EUROPEAN JOURNAL OF DIGITAL ECONOMY RESEARCH

CONTENTS

THE NETWORK EFFECT AND THE PANDEMIC CONSPIRACY THEORIES

Ever wonder why only a limited number of networks like Facebook, Instagram, Twitter and Tiktok can remain popular among hundreds of social networks? Or why the aforementioned social networks are not directly competitors with each other, but each one stands out in a different field?

Let us explain this puzzle with an example: You are traveling on a highway and you are very hungry. There are diners on both sides of the road. The one on the left is a bit shabby, but many trucks are parked in front of that diner, while the other does not even have a single customer. Which one would you prefer?

In the early years of the invention of telephone, if only a few people found this device useful to use, it would be very difficult for this invention to spread worldwide. Established by Graham Bell 135 years ago, A&T emphasizes the importance of this situation in its 1908 annual report:

"*A telephone-without a connection at the other end of the line-is not even a toy or a scientific instrument. It is one of the most useless things in the world. Its value depends on the connection with the other telephone - and increases with the number of connections.*" [1]

This fact was named as "Network Effect" in the following years. In its simplest form, the network effect implies that "the value of a good or service rises as the number of people using that good or service increases". In other words, "new subscribers joining a network increase the utility of current subscribers."[2]

If we know what network impact is, then we can realize why the most important capital of popular social networks is their users. The more users a social network has, the faster it grows; the bigger a social network, the more users join it. Hence, it is very difficult for newly established alternative networks to compete with mainstream social networks such as Facebook, Instagram and Twitter, which already became monopoly in different areas.

The network effect not only adds strength to the power of mainstream social networks, but also facilitates the dissemination of disinformation by those who use those networks effectively.

Interestingly, the conspiracy theories initiated against the drugs and vaccinations, used in the treatment and prevention of COVID-19 spreads from the social networks thanks to network effect.

Sadly, disinformation sources use social networks quite effectively, managing to deceive their victims with convincing false evidence. Scientists though simply prefer criticizing the people who believe conspiracy theories rather than fighting with conspiracy theories and refute sources of disinformation with scientific facts. For example, some scientists are contented with making unconvincing, superficial and upside-down statements such as "these theories are quite stupid, only fools can believe in such disinformation, and the public should not go beyond the suggestions of scientists."

However, the explanation individuals need to hear is not that conspiracy theories are stupid, but why they are not correct. Because, these conspiracy theories, which were previously only shared on social networks, have now become serious in practice. An important number of individuals now seriously believe that vaccines are not safe or that they were developed to destroy the human race and establish a new world order. This situation proves us that not real information but information that can persuade people are effective in social networks.

The solution? Accurate, complete and timely information flow from its source to the target audience in a simple form, of course!

December 2020

Prof. Dr. Mustafa Zihni TUNCA
Editor-in-Chief

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LOCAL NEWSPAPERS AT THE DAWN OF THE DIGITAL AGE: A BRIEF REVIEW OF THE STATE OF THE TURKISH LOCAL NEWSPAPERS

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ABSTRACT

Local newspapers are one of the leading businesses affected by the digital age. Especially having a fragile structure than the mainstream national newspapers, their local competitors face with serious difficulties to survive in the digital era. The obstacles that local newspapers face include economic problems, inadequate qualified personnel and technological infrastructure deficiencies. Especially the currency crisis in 2018 and the COVID-19 pandemic brought the existing problems of the local newspapers to a more serious level in Turkey. The purpose of this paper is to discuss the functions and problems of the local newspapers in Turkey and to present suggestions for strengthening their future.

Keywords: *Local Newspapers, Turkey, Media, Digital Age.*

1. INTRODUCTION

Local media refers to the journalism that is not geographically distributed across the country. Hence, two main characteristics of local newspapers are decentralization and geographical limitation. It also represents a regional content and agenda. In this respect, local newspapers have the role of conveying news and issues that cannot be found in the national newspapers to the readership.

Local newspapers have the functions of informing and creating local alternative agendas in order to supervise local governments and decentralization units. They also ensure that regional problems and local demands are discussed publicly. While the contents of the national newspapers are determined according to the news agencies and the order of national importance, local problems usually are ignored in their daily contents. The elimination of this deficiency is the transmission of local or regional problems, demands and agendas to the readership through local newspapers.

In this respect, the local newspapers cannot be seen as an alternative but a complement to the mainstream or national media. One of the basic criteria that separates local and national newspapers from each other is the audience, interested in the news content. While the topics that make up the national agenda may be of interest to many citizens, regional news only attracts the attention of the local community and a limited number of interest groups. Likewise, local newspapers also have the function of bringing local problems to national interest groups.

Unlike developed countries, the functions and the issues of the local newspapers in Turkey carries unique differences. The local newspapers, which assumed important duties in the last periods of the Ottoman Empire and the period of establishing the new Republic, began to lose its importance in last decades, due to both legal restrictions and the severe problems it faced, and gradually lost power against the Istanbul-based mainstream media (Gezgin, 2007).

Nowadays, local newspapers face many obstacles such as economic problems, inadequate qualified personnel and technological infrastructure deficiencies. Especially the currency crisis in 2018 and the pandemic that spread all over the world brought the problems of the local newspapers to a more serious level. As a result, it is reported that many local newspapers all over the world, including the USA, are closing down. The purpose of this study is to discuss the functions and problems of the local newspapers in Turkey and to present suggestions for strengthening their future.

2. FUNCTIONS OF THE LOCAL NEWSPAPERS

Local newspapers are regarded as the voices of the people living in regional communities. Local media outlets are extremely important for citizens to be informed about the problems, events, economic and social developments and the decisions taken by local governments in their regions. Therefore, an important function of the local newspapers is to publicize public services in a healthy and correct

manner within the framework of the state and local citizens' relationship. The local media, which ensures the announcement of the public services in the neighborhood, acts as an intermediary in the establishment of the government-citizen relationship at regional level (Şeker, 2007).

Local newspapers are seen as dynamics that enable the decentralization of authority and the creation of a structure that respects people. In this context, local newspapers are extremely important, especially for developing countries. This role shows that another function of the local newspapers should be establishing a control mechanism. In other words, it is another responsibility of the local newspapers to inspect the local governors on behalf of the public. The central government can react more quickly to the problems and malfunctions experienced at the local level through the news made by the local media. Hence, local newspapers play a key role in generating solutions by bringing regional problems and developments to the national agenda (Girgin, 2009).

Another important public responsibility of the local newspapers is its education function. Especially, developing citizenship consciousness is a great task of the local newspapers in developing countries. One of the most important functions of the local media is to establish the culture of democracy, necessary for the correct and purposeful reflection of the national will. The local media, which conveys social, economic, cultural and social developments to the people in the neighborhood, acts as a mirror that reflects the economic, cultural, social and political characteristics of the local community (Gezgin, 2007).

