relationship among short term variables revealed, same relation was found negatively for long term. Lise and Montfort (2007) examined relationship between gross domestic product and energy consumption. The results of the cointegration and vector error correction model in the study, in which annual data for the period 1970-2003 were used, showed that the variables in question act together in the long run and that the causality is from GDP to energy consumption. In the study of Erdal et.al (2008), causal relationship between energy consumption and real gross domestic product was analyzed with using data of Turkey belongs to 1970 – 2006 period. Johansen cointegration and pair-wise Granger causality test results revealed that considered variables had bidirectional interaction. Kar and Kınık (2008) examined the relationship between total electricity consumption, industrial electricity consumption, residential electricity consumption and economic growth for the 1975-2005 period, taking into account the developments in time series analysis. Johansen cointegration test demonstrated a relation among total, industrial and residential electricity consumption and economic growth, and vector error correction method also showed direction of causality occurs from electricity consumptions to economic growth. Bidirectional causality relation was found only between residential electricity consumption and economic growth. Kapusuzoğlu (2011) researched the relationship between crude oil, electricity, natural gas, coal prices, interest rates and stock market indexes of 24 OECD countries. As a result of the study, it was determined that the relationship between the variables was very complex and different results were obtained in the same region or countries with the same economic development, but there was a strong relationship between energy prices and macroeconomic variables in all countries. Especially for Turkey, Johansen cointegrated test results showed long term relationship between crude oil, electricity, natural gas, coal price and stock market index. According to the Granger causality analysis, it has been concluded that stock market index for crude oil price; crude oil and natural gas prices for electricity price; electricity and coal prices for natural gas price; stock market index for coal price; and additionally, prices of crude oil, natural gas, coal and electricity for stock market index were Granger cause. Koç (2014) analyzed the energy consumption and financial development of 57 countries, including Turkey, by dividing the countries into four continents. Dumitrescu and Hurlin (2012), which takes into account the cross-sectional dependence in the determination of the causality relationship between the variables that are stationary at the same level, and the Emirmahmutoğlu and Köse (2011) panel causality test, which also considers the cross-sectional dependence for the variables that are stationary at different levels, were used. As a result of the study, the relationship between financial development and energy consumption was determined only in coastal countries. Contrary to expectations, the effect of financial development on energy consumption also emerged in underdeveloped countries.

3. METHODOLOGY

3.1. Scope of The Study

GDP is the most important concept with respect to financial development and economic growth. In addition to GDP, stock market exchange, current account balance, foreign exchange rate, inflation rate, interest rate, unemployment rate and public expenditures could be counted as fundamental macroeconomic indicators. Energy consumption, on the other hand, is affected by economic developments or affects economic development as a result of both being an industrial input and an increase in the level of welfare and an increase in individual consumption. Therefore, the existence, size and direction of the relationship between macroeconomic indicators and energy consumption should be investigated.

3.2. Importance of The Study

There are many studies in the national literature examining the relationship between energy consumption and economy. However, most of these studies focused on merely economic growth and analyzed the relationship between energy consumption and GDP. In this study, whether there is a relationship between energy consumption of Turkey and macroeconomic indicators, if any, intensity and direction of this relationship is researched with 30 years of data and also surveyed for important macroeconomic variables in addition to GDP which are stock market index, current account balance, foreign exchange rate, inflation rate, unemployment rate and public expenditures. In this respect, the research differs from its counterparts in the national literature. Moreover, most of the studies related Turkey were conducted more than 10 years ago, while this study also includes economic developments in recent years.

3.3. Methodology of The Study

In this study, the relationship between Turkey's electricity consumption and macroeconomic indicators is examined. For this purpose, firstly, data were compiled from official sources. Some of these data are not affected by changes in the value of currencies, such as electricity in gigawatt-hours, while others are affected, such as GDP. In order to prevent this condition negatively affects the results of the analysis, the data were adjusted for the effect of inflation. Then, the data that were stationary at the same level with the Augmented Dickey Fuller (ADF) unit root test were determined and analyzed. Johansen cointegration test was performed to determine whether there is a relationship between them in the long term, and then, whether there is causality between electricity consumption and macroeconomic variables was investigated with Granger causality analysis.

3.4. Data Set and Method

In the study, electricity consumption, stock market index, current account balance, foreign exchange rate, inflation rate, interest rate, GDP, unemployment rate and public expenditures data were used. According to two basis reasons, the data set was taken as annual. First, it is more accurate to obtain some of the data annually, such as electricity consumption and GDP. The second is to prevent data such as energy consumption, public expenditures, inflation rate and current account balance from seasonal effects. Under the goal of analyzing 30 years' period backwards, starting and ending year was chosen as 1989 and 2018 respectively. Obtaining method of the variables, that included in analysis, were explained below.

Electricity Consumption: The data of electricity consumption was obtained from official website of Turkish Statistical Institute. Since the data is in gigawatt hours, it was used in the analysis without further processing. *Stock Market Index:* The data of stock market index was gathered from official website of Istanbul Stock Exchange (BIST). Represented by the code XU100, year-end closing data of BIST national 100 index was taken as base. Stock market index was adjusted for inflation based on the year 1989. However, since this data was found to be stationary in the first order in the ADF unit root test, the raw form, not the inflation-adjusted version, was used in the Johansen and Granger causality tests.

Current Account Balance: The data of current account balance was provided in US dollars from Data Distribution System of Turkish Central Bank.

Foreign Exchange Rate: The data of foreign exchange rate was selected in US dollars and German Mark/Euro from Data Distribution System of Turkish Central Bank, and a basket was prepared to prevent it from effects of fluctuation in US dollar. Since it was understood that this data was not stationary in the unit root test results, the data of US Dollar was adjusted for inflation based on 1989 and used in the analyses.

Inflation Rate: The data of inflation rate was acquired from Biruni database of Turkish Statistical Institute. A new index was created based on wholesale price index of 1968, 1987, 1993 and 2003 and calculated inflation rates according to new index was used in analysis.

Interest Rate: The data of interest rate was obtained from official website of Turkish Statistical Institute and was included in analysis without any further process. *Gross Domestic Product:* GDP were prepared by using data from the Turkish Statistical Institute and OECD, and were included in the analyzes by taking the 1989 base year, after adjusting for inflation.

Unemployment Rate: The data of unemployment rate was gained from Data Distribution System of Turkish Central Bank and was included in analysis without any further processing.

Public Expenditures: The data of public expenditures was obtained in Turkish Lira from the official website of the Ministry of Finance, General Directorate of Budget and Fiscal Control, and were used in the analyses after being adjusted for inflation based on 1989. ADF unit root test was applied to examine stationarity of data which is prior condition before econometric analysis. Johansen cointegration test was applied on the data that were found to be stationary at the same level. Following the determination of whether the data were acting together on long term, Granger causality test was applied on electricity consumption and other variables in order to identify whether there is Granger causality, and if any, direction of causality was specified. ADF unit root test, Johansen cointegration test and Granger causality test were performed using Eviews 8 package program.

3.4.1. Econometric Analysis

In the study, the Johansen cointegration test was used to reveal the coexistence of time series and the Granger causality test was used to test the causality between them. In order to examine the stationarity, which is prerequisite for Johansen cointegration and Granger causality tests, ADF unit root test was conducted. Table 1 shows the descriptive statistics of the variables.

Table 1. Descriptive Statistics

	EC	BIST	BISTINF	CAB	FER	FERINF	INF	INT	GDP	UNEM	PEINF
Mean	115938.3	26566.89	8.268387	-17323.10	2244799.	1161.855	38.43033	44.70500	161155.6	9.223333	35123.66
Median	100621.9	14495.77	7.598350	-6993.500	2767501.	1079.150	41.42000	46.15000	154476.6	9.050000	36700.65
Maximum	231203.7	85721.13	22.70340	3760.000	6653688.	2753.150	119.7500	96.60000	242154.6	14.00000	54597.44
Minimum	36697.30	3.740000	2.203900	-74402.00	1880.900	493.4400	1.190000	7.200000	100444.6	6.500000	12637.60
Std. Dev.	59722.59	29326.97	4.040076	21832.76	2083849.	603.5531	31.06088	33.07174	35898.03	1.718998	11150.72
Skewness	0.385498	0.732528	1.852515	-1.025430	0.345775	0.543278	0.588483	0.294150	0.389434	0.489936	-0.547123
Kurtosis	1.877981	2.057015	7.389968	2.985178	1.903953	2.484620	2.589368	1.563330	2.639210	3.252720	2.621286
Jarque-Bera	2.316701	3.794513	41.24884	5.257810	2.099450	1.807779	1.942333	3.012646	0.921005	1.280020	1.676000
Probability	0.314004	0.149980	0.000000	0.072157	0.350034	0.404991	0.378641	0.221724	0.630967	0.527287	0.432575
Sum	3478148.	797006.5	248.0516	-519693.0	67343969	34855.65	1152.910	1341.150	4834668.	276.7000	1053710.
Sum Sq. Dev.	1.03E+11	2.49E+10	473.3443	1.38E+10	1.26E+14	10564012	27978.58	31718.47	3.74E+10	85.69367	3.61E+09
Observations	30	30	30	30	30	30	30	30	30	30	30

According to Table 1, while the mean of electricity consumption is 115,938.3, the median is 100,621.9, the highest value is 231,203.7, the lowest value is 36,697.3, and the standard deviation is 59,722.59. While the mean of inflation-adjusted stock market index is 8,2683, its median is 7,5983, the highest value is 22,7034, the lowest value is 2,2039, and its standard deviation is 4,04. The mean of current account balance is -17,323,10, the median is -6,993.5, the highest value is 3,760, the lowest value is 74,402 and its standard deviation is 21,832,76. The mean of inflation-adjusted foreign exchange rate is 1,161.55, the median is 1,079.15, the highest value is 2,753.15, the lowest value is 496,44, and its standard deviation is 603,55. The mean of inflation rate is 38,43033, its median is 41,42, the highest value is 119,5, the lowest value is 1,19, and its standard deviation is 31,06088. The mean of interest rate is 44,705, the median is 46,15, the highest value is 96,60, the lowest value is 7,20, and its standard deviation is 33,07174. The mean of GDP is 161,155.60, its median is 154,476.60, the highest value is 242,154.60, the lowest value is 100,444.60, and its standard deviation is 35,898.03. The mean of unemployment rate is 9,223, the median is 9,05, the highest value is 14,00, the lowest value is 6,50, and its standard deviation is 1,719. The mean of inflation-adjusted public expenditures is 35,123,66, the median is 36,700,65, the highest value is 54,597,44, the lowest value is 12,637.60, and its standard deviation is 11,150,72.

