ANALYSIS OF THE EFFICIENCY OF THE WELFARE STATE SPENDING: TURKEY AND EUROPEAN COUNTRIES

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Abstract

Education, health and social protection expenditures, the total of which is considered as welfare state spending, are public expenditures with national significance in current times. Despite the neoliberal policies that have been prevalent in the global scale since the 1980s, it was observed that welfare state spending and related state interventions have not decreased and even continued to increase along with social changes. Adequate use public spending without squandering is important for economic wealth as well as the amount of public spending. In the present study, the efficiency of welfare state spending in European countries and Turkey was compared with Data Envelopment Analysis (DEA). Cluster analysis was conducted to ensure the homogeneity of the decision-making units among the analyzed nations. Based on the DEA findings for the first cluster, it was determined that Ireland had the lowest efficiency score and an improvement of 65.11% and 45.86% was suggested in Employment and the share of lowest 10% in GDP variables. In the second cluster, Romania had the lowest efficiency score. Turkey, on the other hand, ranked 10th among 16 countries in efficiency ranking. The most referenced nation in this group was Portugal.

Keywords: Education, health, social protection, welfare state, data envelopment analysis.

JEL Classification: H5, I30, C44

REFAH DEVLETİ HARCAMALARININ ETKİNLİĞİNİN DEĞERLENDİRİLMESİ: TÜRKİYE VE AVRUPA ÜLKELERİ

Öz

Refah devleti harcamaları olarak tabir edilen eğitim, sağlık ve sosyal koruma harcamaları günümüzde ülkeler için son derece önemli olan kamu harcamalarıdır. 1980'lerden itibaren dünya genelinde uygulanan neoliberal politikalara rağmen refah devleti harcamalarının ve bu konudaki devlet müdahalelerinin azalmadığı hatta yaşanan toplumsal değişimlerle birlikte artmaya devam ettiği gözlenmektedir. Kamu harcamalarının miktarı kadar israf edilmeden amacına uygun şekilde kullanılması da ekonomik refah için önem arz etmektedir. Bu çalışmada Avrupa ülkeleri ve Türkiye'nin refah devleti harcamalarının etkinliği Veri Zarflama Analizi (VZA) kullanılarak karşılaştırılmıştır. Çalışma kapsamındaki ülkelere öncelikle karar verme birimlerinin homojenliğinin sağlanması amacıyla kümeleme analizi uygulanmıştır. Birinci küme için uygulanan VZA bulgularına göre, İrlanda'nın en düşük etkinlik skoruna sahip ülke olduğu görülmüş ve etkin olabilmesi için İstihdam ile Milli gelirden en az pay alan %10'luk kesim değişkenlerinde sırası ile %65,11 ve %45,86 oranında gelişme sağlaması önerilmiştir. İkinci kümede ise, Romanya en düşük etkinlik skoruna sahip olan ülke olmuştur. Türkiye ise etkinlik sıralamasında 16 ülke arasında 10. sırada konumlandığı gözlenmiştir. Bu grupta en çok referans gösterilen ülke ise Portekiz'dir.

Anahtar Kelimeler: Eğitim, sağlık, sosyal koruma, refah devleti, veri zarflama analizi.

JEL Sınıflaması: H5, I30, C44

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1. Introduction

With the Industrial Revolution, economic growth, enrichment and technology became prevalent globally, however this rapid change also led to major economic crises, world wars and social problems. The search for a solution began after the 1929 Great Depression, and John Maynard Keynes's suggestions were accepted globally and particularly in developed countries. Keynesian economic policies that were based on state intervention and claimed to save the economies from the crisis prevailed until the mid-1970s. Especially in the post-second world war era, both the scope and content of the duties and obligations imposed on the state increased and this phenomenon was associated with the concept of welfare state.

The foundations of the welfare state were constructed by the Keynesian view that the unemployment and economic crises could be prevented by increasing public spending and total demand, which in turn increased confidence in Keynesian theory. After the Second World War, social programs were transformed into comprehensive universal benefit systems, guaranteeing a basic standard of living. Prominent examples of welfare state implementations during this period include regulations such as pensions, healthcare programs, and unemployment insurance. The welfare state is an outcome of social democracy and it was not surprising that nations, where welfare state institutions and programs were successfully implemented, were also the states of economic and social development (Quadagno, 1987: 110-112). Certain studies claimed that welfare states targeted both simple and expanded population growth, with temporal and spatial differences after the Second World War. Institutions and regulations constructed for this purpose provide opportunities such as education, accommodation, health, income guarantee, and social services for the individuals. Thus, welfare state practices became complementary to social systems and institutions such as other economic systems, family, local communities, and associations (Therborn, 1987: 240). The welfare state aimed to eliminate market failures in at least three aspects. The first is to provide a minimum income guarantee regardless of the market value of the businesses and individual and familial properties, while the second is to minimize the problems that individuals experience in case of illness, old age, and unemployment, and the third is to guarantee a certain range of social services for all without a discrimination based on status or class (Briggs, 1961 : 228).

During the 1950s and 1960s, state intervention was most common in developed countries. The welfare state policies implemented between 1945 and 1975 contributed to the development of human capital, which was vital for the nations, and established the basis for the economic and technological developments in developed countries. In this period, the

state interventions in social and economic life were at the highest level. These interventions were mainly in the areas of education, health and social protection spending, in other words, welfare expenditures. The main objective was to create an educated, healthy society where social justice prevailed. Thus, the nations attempted to eliminate significant obstacles to economic development and growth. The high level of public expenditures, borrowing and budget deficits caused by the rise in oil prices between 1973 and 1979 led to a debate on state intervention in economic and social life. Lower increase in tax revenues when compared to the increase in public expenditures led to budget deficits, borrowing and new crises in several nations. In the post-1945 period, the aim of the states was to ensure the individual welfare and to overcome the crisis, while since 1975, the aim was to overcome the crisis and to reduce the share of the public sector in the economy. For this purpose, neoliberal policies were implemented globally (Özdemir, 2005: 172).