Publication of news regarding the inhabited contributes to the development of that region. Therefore, local media play an important role in terms of the sustainability of local development. An individual who has information about the events and developments in the region where he/she lives becomes more sensitive to local problems. Thus, local newspapers play an important role on creating unity, and solidarity in solving problems (Gezgin, 2007).

3. MAIN PROBLEMS OF THE LOCAL NEWSPAPERS

While the local newspapers have important missions on democracy, the fulfillment of these duties depends on economic freedom and independency. The financial independence necessary for the freedom and independence of the local newspapers is however limited to advertising and subscription revenues.

The radical technological changes experienced in the 2000s have shown that the media is one of the industries that must keep up with the digital age. The digital transformation, which has affected the whole world, has also caused a radical change in 'news following' habits of the Internet users (Arvas, 2019). Especially, as a result of the development of individuals' habits of reading news on the Internet, there has been a serious decrease in the circulation of both national and local newspapers all over the world. As this situation also negatively affected their advertising revenues, many local newspapers that suffered serious revenue losses had to bankrupt (Özcan, 2016)

The existing local newspapers try to survive in a very harsh environment. Technical inadequacies for digital transformation led to a wide variety of negativities, from the layout of the newspapers to the print and the distribution networks. Since the existing public advertisement revenues are not sufficiently enough to cover expenses, most of the local newspapers provide additional printing services such as flyers, brochures, etc. Additional income from these jobs is mostly used to finance their core activities (Nalcıoğlu, 2007).

The local newspapers that need to digitalize their activities to a great extent, do not have constant sources of income other than public advertisements. As a result, they face difficulties in hiring employees such as reporter, graphic designer to fulfill tasks such as typesetting and design, and columnists to interpret the news. Instead, they employ insufficient number of employees that are mostly underqualified or semiskilled (Karaduman, 2017).

Lack of qualified staff reduce the quality of the content and layout of the local newspapers. The problems arising from the employment of limited number of personnel led the owners and employees to simultaneously perform several tasks from designing to typesetting (Kayacan, 1996). Lack of reporters also leads the local newspapers to gather news from the bulletins of the national news

agencies. Finally, many newspaper employees that do not earn sufficient income need to have a second job. This situation is in principle incompatible with the independence and impartiality of journalism (Altun, 2005).

4. SUGGESTIONS FOR STRENGTHENING THE LOCAL NEWSPAPERS

In Turkey, there is a serious gap between local and mainstream national newspaper in terms of financial opportunities. Therefore, in order to strengthen the local newspapers, important duties fall on the governmental bodies, professional organizations, NGOs, local businesses, scientists in different disciplines, and local media owners and employees.

Above all, local newspapers need to access urgent financial resources to compete with the national newspapers. Financial support primarily provided by governmental bodies will help local newspapers to establish technological infrastructure. Additionally, employees with technological qualifications needs to be employed by the local newspapers. Solving those significant problems will help local newspapers to attract more readers in short run (Mısırlı, 2020).

Public loans and financial supports can provide significant benefits to solve aforementioned problems of the local newspapers. However, the financial sustainability of local media activities depends on the business community's support through transparent and legitimate means (e.g., ads and subscriptions). If the relationship between the local media and the local business world develops, the desire of local economies to use local media as an advertising alternative will increase. Successful economic reporting, when combined with the stimulating role of the local news, can make a significant contribution to the local economy (Demirkent, 1998, 33).

Similarly, public attention to subscription to local newspapers not only provides financial support to the local newspapers but is also important in terms of ensuring the effectiveness of the news presented. It is also important to provide an interactive environment of interaction with the readers, especially on social media, as the stronger the local newspapers will make their readers' voices heard.

Finally, increasing number of academic studies on the future of the local newspapers, encouraging postgraduate research as well as international projects on this subject are of great importance for the future of the industry. Therefore, it is essential to support interdisciplinary studies in the field of social sciences, especially in communication faculties in higher education (Çavuş, 2017).

5. CONCLUSION

Newspapers are one of the leading establishments that give the most serious test in keeping up with the digital age. Especially having a fragile structure than the national newspapers, their local competitors faced with serious difficulties in Turkey as well as all over the world. While approximately 2100 local newspapers bankrupted in the United States between 2004 and 2019, nearly a thousand newspapers shut down in Turkey during 2016 - 2019 period (Erandaç, 2019).

Widespread shift to the Internet journalism decreased circulation and advertising revenues of the newspapers, which are the most important sources of income for the local newspapers. Besides, the significant increase in cost factors, especially paper prices and labor expenses, also made it difficult for the industry to fulfill its functions.

Rising costs and insufficient sources of income cause local media outlets to turn to a limited and unqualified workforce, further distracting them from readers. Therefore, it is clear that unless financial problems are not solved, other problems cannot be settled.

In this paper, the main functions of the local newspapers in Turkey and in particular the problems faced today have been discussed. Suggestions for the future of the industry have been also given. The study is important in terms of emphasizing the importance of determining the position of the local newspapers in the digital age. It is important both in practical and theoretical terms

to conduct future academic studies at the level of detailed empirical analyses.

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CLUSTERING LIVABLE COUNTRIES USING SELF-ORGANIZING MAPS

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ABSTRACT

People living in developing and underdeveloped countries are looking for a way to live in countries that are developed in terms of democracy, have high economic welfare, and have high social life. In this study, considering the 2017 "Better Life Index" data, prepared by the OECD a cluster analysis has been conducted for the livable countries. Better Life Index consists of 22 variables in housing, income, employment, society, education, environment, civil participation, health, life satisfaction, security, work life balance groups. One-way ANOVA and Kruskal Wallis tests are also carried out in order to examine the presence of any statistically significant difference among the clusters.

Keywords: *Better Life Index, OECD, Clustering Analysis, Livable Countries, Data Mining, Self-Organizing Maps.*

1. INTRODUCTION

Data mining, which is also known as knowledge discovery, machine learning, knowledge mining, is the extraction process of valuable information from big data structures (Jaseena & David, 2014: 131). The aim of data mining is to find out hidden pattern, increase the value of data and convert data to knowledge (Burbidge & Buxton, 2001:3). Data mining also determines the rules for predicting the future through using available data (Parlar & Kakıllı Acaravcı, 2017: 693).

Information technologies, which enable long term storage of high-volume information, lead widespread usage of data mining applications (Fayyad et al. 1996: 28). Data mining models are mainly descriptive and predictive. Patterns that will be used in decision making constitue descriptive models. In descriptive models, the patterns that will be used in decision making are defined. In predictive models, however, results are are estimated through existing data. (Jain & Srivastava, 2013: 116).

"Clustering Analysis", which is one of the data mining methods, used in the study and shown in the descriptive model, is a commonly used technique that allows to classify the examined units according to their similarities in certain groups, to reveal the common attibutes of the units and to make definitions about the created groups. (Chen & Wang, 2008: 4262).