The skewness value indicates the degree and direction of skewness of the normal distribution graph of the data. The closer the value is to zero, the less skewed it is. A positive skewness value indicates that the normal distribution curve is skewed to the left, and a negative value indicates that it is skewed to the right. The kurtosis value shows whether the normal distribution graph is flat or high (peak). It is expected to be 3 in the normal distribution. The distribution above 3 creates peak (high) graphics, and those below create flat graphics. The skewness and kurtosis values for the data used in the research are as follows: electricity consumption; 0.385498 and 1.877981, stock market index; 1.852515 and 7.389968, current account balance; -1.02543 and 2.985178, foreign exchange rate; 0.543278 and 2.4846.2, inflation rate; 0.588483 and 2.589368, interest rate; 0.29415 and 1.54333, GDP; 0.389434 and 2.63921, unemployment rate; 0.489936 and 3.25272, public expenditures; -0.547123 and 2.621286.

If the probability value is greater than 0.05, it means that the data has a normal distribution. In the analysis, the probability value of the inflation-adjusted stock market index was calculated as 0, the values of the others were above 0.05 and showed a normal distribution feature. Table 2 shows the correlation values between the variables.

Table 2. Correlation Values

	EC	BIST	BISTINF	CAB	FER	FERINF	INF	INT	GDP	UNEM	PEINF
EC	1										
BIST	0.954	1									
BISTINF	-0.097	-0.054	1								
CAB	-0.846	-0.850	0.105	1							
FER	0.961	0.916	-0.215	-0.753	1						
FERINF	-0.861	-0.821	0.193	0.779	-0.865	1					
INF	-0.785	-0.791	0.205	0.724	-0.824	0.942	1				
INT	-0.839	-0.847	0.172	0.779	-0.874	0.917	0.948	1			
GDP	0.621	0.566	0.263	-0.465	0.484	-0.212	-0.087	-0.170	1		
UNEM	0.627	0.597	-0.345	-0.484	0.712	-0.694	-0.741	-0.767	0.059	1	
PEINF	0.757	0.632	0.206	-0.468	0.709	-0.514	-0.352	-0.428	0.729	0.288	1

The correlation coefficient is used to measure the existence, if any, direction and intensity of a linear relationship between two variables. If the absolute value of correlation coefficient (r) is less than 0.2, it means very weak relation or no correlation. If the correlation coefficient is between 0.2-0.4, it means weak correlation. If the correlation coefficient is between 0.4-0.6, it means moderate intensity correlation. If the correlation coefficient is between 0.6-0.8, it means high correlation. If the correlation coefficient is between more than 0.8, it means very high correlation. In addition, when the correlation coefficient is positive, it means two

variables moves on same direction, and when the correlation coefficient is negative, it means two variables moves on opposite direction.

The correlation coefficients of all data with each other are given in Table 2. In the first column, the relationship between electricity consumption and other variables is examined. As can be seen in Table 2, the correlation coefficient among stock market index and foreign exchange rate with electricity consumption is very close to 1. In other words, there is a very strong relation in same direction. A very high correlation on opposite direction can be seen between current account balance and interest rate and electricity consumption. Again, between the inflation rate and electricity consumption, there is an inverse and high correlation. There is a high correlation in the same direction between GDP, unemployment rate, public expenditures and electricity consumption.

3.4.1.1. Unit Root Test

In analyzes using time series, the time series is stationary if the mean and variance of the series do not change over time and the common variance between the two periods does not change according to the distance between the two periods and its calculated period (Gujarati, 2009: 713). The time series to be used in the analysis should be stationary in order to avoid fake regression problems and therefore not to be misleading (Granger and Newbold, 1974: 111). In this study, ADF unit root test was used to control the stationarity of the data. The formula of ADF unit root test is given below (Gujarati, 2009: 713):

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + \varepsilon_t \qquad (1)$$

Table 3 shows the results of the ADF unit root test of the data at the level values.

Table 3. ADF Unit Root Test Results at The Level Values

	NONE		LIMITED		LIMITED TREND	
Variables	t-Stat	Prob	t-Stat	*Variables*	t-Stat	Prob
Stock Market Index	1.711137	0.9759	0.407637	0.9797	-3.344432	0.0791
Stock Market Index (Adjusted for Inflation)	-0.680312	0.4132	-5.3856920*	0.0001	-5.346077*	0.0008
Current Account Balance	-1.012385	0.2724	-1.661904	0.4393	-3.062417	0.1338
Foreign Exchange Rate (Basket)	4.176069	0.9999	1.887874	0.9997	-2.446817	0.3494
Foreign Exchange Rate (Basket Adjusted for Inflation)	-1.537176	0.1145	-4.963278*	0.0007	-0.206627	0.9884
Foreign Exchange Rate (USD Adjusted for Inflation)	-1.658934	0.0910	-1.204952	0.6579	-1.717805	0.7153
Current Account Balance	8.811350	1.0000	2.681559	1.0000	-1.127473	0.9066
Foreign Exchange Rate (USD Adjusted for Inflation)	-1.085529	0.2448	-1.297191	0.6171	-3.029035	0.1419
Electricity Consumption	-0.983057	0.2839	-0.912015	0.7698	-2.788994	0.2122
Inflation Rate	1.317883	0.9490	-0.868447	0.7837	-1.278916	0.8732

Interest Rate	0.252501	0.7524	-1.668739	0.4359	-2.228561	0.4571
GDP (Adjusted for Inflation)	1.153522	0.9319	-1.413033	0.5621	-2.074063	0.5380

* Stationary according to ADF test.

As it can be seen in Table 3, stock market index (adjusted for inflation) and foreign exchange rate (basket adjusted for inflation) are stationary in the first order. Since the probability value of the stock market, current account balance, foreign exchange rate (basket), foreign exchange rate (USD adjusted for inflation), electricity consumption, inflation rate, interest rate, GDP, unemployment rate and public expenditures do not reach the 5% significance level, the series contains unit root and is not stationary. The first differences of electricity consumption and of other non-stationary data were taken into consideration. ADF unit root test results of the data with the first difference are given in Table 4.

Since the stock market index (adjusted for inflation) and the foreign exchange rate (basket) are stationary at their levels, their differences could not be taken, so they could not be used in the Johansen cointegration and Granger causality tests. Instead of the inflation adjusted stock market index, the first difference of the raw stock market index is taken. Instead of the foreign exchange rate (basket), the analysis continued by taking the differences of the raw version of the foreign exchange rate (basket) and the inflation-adjusted version of the US Dollar.

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Table 4. ADF Unit Root Test Results of First Differential Series

	NONE		LIMITED		LIMITED TREND	
Variables	t-Stat	Prob	t-Stat	Variables	t-Stat	Prob
Electricity Consumption	0.177251	0.7291	-3.977277*	0.0050	-4.963210*	0.0024
Stock Market Index	-9.038765*	0.0000	-9.907519*	0.0000	-10.08420*	0.0000
Current Account Balance	-6.799566*	0.0000	-6.747923*	0.0000	-6.618806*	0.0000
Foreign Exchange Rate (Basket)	-2.227962	0.0273	-3.151532	0.0341	-3.576715	0.0504
Foreign Exchange Rate (USD Adjusted for Inflation)	-1.357624	0.1568	-8.052789*	0.0000	-7.926036*	0.0000
Inflation Rate	-6.976868*	0.0000	-4.867668*	0.0006	-4.776751*	0.0037
Interest Rate	-6.305172*	0.0000	-4.860212*	0.0006	-4.860855*	0.0030
GDP (Adjusted for Inflation)	-5.058193*	0.0000	-5.395541*	0.0001	-5.315723*	0.0010
Unemployment Rate	-4.660294*	0.0000	-4.601965*	0.0011	-4.512057*	0.0065
Public Expenditures (Adjusted for Inflation)	-5.583693*	0.0000	-6.124017*	0.0000	-6.036664*	0.0000

* Stationary according to ADF test.

As can be seen in Table 4, the foreign exchange rate (basket) is not stationary after the first difference is taken and contains a unit root. Therefore, it could not be used in Johansen cointegration and Granger causality tests. Instead, the inflation-adjusted version of the US dollar foreign exchange rate was used.

As a result of the ADF unit root test on the first difference, probability value of 1% significance in electricity consumption and foreign exchange rate (USD adjusted for inflation) in limited and limited trend; stock market index, current account deficit, inflation rate, interest rate, GDP, unemployment rate and public expenditures in both limited, limited trend and none level does not contain a unit root and is stationary. Therefore, electricity consumption and these eight macroeconomic indicators were analyzed by Johansen cointegration and Granger causality tests.

3.4.1.2. Johansen Cointegration Tests

Cointegration is obtaining stationary relation between two or more non-stationary series. At the condition of two-time series are cointegrated, these series are limited with stationary linear relation and have tendency to act together. Even there are deviations from this relation, they are temporary (Engle and Granger, 1987: 258). Briefly, the cointegration of two-time series shows that they act together. For instance, the fact that electricity consumption and inflation rate are cointegrated means that they move together. To be able to conduct Johansen cointegration test, the stationarity of time series should be identified by unit root tests. The lag length to be used in the test is determined by VAR (Vector Autoregression) analysis (Enders, 1995: 301). Table 5 shows the results of the Johansen cointegration test.

Table 5. The Results of Johansen Cointegration Test

Variables	Hypothesis	Eigen Value	Trace Statistic	Possibility	Maximum Eigenvalue Statistic	Possibility
Electricity Consumption and Stock Market Index	No Cointegration (H_0)	0.517048	31.16484	0.0100*	19.65161	0.0458*
	Maximum 1 Cointegration (H_1)	0.347155	11.51324	0.0732	11.51324	0.0732
Electricity Consumption and Current Account Deficit	No Cointegration (H_0)	0.588878	24.08186	0.0004*	23.99936	0.0002*
	Maximum 1 Cointegration (H_1)	0.003051	0.082503	0.8135	0.082503	0.8135
Electricity Consumption and Foreign Exchange Rate	No Cointegration (H_0)	0.549241	40.80106	0.0004*	21.51420	0.0242*
	Maximum 1 Cointegration (H_1)	0.510479	19.28686	0.0032*	19.28686	0.0032*
Electricity Consumption	No Cointegration (H_0)	0.535271	36.69215	0.0015*	20.69012	0.0322*

and Inflation Rate	Maximum 1 Cointegration (H_1)	0.447149	16.00203	0.0125*	16.00203	0.0125*
Electricity Consumption and Interest Rate	No Cointegration (H_0)	0.547139	37.43236	0.0000*	21.38856	0.0114*
	Maximum 1 Cointegration (H_1)	0.448004	16.04380	0.0001*	16.04380	0.0001*
Electricity Consumption and GDP	No Cointegration (H_0)	0.529976	32.56162	0.0063*	20.38424	0.0357*
	Maximum 1 Cointegration (H_1)	0.363018	12.17738	0.0570	12.17738	0.0570
Electricity Consumption and Unemployment	No Cointegration (H_0)	0.445472	16.51841	0.0094*	15.92020	0.0070*
	Maximum 1 Cointegration (H_1)	0.021912	0.598208	0.5006	0.598208	0.5006
Electricity Consumption and Public Expenditures	No Cointegration (H_0)	0.549576	34.44699	0.0034*	21.53425	0.0240*
	Maximum 1 Cointegration (H_1)	0.380133	12.91274	0.0429*	12.91274	0.0429*

When Table 5 is examined, the following findings are reached:

➢ The hypothesis that there is no cointegration vector between electricity consumption and stock market index was rejected and it was determined that there was a long-term relationship between the variables.