Despite the neoliberal policies implemented in the last thirty years, it is not possible to suggest that welfare state spending have declined significantly. Studies demonstrated that public spending continued to increase, especially in developed countries, for various reasons. Welfare spending did not diminish due to the perception of education and health as a human right, high expectations from the state, demographic changes, high unemployment rates, social justice concerns, the association between the high welfare spending and the development level of the nations, and global income inequalities. It is possible to list several important reasons for the concomitance of education, health and social protection expenditures. These three expenditure categories are in the public domain, require state intervention, dissipate positive externalities, there are complementary and reinforcing correlations between health, education and social protection policies, these three expenditures have the potential to reflect social welfare to the global level, and finally they nourish and develop human capital (Haile and Zarazua, 2018: 371).

Today, social benefits and expectations acquired due to the expenditures are important as well as the amount of expenditures, in other words, the outputs of public spending are extremely important. Certainly, it is unrealistic to consider the state as a corporation and expect maximum benefit with minimum spending. However, disciplining the spending and efficient use of the resources are very important to balance the national budget. Rather than raising the tax rates or introducing new taxes, it is a more risk-free for the nations to use resources efficiently without wasting resources when financing public spending. Furthermore, efficient and effective use of public resources is of utmost importance for social welfare, income justice, economic stability, sustainable growth and development.

The present study aimed to analyze the efficiency of education, health and social pro-

tection expenditures, considered as welfare spending in selected European countries and Turkey along with the variables determined as the outputs of these expenditures and to determine which countries should be considered as role models. For this purpose, the current state of global welfare spending is assessed in the second part of the study, a literature review on the topic is presented in the third section, information on the data set and the variables used in the analysis is provided in the fourth section, and the empirical findings of the analysis conducted on European countries and Turkey are given in the fifth section. In the conclusion section, comments and recommendations are presented.

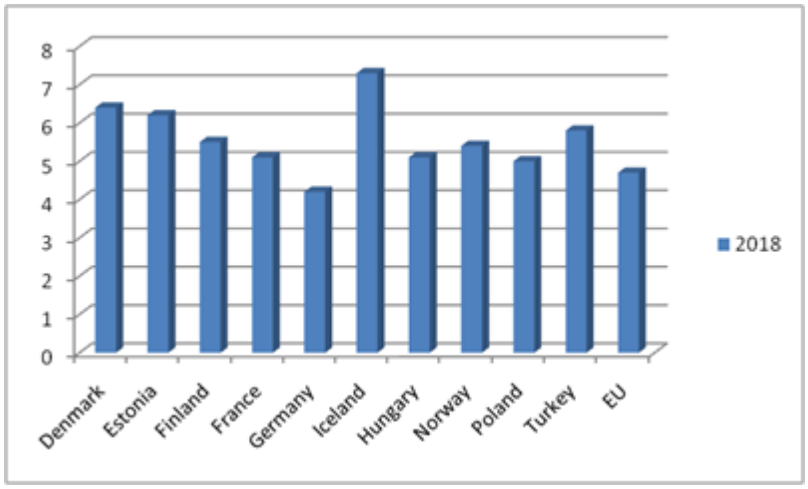
2. Welfare State Spending – The General Outlook

Education, health and social protection expenditures, which are the indispensable tools of the welfare state, are described as semi-public goods and services in finance literature. Semi-public goods and services are goods where public and private benefits are provided together. Semi-public goods provide both direct and external benefits for the beneficiaries. Due to their external benefits, semi-public goods are considered as a public service. The external benefit property of these goods constitutes the reason for state intervention. Healthy and educated individuals are considered the human capital stock in a society and provide economic and social benefits for the society. Education services improve the chances of success in individuals' lives and ensure personal income. However, they also have several social benefits. Education and health services could not be limited with the narrow definition of public goods, but the intensity of the external benefits they provide assigns these services a public character. Although education is a part of the quality of life, it is a service that benefits future generations with important effects on economic development goals. The external benefit dimension, which includes the effects of education on development goals, constitutes the rationale for the state to intervene in the provision of educational services (McMahom, 2004: 211).

High educational achievement in a society is one of the important factors that affect the lifelong individual income in that society. The skills acquired through education will determine the future welfare levels of the individuals, and thus, those of the societies. The fact that education is a prerequisite for economic development and growth is the reason for the state intervention in education. Education is a basic human right, as well as a tool that could be used to solve several social problems with the right policies. Education for individuals strengthens human capital, increases economic opportunities, promotes health, and improves the ability to make effective choices. Education for the society could increase economic opportunities, social mobility, and transform institutions into more effective organi-

zations. Higher education means more advanced financial capability and better health, as well as scholar achievements (The World Bank, 2018: 27). Education is an important factor that improve individual skills and income. Thus, education policies have an important role in eliminating the existing and expanding differences in income. It is clear that in a better educated society, the efficiency of public spending increases, leading to positive effects on income distribution and economic development. Because, it would be easier for a more educated society to monitor and control political processes (Afonso et al., 2010: 368). The modern state intervenes in education mostly via public spending. The efficiency of these expenditures are analyzed based on their contributions to science and technology, the topic, the reports that determine the quality of education at an international level, or macroeconomic outputs such as per capita income, unemployment rate, poverty and Gini coefficient.

Chart 1. Public Education Expenditures in Selected Nations (% of the GDP)



Resource: Compiled from the Eurostat and Turkstat. Data includes primary, secondary and tertiary education expenditures. Accessed on 04.05.2020.

Chart 1 demonstrates the share of education spending in selected countries within GDP. As seen in the chart, the countries with the highest total education spending to GDP ratio are Scandinavian countries such as, Denmark, Iceland and Finland. The mean European Union and OECD rates are around 5-6%. Turkey seems to have approached the mean EU and OECD rates in 2018.