The Organization for Economic Cooperation and Development (OECD) was created in 1961 with the Paris Peace Agreement. Defining itself as an international organization that aims to create better policies for better lives, OECD offers governments a platform where they can share their experiences with each other and produce mutual solutions to problems. OECD tries to understand the factors behind economic, social and environmental changes, and measures global trends and productivity in the fields of trade and investment (OECD, 2020).

The Better Life Index, published since 2011 by OECD is generated through housing, revenue, employment, society, environment, civic engagement, health, life satisfaction, security, and work-life balance criterion in order to compare prosperity levels of countries on different fields (Do Carvalhal Monteiro et al. 2019: 478).

In study, 38 countries were grouped based on 22 different variables through clustering analysis. Clustering analysis allows collecting the countries in groups in terms of the specified variables (attributes), and also allowing each group (cluster) to be identified and differentiate from each other so that livability can be assessed from different aspects. The aim of this study is to make clustering analysis using "Better Life Index" data belongs to 35 OECD member countries as well as South Africa, Russian Federation and Brazil. Although

South Africa, Russian Federation and Brazil are not members of OECD, these countries are possible members that OECD cooperate with through the "The Centre for Cooperation with Non-Members" established within the organization (MFA, 2020).

In the study, Artificial Neural Networks (ANN) based Self-Organizing Maps (SOM) used for clustering analysis. Furthermore, Dunn Index is used to determine the optimum cluster numbers. In the following sections, a brief literature review, methodology and the findings of the analysis will be given.

2. LITERATURE REVIEW

Some recent clustering studies are as follow:

Azar et al. (2013) applied clustering analysis using the data of the patients with thyroid, a hormone which plays an important role on the regulations of body functions. At this research all the cluster numbers from 2 to 11 are tested and the optimum number is concluded as three.

In the study of Hudson et al. (2016), Australian railway workers; were divided into four clusters according to asleep and awake hours by using SOM method.

Wu et al. (2016) also used SOM along with Kernel Principal Component Analysis (KPCA) and Support Vector Machine (SVM) methods in order to classify the quality of a solar cell patents in the solar industry.

Voutilainen and Arvola (2017) using 27 meteorological, biologic, physical and chemical variables for a duration of 21 years of a lake found in Finland, obtained three clusters by SOM Methodology at their study.

Pal et al. (2018), using World Health Organization (WHO) accident database, evaluated 176 countries in terms of 44 attributes. SOM technique is used in the study divided and countries into three clusters. There are 89 countries in the first cluster of middle-income countries, 51 countries in the second cluster of low-income countries, and 36 countries in the third cluster of high-income countries.

Özdemir and Kaya (2018) in their study, clustered OECD member countries according to carbon dioxide emission indicators derived from fossil fuel consumption by using K-Medoids and Fuzzy C-Means algorithms. Countries have divided into two clusters according to K-Medoids method and four clusters according to Fuzzy C-Means method.

Chang and Chen (2018) in their study, clustered OECD member countries according to PISA 2015 data. Countries are divided into three clusters in the study using hierarchical clustering.

In the study of Do Carvalhal Monteiro et al. (2019) OECD member countries clustered according to better life index data using a proposed new clustering analysis approach. In addition, Silhouette coefficient was used to determine the optimal number of clusters.

3. METHODOLOGY

3.1. Artificial Neural Networks (ANN)

ANN is a method inspired from the human brain that can learn and produce new information. Learning is achieved by training ANN with examples. A trained ANN can carry out mathematically, the procedures like, data classification, identification, data association, optimisation and prediction for the future (Maind & Wankar, 2014: 96).

An ANN is composed of neural cells called neurons which are interconnected in different forms and generally organized as layers. Three layers (input layer, hidden layer and output layer) are generally found in ANN. Input Layer receives information from the exterior while the output layer extracts the results. While input and output are composed of single layers, many hidden layers can be found between them. (Park et al. 1991: 444). Hidden layer is the part where, the data received from the input layer are transferred to the output layer. (Sarle, 1994: 4).

3.2. Self Organizing Map

SOM, also known as the Kohonen Network, is a ANN-based unsupervised learning algorithm used to perform clustering in data analysis (Gassen et al. 2015; 636; 680: Jin et al., 2015: 84). Nodes found at the input layer of SOM algorithm signifies variables, and the nodes at the output layer (Kohonen Layer) construct clusters (He & Deng, 2005: 252).

In SOM-based clustering analysis, assuming that there are m variables and n clusters, the distance of each input from each set is examined. In order to

form sets, the distance between the weight vector (w) of each variable and the input vector (x) is calculated. Equality (1) is used when calculating the distance.

$$d_i = \sqrt{\sum_{j=1}^{m}(x_j - w_{ij})^2} \qquad (1)$$

The steps of SOM-based clustering analysis are as follows (Kohonen, 1990: 1465; Gan & Wu, 2007: 56-59):

Step 1: An initial random value between 0 and 1 is attributed to weight vector.

Step 2: The distance between each input and weight vector is calculated through equation 1.

Step 3: Input having the shortest distance between the distances calculated at the previous step is chosen and is entitled as the winner node.

Step 4: Through the winner node and learning parameter, weights are updated by means of Equation 2. It is assumed that α has a value between 0 and 1, generally close to 0.

$$w_j(new) = w_j(current) + \alpha[x - w_j(current)] \quad (2)$$

Step 5: Until the ending conditions are met, step 3 and step 4 are reiterated.

The biggest advantage of SOM-based clustering analysis is that it can reduce a multidimensional data set to two dimensions.

3.3. Dunn Index

Several methods are used to measure the cluster quality. The Dunn Index is one of those methods. Minimizing the distance among clusters and maximizing the in-cluster distance is the main objective of the Dunn Index. Higher values of the Dunn Index indicate the quality of the cluster. (Azar, 2013: 8). The disadvantage of the index is the extension of the analytical need necessary fort he calculation of increasing c and n numbers and calculation difficulties. Dunn index is calculated as at the equation 3.

The disadvantage of the index is that as the number of c and n increases calculation becomes more

difficult. The Dunn Index is calculated as in Equation 3

$$DI(c) = min_{i \in c} \left\{ min_{j \in c, i \neq j} \left\{ \frac{\left(min_{x \in c_i, y \in c_j} d(x,y) \right)}{max_{x,y \in c} d(x,y)} \right\} \right\} (3)$$

4. ANALYSES

Better Life Index is prepared by the OECD and taken from the Internet address of Turkey Statistical Institute (TUIK, 2017). In this study, housing, revenue, jobs, community, education, environment, civic engagement, health, life satisfaction, safety, work-life balance are examined by considering 22 different variables from 38 countries. The variables are dwellings without basic facilities (%), housing expenditures (%), room per person (%), household net adjusted disposable income ($), household net wealth ($), labor market insecurity (%), employment rate (%), long-term unemployment rate (%), personal earnings ($), educational attainment (%), years in education, air pollution (mcg per m3), water quality (%), stakeholder engagement for the developed regulations (average score), voter turnout (%), life expectancy (years), health declaration (%), life satisfaction (average score), feeling safe walking alone at night (%), murder rate, employees working very long hours (%), time devoted to leisure and personal care (hours).