➢ The hypothesis that there is no cointegration vector between electricity consumption and current account deficit was rejected and it was determined that there was a long-term relationship between the variables.

➢ The hypothesis that there is no cointegration vector between electricity consumption and inflation rate was rejected and it was determined that there was a long-term relationship between the variables.

➢ The hypothesis that there is no cointegration vector between electricity consumption and interest rate was rejected and it was determined that there was a long-term relationship between the variables.

➢ The hypothesis that there is no cointegration vector between electricity consumption and GDP was rejected and it was determined that there was a long-term relationship between the variables.

➢ The hypothesis that there is no cointegration vector between electricity consumption and unemployment rate was rejected and it was determined that there was a long-term relationship between the variables.

➢ The hypothesis that there is no cointegration vector between electricity consumption and public expenditures was rejected and it was determined that there was a long-term relationship between the variables.

As a result, the macroeconomic variables that are the subject of the analysis such as; stock market index, current account deficit, inflation rate, interest rate, GDP, unemployment rate, public expenditures and electricity consumption are cointegrated and move together in the long run.

When the results of the Johansen cointegration test are evaluated in general, i is seen that all examined variables are associated with electricity consumption in the long run. A relationship has been determined between economic growth and electricity consumption. It is an expected result that other indicators such as stock market index, foreign exchange rate, inflation rate, interest rate, unemployment rate and public expenditures are related to electricity consumption. It is also a proof of the relationship of electricity consumption with

economic growth and the general course of the economy. In previous studies, solely Jobert and Karanfil (2007) could not find a relationship between energy consumption and GDP, on the contrary, Lise and Montfort (2007), Erdal et al. (2008), Ulusoy (2006), Şengül and Tuncer (2006), Akinlo (2008), Paul and Bhattacharya (2004) and Odhiambo (2009) found a long-term relationship in accordance with the findings of this study. There is a direct relationship between the current account deficit and electricity consumption due to the use of imported energy.

Since Johansen cointegration test only detects long term relationship between variables and does not give information about the direction of the relationship, Granger causality test was conducted to have a notion on the direction of relationship.

3.4.2.3. Granger Causality Test

Granger causality test depends on the hypothesis of the fact that stationarity of series. In addition, the time series should not be cointegrated. Otherwise, error correction improved Granger causality testing should be applied instead of Granger causality test. Since the time series used in this study are cointegrated, error correction improved Granger causality test was applied. The main idea of this test is that a cause does not follow an effect. If x affects y, it will also help to make an estimation about the y. In the model where y is dependent variable and previous values of x and y are independent variable, if the predictions of y are significantly affected by independent variables, it is said that x is the Granger cause of y. The same is valid as well when y is Granger cause of x. The formulas are given below (Lutkepohl, 1993: 44):

$$Y_t = \sum_{i=1}^{n} \alpha_i X_{t-i} + \sum_{j=1}^{n} \beta_j Y_{t-j} + \mu_{1t} \qquad (2)$$

$$X_t = \sum_{i=1}^{n} \lambda_i X_{t-i} + \sum_{j=1}^{n} \delta_j Y_{t-j} + \mu_{2t} \qquad (3)$$

Table 6 shows the results of the Granger causality test.

Table 6. The Results of the Granger Causality Test

Dependent Variable	Independent Variable	Chi-Sq	Possibility
Stock Market Index	Electricity Consumption	2.407409	0.1208
Electricity Consumption	Stock Market Index	10.91617	0.0010*
Current Account Deficit	Electricity Consumption	8.942659	0.0028*
Electricity Consumption	Current Account Deficit	4.713840	0.0299*
Foreign Exchange Rate	Electricity Consumption	4.769247	0.0290*
Electricity Consumption	Foreign Exchange Rate	3.280108	0.0701
Inflation Rate	Electricity Consumption	0.311163	0.5770
Electricity Consumption	Inflation	0.692024	0.4055
Interest Rate	Electricity Consumption	0.593585	0.4410
Electricity Consumption	Interest Rate	0.866342	0.3520
GDP	Electricity Consumption	1.444377	0.2294
Electricity Consumption	GDP	0.005036	0.9434
Unemployment	Electricity Consumption	0.304404	0.5811
Electricity Consumption	Unemployment	0.757526	0.3841
Public Expenditures	Electricity Consumption	1.930212	0.1647
Electricity Consumption	Public Expenditures	2.880906	0.0896

When the results of the Granger causality test are examined in Table 6, the following findings are reached:

➢ Stock market index is not Granger cause of electricity consumption (H_0 is accepted).
➢ Electricity consumption is the Granger cause of the stock market index (H_1 is accepted).
➢ The current account deficit is the Granger cause of electricity consumption (H_1 is accepted).
➢ Electricity consumption is the Granger cause of the current account deficit (H_1 is accepted).
➢ Foreign exchange rate is the Granger cause of electricity consumption ((H_1 is accepted).
➢ Electricity consumption is not the Granger cause of foreign exchange rate (H_0 is accepted).
➢ Inflation rate is not the Granger cause of electricity consumption (H_0 is accepted).
➢ Electricity consumption is not the Granger cause of inflation rate (H_0 is accepted).
➢ The interest rate is not the Granger cause of electricity consumption (H_0 is accepted).
➢ Electricity consumption is not the Granger cause of the interest rate (H_0 is accepted).
➢ Gross domestic product is not the Granger cause of electricity consumption (H_0 is accepted).
➢ Electricity consumption is not the Granger cause of gross domestic product (H_0 is accepted).
➢ Unemployment rate is not the Granger cause of electricity consumption (H_0 is accepted).
➢ Electricity consumption is not the Granger cause of unemployment rate (H_0 is accepted).
➢ Public expenditures are not the Granger cause of electricity consumption (H_0 is accepted).
➢ Electricity consumption is not the Granger cause of public expenditures (H_0 is accepted).

The results could be interpreted as in below:
✓ There is a unidirectional Granger causality relationship from electricity consumption to stock market index.

- ✓ There is a bidirectional Granger causality relationship between electricity consumption and current account deficit.
- ✓ There is a unidirectional Granger causality relationship from foreign exchange rate to electricity consumption.
- ✓ There is no Granger causality relationship between inflation rate and electricity consumption.
- ✓ There is no Granger causality relationship between interest rate and electricity consumption.
- ✓ There is no Granger causality relationship between GDP and electricity consumption.
- ✓ There is no Granger causality relationship between unemployment rate and electricity consumption.
- ✓ There is no Granger causality relation between public expenditures and electricity consumption.

When the results of Granger causality test are examined in detail, electricity consumption is the Granger cause of the current account deficit. Considering that a significant part of the energy used in Turkey is imported, this is an expected result. As electricity consumption increases, it also increases the current account deficit. However, the current account deficit is also the Granger cause of electricity consumption. The individuals, who increases current account deficit especially through turning to consumption instead of saving, increases production at the same time, and electricity consumption also escalates as a result of increment in both consumption and production.

Additionally, it is determined that the electricity consumption is also Granger cause of stock market index. As a result of increment at the production of companies, which are in the position of large amount of electricity consumer, firstly electricity consumption is raised, and value of the companies are increased after making profit from their production. The causality between electricity consumption and stock market index arises after the reflection of values of companies on stock market index directly.

The reason why foreign exchange rate is a Granger cause of electricity consumption is should not be connected that energy is imported. Because the electricity consumption was taken in terms of GWH instead of TL in analysis. Therefore, no error arises from influence of foreign exchange rate change on electricity cost in analysis. Import goods become expensive resulting of increase in foreign exchange rate and consumers turn to import domestic substitutes. Moreover, if the values of exported goods remain constant in terms of domestic currency, its

price declines in terms of foreign currency and demand is increased. Hence, increment in foreign exchange rate raises production in the country and energy consumption is also increased as a result. Even though exported goods in Turkey depends more on imported input, an advantage was provided in respect to labor costs and entrepreneur incomes.

Granger causality could not be found between inflation rate, interest rate, GDP, unemployment rate, public expenditures and electricity consumption. Granger causality analysis could yield different result in different countries and at different times when similar studies are considered. For example, in Koç (2014)'s study examining the causality between financial development level and energy consumption in 57 countries, a causal relationship was found between energy consumption and financial development indicators in some countries, but not in some countries. Again, Rufael (2006) found Granger causality between electricity consumption and GDP in 12 of 17 African countries. As a result, the findings of these studies show that there is no Granger causality between the five macroeconomic indicators and electricity consumption in Turkey between 1989 and 2018.