About 60-70% of public education spending in the EU and Turkey is used in educational institutions other than tertiary education (OECD, 2018; 266). The majority of education spending in the EU and Turkey is mainly financed by the central government budget. However, in nations such as Denmark, Sweden and Finland, mainly the local governments finance educational expenditures (Egeli and Hayrullahoğlu, 2014: 593).

An analysis of global public education spending would demonstrate that the expenditures of EU countries are average or above average. However, their social and economic goals in 2020 and on focus on education. These include intelligent growth based on knowledge and innovation, sustainable growth with more efficient use of resources, and high employment and inclusive growth for social and regional cohesion. There are extremely important steps that need to be taken to achieve these objectives. 75% of the population between the ages of 20 and 64 should be employed. The rate of school dropouts should be reduced to lower than 10%. At least 40% of the young population should attend higher education. Less than twenty million people should be at risk of poverty. All these goals are interrelated. Better educated individuals would help increase the employment rate, and thus reduce poverty. With improved resource efficiency, further resources could be allocated to research and development in all industries and the number of R&D personnel would increase due to education. Thus, the competitiveness of EU nations would be improved with the planned services (European Commission, 2010).

Health services are among basic human rights. State support and intervention is mandatory to provide equal healthcare services for all without any discrimination. It is unconceivable to privatize healthcare services completely. Because, if the health services are produced only by private enterprises, it becomes a property that only those who could afford it would benefit. Due to the fact that health includes externalities at both local and international levels, it is considered as a global public good. One of the externalities that health possesses as a global public good is the prevention and control of infectious diseases. The prevention or treatment of an infectious disease in a nation could prevent the spread of the disease to neighboring countries. Thus, the dimensions of externality reach a global dimension by superseding individual and national dimensions (Smith et al., 2003: 10-12).

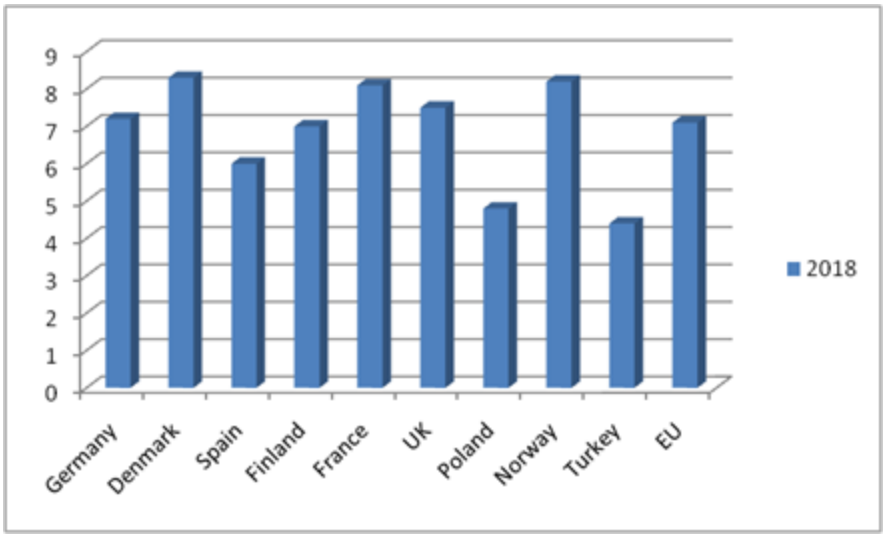
In modern world, health is an important concept consistent with the national development levels, similar to education. The developments in human health during the last hundred and fifty years have been both the cause and outcome of economic growth in the history of economy. Life expectancy started to increase globally since the second half of the 19th century, and in the 20th century, the life expectancy has increased significantly, especially in European nations. Increased income, hygiene and nutrition were considered among

the main reasons for the decrease in mortality during the 19th century. In the 20th century, it is considered that significant discoveries such as vaccines, antibiotics and microbes have been effective in the improvement of human health and extending life expectancy (Bloom et al., 2004: 10). Health is an important source of welfare. Health has various effects on the economy. For example, There are several direct and indirect correlations between health and economy; productivity losses could be experienced due to employee health, or productivity could increase due to better nutrition, high learning skills among healthy individuals, diverting the resources that could be spend to cure diseases to different benefits for healthy individuals, and healthy individuals would have higher income opportunities (WHO, 2004: 15). The state intervention in health includes public health spending. Most countries finance healthcare through government programs or compulsory health insurance. Nations such as the United Kingdom, Iceland, Denmark, and Sweden finance about 80% of health spending through national and regional government programs, i.e., general tax revenues. Czech Republic, Germany, France, Japan, Luxembourg, Slovakia, and Turkey funds about 70% of the healthcare system through social security insurance (OECD, 2018).

Factors such as how care is organized and prioritized across providers, input costs and population requirements affect the level of spending for different services. Inpatient and outpatient services require the highest share – typically accounting for around 60% of all health spending across the EU countries. Medical goods (mostly pharmaceuticals) take up a further 20%, followed by an increasing share of long-term care, which in 2017 averaged around 14% of health spending. Administration and overall governance of the health system, together with preventive care accounted for the remainder (OECD, 2019: 160).

The efficiency of health expenditures is suitable for analysis based on multiple perspectives. However, in economic studies, health expenditure outcomes or efficiency outcomes are analyzed with variables such as life expectancy and maternal and infant mortality rates.

Chart 2. Public Health Expenditures in Selected Nations (% of GDP)



Resource: Compiled from the Eurostat and Turkstat. Accessed on 04.05.2020.