Clustering analysis will enable countries to be divided into groups in terms of specified variables (attributes), enabling each group (cluster) to be identified, differences in groups emerging, and an assessment of livability in the context of the specified variables.

The set of variables of 38 countries are seen at Table 1. Main purpose of this study is to group these 38 countries in terms of livable countries using SOM algorithm that is an ANN based clustering technique and interpret obtained results. Moreover, One-way ANOVA and Kruskal Wallis tests are also carried out in order to examine the presence of any statistically significant difference among the clusters.

Table 1. Variables Used in the Study

Kod	Variable Name	Kod	Variable Name
X_1	Dwellings without basic facilities (%)	X_{12}	Air pollution (mcg per m3)
X_2	Housing expenditures (%)	X_{13}	Water quality (%)
X_3	Room per person (%)	X_{14}	Stakeholder engagement for the developed regulations (average score)
X_4	Household net adjusted disposable income ($)	X_{15}	Voter turnout (%)
X_5	Household net wealth ($)	X_{16}	Life expectancy (years)
X_6	Labor market insecurity (%)	X_{17}	Health declaration (%)
X_7	Employment rate (%)	X_{18}	Life satisfaction (average score)
X_8	Long-term unemployment rate (%)	X_{19}	Feeling safe walking alone at night (%)
X_9	Personal earnings ($)	X_{20}	Murder rate
X_{10}	Educational attainment (%)	X_{21}	Employees working very long hours (%)
X_{11}	Years in education	X_{22}	Time devoted to leisure and personal care (hours).

The number of clusters in SOM algorithm are determined by the user. At this study, the Dunn Index was used to limit the number of clusters. The Dunn Index values are found in Table 2.

Table 2. The Dunn Index Values with Respect to Different Number of Clusters

Number of Clusters	The Dunn Index Values
2	0,26
3	0,27*
4	0,27*
5	0,25

As seen in Table 2, the highest Dunn value is obtained if the countries are clustered in three or four groups.

Everitt (1974) asserts that if the number of clusters cannot be determined, then Equation 4 can be used.

$$K = \sqrt{\frac{n}{2}} \qquad (4)$$

Equation 4 suggests that the optimum number of clusters for this study is four. After determining the number of clusters, basic statistical analyzes are conducted through the WEKA program. In Figure 1, the ranges, average and standard deviation values and histogram graph of the "room per person" variable are seen as an example.

Figure 1. Screenshot from the WEKA Window
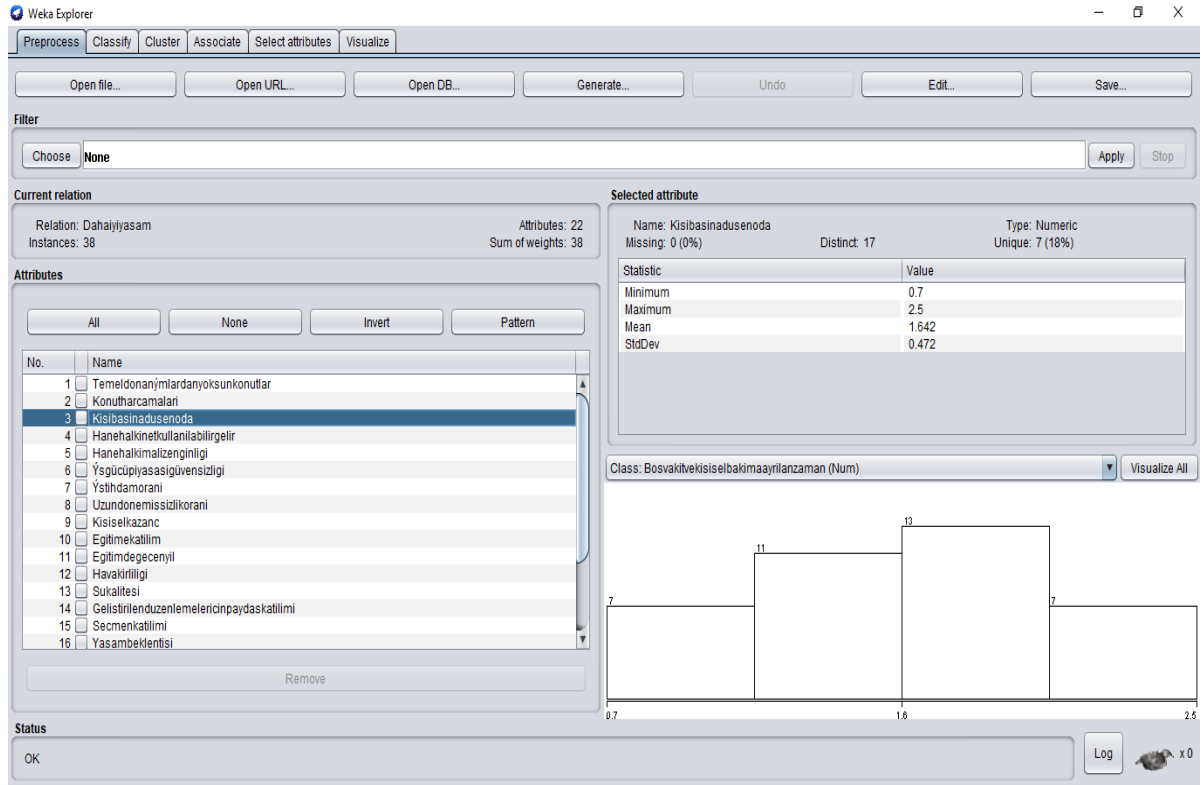
In Figure 2, the number of countries in each cluster is shown on a bar graph.

Figure 2. Number of Countries in Each Cluster
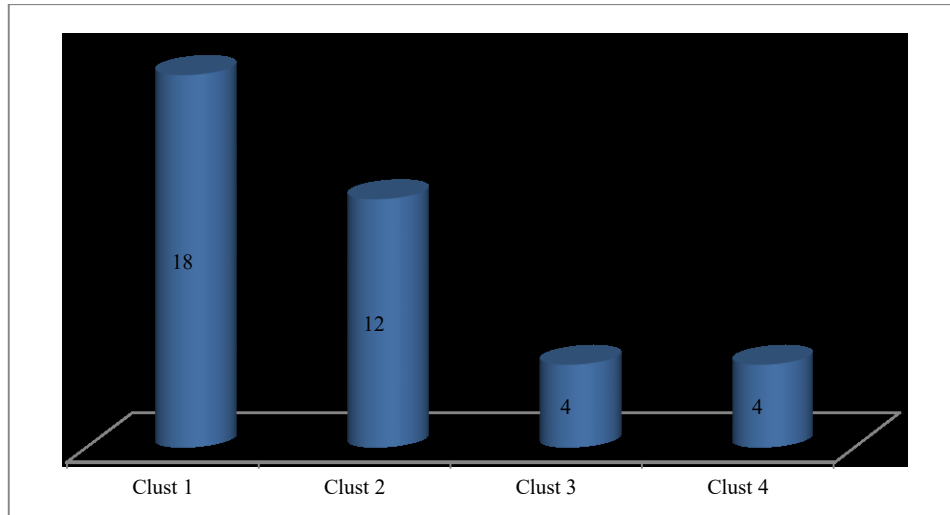
According to the findings obtained from the SOM Algorithm, there are 18 countries in "Cluster 1", 12 in "Cluster 2", 4 in "Cluster 3" and 4 in "Cluster 4".