4. CONCLUSIONS

The energy becomes an effective and significant factor for production, input costs and every part of our daily life because of enhancements in technology. The resources of energy can be divided into non-renewable and renewable fundamentally. In respect to distribution of energy sources, huge differences can be seen among countries. While some of countries are energy exporter, others are importer. Turkey is one of the energy importing countries and Turkey's high current account deficit, especially in recent years, consists mostly of energy costs. In this study, it was investigated whether energy consumption affects economic growth and therefore macroeconomic indicators associated with economic growth. In econometric analysis, Johansen cointegration test and Granger causality test were performed. In order to apply these tests, the stationarity of the variables was tested with the ADF unit root test, and the first differences of all non-stationary variables were made stationary. As a result of the analysis, it has been determined that all of the macroeconomic variables subjected to the Johansen cointegration test are cointegrated with electricity consumption and act together in the long run. Afterwards, Granger causality test was applied and bidirectional Granger causality was determined between electricity consumption and current account balance. In other words, current account is the Granger cause of electricity consumption, while electricity consumption is the Granger cause of current account. In addition, a unidirectional Granger causality was found between both foreign exchange rate and electricity consumption, and between electricity consumption and stock market index. In this framework, foreign exchange

rate is the Granger cause of electricity consumption, and electricity consumption is also the cause of foreign exchange rate. On the other hand, Granger causality relationship could not be determined between inflation rate, interest rate, GDP, unemployment rate and public expenditures with electricity consumption. In the related literature, Jobert and Karanfil (2007) could not find a relationship between energy consumption and GDP, on the contrary, Lise and Montfort (2007), Erdal et al. (2008), Ulusoy (2006), Şengül and Tuncer (2006), Akinlo (2008), Paul and Bhattacharya (2004) and Odhiambo (2009) determined the existence of a relationship between energy consumption and economic growth. Kapusuzoğlu (2011) investigated the long term relationship between the stock market index and the interest rate with energy prices and found a relationship in almost all countries, although different results were obtained in different countries in terms of the intensity of the relationship. Therefore, the findings of this study support previous studies. In terms of causality, different results were obtained in previous studies. In this study, Granger causality between GDP and electricity consumption could not be determined. Paul and Bhattacharya (2004) found a bidirectional causality in their study for the 1950-1996 period in India, while Akinlo (2008) found a bidirectional causality in 11 African countries, bidirectional causality in three countries, and unidirectional causality from electricity consumption to economic growth in two countries. In six countries, causality could not be determined. While this study does not support the study of Paul and Bhattacharya (2004), it does support some of Akinlo (2008)'s research. When the studies in the national literature are examined; Şengül and Tuncer (2006), Ulusoy (2006), Kar and Kınık (2008) found unidirectional causality from electricity consumption to economic growth, Lise and Monfort (2007) found unidirectional causality from economic growth to electricity consumption, Erdal et al. (2008) found bidirectional causality. Koç (2014), on the other hand, found countries with no causality as well as countries with bidirectional and unidirectional causality in his study in 57 countries. The causality determined by Kapusuzoğlu (2011) between the stock market index and electricity prices also supports the result reached in this study.

When the analysis results are evaluated in general, it has been determined that as Turkey's energy expenditures increase, the current account deficit increases, and as the current account deficit increases, energy expenditures increase. In this context, when other macroeconomic variables are considered, it has been concluded that Turkey's energy expenditures have increased in the last 30 years. Despite of this increment, in last 30 years, while seen that GDP, unemployment and public expenditures were enlarged, inflation and interest rates were declined.

With the vision Turkey has put forward in recent years, Turkey aims to become an important energy trade center in its region by going beyond its role of being an energy bridge or an energy crossroad in its geography. Currently, energy continues to be one of the highest items in Turkey's total imports. Energy imports, which were 43,5 billion dollars (18.9%) in 2018, were reported as 41,1 billion dollars (19.5%) in 2019. This situation causes our energy imports to be responsible for approximately 20% of total imports. More than 98% of the natural gas consumed in our country for the current reserve situation is imported. Energy is a crucial import item for the Turkish economy and is one of the items making the highest contribution to inflation.

Turkey is one of the countries that consumes energy relatively expensive. A lot of items could be listed as a reason of high energy pricing. One of these reasons is that Turkey has a contract includes purchase or repay provision indexed to oil. Although these agreements are without alternatives for the conditions of the period they were signed, they should be redesigned in accordance with today's competitive market structure in line with the interests of the country, since they will be concluded in the upcoming period. The natural gas treaties of Turkey, which will be ended in upcoming five years, has great importance. Due to the purchase or pay provisions, Turkey had to pay the price of even unused natural gas in some periods. The contracts that will expire in the near future and the agreements corresponding to one-third of the annual natural gas imports are as follows; Russia (Western Line) in 2021, Algeria (LNG) in 2021, Nigeria (LNG) in 2021, Azerbaijan in 2022. The major expected conversion will be from 2026. In 2026, the 25-year contract with Iran will expire. Following the expiry of these contracts, the natural gas reserve discovered in the Sakarya gas field in the Black Sea will act as a very important lever for the country. While Turkey had a reserve of 10,2 billion m3 in 2002, 11,7 billion m3 of gas has been produced so far, and an additional 4,6 billion m3 reserve has been provided in the last 18 years with new discoveries and the development of existing fields. The resource in the Sakarya gas field, on the other hand, has made a leap in Turkey's natural gas reserve, enabling its current reserve to reach 405 billion m3.

Turkey uses 30% of imported natural gas on electricity generation. For the electricity generation in question, alternative sources other than natural gas is required. At this point, the important source that could replace natural gas is nuclear energy. Today, there are 450 nuclear power plant on the earth notably in USA, Russia, China and France, meeting world's electricity requirement by 11%. Moreover, 60 more nuclear reactors are under construction and 164 reactors are planned to be built. Nuclear energy activities in Turkey were started by signing agreements towards on establishing nuclear power plants in Akkuyu with Russia and

in Sinop with Japan, in 2010 and 2013 respectively. Establishment of mentioned nuclear energy power plants continue and will be launched in 2023. Nuclear power plants (NPPs) have huge importance for ensuring energy supply security for Turkey and for declining current account deficit. In 2023, approximately 70 billion kWh of annually electricity generation is predicted with finishing and commissioning first facilities of Akkuyu and Sinop NPPs. For the generation same amount of electricity with natural gas, approximately 16 billion m^3 natural gas import corresponding 7,2 billion dollars must be paid. When the Akkuyu and Sinop NPPs with a production capacity of 70 billion KWh are commissioned, natural gas will not be imported at the current price of approximately 7,2 billion dollars yearly. The annual nuclear fuel cost of two plants will be merely 720 million dollars. According to these numbers, nuclear energy carries vital importance for Turkey. In this context, Turkey will be freed from 20 billion dollars' energy cost burden with 12,8 billion dollars' worth natural gas discovered in Sakarya field by replacing for imported gas and 7,2 billion dollar commissioning two NPPs. As a result of this, the total energy import will be decreased by half and total import will be declined by 10%. Every year, 20 billion dollars, which goes out of the country through energy imports, will be remained and contributed Turkish economy.

In addition, the renewable energy, which gets huge attention in recent years, should be considered. Hydroelectric energy meets 14% of primary energy production and 3.9% of total consumption in Turkey. The energy production and hydraulic energy production of Turkey is 32,229 thousand TOE (tons of oil equivalent), 4,501 thousand TOE respectively. 4,501 thousand TOE (3.9%) out of 114,480 thousand TOE consumption is provided by hydroelectric. Turkey's hydroelectric energy potential corresponds to 5% of the world and 16% of Europe. In respect to potential, Turkey has the second place after Norway in Europe. While hydroelectric potential power of Turkey is 47,947 MW/year (megawatt/year), only 19,619 MW/year part, which is 41.3% of total, is in operation. The potential will be increased to 58.9% with commissioning 256 hydroelectric central in capacity of 8,343 MW/year. Thus, energy production capacity will be improved greatly by profiting from renewable energy sources. Enhancing the dam potential of Turkey through hydroelectric energy production has great significance. On the other hand, investments on solar and wind energy in context of renewable energy are not sufficient yet and improvement on this subject continues. Moreover, acceleration is required on investments at alternative energy production such as hydrogen and biomass energy fields.

In this frame, the energy is needed to enhance and grow economies. Therefore, cheap and accessible energy is an important factor for enhancement of economy. Hence, decreasing cost

and dependence to foreign countries in field of energy, in addition to declining expenditures of countries by turning to its sources have great importance. One of the important riches of the country is the values of the companies and brands operating in the energy sector, as well as the resources owned. The most important indicator of firms' value in the country is the stock market index that calculated through firms traded in stock market. In this study, one of the results was electricity consumption is a cause for stock market index. Therefore, increase of energy consumption should be made easier, especially to raise value of manufacturing companies. Decreasing energy costs would be counted as one of the ways for this.

One of the most important issues to be addressed in terms of energy and energy costs is energy efficiency. Concept of energy efficiency expresses that protection of affluence in terms of economy and production in same amount through using less energy. Energy costs of individuals and manufacturers will be declined, and disadvantage of current account deficit since most of the used energy is imported will be reduced through using energy efficiently. Both producers, consumers and policy makers have important duties for energy efficiency.

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DETERMINATION OF COMPANY SPECIFIC AND MACROECONOMIC FACTORS AFFECTING DIVIDEND PAYOUT POLICIES: A CASE STUDY ON BORSA ISTANBUL DIVIDEND INDEX*

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Abstract

Dividend payout policy is a set of decisions concerning the distribution of profit to shareholders or the use of it for investment purposes and it is highly effective in achieving the desired performance and objectives of companies. The companies determine their own dividend payout policies themselves and the management chooses the most beneficial dividend policy for the company in the decision-making process. This study is a research on company specific and macroeconomic factors affecting the dividend payout policies and it aims to explain which factors are more effective in decisions about dividend payout policy of companies, which factors are significant and at the same time the effects of variables of this research on dividend payout policy of companies. In this context, the data of 84 companies that are traded on Borsa Istanbul (BIST) Dividend Index and operate in different sectors are examined and the factors affecting the dividend payout policies of these companies are investigated by panel data analysis. As a result of this study it is found that variables such as the cash ratio, market value, stock transaction volume, age of the company and exchange rate affect the dividend distribution rations in a positive way, financial leverage, return on asset and free float share rate affect in a negative way. In this study, it is seen that the variables such as size of the company, price/earnings ratio, net sales growth rate, taxes paid, earnings per share, whereas assets growth rate, gross operating profit margin, inflation rate and interest rate do not have a significant effect on the dividend distribution ratios of the companies.

Keywords: Dividend Payout Policy, Borsa Istanbul Dividend Index.

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1. INTRODUCTION

The dividend payout policy is the series of decisions that determined how much of a company's earnings will be paid out to its shareholders as dividends, and how much will be retained at the company to be invested rather than paid out to its shareholders. The retained dividends are a key source of funds that will fuel business growth, whilst dividends paid out to shareholders represent a cash flow from the businesses to the shareholders (Boztosun, 2006: 11). Businesses determine their own dividend payout policies, which are crucial for their future and the administration prefers the most beneficial dividend payout method, time, and type for the business during the decision-making phase. The role of business administration in this regard is to ensure that the business dividend payment ratio, method, time and organization are optimal for the business and its shareholders after analysing and assessing all factors that affect the dividend policy decisions (Shapiro, 1991: 550-551). When the businesses payout dividends, their financial structure should be analysed and the dividend should be paid out without impairing the financial structure. Therefore, it is essential to analyse the factors that affect the dividend payout policy of businesses (Erdaş, 2017: 50).