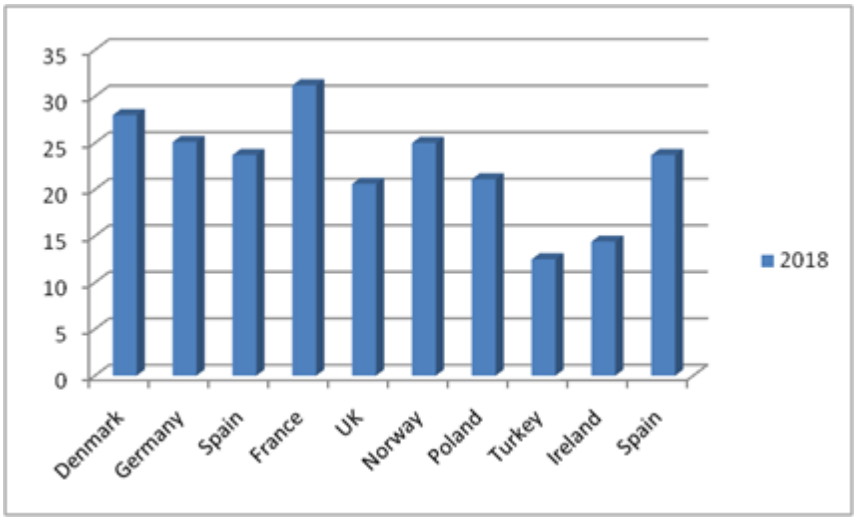
Chart 2 demonstrates public health expenditures in selected countries. As seen in the chart,public health expenditures in developed countries are about 7-8% of the GDP. Turkey is among the countries with the lowest health expenditures in Europe (4.4%).

Social protection reflects a group of policies designed to ensure adequate living conditions for all women, men and children throughout their lives. Poverty reduction and prevention play an important role in eliminating social inequalities. Furthermore, countries invest in social protection for various reasons such as ensuring human development, improving socialization, ensuring sustainable growth, and supporting the labor force. Social protection was determined as a vital tool in the 2030 sustainable development targets, and it is the foundation for achieving certain goals (United Nations, 2018). Social protection is crucial for improving services such as health and education, as well as its contributions to poverty, income injustice and inclusive growth. Previous studies demonstrated that social protection programs contribute significantly to the increase in schooling rate, overcoming obstacles to educational demands, and reducing child labor. Furthermore, free health services policies led to the reduction of child and maternal mortality rates in undeveloped countries in a short period of time. It plays important roles in achieving full and productive employment and in creating adequate job opportunities for all, including women and young adults (ILO, 2018).

Especially the developed countries in Europe have the best practices and the highest social protection expenditures in the implemented programs. The outcomes of this level of public spending include economic and social welfare.

The social protection spending includes the expenditures of all public social security institutions and the expenditures of social protection programs implemented by other institutions in a country. These expenditures vary slightly from one country to another, but generally include all income support and assistance programs including medical care, sickness allowance, family allowance, maternity allowance, and cash transfers to the poor (Bergh, 2017: 13). A significant portion of the funding for social protection programs include contributions provided by the state, but different types of financing are also included in the system. These include employer contributions, social contributions made by the individuals with social protection and other income such as donations, dividends, and interest income (Turkstat, 2014).Social protection expenditures in selected countries are presented in Chart 3.

Chart 3. Social Protection Expenditures in Selected Nations (% of GDP)



Resource: OECD. Accessed on 04.05.2020.

As seen in Chart 3, developed European nations spend the highest amount of public funds on social protection. About 30% of GDP is allocated to social protection spending. Turkey is among the countries with the lowest social protection expenditures in Europe (12.5%). In EU countries, the most important part of social protection spending includes pensions. The second highest share is that of social assistance spending. Unemployment payments are the third (Eurostat, 2018). The EU planned to save at least twenty million

individuals from poverty and social exclusion by 2020. It was emphasized that the effectiveness of social protection was vital for the sustainability of the prosperity and success of European social integration (Nelson, 2011: 7-8).

3. Literature

The concepts of productivity and efficiency are associated with the correlation between input and output. However, measurement of the efficiency and effectiveness of public expenditures is not as easy as measurements conducted in the market. Since public services are interlinked, one public service output could be used as an input for another public service. For example, the public transportation system is the output of infrastructure expenditures and it could be considered as the input in education spending for the accessibility of school buildings. Contrary to the market, it is difficult to establish a definite input-output correlation in the public sector. In the public economy, efficiency correlates input and output with the objectives, in other words, with the results. Results are often associated with welfare or growth targets. In brief, the concept of efficiency in public economy reflects the success of the use of public resources in achieving the predetermined targets (Mandl et al., 2008: 3). Various studies were conducted to investigate the effectiveness of different public spending and different findings were obtained for country groups and selected public expenditures.

In a study conducted on transition economies, the efficiency of social protection expenditures was investigated and it was concluded that social protection expenditures was not productive due to the high number of early retirement beneficiaries (Fakin and Crombrugghe, 1997: 24). In another study on the efficiency of education and health expenditures in several developing countries, it was reported that in countries where these expenditures were efficient, schooling rates, child and infant mortality rates improved, inequality was reduced and these developments contributed to second level reforms (Gupta et al., 1999: 19). In a study conducted on 37 African countries in the 1984-1995 period, health and education expenditures were analyzed and African nations were compared to Asian and European countries. Although it was determined that African countries were inefficient in expenditures when compared to the other group, it was observed that they have improved compared during the recent period. In African countries, it was emphasized that control of the expenditures that benefit high income groups would be better than allocating a high budget share for the efficiency of the public expenditures (Gupta and Verhoeven, 2001: 433-467). In a study conducted on 140 countries, it was argued that public spending was inefficient in countries with high income inequality and where fatal epidemics such as

AIDS/HIV prevail. It was reported that such countries that receive international aid could not balance their public budget due to financial irregularities, and thus the expenditures tend to be inefficient (Herrera et al., 2005: 32).