The clusters with the countries are presented in Table 3, while visualisation of the clusters are given in a world map in Figure 3.

Table 3. Clusters

Clusters	Countries
Cluster 1	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Netherlands, Luxembourg, Norway, New Zealand, Sweden, Switzerland, United States of America
Cluster 2	Czech Republic, Estonia, Israel, Japan, Korea, Latvia, Hungary, Poland, Slovakia, Slovenia, Chile, Russian Federation
Cluster 3	Spain, Italy, Portugal, Greece
Cluster 4	Mexico, Turkey, Brazil, South Africa

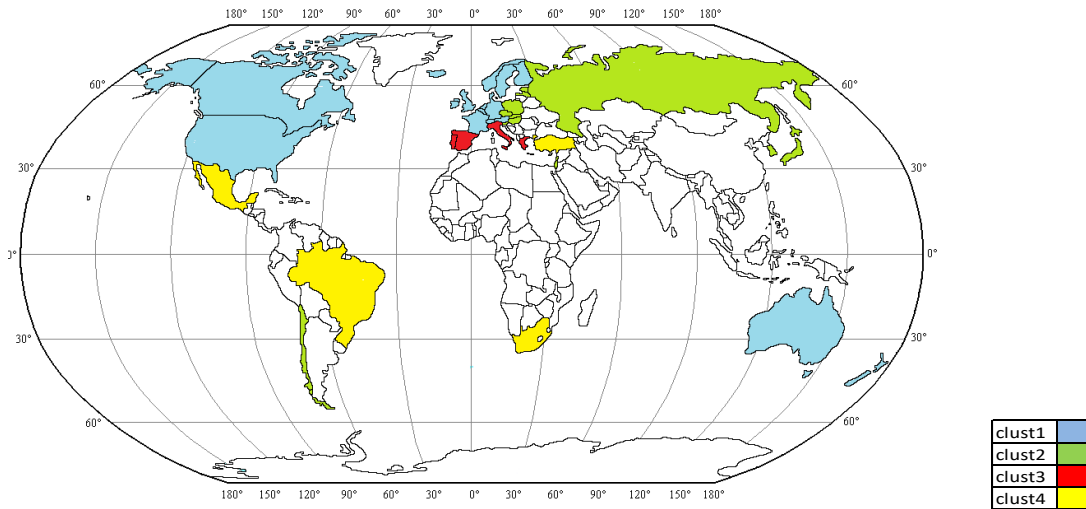**Figure 3.** Visualisation of the Clusters on the Map

Following the clustering procedure, an examination in detail were made to through the One-Way ANOVA and Kruskal Wallis test analysis which determine whether or not there exist a statistically significant difference among clusters and normal distribution of variables. Normality tests through Kolmogorov-Smirnov were performed for each variable of clusters firstly. Then secondly, One-Way ANOVA test for the variables meeting the normality assumption, Kruskal Wallis test for the variables that are not meeting the assumption are used to determine the existence of a statistically significant difference. According to Kolmogorov-Smirnov test, variables X_2, X_3, X_4, X_5, X_7, X_9, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{18}, X_{19}, X_{22} provide assumption of normality. However, because of Levene test statistic value of X_{18} and X_{22} variables is less than 0.05, Kruskal Wallis test was applied to these variables. The results obtained from these tests are shown in Table 4.

Table 4. Test Results

Variables	Normality Test	Test Results of the Variables with Normal Distribution			Test Results of the Other Variables	
	Kolmogorov-Smirnov (p)	Anova Test (p)	Tukey	Tukey Test (p)	Kruskal Wallis Test (p)	Mean Rank
X_1	0.000	-	-	-	0.000	Clust1:11.36 Clust2:28.42 Clust3:16.25 Clust4:32,63
X_2	0.196	0.244	-	-	-	-
X_3	0.099	0.000	Clust1: 2, 3, 4 Clust2: 1, 4 Clust3: 1, 4 Clust4: 1, 2, 3	0.000-0.022-0.000 0.000-0.017 0.022-0.007 0.000.007	-	-
X_4	0.200	0.000	Clust1: 2, 3, 4 Clust2: 1 Clust3: 1 Clust4: 1	0.000-0.001-0.000 0.000 0.001 0.000	-	-
X_5	0.057	0.000	Clust1: 2, 4 Clust2: 1 Clust4: 1	0.001-0.002 0.001 0.002	-	-
X_6	0.000	-	-	-	0.002	Clust1:14.61 Clust2:18.25 Clust3:34.13 Clust4:30.63
X_7	0.090	0.000	Clust1: 3, 4 Clust2:3, 4 Clust3:1, 2 Clust4:1, 2	0.000-0.000 0.028-0.001 0.000-0.028 0.000-0.001	-	-
X_8	0.000	-	-	-	0.013	Clust1:15.83 Clust2:18.67

						Clust3:35.75 Clust4:22.25
X_9	0.090	0.000	Clust1: 2, 3, 4 Clust2:1, 4 Clust3:1, 4 Clust4:1, 2, 3	0.000-0.000-.0.000 0.000-0.016 0.000-0.013 0.000-0.016-0.0013	-	-
X_{10}	0.000	-	-	-	0.000	Clust1:19.69 Clust2:29.13 Clust3: 6.50 Clust4: 2.75
X_{11}	0.200	0,008	Clust1: 2, 4 Clust2: 1 Clust4: 1	0.047-0.017 0.047 0.017	-	-
X_{12}	0.200	0.000	Clust1: 2, 4 Clust2: 1 Clust4: 1	0.000-0.038 0.000 0.038	-	-
X_{13}	0.166	0.000	Clust1: 2, 3, 4 Clust2: 1 Clust3: 1 Clust4: 1	0.000-0.003-0.000 0.000 0.003 0.000	-	-
X_{14}	0.200	0.405	-	-	-	-
X_{15}	0.200	0.001	Clust1: 2 Clust2: 1	0.001 0.001	-	-
X_{16}	0.000	-	-	-	0.001	Clust1:24.61 Clust2:14.00 Clust3:27.50 Clust4: 5.00
X_{17}	0.009	-	-	-	0.000	Clust1:27.44 Clust2: 9.21 Clust3:17.38

						Clust4:16.75
X_{18}	0.098	-	-		0.000	Clust1:28.78 Clust2:12.58 Clust3:7.50 Clust4:10.50
X_{19}	0.200	0.000	Clust1: 2, 4 Clust2: 1, 4 Clust3: 4 Clust4:1, 2, 3	0.002-0.000 0.002-0.004 0.003 0.000-0.004-0.003	-	-
X_{20}	0.000	-	-	-	0.007	Clust1:14.78 Clust2:22.42 Clust3:16.63 Clust4:34.88
X_{21}	0.000	-	-	-	0.083	-
X_{22}	0.109	-	-	-	0.030	Clust1:23.83 Clust2:16.58 Clust3:21.50 Clust4:6.75

The test statistics at Table 4 assert that there is no significant difference among the clusters, as the p values of X_2 and X_{14} that meet the condition of normal distribution, are higher than 5%. As the p value of X_3, X_4, X_5, X_7, X_9, X_{11}, X_{12}, X_{13}, X_{15}, and X_{19} variables are lower than 5% it can be said that a significant diference among the clusters exist. Considering the variables meeting the normality condition and having a significant difference among the clusters, the differences between the clusters are indicated in the Table 4 in details. The findings suggest that the Cluster 1 is different from the others.