This study aims to determine the business-specific and macroeconomic factors affecting dividend payout policies as well as to identify which of these factors have a greater effect on the businesses' dividend payout policies. For this purpose, a review of the relevant literature was initially conducted, followed by information on research hypotheses and methods, and the findings gained from the analysis were evaluated.

2. LITERATURE REVIEW

International and national literature on the factors affecting the dividend payout policy in businesses are analysed in terminological order below:

As one of the first studies to analyse dividend payout policies and business variables, Lintner (1956) is a landmark. Researchers interviewed 28 managers from US-based companies between 1947 and 1953 for the study. Employing the empirical analysis and survey method together, the study indicated that 15 variables, such as the business size, investment expenditures, external financing expenditure trends, profit ratios and operating profits affected the dividend payout policy.

The study by Baker et al. (2001) explored factors that affected the decisions taken by corporations regarding their dividend payout policies by surveying the senior executives of

651 companies trading on the Nasdaq Stock Exchange between 1996 and 1997. The study found that the amount and payment of dividends in past periods, the stability of operating profits, current period earnings, and expected future earnings affected the decisions taken by the companies regarding dividend distribution policies. Lobo and Zhou (2001), on the other hand, studied 803 companies traded on the Hong Kong Stock Exchange between 1990 and 1995. The study utilized a multiple regression method and the variables included in the analysis consist of voluntary accruals, the information disclosure policy, the relative current and future performance of the sector, leverage, size and return of stocks. The study found a positive relationship between the dividend payout policy and the business size, but a negative relationship between the dividend payout policy and the information disclosure policy.

Ho (2003) utilized data from 140 companies trading on the Australian Stock Exchange and 192 companies trading on the Japan Stock Exchange for the years 1992-2001. The study compared and analysed the dividend payout policies followed by the corporations trading in the Australian and Japanese capital markets through the panel data method. Consequently, it was found that, although the size factor has a favourable effect on the dividend payout policies of Australian corporations, the companies operating in Japan are positively affected by the variable of liquidity level but negatively affected by the business risk factor.

Amidu and Abor (2006) utilized data from 22 companies trading on the Ghana Stock Exchange between 1998 and 2003. The study, which employed the least squares method and panel data analysis, found a positive relationship between the dividend payout ratio and the profitability, free cash flow and tax variables, but a negative relationship with conglomerate, risk and Market Value/Book Value. Kang (2006) employed a multiple logistic regression method, utilizing data from 237 businesses trading on the capital markets of 4 developed countries such as; Australia, France, England, and the United States between 1986 and 1995. The study found a positive relationship between the dividend payout ratios and the variables of the current earnings, liquidity, depreciation, industry type and tax rate. On the other hand, a negative and significant relationship was found between dividend payout ratios and business size, growth ratio, business risk, share issue costs, dividend payment method in the form of share repurchase and administrational structure variables in which administration is made up of partners.

Al-Malkawi (2007) used the Tobit regression analysis method in his study in which data belonging to 160 companies trading on the Amman Stock Exchange between 1989 and 2000 were handled. The study found a positive relationship between the dividend payout ratios and the operating age, size and profitability variables, but a negative relationship between the dividend payout ratios and the financial leverage. Utilizing data from 191 non-financial companies operating in emerging countries such as Kuwait, Saudi Arabia, Oman, Qatar, and

Bahrain from 1999 to 2003, the study by Al-Kuwari (2009) employed the panel data analysis method. The study found a statistically significant positive relationship between the dividend payout ratio and the partnership structure, business size and profitability, but a negative relationship with the financial leverage. However, no statistically significant relationship between free cash flow, growth opportunities, business risk and dividend payout ratio were established.Utilizing data from 266 manufacturing and service companies operating in the United States in 2007, the study by Gill et al. (2010) determined that the dividend payout ratio was a function of profitability, growth and leverage factors. A significant negative relationship was reported between the dividend payout ratios of the manufacturing companies and a significant positive relationship between tax and market value/book value. However, a positive relationship was established between the dividend payout ratio of the service companies and the profitability and leverage variables, but a negative relationship with the growth. Al-Shubiri (2011) utilized data from 60 industrial companies trading on the Jordan Amman Stock Exchange from 2005 to 2009. The study that employed Tobit and logit regression analysis method, found a negative relationship between the dividend payout ratio and the financial leverage, ownership structure, business risk and asset structure, but a positive relationship between the dividend payout ratio and the profitability, growth opportunity and free cash flow. Zameer et al. (2013) used data from 27 foreign and national banks registered in different indices in Pakistan between 2003 and 2009, using the discrete regression analysis method. The study determined that the ownership structure, profitability and dividend payment for the previous year had a positive effect on the dividend payments, and the liquidity variable negatively affected the dividend payment. Utilizing data from 11 companies in the financial sector trading on the Ghana Stock Exchange from 2005 to 2009, the study by Badu (2013) employed the panel data analysis method. The study found a positive relationship between the dividend payout policy and operating age and liquidity variables. It was determined that the main variables that affect the dividend payout policies of the financial institutions in Ghana were operating age, collateral and liquidity. Utilizing data from 118 industrial companies trading on the Bosra Istanbul from 2003 to 2010, the study by Yıldız et al. (2014) employed the panel data analysis method. While determining the effect of taxes, profitability, growth opportunities, business size, leverage and liquidity on the cash dividend payment policies, the study found a negative relationship between the financial leverage ratios of companies and the cash dividend payout ratios. Kuzucu (2015) utilized data from 142 companies registered on the Istanbul Stock Exchange from 2006 to 2013. The study that employed panel data analysis method, found a negative relationship between the dividend payout and the and financial leverage, growth ratio, profitability and control power, but a positive relationship between the dividend payout and the size, operating age, and

price/earnings ratio. Utilizing 2010-2015 data of the companies trading in Borsa Istanbul 30 Index, the study by Erdaş (2017) found a positive relationship between the variables of the business size, cash ratio, earnings per share and market value of share and the dividend payout ratio, but a negative relationship with the financial leverage ratio and the square of the operating age.

3. RESEARCH METHODOLOGY

3.1.   PURPOSE AND IMPORTANCE OF THE RESEARCH

This study examines the business-specific and macroeconomic factors that affect dividend distribution policies in businesses operating in Turkey. It is aimed to explain which factors are more effective in decisions made by businesses regarding dividend payouts, which factors should be considered, and at the same time, the effects of the variables that are the subject of the research on the dividend payout policies of the businesses. In this context, the study analysed the data of the companies trading on the BIST Dividend Index for the years 2011-2018. The BIST Dividend Index was preferred since it consists of shares of businesses that trade on the star market, main market, and emerging companies' markets, and that have distributed cash dividends in the past three years as of the valuation date (Borsa Istanbul, 2019).

In the study, business-specific and macroeconomic factors that are thought to affect the dividend payout policies of the businesses whose stocks are traded on the Borsa Istanbul Dividend Index are determined, and hypotheses are developed and tested to what extent these factors affect the dividend payout policies of the businesses. A review of the national literature reveals that a limited number of studies have been conducted on the factors that affect dividend payout policies, and such studies tend to focus on business-specific factors that affect dividend payout policies. In addition to business-specific factors that affect dividend payout policies, this study also examined macroeconomic indicators, such as foreign exchange rate, interest rate and inflation rate. In this respect, the study contributes to national literature on the factors that affect dividend payout policies. It is also anticipated that the findings of this study would assist business administration to manage more successfully the dividend payout policies, which are essential for businesses, and guide the investors and managers.

3.2. DATA SET AND VARIABLES

The research was conducted on a total of 84 companies that operate in different sectors and trade on the BIST Dividend Index between 2011 and 2018. The number of companies' subject to the research and the sectors in which they operate can be listed as follows: 45 in manufacturing industries, 27 financial institutions, 3 in technology industries, 3 in wholesale and retail trade hotels and restaurants, 2 in transport sectors, as well as 2 in construction and public works sectors, 1 in administrative and support service sector and 1 in education health sports and other social services sectors. Data were derived from Borsa Istanbul, Public Disclosure Platform, www.finnet.com, www.stockeys.com and official websites of related companies, and was assumed to be accurate and up-to-date. The data utilized in the study is annual and a total of eight periods were reviewed.

The study used the dividend payout ratio as a dependent variable to analyse the effect of business-specific and macroeconomic factors on dividend payout policy. The independent variables of the study include business-specific factors, such as business size, financial leverage, price/earnings ratio, return on assets, cash ratio, gross operating profit margin, asset growth ratio, growth ratio in net sales, paid taxes, earnings per share, market value, share volume, free-float rate and operating age, as well as the macroeconomic factors, such as the foreign exchange rate (inflation-adjusted), inflation rate and interest rate. Table 1 shows the variables and calculation methods of the research.

Table.1. Research Variables and Calculation Methods

VARIABLE CODE	VARIABLE NAME	CALCULATION METHODS
DOR	Dividend Payout Ratio (%)	(Net Dividend / Net Profit/Loss for the Period) *100
BS	Business Size	Natural Logarithm of Total Assets
FL	Financial Leverage Ratio (%)	(Total Financial Liabilities/Total Assets) *100
PER	Price/Earnings Ratio (%)	Market Value / Parent Company Profit/Loss (Annual)
RoA	Return on Assets (%)	(Net Profit / Assets (Average)) *100
CR	Cash Ratio (%)	(Liquid Assets/Short-term Liabilities) *100
NSGR	Growth Ratio in Net Sales (%)	(Net Sales-Net Sales for the Previous Year) / (Net Sales for the Previous Year)) *100
PT	Paid Taxes	Taxes Payable and Legal Liabilities in the Income Statement
EPS	Earnings Per Share	Parent Company Profit/Loss (Annual) / Number of Shares in the Selected Balance Sheet Period
AGR	Asset Growth Ratio (%)	(Total Assets - Total Assets for the Previous Year) / (Total Assets for the Previous Year)) *100
MV	Market Value	Number of Shares * Undivided Closing Price
GOPM	Gross Operating Profit Margin (%)	(Gross Operating Profit/Loss) / Net Sales) *100
SV	Stock Trading Volume	Annual Share Volume Average
FFR	Free-float Rate (100%)	Free-float Ratio
Age	Operating Age	Field of Activity Year - Company Incorporation Year
ER	Foreign Exchange Rate (Inflation-Adjusted)	Inflation-adjusted American Dollar and Euro from the Central Bank of the Republic of Turkey's Electronic Data Distribution System are deployed.
INFL	Inflation Rate (%)	The wholesale pricing indices for 1968, 1987, 1993 and 2003 was generated by utilizing data from the Biruni database of the Turkish Statistical Institute and the inflation rates calculated by such indices were employed in the analysis.
Interest	Interest Rate (%)	Weighted average interest rates data from the Central Bank of the Republic of Turkey's Electronic Data Distribution System, which is charged to deposit accounts opened by banks, was utilized.