In a study where the efficiency of R&D and education expenditures was analyzed in EU nations, it was argued that environmental conditions could have a significant impact on productivity and efficiency. It was reported that high R&D expenditures does not necessarily lead to high innovation and is influenced by various conditions (Mandly, 2008: 28). In a study that compared public sector productivity in new EU-member European countries and developing countries, it was concluded that factors such as per capita income, education level and property rights helped prevent unproductivity in the public sector and even increased public sector productivity (Afonso et al., 2010: 2147-2164). In another study that examined the efficiency of public expenditures per capita in health and education industries in 81 countries, human development index was used as the output variable. It was found that about 16 out of 81 countries have always been on the efficiency threshold during the years of study, and Singapore and Zambia exhibited positive developments in health and education industries in the same period (Prsetyo and Zuhdi, 2013: 621). The efficiency of the health system in European countries was analyzed with data envelopment methodology and it was determined that health expenditures were mostly inefficient despite the fact that both developed and developing countries were at the efficiency threshold (Asandului et al., 2014: 261-268). In a study conducted on OECD countries, the efficiency of health, education and social protection spending was analyzed using the human development index. In the study that was conducted with the disposable envelope method, it was determined that Turkey was relatively efficient when compared to other countries during the period covered in the study (Aysu and Bakırtaş, 2016: 81-107). In a study on the productivity of Romanian health system, immunization rate and health expenditures were employed as input variables, and adult survival rate and tuberculosis prevalence were used as output variables. The study emphasized that Romania had an inefficient Health System and even though the Romanian Health System has underwent various reforms and improvements in the last two decades, certain areas were still below the European standards and the system still failed to provide adequate services for the citizens (Popescu et.al, 2014: 1185-1189).

In a study where Latin American countries were compared with high income nations, the efficiency of public education spending was investigated. Despite lower public resources, it was found that Latin American countries started to achieve similar educational outcomes since the 1990s. Globalization and democracy are the prominent factors that lead to productivity increases in Latin American nations (Dufrechou, 2016: 192). In another

study that analyzed the efficiency of education and health expenditures in Asian countries, it was reported that the outputs remained lower when compared to spending levels. It was argued that 93% of the existing budgets were sufficient to achieve the current outputs (Lavado and Domingo, 2015: 38).

In a study that investigated the efficiency of public spending in higher education in Turkey and 17 EU member states, it was determined that as number of students per academic staff and number of academicians increased, national efficiency scores decreased, while as employment, life satisfaction of college graduates and their share in the population increased, national efficiency scores increased as well (Bursalıoğlu and Selim, 2015: 63). In a study where Serbian public sector productivity was compared to other EU countries, it was argued that Serbia had an extremely inefficient public sector and experienced problems such as economic instability, borrowing and budget deficit, and it was concluded that public spending should be reduced by 25% (Lovre and Jotic, 2016: 145). In the study conducted on Saudi Arabia, the efficiency of public spending in health, education and infrastructure industries was investigated. In that study, it was concluded that all public expenditures were inefficient, however health and infrastructure expenditures were more efficient when compared to education spending. It was stated that there were environmental factors that affected public expenditures, and the size of the state contributed positively to public spending efficiency, however unemployment and large money supply adversely affected health and infrastructure expenditures (Ouertani et al., 2018: 14).

4. Dataset and Variables

Twenty nine EU member states (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom) and Turkey were included in the present study. Since the most recent available data was for 2014 for Bulgaria, 2014 data were used for Bulgaria and the 2015 data compiled from Eurostat, The World Bank, Turkish Statistical Institute resources were used otherwise. Variables with multicollinearity between the data compiled for these variables were excluded in the analysis. The variables analyzed in the study are presented in Table 1 and descriptions of the variables are presented in the following section.

Table 1. Input and Output Variables for EU Countries and Turkey

Input Variables	Output Variables
Education expenditure (Edu exp) (%)	GDP per capita
Health expenditure (Hlt exp) (%)	Lowest %10
Social protection expenditure (Sp exp) (%)	Life expectancy (Life exp)
	Employment (Empl) (%)

Public education expenditure (%) (I): General government expenditure on education (current, capital, and transfers) expressed as the percentage of GDP.

Public health expenditure (%) (I): Level of current health expenditure expressed as the percentage of GDP. Estimates of current health expenditures include healthcare goods and services consumed during the year. This indicator does not include capital health expenditures such as buildings, machinery, etc.

Social protection expenditure (%) (I): Expenditures on social protection include social benefits, including transfers, in cash or in kind, to households and individuals to relieve them of the burden of a defined set of risks or requirements, administration costs, which represent the management costs charged by the scheme, other expenditures, which include miscellaneous expenditures by social protection schemes.

GDP per capita (O): GDP per capita was based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar in the United States.

Income share of the lowest 10% (%) (O): Percentage share in income or consumption is the share that accrued by population subgroups indicated by deciles or quintiles.

Life expectancy (O): Life expectancy at birth indicates the number of years a newborn infant is expected to live based on the assumption that prevailing mortality pattern at the time of its birth will stay the same throughout its life.

Employment (%) (O): Employment rates are defined as a measure of the extent to which available labor resources (potential work force) are used. It is calculated as the ratio of the number of employed individuals to the work age (20-64 age) population.

5. Empirical Findings

The present study aimed primarily to present the clusters of EU member countries and Turkey based on the variables for which the data were compiled. In this context, Ward's Linkage Method that utilizes agglomerative algorithms and one of the hierarchical cluster methods, was applied. Thus, the method aimed to maximize homogeneity within the cluster and heterogeneity among the clusters. The dendrogram representing the nation clusters determined in the analysis is presented in Figure 1.