Kruskal Wallis was applied to X_1, X_6, X_8, X_{10}, X_{16}, X_{17}, X_{20}, X_{21} variables that do not meet the normal distribution condition as well as X_{18}, X_{22} variables in which Anova test could not be applied as a result of the Levene test. According to Kruskal Wallis test results, since the p value of X_{21} variable is greater than 5%, it can be interpreted that there is no significant difference between the clusters. As p values belonging to X_1, X_6, X_8, X_{10}, X_{16}, X_{17} X_{18} X_{20} and X_{22} are lower than 5%, it can be said that a significant difference among variables exist.

Main indicators among variables; dwellings without basic facilities (X_1), labor market insecurity (X_6), long-term unemployment rate (X_8), air pollution (X_{12}), murder rate (X_{20}) and employees working very long hours (X_{21}) are negative indicators and it is preferred that they take lower values. Higher values are expected for rest of the positive variables.

Finally, the variables in Table 4. that do not meet the condition of normal distribution and having a significant relation among clusters are X_1, X_6, X_8, X_{20} variables. When the clusters mean ranks of Kruskal Wallis Test results for these variables are examined, Cluster 3 and cluster 4 are ranked first, whereas Cluster 1 and Cluster 2 are ranked in the last rows.

5. CONCLUSION

In this study; using "Better Life Index" data provided by the OECD, has been done clustering with WEKA software by taking the SOM algorithm into account. Optimum cluster number is determined by considering the Dunn Index.

As seen at Figure 3. Cluster 1 consists of Australia, Austria, Belgium, Germany, Denmark, Finland, France, Germany, Netherlands, Ireland, Sweden, Switzerland, Iceland, Canada, Luxembourg, Norway and New Zealand. This group is composed of the countries, having a higher democracy culture and economic prosperity along with modern social lifestyle. In this context, the considered variables of the countries in this cluster within the framework of economic, social and political dimensions have taken close values.

Cluster 2 is composed of Czech Republic, Estonia, Israel, Japan, Korea, Latvia, Hungary, Poland, Slovakia, Slovenia, Chile and Russia. The cluster basicly consists of Eastern Europe countries as well as some emerging countries in the Middle East, South America and Far East. Czech Republic, Estonia, Latvia, Hungary, Poland, Slovakia and Slovenia taking place in this group are the countries that are recent EU member states after the disintegration of the Soviet Union. They have lower economical power than the developed EU countries.

It is seen that Russia, another country in this cluster, after taking some steps on democratization and eliminating the old communist system, was still far from fulfilling the requirements of a true democratic government, even though it structured the previous 1977 Constitution between 1991-1993. It can be stated that liberal democracy does not rule in Russia today as the political and economic system in the country is still in transition (Baharçiçek & Ağır, 2014: 17-19).

Other countries of this cluster like Israel, Japan, Korea and Chile can be given examples to the countries, having prominent local economic powers. Nevertheless, Japan and Korea, the countries with developed economic dinamics does not taking place in cluster 1 can be explained due to their variable values of "life satisfaction" and "very

long working rate" being low within the framework of social dimension of this study.

However, it can be stated that especially countries with developed economic dynamics such as Japan and Korea are not included in "Cluster 1" because of the low values of variables such as "life satisfaction" and "working very long hours" within the framework of the social dimension. Therefore, it can be thought that the economic dimension alone is not effective in determining clusters.

Cluster 3 can be defined as a cluster in which the EU countries like Spain, İtaly, Greece and Portugal having closer geographical positions, cultural habits, economical situations and lifestyles. Although these countries are in EU not in cluster 1 but in cluster 3, the economic problems that these countries have recently faced are "labor market insecurity", "employment", "long-term unemployment", etc., so it can be interpreted that negatively affects the values of the variables and causes the "life satisfaction" rate to decrease within the social dimension. As the fact that those EU member states are in Cluster 3 instead of Cluster 1, it is possible to state that the economic problems that these countries have been experiencing recently negatively affects the variables such as "labor market insecurity", "employment", "long-term unemployment", causing a decrease in the "life satisfaction" in those countries.

Cluster 4; is a group composed of countries like Turkey, Mexico, South Africa and Brazil which are located at different continents. While their economical and political situation, population and areas sizes are similar, the economical variables: "employment rate", "long-term unemployment rate", "personal earning rate", "household net adjusted disposable income", the social variables: "life satisfaction", "feeling safe walking alone at night", and the political varibale "political participation rates" are relatively lower from the other countries.

The study of clustering countries according to the Better Life Index is a multi variable study taking many economical, political etc. variables into account that present significant findings. Even though the most important factor on grouping the

countries in different clusters seems the economic dimension, the social and political dimensions such as political stability, geographical position, socio-cultural conditions, habits are also seen very important.

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A GLANCE AT GROWTH ACCOUNTING:
COBB-DOUGLAS MODEL FOR G-7 (1950-2018)

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ABSTRACT

In this article, we inspected the impact of human capital on economic growth by estimating a Cobb-Douglas model for G-7 countries during (1950-2018). Our results show that, human capital has a positive impact on economic growth in the long-run with a contribution of 0.44% whereas evidence is only found for physical capital for the short-run. While the current data for G-7 with the application of pmg reveals that tfp was insignificant.

Keywords: *Human Capital, Cobb-Douglas Production Function, Growth, PMG.*

Jel Codes: *C01, D24.*

1. SOME ARGUMENTS ABOUT GROWTH ACCOUNTING

The argument about the growth of the source of East Asian countries was initiated by Young (1994) and Krugman (1994). For years, the pros and cons of Krugman-Young analysis have been examined by scholars. If the diminishing returns hold, which is an assumption of the neoclassical growth model, then capital alone cannot provide long term growth and TFP becomes important and technological development is accepted as a crucial factor for productive efficiency (Romer,1986; Lucas,1988). So by assuming constant returns to scale, physical capital, and human capital as two inputs and technology as captured by "A" is relatively unimportant in Cobb- Douglas (C-D) framework (Cobb&Douglas,1928). In addition to that, Acemoğlu and Dell (1010) have found that human capital is an important determinant of between-country and between-municipality differences.