3.3.   RESEARCH HYPOTHESES

This study aims to examine the business-specific and macroeconomic factors that affect dividend payout policies in businesses operating in Turkey and thereby, the following were hypothesized.

H_1: The business size has an effect on the dividend payout ratios of the businesses.
H_2: The financial leverage has an effect on the dividend payout ratios of the businesses.
H_3: The price/earnings ratio has an effect on the dividend payout ratios of the businesses.
H_4: The return on assets has an effect on the dividend payout ratios of the businesses.
H_5: The cash ratio has an effect on the dividend payout ratios of the businesses.
H_6: The growth ratio has an effect on the dividend payout ratios of the businesses.
H_7: The paid taxes have an effect on the dividend payout ratios of the businesses.
H_8: The earnings per share have an effect on the dividend payout ratios of the businesses.
H_9: The asset growth ratio has an effect on the dividend payout ratios of the businesses.
H_{10}: The market value has an effect on the dividend payout ratios of the businesses.
H_{11}: The gross operating profit margin has an effect on the dividend payout ratios of the businesses.
H_{12}: The stock trading volume has an effect on the dividend payout ratios of the businesses.
H_{13}: The free-float rate has an effect on the dividend payout ratios of the businesses.
H_{14}: The operating age has an effect on the dividend payout ratios of the businesses.
H_{15}: The foreign exchange rate has an effect on the dividend payout ratios of the businesses.
H_{16}: The inflation rate has an effect on the dividend payout ratios of the businesses.
H_{17}: The interest rate has an effect on the dividend payout ratios of the businesses.

4.   METHOD AND FINDINGS

This study was conducted on 84 companies operating in different sectors traded on the BIST Dividend Index between 2011 and 2018 and examined the business-specific and macroeconomic factors that affect dividend payout policies in businesses. Specifically, this study employed panel data analysis since it includes the time factor as well as the cross-sectional data. The Stata 15.0 package program was utilized to test the statistical model.

4.1.   MODEL IDENTIFICATION

Panel data models were used in the study. In the first stage, the panel data was estimated by the pooled least squares method, which is the joint effect model. Then, fixed unit effect and random unit effect models, which are one-way unit effect models, were estimated. Which model should be preferred between the joint-effects model and the fixed-effects model was decided by using the F test, and which model should be preferred between the random-effects model and the co-effects model was decided by using the Breusch-Pagan LM (1980) test. On the other hand, Hausman (1978) specification test was used to determine whether the model, the unit fixed effect or the random effect, was valid.

Among the independent variables market value, share volume and paid taxes were included in the analysis by computing logarithm. The logarithm of these variables with a wide data range was computed and the range was narrowed and linearized. Besides, computing the logarithm of the relevant variables allows for a clearer and more effective interpretation of the projected regression coefficients.

The panel data model to be projected is as follows:

$$DOR_{it} = \beta_1 + \beta_2 BS_{it} + \beta_3 FL_{it} + \beta_4 PER_{it} + \beta_5 ROA_{it} + \beta_6 CR_{it} + \beta_7 GOPM_{it} + \beta_8 AGR_{it}$$
$$+ \beta_9 NSGR_{it} + \beta_{10} EPS_{it} + \beta_{11} FFR_{it} + \beta_{12} lnMV_{it} + \beta_{13} lnSV_{it} + \beta_{14} lnPT_{it}$$
$$+ \beta_{15} age_{it} + \beta_{16} ER_t + \beta_{17} infl_t + \beta_{18} interest_t + \mu_i + u_{it}$$

$$i = 1, \ldots, N \quad t = 1, \ldots, T$$

Here; DOR_{it}; refers to the dividend payout ratio of the ith business in the year t, BS_{it}; refers to the size of the ith business in the year t, FL_{it}; refers to the financial leverage ratio of the ith business in the year t, PER_{it}; refers to the dividend payout ratio of the ith business in the year t, ROA_{it}; refers to the return on assets of the ith business in the year t, CR_{it}; refers to the cash ratio of the ith business in the year t, $GOPM_{it}$; refers to the gross operating profit margin of the ith business in the year t, AGR_{it}; refers to the asset growth ratio of the ith business in the year t, $NSGR_{it}$; refers to the growth ratio in net sales of the ith business in the year t, EPS_{it}; refers to the earnings per share of the ith business in the year t, FFR_{it}; refers to the free-float rate of the ith business in the year t, $lnMV_{it}$; refers to the market value of the ith business in the year t, $lnSV_{it}$; refers to the share volume of the ith business in the year t, $lnPT_{it}$; refers to the paid tax of the ith business in the year t, age_{it}; refers to the age of the ith business, ER_t; refers to foreign exchange rate in the year t, $infl_t$; refers to inflation rate in the year t, $interest_t$; refers to interest rate in the year t, μ_i; refers to units-specific effects and u_{it}; independent and identical distribution error terms.

4.2.   PROJECTION RESULTS

Table 2 shows the pooled least squares estimation results for the common unit effect model.

Table.2. Pooled Least Squares Estimator

Variables	Coefficient	t value	p value
BS	-12.45699***	-6.55	0.000
FL	0.13763	1.56	0.119
PER	-0.00198	-0.95	0.344
RoA	-0.50549**	-2.17	0.031
CR	0.02084***	6.41	0.000
GOPM	0.01656	0.24	0.812
AGR	-0.20457***	-2.64	0.009
NSGR	0.02935*	1.65	0.098
EPS	0.13963	0.54	0.592
FFR	-0.13949	-1.47	0.142
lnMV	15.90277***	6.82	0.000
lnSV	-4.18499***	-3.51	0.000
lnPT	1.81323	1.37	0.170
Age	0.00530	0.06	0.954
ER	0.06553	1.38	0.167
INFL	-1.26440***	-2.59	0.009
Interest	1.75312	0.73	0.467
Fixed	-24,86136	-1.08	0.282
Number of Observation	569	F (17,551)	9.91
R^2	23.42	prob >F	0.000

*** p<0.01, ** p<0.05, * p<0.10

When the pooled least squares estimation results of the panel data in Table 2 are reviewed, *F* test statistics were calculated as 9.91, and the probability value was calculated as 0.000, which is the significance of the overall model. The *F* test indicates that the overall model is significant. Also, the determination coefficient (R^2) of the model was calculated as 23.42%. The estimated model clarifies 23.42% of the changes in the dividend payout ratio. When the calculated *t*

statistic values and probability values of the coefficients are reviewed, the variables of business size, cash ratio, asset growth ratio, market value, share volume and inflation rate appeared to have a significant effect on dividend payout ratio at a significance level of 1%, and return on assets has effects at a significance level 5% whereas growth ratio in net sales has effects at a significance level 10%.

Table. 3. Random Unit Effect Estimator

Variables	Coefficient	z value	p value
BS	-12.03314***	-4.73	0.000
FL	-0.02133	-0.18	0.857
PER	-0.00128	-0.69	0.489
RoA	-0.58911**	-2.38	0.017
CR	0.01847***	5.39	0.000
GOPM	0.04455	0.4	0.689
AGR	-0.07808	-1.12	0.261
NSGR	0.01213	0.74	0.457
EPS	0.08662	0.32	0.752
FFR	-0.25306*	-1.75	0.081
lnMV	14.45726***	4.66	0.000
lnSV	-1.74905	-1.13	0.258
lnPT	1.09313	0.75	0.455
Age	0.00717	0.05	0.963
ER	0.07785*	1.95	0.051
INFL	-1.23370***	-2.98	0.003
Interest	1.16891	0.57	0.566
Fixed	-25,01318	-0.82	0.415
Number of Observation	569	Wald χ^2 (17)	97.86
Unit number	80	prob > χ^2	0.000
R^2	31.86		

*** $p<0.01$, ** $p<0.05$, * $p<0.10$

When the estimation results of the unit random effect model in Table 3 are reviewed, Wald test statistics were calculated as 97.86, and the probability value was calculated as 0.000. The Wald test indicates that the overall random unit effect model is significant. Also, the

determination coefficient (R^2) of the model was calculated as 31.86%. The estimated model clarifies 31.86% of the changes in the dividend payout ratio. When the calculated z statistic values and probability values of the coefficients are reviewed, the variables of business size, cash ratio, market value, and inflation rate appeared to have a significant effect on the dividend payout ratio at a significance level of 1%, and return on assets has significant effects at a significance level 5% whereas free-float rate and foreign exchange rate have significant effects at a significance level 10%.

Table.4. Unit Fixed Effect Estimator

Variables	Coefficient	t value	p value
BS	-2.48649	-0.32	0.747
FL	-0.40012**	-2.21	0.028
PER	-0.00046	-0.25	0.805
RoA	-0.73125***	-2.69	0.007
CR	0.01614***	4.20	0.000
GOPM	-0.31448	-1.14	0.256
AGR	0.00395	0.05	0.957
NSGR	-0.00227	-0.13	0.893
EPS	-0.01464	-0.05	0.962
FFR	-0.79778***	-2.83	0.005
lnMV	7.04506*	1.65	0.092
lnSV	4.16932*	1.96	0.051
lnPT	1.46633	0.83	0.408
Age	2.39236*	1.71	0.089
ER	0.07941**	1.98	0.048
INFL	-0.34551	-0.65	0.516
Interest	-3.57048	-1.41	0.160
Fixed	-210.39*	-1.78	0.076
Number of Observation	569	F (17,472)	4.92
Unit number	80	prob > F	0.000
R^2	15.05		

*** $p<0.01$, ** $p<0.05$, * $p<0.10$

When the estimation results of the unit fixed effect model in Table 4 are reviewed, F test statistics were calculated as 4.92, and the probability value was calculated as 0.000. The F test

indicates that the overall model is significant. The determination coefficient (R^2) of the fixed effect model was calculated as 15.05%. The estimated fixed effect model clarifies 15.05% of the changes in the dividend payout ratio. When the calculated t statistic values and probability values of the coefficients are reviewed, the variables of return on assets, cash ratio, and free-float rate appear to have significant effects of dividend payout ratio at a significance level of 1%, and financial leverage and foreign exchange rate have significant effects at a significance level 5% whereas the market value, share volume and operating age have significant effects at a significance level 10%.