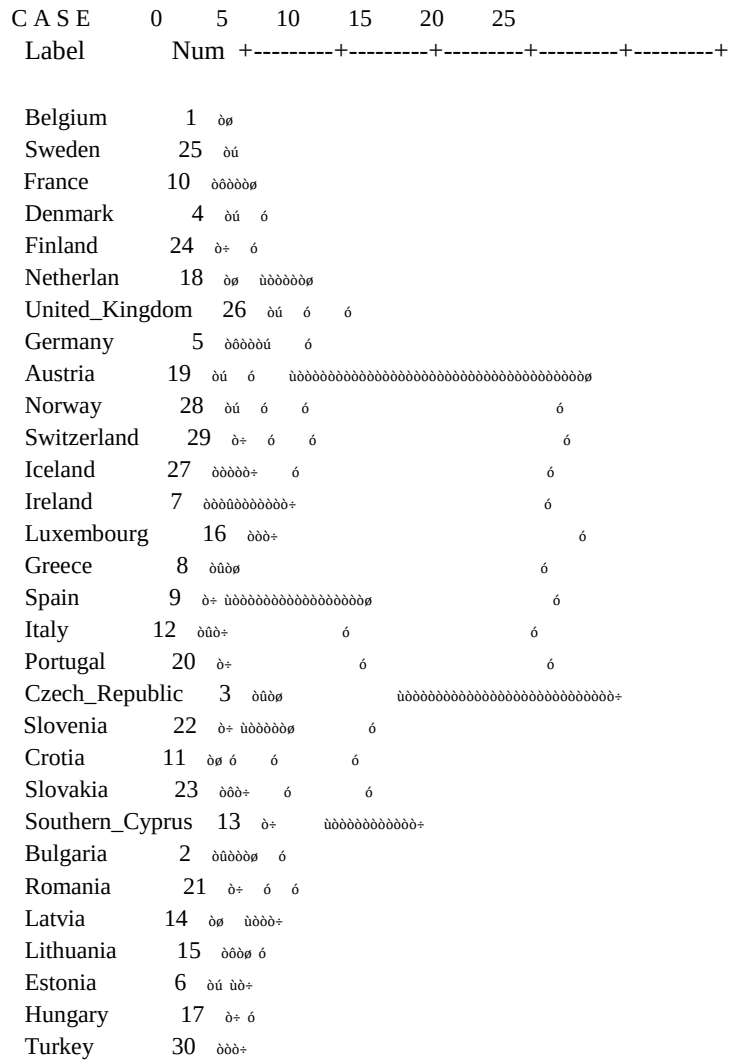


Figure 1. Ward's Method Dendrogram

Review of the dendrogram presented in Figure 1 demonstrated that these countries should be grouped under two main clusters based on DEA. Cluster members nations are presented in Table 2.

Table 2. Ward's Method Cluster Members

Cluster number	Cluster member
1	Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Sweden, Switzerland, United Kingdom.
2	Bulgaria, Crotia, Czech Republic, Estonia, Greece, Hungary, Italy, Latvia, Lithuania, Portugal, Romania, Slovakia, Slovenia, Spain, Southern Cyprus, Turkey.

As seen in Table 2, 14 countries were included in the first cluster, namely Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Sweden, Switzerland and the United Kingdom. Turkey was a member of the second cluster with Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Italy, Latvia, Lithuania, Portugal, Romania, Slovakia, Slovenia, Spain and Cyprus. Analysis of the cluster members revealed that economic welfare levels of the nations played an important role in this clustering. It was observed that the countries in the first cluster were developed countries and the countries in the second cluster were less developed countries. Thus, two homogeneous clusters were obtained.

In the second stage of the study, the output-oriented DEA with constant returns to scale (CRS) assumption was applied to both clusters. Since the aim of the study was to obtain maximum output with the current inputs, the output-oriented model was used. In this model, Education, Health and Social protection expenditures are used as input variables, GDP per capita, Lowest 10%, Life expectancy and Employment are used as output variables. Since it was considered that a country could be effective to the extent that it could increase inputs, all inputs were calculated as 1/input variable in the analysis. As a result of this analysis, which was utilized in several studies, the reduction of the input values would translate to the reduction of 1/input variable ratio. This actually would mean increasing the input variable values. In Table 3, the efficiency scores obtained with the analysis of the first cluster countries and reference countries for inefficient nations are presented.

Table 3. CCR-CRS Efficiency Scores of First Cluster Countries and Reference Countries

Countries	Score	Rank	Reference Countries			
Belgium	0,9732	11	Sweden	Switzerland	France	Denmark
Finland	1	1	Finland			
Sweden	1	1	Sweden			
United_Kingdom	0,8736	13	Sweden	Switzerland	France	
Iceland	1	1	Iceland			
Norway	1	1	Norway			
Switzerland	1	1	Switzerland			
Ireland	0,7573	14	Switzerland	Luxembourg		
France	1	1	France			
Luxembourg	1	1	Luxembourg			
Denmark	1	1	Denmark			
Germany	0,9931	9	Sweden	Switzerland	France	
Netherland	0,9859	10	Switzerland	Denmark		
Austria	0,9725	12	Sweden	Norway	France	Denmark

Review of Table 3 demonstrated that the results of the analysis conducted on 14 countries in the first cluster revealed that Finland, Sweden, Iceland, Norway, Switzerland, France, Luxembourg and Denmark were efficient. Germany, Netherland, Belgium, Austria, the United Kingdom and Ireland were inefficient, and Ireland had the lowest efficiency score (0.76). In the last columns of Table 3, reference countries that inefficient nations should take as an example to improve their efficiency are presented. Review of the number of times that these countries are referenced demonstrated that the most referenced countries were Switzerland, Sweden, France and Denmark, respectively. Potential recovery data for inefficient nations are presented in Table 4.