Human capital is a crucial component of economic and industrial growth. For that reason, the impact of human capital on economic growth has taken the attention of many authors. Human capital refers to the training, experience, judgment, intelligence, relationships, insights (Barney, 1991) as well as the knowledge and skills (Hatch and Dyer, 2004; Martin de Castro *et al*., 2011; Leitner, 2011) of the individuals. Adam Smith, John S. Mill, and Alfred Marshall are considered to be the first economists talking about human capital accumulation. However modern theory of human capital is not very affected by those three, as stated by Bowman (1990). According to Smith (various additions), human capital is not much important in terms of growth. Mill (1909) on the other hand, make sense of education from a self-interest or investment motive perspective. These two motives are integral in the modern theory of human capital, constituted by Schultz (1961) and Becker (1962). One of the common points of endogenous growth models is that the importance given to physical capital over a long period is exaggerated and the most important factor in terms of growth is human capital. This study can not summarize all the literature on growth accounting, however, one must see Solow (1957) paper as one of the oldest studies within that respect K o l 998) in his analysis has also stated that skilled labor and technological spillover are more important than physical capital in growth accounting. The paper by Freire-Seren (2002) presents the empirical findings of a direct relationship between human capital accumulation and economic growth. In another empirical study by Rao and

Shankar (2012) significant estimates implied that, for a 20 year period, an additional year of education permanently added about 5% to the output growth. Finally, Wilson and Briscoe (2004) paper has examined a huge literature about GNP and human capital relationships and have concluded that investment in education has a positive and significant impact on growth.

Barro and X Sala-i Martin (1995) book is another important study of endogenous growth theories. Lucas's (1988) pioneering paper has caused many many endogeneous growth models such as Stokey (1988) Young (1991). Of course, most of the studies are affected by Romer (1986) increasing returns and other detailed features of endogenous growth models. Mincer (1995) stated that if sectoral technological growth increases than demand for an educated and trained workforce also increases. Tansel (2002) has estimated that for Turkey vocational high schools are superior to general high schools in terms of human capital. İsmihan and Özcan (2009) have shown that TFP and capital accumulation are important sources of growth, in their study where they investigated the IRF for the (1960-2004) period in Turkey. Sarkar (2007) has found that human capital is crucial for growth with its positive and significant effect on growth. Hussain (2016) paper finds that the coefficient for K and L is 0.49 and 0.51 for the Bangladesh manufacturing sector. So, the Cobb-Douglas production function exhibits increasing returns to scale for the manufacturing sector of Bangladesh. With this study, we aim to contribute to the existing literature by empirically analyzing the effects of productivity and human capital on growth for G-7 economies. In addition to that, we construct a new data set for G-7 countries in the Cobb-Douglas framework following İsmihan's (1996) paper. The study is structured as follows. In section I, a brief summary of the li is argued. In section II and III, model and the data set is investigated within a Cobb-Douglas environment. In the last section results and a discussion is provided.

2. METHODOLOGY AND THE DATA

The general practice for panel data is to estimate N separate regressions and calculate coefficient averages called mean group (MG) estimator or pool the data and assume that the slope coefficients and error variances are the same. This article uses the pooled mean group (PMG) estimator, a procedure that limits long-term coefficients to be the same but allows short-term coefficients and error variances to differ between groups. It is possible to derive the asymptotic distribution of PMG estimators, taking into account both the state that the regressors are stationary, the state in which they follow unit root processes and both cases when the time dimension goes infinity.

The model we use inspects the effect of total factor production, capital accumulation, human capital index on economic growth with a standard Cobb-Douglas production function such as:

$$Y_{it} = A.K^a_{it} \, H^b_{it} \qquad (1)$$

where, Y_{it} is GDP, K_{it} is capital, A is total factor productivity and H is human capital for representing labor. i and t represent cross-sections and t is respectively. Equation 1 is a modified form of Wooldridge (2009) model with a difference. The difference is that our model uses human capital instead of labor. Assuming that the law of diminishing returns does not exist, H (human capital index) representing human capital is preferred instead of L in the two-factor production function. Such a representation would be more appropriate if today's industry 4.0 and the existence of high-tech industries are taken into account.

The data seen below was collected from the Penn World Table version 9.1.

Y   Real GDP at constant 2011 national prices (in mil. 2011US$)

K   Capital stock at constant 2011 national prices (in mil. 2011US$)

H   Human capital index, based on years of schooling and returns to education; see Human capital in PWT9

TFP   TFP at constant national prices (2011=1)

Below panel ardl data with time periods, t = 1,2, ... ,T, and groups, i = 1,2, ... ,N, we aim to estimate an ARDL(p, q, q, ... ,q) model,

$$y_{it} = \sum_{j=1}^{p} \theta_{ij} Y_{i,t-j \, i} + \sum_{j=0}^{q} \gamma'_{ij} X_{i,t-j} + \mu_i + \varepsilon_t \quad (2)$$

Here vector of explanatory variables are Xit (k xl), μ_i shows the fixed effects; the lagged dependent variables, θ_{ij} are scalars; and γ'_{ij} are k x 1 coefficient vectors. Each group seperately estimated with a large T. The following variables are used for representation of the model:

$$\Delta logY_{it} = \beta_i[\Delta logY_{i,t-1} + \gamma'_i X_{i,t}] + \sum_{j=1}^{p-1} \theta_{ij} l\Delta ogY_{i,t-j}$$
$$+ \sum_{j=0}^{q-1} \vartheta'_{ij} \Delta X_{i,t-j} + \varepsilon_t \qquad (3)$$

β_i: is the group specific speed of adjustment coefficient

γ'_i: is the long-run relationship vector

ECT = $[\Delta logY_{i,t-1} +\gamma'_i X_{i,t}]$, error correction term

$\theta_{ij}\vartheta'_{ij}$: short-run dynamic coefficients

Four procedures such as; pooling, aggregating, averaging group estimates, and cross-section regression are used in panel data. The estimates are unbiased if the coefficients differ and pooling gives inconsistent results when the coefficients differ across groups. So the cross-section provides

consistent results for the long-run (Pesaran and Shin, 1995).

In principle, PMG estimators can be computed whether the regressors are 1(0) or 1(1) (Pesaran et al, 2012:625).

3. RESULTS

First we specify the model and then looking at correlation analysis, we perform unit root tests and selecting optimal lags. After looking at cointegration test and Hausman test we estimate the model and causality relationship.