The Breusch-Pagan LM test and score test was employed to test the validity of unit random effects against the common effect model. The Breusch-Pagan LM tests whether the pooled least squares estimators are eligible against the random effect model. The score test was developed by Bottai (2003). It tests the pooled least squares model derived from the LR test against the random-effect model. The null and alternative hypotheses in the Breusch-Pagan LM test and score test are as follows:

H_0: Pooled least squares estimators are valid.
H_1: The random effects estimators are valid.

Table. 5. Test Results for Random Effects Validity

	$\chi^2(1)$	prob > χ2
Breusch-Pagan LM	143,57	0.000
Score Test	469,71	0.000

In the Breusch-Pagan LM test, χ^2 test statistics were calculated as 143.57, and the probability value was calculated as 0.000; and the null hypothesis was rejected, but the alternative hypothesis was accepted, suggesting that the unit random effects were valid. Score test also came out with the same results. Unit random effect model should be preferred instead of pooled least squares.

The F test was employed to test the validity of unit fixed effects against the common effect model. The F test is employed to test whether the data differ by unit. The null and alternative hypotheses in the F test are as follows:

H_0: Pooled least squares estimators are valid.
H_1: The fixed effects estimators are valid.

Table. 6. Validity Test for Fixed Effects

	F (79,472)	prob > F
F	4.47	0.000

In the F test, test statistic was calculated as 4.47, and the probability value was calculated as 0.000. The null hypothesis was rejected, but the alternative hypothesis was accepted, suggesting that the unit fixed effects were valid. The unit fixed-effect model should be preferred instead of pooled least squares.

Once the validity of the unit effects has been established, the next step is to determine if they are fixed or random. The validity test between the unit fixed-effect model and the unit random effect model is done through the Hausman (1978) specification test.

Table. 7. Hausman Test Results

	$\chi^2(16)$	prob > χ^2
Hausman Test	153,62	0.009

H_0: The difference between the coefficients is not systematic.
H_1: The difference between the coefficients is systematic.
The fixed-effects model is consistent under hypotheses H_0 and H_1, but inconsistent under H_1 and effective under H_0. The Hausman test was done under null and alternative hypotheses. When the Hausman test is reviewed, the null hypothesis was seen to be rejected. Fixed-effect estimators were considered valid.

Based on the estimation results of the unit fixed-effect model in Table 4, the effect of the financial leverage on the dividend payout ratio was calculated as negative. Since the probability value is p=0.028<0.05, the financial leverage has a significant effect on the dividend payout ratio at a 5% significance level. A one-unit increase in the financial leverage value reduces the dividend payout ratio by 0.40%. The coefficient of the return on assets was calculated as significant at a 1% significance level, as it was negative and p=0.007<0.01. A one-unit increase in the return on assets of the businesses would reduce the dividend payout ratio by 0.731%.

The effect of the cash ratio on the dividend payout ratio was calculated as positive. Since the probability value is p=0.000<0.01, the cash ratio of the businesses has a significant effect on the dividend payout ratio at a 1% significance level. A one-percent increase in the cash ratio

of the businesses raises the dividend payout ratio by 0.016%. The coefficient of the free-float rate appears to have a negative and significant effect at a 1% significance level. A one-percent increase in the free-float rate of the businesses reduces the dividend payout ratio by 0.797%. The coefficient of the market value was calculated as significant at a 10% significance level, as it was positive and the probability value was $p=0.092<0.10$. A one-percent increase in the market value of the businesses raises the dividend payout ratios by 0.0704%. The coefficient of the share volume appears to be significant at a 10% significance level, as it was positive and the probability value was $p=0.051<0.10$. A one-percent increase in the share volume of the businesses raises the dividend payout ratios by 0.0416%.

The coefficient of the operating age is calculated positively. The effect of the operating age on the dividend payout ratio is significant at a 10% significance level. When other variables are fixed, those with an older operating age have a greater dividend payout ratio than those with younger operating age. The coefficients of the foreign exchange rate were calculated positively. The effect of the foreign exchange rate on the dividend payout ratio appears to be significant at a 5% significance level. Increases in the foreign exchange rate have a positive effect on the dividend payout ratio.

Based on the estimations of panel data regression, the coefficients of business size and price/earning ratio were calculated negatively. The calculated t statistic and probability value indicates that the business size and the price/earnings ratio had no statistically significant effect on the dividend payout ratio. Similarly, it is observed that the coefficients of the gross operating profit margin, growth ratio in net sales and earnings per share were also negative and that these had no significant effect on the dividend payout ratio. The coefficients of the asset growth ratio and the paid taxes were calculated positively. The calculated t statistic and probability value refer that such variables have no statistically significant effect on the dividend payout ratio. The estimation results also suggest that the changes in inflation rate and interest rates did not affect the dividend payout ratio of the businesses.

5. CONCLUSIONS

One of the goals of businesses is to make profit. Because profit not only raises the market value of businesses but also the wealth of its shareholders. Businesses can evaluate their profits in two ways. The first is the profit payout to shareholders, whereas the second is retaining the profits in the business to be invested rather than paying out to shareholders. The dividend payout policy is defined as the series of decisions that determines how much of a company's earnings will be paid out to its shareholders as dividends, and how much will be retained at the company to be invested rather than paid out to its shareholders. Both

decisions are of great importance to the business and the retained dividends are a key source of funds that will fuel business growth, whilst dividends paid out to shareholders represent a cash flow from the businesses to the shareholders. While the business administration aims to pay out a consistent and satisfactory dividend to shareholders, on the other hand, it also intends to use the retained dividends to supply the resources needed for its growth and development. Although achieving these two conflicting goals at the same time is extremely challenging, it does necessitate a sound dividend policy decision. At the decision-making stage, the most important task of the administration, which determines dividend payout policies, is to thoroughly analyse and evaluate the factors that affect dividend payout policy decisions and to determine the most advantageous method of dividend payout method, dividend payment time, and dividend payout type for both the company and the shareholders. As dividend payout policy is of great importance to businesses and investors, this study examined business-specific and macroeconomic factors that affect dividend payout policies in businesses operating in Turkey and aimed to clarify which factors are more effective in decisions made by businesses regarding dividend payouts, which factors should be considered, and also the effects of the variables under investigation on the dividend payout policies of businesses. This study examined 84 companies that operate in different industries and trade on the BIST Dividend Index, which consists of shares of businesses that trade on the star market, main market, and emerging companies' markets, and have distributed cash dividends in the past three years as of the valuation date, between 2011 and 2018. The study included business-specific factors, such as business size, financial leverage, price/earnings ratio, return on assets, cash ratio, gross operating profit margin, asset growth ratio, growth ratio in net sales, paid taxes, earnings per share, market value, share volume, free-float rate and operating age, as well as the macroeconomic factors, such as the foreign exchange rate (inflation-adjusted), inflation rate and interest rate and examined the relationship between such variables and the dividend payout ratio, which is the dependent variable.

Panel data models were used in the study. In the first stage, the panel data was estimated with the pooled least squares method, which is the common effect model. Then, unit fixed-effect and unit random effect models, which are one-way unit effect models, are estimated. Which model should be preferred between the common-effect model and the fixed-effect model was decided by using the *F* test, and which model should be preferred between the random-effect model and the common effect model was decided by using the Breusch-Pagan LM (1980) test. On the other hand, Hausman (1978) specification test was used to determine whether the model, the unit fixed-effect model or the random effect model, was valid.

The study found that the financial leverage had a negative effect on the dividend payout ratio at a 5% significance level. The studies by Al-Kuwari (2009), Afza and Mirza (2011), Al-Shubiri

(2011), Patra, et al. (2012), Nnadi, et al. (2013), Tamimi, et al. (2014), Yıldız, et al. (2014) and Kuzucu (2015) found a negative relationship between the dividend payout and the financial leverage ratio. Again, the study found that the coefficient of the return on asset had a negative and significant effect at a 1% significance level. In other words, it was determined that an increase in the return on assets of businesses may result in a decrease in the dividend payout ratio. Similar results have been seen in the studies by Kuzucu (2015) and Hosain (2016). The cash ratio was found to have a significant and positive effect on the dividend payout ratio at a 1% significance level. This result is similar to the studies by Amidu and Abor (2006) and Erdaş (2017). The effect of the free-float rate on the dividend payout ratio was found to be significant and negative at a 1% significance level. Studies that reviewed the relationship between the free-float rate and dividend payout ratio found that in general, there was no significant relationship between the two variables. The study indicated that there was a significant and positive relationship between the market value and the dividend payout ratio at a 10% significance level. This result supports the finding of Erdaş (2017). The effect of the share volume on the dividend payout ratio was found to be significant and positive at a 10% significance level. The relationship between the operating age and the dividend payout ratio was found to be significant and positive at a 10% significance level. When other variables are fixed, those with older operating age were observed to have a greater dividend payout ratio than those with younger operating age. Similar results have been found in the studies by Al-Malkawi (2007), Badu (2013), Nnadi, et al. (2013), Tamimi, et al. (2014) and Kuzucu (2015).

The effect of the foreign exchange rate on the dividend payout ratio was found to be significant and positive at a 5% significance level. Increases in the foreign exchange rate have a positive effect on the dividend payout ratio. There is no research published in the literature that examines the relationship between the foreign exchange rate and the dividend payout ratio.

The coefficients of the business size and price/earnings ratio appear to be negative in the estimations of panel data regression. The calculated t statistic and probability value indicates that the business size and the price/earnings ratio have no statistically significant effect on the dividend payout ratio. Similarly, it is observed that the coefficients of the gross operating profit margin, growth ratio in net sales and earnings per share were also negative and that these had no significant effect on the dividend payout ratio. The coefficients of the asset growth ratio and the paid taxes were positive. The calculated t statistic and probability value refer that such variables have no statistically significant effect on the dividend payout ratio. The estimation results also suggest that the changes in inflation rate and interest rates did not affect the dividend payout ratio of the businesses.

Eventually, the $H_2, H_4, H_5, H_{10}, H_{12}, H_{13}, H_{14}, H_{15}$ were accepted. It has been concluded that financial leverage, return on assets, cash ratio, market value, stock trading volume, free-float rate, operating age and foreign exchange rate affect the profit payout ratios of the businesses. However, the $H_1, H_3, H_6, H_7, H_8, H_9, H_{11}, H_{16}, H_{17}$ were rejected. In other words, the hypotheses that business size, price/earnings ratio, growth ratio in net sales, paid taxes, earnings per share, asset growth rate, gross operating profit margin, inflation rate and interest rate affect the profit payout ratios of the businesses, were rejected.