Table 4. Potential Recovery Options for Inefficient Countries in the First Cluster

Countries							
Belgium	Edu exp	Hlt exp	Soc pro exp	Per capita	Lowest %10	Life exp	Empl
Data	0,16	0,10	0,05	45629,35	3,40	81,29	67,20
Projection	0,16	0,10	0,05	51340,67	3,49	83,53	79,15
Difference(%)	0,00	0,00	0,00	12,52	2,76	2,76	17,78
UK							
Data	0,20	0,10	0,06	42124,65	2,90	81,60	76,80
Projection	0,19	0,10	0,06	57094,66	3,48	93,41	87,91
Difference(%)	-3,79	0,00	0,00	35,54	20,12	14,47	14,47
Ireland							
Data	0,27	0,13	0,10	69627,54	3,10	81,50	69,90
Projection	0,25	0,13	0,10	91943,84	4,52	118,05	115,41
Difference(%)	-8,76	0,00	0,00	32,05	45,86	44,84	65,11
Germany							
Data	0,24	0,09	0,05	48170,26	3,10	81,09	78,00
Projection	0,16	0,09	0,05	50612,17	3,12	81,65	78,54
Difference(%)	-33,98	0,00	0,00	5,07	0,69	0,69	0,69
Netherland							
Data	0,19	0,09	0,06	50054,19	3,50	81,71	76,40
Projection	0,16	0,09	0,06	55107,84	3,55	82,87	79,42
Difference(%)	-17,32	0,00	-10,08	10,10	1,43	1,43	3,96
Austria							
Data	0,204082	0,096899	0,046729	50087,73	3	81,8439	74,3
Projection	0,181584	0,096899	0,046729	51505,76	3,3520896	84,16098	76,4035
Difference(%)	-11,024	0	0	2,831	11,736	2,831	2,831

In Table 4, the actual data and projections for decision-making units and the difference between these two figures are presented. General review of Table 4 demonstrated that inefficient nations are required to increase their education spending to improve their efficiency. Based on the data presented in the table, the highest potential improvement in input variables was recommended for Germany (33.98%) and the lowest potential improvement was recommended for the United Kingdom (3.79%). Thus, it could be suggested that these two nations should increase their education spending by 33.98% and 3.79%, respectively. Review of the Table 4 based on output variables demonstrated that the Employment variable was significant. For this variable, the highest potential improvement was recommended for Ireland (65.11%) and the lowest potential improvement was recommended for Germany (0.69%). Also, in the lowest 10% variable, Ireland is required to improve by 45.86%.

After the interpretation of the findings obtained for the first cluster, the second cluster findings were interpreted. Thus, the results of the analysis conducted on the second cluster are presented in Table 5.

Table 5. CCR-CRS Efficiency Scores of Second Cluster Countries and Reference Countries

Countries	Score	Rank	Reference Countries			
Bulgaria	0,889	11	Portugal			
Czech_Republic	0,9281	9	Estonia	Portugal	Slovenia	
Estonia	1	1	Estonia			
Greece	0,9748	7	Italy	Portugal		
Spain	1	1	Spain			
Crotia	0,7927	15	Spain	Italy	Portugal	Slovenia
Italy	1	1	Italy			
Southern_Cyprus	0,9986	6	Portugal	Slovenia		
Latvia	0,9418	8	Estonia	Portugal		
Lithuania	0,8879	12	Estonia	Portugal		
Hungary	0,8728	13	Estonia	Portugal	Slovenia	
Portugal	1	1	Portugal			
Romania	0,5904	16	Italy	Portugal		
Slovenia	1	1	Slovenia			
Slovakia	0,8214	14	Italy	Portugal	Slovenia	
Turkey	0,8942	10	Portugal			

Based on the results of the analysis conducted on 16 countries in the second cluster and presented in Table 5, it was determined that Estonia, Spain, Italy, Portugal and Slovenia were efficient countries, while Cyprus, Greece, Latvia, Czech Republic, Turkey, Bulgaria, Lithuania, Hungary, Slovakia, Croatia and Romania were inefficient countries. With a score of 0.59, Romania had the lowest efficiency score among these countries. Although Turkey was in the inefficient nations segment, it ranked 10th in the efficiency ranking. Review of the reference country sets demonstrated that the most referenced country was Portugal, followed by Slovenia, Italy and Estonia. The potential improvement data for the second cluster countries are presented in Table 6.

Table 6. Potential Recovery Options for Inefficient Countries in the Second Cluster

Countries							
South_Cyp	Edu exp	Hlt exp	Soc pro exp	Per capita	Lowest %10	Life exp	Empl
Data	0,18	0,15	0,08	31539,53	3,20	80,29	67,90
Projection	0,18	0,12	0,06	31582,53	3,67	80,40	68,47
Difference (%)	0,00	-21,44	-32,09	0,14	14,80	0,14	0,85
Greece							
Data	0,23	0,12	0,05	26450,13	1,90	81,59	54,90
Projection	0,23	0,11	0,05	35917,08	1,95	83,70	62,99
Difference (%)	0,00	-6,07	0,00	35,79	2,86	2,59	14,74
Latvia							
Data	0,17	0,18	0,09	24903,98	2,50	74,12	72,50
Projection	0,17	0,15	0,08	29584,33	2,71	78,70	76,98
Difference (%)	0,00	-13,32	-11,92	18,79	8,53	6,18	6,18
Cz_Rep							
Data	0,20	0,14	0,08	34048,19	3,90	79,47	74,80
Projection	0,20	0,14	0,07	36704,31	4,20	93,76	80,59
Difference (%)	0,00	0,00	-14,22	7,80	7,75	17,98	7,75
Turkey							
Data	0,17	0,24	0,08	24065,68	2,10	75,41	53,90
Projection	0,17	0,12	0,06	30763,64	2,48	84,33	71,48
Difference (%)	0,00	-51,45	-32,17	27,83	18,23	11,84	32,62