Limited studies have been done in Turkey on the variables that affect dividend payout policies, and these studies have focused on the business-specific factors that affect dividend payout policies, as documented in the literature. The most significant difference between this study and the national literature is the inclusion of the business-specific factors that affect dividend payout policies, as well as the relationship between macroeconomic indicators such as foreign exchange rate, interest rate, inflation rate, and dividend payout policies. The study is, in this respect, expected to fill the gap in the available literature. It is also believed that the findings of this study would assist business administration to manage more successfully the dividend payout policies, and of great importance for the investors and finance managers. Studies involving a diverse range of sectors and macroeconomic factors may be recommended in the future.

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LESSONS FROM THE PANDEMIC: NEW LEGAL AND MANAGERIAL CHALLENGES FOR HEALTHCARE SERVICES

Olga SOVOVA[1]

Abstract

Health is considered a fundamental human right that is the basis for the exercise of other human rights. Therefore, it is necessary to examine new challenges caused by the COVID-pandemic. New approaches in daily management as well as in the strategy for the following years became a must. The pandemic brought the necessity of redesigning acute, planned and long-term healthcare. The executive power restricted the decision-making autonomy of a patient and also the independence of the healthcare professionals. The public administration and healthcare management should consider balancing the right to health, the highest possible healthcare services standard, and the appropriate provision of public resources. Based on new demands of redistributing resources and medical technology, managerial responses lag behind the needs of pandemic medicine. The public administration and the legal practice could not react appropriately in issuing new laws, by-laws and instructions for managing crisis health services. The public administration minimises the daily operation of the public health services to comply with the need to rescue lives without enabling any preventive or surgical care. The paper highlights mentioned issues, using practical managerial examples in health services and case-law of Czech courts. The paper argues the necessity of public administration's intervention on shortage of scarce resources in the pandemic. The article brings examples of good practice of public healthcare services in the Czech Republic. The paper uses the methodology of economic approach, desk research and analysis of legal regulation and case-law. The article underlines the right to healthcare as a fundamental human right. The paper concludes with proposals on coping with the legal and managerial tasks in health services for the next future.

Keywords: Health Services, Pandemic, Public Administration, Decision-Making Autonomy, Public Law, Healthcare Management

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ERA OF DIGITISATION IN PUBLIC ADMINISTRATION: LEGAL ISSUES OF THE RIGHT FOR DIGITAL SERVICES IN PRACTICE

Olga SOVOVA[1]

Abstract

The 21st century is called the era of digitisation. Modern and well-developed countries emphasise access to public administration and its services via the internet. The pandemic and lockdowns worldwide underlined the need for daily distance communication between the user and the public administration officer. The paper examines the current situation, issues and possibilities for the digitisation of the public administration. The article argues, using the experience of the Czech Republic in developing new public digital space, problems in realising the legal claim to the general digital services. The paper examines the Law on Digital Services. It analyses its recently adopted changes, which will bring since 2023 compulsory digital communication in most daily and life situations, as an example of the right to digital service in the public space. The paper argues to what extent the public space, its users, and administration are ready to change their regular communication and interaction. The paper concerns the privacy of persons and legal entities. The article warns that the state will not only guarantee but also regulate, supervise and control digitisation. Based on the desk research, the paper analysis examples of good practice in the national public administration. The paper uses the methodology of the economic-legal approach and comparative analysis. The article concludes with proposals for raising good administrative practice to a higher level, addressing some governance models as steps from the government to governance, privacy protection and sustainability. The paper underlines the necessity of avoiding simplification, legal uncertainty, exclusion of vulnerable groups from the public space and unjustified expenditures in public administration.

Keywords: Digitisation, Digital Services, Public Administration, Governance, Privacy, Comparative Analysis, Sustainability

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LEADERSHIP: OPPORTUNITIES AND CHALLENGES IN THE POST-PANDEMIC BUSINESS WORLD

Leydiana de Sousa PEREIRA[1]

Abstract

Leadership is essential for the success of any organization, no matter its size, structure, or activity type provided. The leadership factor is influential in several organizational aspects, among which motivation, engagement, sense of unity and cooperation, conflict management, achieve goals, and promotion of employees' mental health. However, given the COVID-19 pandemic, organizations were affected by several restrictions (political, economic, and social) that directly impacted the people management, resulting in resignation rates have increased, wage cut practices, uncertainty about future employs, work processes changes, expansion of home office, among others changes. In this sense, it is important to discuss the opportunities and challenges for people management to adapt to the "New Normal" after the COVID-19 pandemic. A case study in a metropolitan region of Brazil was realized. In this analysis were consider organizations from both sectors, manufacturing, and service. Our study demonstrates that major challenges are resistance from employees and inflexibility of the organizational culture. In terms of opportunities, actions as humanized management implementation, based on principles of collaboration, resilience, and communicability are emphasized. Thus, a strategic indicators plan was developed considering aspects like productivity, resilience, work satisfaction, sense of responsibility, and skills development in order to support long-term organizational goals.

Keywords: Leadership, COVID-19 Pandemic, Humanized Management, Strategic Indicators.

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ISO 9001:2015 IMPLEMENTATION IN A COMMERCIAL SECTOR: A CASE STUDY IN BRAZILIAN HOSPITAL

Leydiana de Sousa PEREIRA[1]

Abstract

Strategic quality management is an essential aspect for any organization in order to develop its products and process. Therefore, aspects such as reliability, accessibility, availability, and security are fundamental to any product or service to obtain advantages over competitors. In line with improving the quality of products and services, it is also necessary to observe organizational processes to reduce costs, maximize efficiency, improve communication, and integrate all activities in a systematic way. From this perspective, quality standards like ISO 9001 can support the organization in strategic quality management. In general, ISO 9001 international standard establishes quality requirements to increase customer satisfaction. This standard is applicable to any organization type, no matter their activity's segmentation, size, or structure. A case study in a hospital located in Brazil northwest city was conducted. The commercial sector was the organizational area analyzed. For this analysis, a mixed-method approach was applied, including interviews with managers and internal results and procedure queries. Our study demonstrates that major challenges during ISO 9001 implantation are resistance from employees, hierarchical structure, and inflexibility of organizational culture. After ISO 9001 implementation, the commercial sector obtained benefits such as a 14.5% waste reduction, more engagement between all employees; and inventory management improvement. These aspects together ensures greater operating efficiency. Thus, strategic indicators were developed considering aspects like quality, efficiency, productivity, and work satisfaction in order to support long-term organizational goals.

Keywords: Quality Management, Commercial Sector, Hospital, Strategic Indicators.

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EVALUATION OF CROATIAN PENSION FUNDS' PERFORMANCE – OLD APPROACH VERSUS THE NEW ONE

Dražen NOVAKOVIĆ[1]

Abstract

A very important element of the pension insurance system based on capitalized savings is the return rate of pension funds. The financial performance of their investments directly affects the amount of accumulated funds and future pension of the insured person. As a new approach to evaluation of the financial performance of pension funds has been developed recently, this paper aimed to conduct both traditional and modern analysis of the financial performance of mandatory pension funds in Croatia and to compare the results. The traditional analysis is focused on the preparation and calculation of financial ratios that indicate the risk-adjusted success of the investment (Sharpe, Sortino and information ratio). Since the integral element of the traditional analysis is the choice of reference value (reference portfolio), the reference value developed by the author for the purposes of his doctoral dissertation was used. The modern approach to financial performance evaluation uses data envelopment analysis (DEA) that assesses whether the observed decision-making units (pension funds) are efficient in the process of converting inputs into outputs. This efficiency is relative because it evaluates success based only on a set of observed units, and not in relation to some absolute, externally given value. The MaxDEA 7 program was used to perform the analysis. Each category of mandatory pension funds was analyzed separately by using monthly data ending with December 2019. Based on the results of the analysis and the consequent ranking of mandatory pension funds, it can be concluded that the traditional and modern approach equally evaluate the performance of funds. Namely, the results do not confront each other, although they are not identical. Therefore, these two approaches cannot be considered as substitutes, but as complementary approaches, as one emphasizes the absolute and the other the relative aspect of the performance measurement.

Keywords: Pension Funds, Croatia, Financial Performance, Risk-Adjusted Ratios, Data Envelopment Analysis

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		Program Schedule
		27 September 2021
		Airport transfers (Only for Blue and Green Package ID Holders)
19:30 - 20:30		Dinner in the Hotel Restaurant (Only for Blue and Green Package ID Holders)
		28 September 2021
09:00 - 09:30		Registration and Opening Ceremony
		Session I
10:00 - 10:15		ANALYSIS OF THE RELATIONSHIP BETWEEN TURKEY'S ELECTRICITY CONSUMPTION AND MACROECONOMIC INDICATORS - İ. ÇITLIK & M. ACAR (Turkey)
10:15 - 10:30		EVALUATION OF CROATIAN PENSION FUNDS' PERFORMANCE – OLD APPROACH VERSUS THE NEW ONE - D. NOVAKOVIĆ (Croatia)
10:30 - 10:45		LEADERSHIP: OPPORTUNITIES AND CHALLENGES IN THE POST-PANDEMIC BUSINESS WORLD - L. de Sousa PEREIRA (Brazil)
10:45 - 11:00		Coffee Break
		Session II
11:00 - 11:15		ERA OF DIGITISATION IN PUBLIC ADMINISTRATION: LEGAL ISSUES OF THE RIGHT FOR DIGITAL SERVICES IN PRACTICE - O. SOVOVA (Czechia)
11:15 - 11:30		DETERMINATION OF COMPANY SPECIFIC AND MACROECONOMIC FACTORS AFFECTING DIVIDEND PAYOUT POLICIES: A CASE STUDY ON BORSA ISTANBUL DIVIDEND INDEX - R. KENDİRCİ & M. ACAR (Turkey)
11:30 - 11:45		ISO 9001:2015 IMPLEMENTATION IN A COMMERCIAL SECTOR: A CASE STUDY IN BRAZILIAN HOSPITAL - L. de Sousa PEREIRA (Brazil)
11:45 - 12:00		LESSONS FROM THE PANDEMIC: NEW LEGAL AND MANAGERIAL CHALLENGES FOR HEALTHCARE SERVICES - O. SOVOVA (Czechia)
19:30 - 22:00		Gala Dinner (Only for Blue, Green and Orange Package ID Holders) MEETING IN THE HOTEL LOBBY
		29 September 2021
		Social Program Mostar – Blagaj – Pocitelj Trips Tours) (Only for Blue and Orange Package ID Holders)
08:30		Departure from the Hotel
		First part of the tour
13:00		Lunch
		Second part of the tour
19:00		Dinner
21:00		Back to the Hotel
		30 September 2021
		Breakfast (Only for Blue and Green Package ID Holders)
		Departure to Airport