Countries							
Bulgaria							
Data	0,25	0,12	0,08	18248,83	2,00	74,47	67,20
Projection	0,18	0,12	0,06	32530,68	2,63	89,18	75,59
Difference (%)	-27,07	0,00	-20,50	78,26	31,27	19,75	12,48
Lithuania							
Data	0,19	0,15	0,09	28936,27	2,10	75,12	73,30
Projection	0,19	0,15	0,08	32929,68	2,90	88,51	82,55
Difference (%)	0,00	0,00	-14,75	13,80	37,92	17,83	12,62
Hungary							
Data	0,19	0,14	0,07	26688,99	3,00	75,96	68,90
Projection	0,19	0,14	0,07	34432,76	3,44	90,66	78,94
Difference (%)	0,00	-1,87	0,00	29,02	14,58	19,35	14,58
Slovakia							
Data	0,24	0,15	0,07	29987,19	3,10	77,21	67,70
Projection	0,24	0,14	0,07	40530,68	3,77	100,59	82,42
Difference (%)	0,00	-2,61	0,00	35,16	21,75	30,28	21,75
Crotia							
Data	0,21	0,14	0,07	22602,19	2,70	77,28	60,60
Projection	0,21	0,14	0,07	37222,49	3,41	97,49	81,75
Difference (%)	0,00	0,00	0,00	64,69	26,16	26,16	34,90
Romania							
Data	0,32	0,20	0,09	22118,82	1,70	74,96	66,00
Projection	0,32	0,19	0,09	53893,34	3,73	138,04	111,78
Difference (%)	0,00	-7,33	0,00	143,65	119,36	84,15	69,37

Based on the data, projection and difference columns in Table 6, the second cluster countries generally are required to increase their health and social protection expenditures in order to become efficient. The highest increases were recommended for Turkey in health and social protection expenditures among the input variables (51.45% and 32.17%, respectively). Bulgaria was the only country that was recommended an increase in education expenditures (27.07%). Furthermore, Bulgaria was recommended to increase social protection expenditures by 20.50% in order to become efficient. Based on the output variables presented in Table 6, Romania was recommended the highest improvement in all output variables. In particular, Romania was recommended to improve GDP per capita and lowest 10% variables by 143.65% and 119.36% respectively. Also, it was determined that

Romania should improve Employment variable by 69.37%. Analysis of the data on Turkey demonstrated that there were improvement recommendations in output variables, as well as the above-mentioned increases in input variables. Among the output variables, the highest improvement recommendations were in employment and GDP per capita by 32.62% and 27.83%, respectively. This was followed by improvements in lowest 10% and life expectancy by 18.23% and 11.84%, respectively.

6. Conclusion

Education, health and social protection are vital for nations as services that require permanent state intervention, create high levels of externality, and complement and reinforce each other. Adequate public expenditures in these services and efficient and active use of public resources allocated to these services are extremely important for national economic development and growth, social justice, improvement of democratic institutions, and sustainable peace in the country. It is not possible to discuss human capital, scientific and technological development, social justice, social protection, healthy population, or even peace and tranquility in nations where these expenditures are not adequate or efficient. Thus, in the present study, the efficiency of welfare state expenditures in 29 European countries with highest welfare state expenditures in the world and Turkey that needs to improve its welfare state expenditures was analyzed. In this context, initially, cluster analysis was conducted to ensure the homogeneity and it is observed that countries were grouped under two clusters based on their development levels.

The first cluster included European nations with high economic, social and political development levels, while the second cluster included ex-Eastern Block nations, Southern European countries, and Turkey with lower economic, social and political development levels. Although welfare state institutions exist in latter group of nations, structural and implementation problems and their predisposition to economic crises deepened the gap between these countries and those in the first cluster .

DEA findings for the first cluster demonstrated that Finland, Sweden, Iceland, Norway, Switzerland, France, Luxembourg and Denmark were efficient. Germany, Netherland, Belgium, Austria, the United Kingdom and Ireland were inefficient. Besides, based on the DEA findings for the first cluster, it was determined that Ireland scored the lowest efficiency and it was suggested that 65.11% and 45.86% improvement in employment and lowest 10% variables would improve the efficiency of that nation. Ireland was one of the countries with the lowest social protection expenditures among EU nations. Thus, it was not surprising that the 10 percentile, which had the lowest share in employment and

national income, had the worst performance in output variables. Switzerland and Sweden were the most frequently referenced countries for inefficient nations to become efficient.

Among the nations in the first cluster, Germany was the country that was highly recommended to improve education expenditures. Germany was recommended to make a 33.98% improvement in education expenditures. The lowest potential improvement recommendation was made to the United Kingdom in the first cluster with 3.79%.

DEA findings for the second cluster indicated that Estonia, Spain, Italy, Portugal and Slovenia were efficient countries, while Cyprus, Greece, Latvia, Czech Republic, Turkey, Bulgaria, Lithuania, Hungary, Slovakia, Croatia and Romania were inefficient countries. Based on the findings of the analysis conducted on the second cluster that included less developed nations, it was observed that Romania had the lowest efficiency score. Turkey, which was not among efficient nations, ranked 10th among 16 countries in the efficiency ranking. Another important finding was the fact that Portugal was the most referenced nation. Countries in this cluster were generally recommended to increase their health and social protection expenditures in order to render their expenditures efficient. In this expenditure group, Turkey had to realize the highest increase (51.45% and 32.17%, respectively).

The highest improvement in education spending was recommended for Bulgaria among the second cluster countries (27.07%).

Furthermore, it was recommended that Turkey should improve employment by 32.62% and GDP per capita by 27.83%. It is possible to suggest that Turkey was way behind in health expenditures and social protection expenditures when compared to European countries. Thus, Turkey should develop social protection policies and the increase the public expenditures that performed poorly as mentioned-above in order to acquire better per capita income and employment output variables that required improvement.

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