Table 1. Descriptive Data

Variable	Obs	Mean	Std.Dev.	Min.	Max
Logy	483	14.31636	.9485411	12.09554	16.6897
Logtfp	483	-.1767118	.234095	-.9325089	.1250409
logK	483	15.70289	.9954217	13.28907	17.6447
logH	483	1.07335	.1745657	.5841789	1.32384

Table 2. Correlation Matrix

	Logy	Logtfp	lokK	logH
Logy	1.0000			
Logtfp	0.4969	1.0000		
logK	0.9828	0.5494	1.0000	
logH	0.6857	0.5291	0.6713	1.0000

After the correlation coefficients among the variables were found to be significant, the stationarity state of the variables was examined. Firstly, panel unit root tests of Levin et all. (LLC,2002), Breitung (2000) and Im et all. (IPS,2003) were used for statioanrity. When deciding about the optimal lag lengths, we look at the most common lag accross the countries for each of the four variables. In the next step, after choosing the optimal lag length we look for the test of cointegration with Pedroni (1999,2004) cointegration test to test the cointegration relation among the variables. Long term parameters of the variables were estimated with MG developed by (Pesaran and Smith,1995) and PMG developed by Pesaran et all. (Pesaran,1999).

Before determining the panel cointegration relationship between the series, it is examined whether or not the series are stationary to avoid the spurious regression problem. Levin et all. (LLC, 2002) proposed a panel unit root test that applies ADF seperately for each cross section. LLC assumes that all units in the panel have first order partial autocorrelation. Breitung (2000) which is a pooled panel unit root test, provides an appropriate data transformation and does not require a correction. The size of distortions are small in this test, while Im et all. (IPS,2003) proposed a unit root test for dynamic heroheneous panels based on the average of individual unit root statistics. The results of panel unit root tests coul be seen in Table 3.

Table 3. Panel Unit Root Tests

variables	LLC (adjusted t*)	Breitung (lambda)	IPS (Z-t-tilde-bar)
level			
Logy	-1.3636	11.6813	-9.9091
	(0.0864)	(1.0000)	(0.0000)
logK	-8.0123	-5.3317	-16.2019
	(0.0000)	(0.0000)	(0.0000)
logH	-10.0671	14.4652	-7.1808
	(0.0000)	(1.0000)	(0.0000)
logtfp	-6.0543	5.2245	-3.5369
	(0.0000)	(1.0000)	(0.0002)
First difference			
d.ly	-15.6491	-16.6111	-15.7023
	(0.0000)	(0.0000)	(0.0000)
d.ltfp	-7.4092	-11.1961	-10.7941
	(0.0000)	(0.0000)	(0.0000)
d.lK	-14.6183	-15.9692	-15.3967
	(0.0000)	(0.0000)	(0.0000)
d.lH	-3.0326	-0.0058	-5.9394
	(0.0012)	(0.4977)	(0.0000)

Pedroni (1999) developed 7 cointegration tests, the first four pooled within dimension which allow heterogeneity for cointegration and the other 3 were between dimension in panel data models. The hypoheses of the test were defined as "H0:no cointegration between series" and H1 cointegration between the series". In six out of 7 statistics the null of "no cointegration" is rejected, because the values are lower than 0.05%, so we can decide about cointegration among the variables. After this step, we decide about whether pooled mean group estimator (pmg) or mean group estimator(mg) is homogeneity, pmg is the most appropriate estimator, so the model supports pmg estimator, since the probability value is greater than 0.05% level. When deciding about the dynamic fixed effects estimator and pmg estimater again we run Hausman test.

Table 4. Pedroni's Cointegration Test

Test Statistics	Panel	Group
V	1.791	.
Rho	-4.155	-3.688
T	-4.241	-4.442
adf	-2.038	-1.796

All test statistics are distributed N(0,1), under a null of no cointegration, and diverge to negative infinity.

4. PANEL ARDL ESTIMATION PROCEDURE

The advantage of the panel ardl is that a dynamic error correction moe explanatory variables fordel can be derived with a simple linear transformation. Two estimators such as mg and pmg are suggested for panel ardl. The mg estimator places no restrictions on specification parameters and derives the long run parameters from the average of the individual ardl estimators long run parameters. It also does not allow for short term heterogeneity of variables. Therefore Pesaran et all (1999) developed pmg as an alternate to mg estimator. PMG estimator reestricts the long-term coefficients and error variances to differ between groups. The pmg estimator assumes that the error terms are unrelated and are independent from the regressors. There is a long-term relationship between dependent variable and long-term parameters are the sam efor all countries. Long-term homogeneity of the parameters are tested with Hausman (1978) test.

Table 5. Panel Ardl (2,1,2,2)

Variable	Mg	Pmg	Hausman
	Long-run coefficients		
d.Ly			
Ltfp	-.0792926 (0.917)*	-.4533831 (0.004)***	.3740905
lK	-.0707371 (0.277)*	-.245691 (0.006)***	.1749539
lH	.3588833 (0.794)*	.4455232 (0.049)**	-.0866399
	Error Correction Term		
ECT	-.4075501 (0.000)***	-.3360963 (0.000)***	
	Short-run Coefficients		
Δltfp	-.3922804 (0.585)*	-.2568994 (0.709)*	
ΔlK	.0154997 (0.338)*	.0407881 (0.000)***	
ΔlH	-.6162845 (0.828)*	.5810866 (0.689)*	
İntercept	1.263865 (0.406)*	2.154987 (0.000)***	
Hausman test chi-square		-4.49	

The values in parentheses are probability values, ***,**, and * are respectively 1%,5%, and 10%

Country Analyses

	Canada	
d.ly		-.1842206 (0.000)
Δltfp		-.131135 (0.886)
ΔlK		.0213523 (0.890)
ΔlH		3.697135 (0.382)
Intercept		1.107595 (0.029)
	France	
ECT		-.3093931 (0.000)
d.Ly		
Δltfp		.2632969 (0.660)
ΔlK		.0265277 (0.789)
ΔlH		-.5097334 (0.704)
Intercept		1.956258 (0.000)
	Germany	
ECT		-.2864646 (0.000)
Δltfp		-.0128831 (0.973)
ΔlK		.0462029 (0.546)
ΔlH		-6.633842 (0.022)
Intercept		1.855709 (0.002)
	Italy	
ECT		-.5092888 (0.000)
Δltfp		2.948401 (0.008)
ΔlK		.0552888 (0.711)
ΔlH		1.513229 (0.193)
Intercept		3.331516 (0.000)
	Japan	
ECT		-.4302523 (0.000)
Δltfp		-1.67262 (0.013)
ΔlK		.0531823 (0.535)
ΔlH		-1.524403 (0.622)
Intercept		3.010206 (0.000)
	UK	
ECT		-.4009424 (0.000)
Δltfp		-2.959613 (0.026)
ΔlK		.0173488 (0.924)
ΔlH		3.835095 (0.575)
Intercept		2.457974 (0.002)

	US	
ECT		
Δltfp		-2.959613 (0.821)
ΔlK		.0656137 (0.599)
ΔlH		3.690126 (0.378)
Intercept		1.365647 (0.015)

We can see from the ECT values that there is cointegration among the variables for each country. However for long run coefficients which shows long run causality in the same time, not all three variables are significant only human capital is significant in some. The coefficients are homogeneous for the full panel in the long-run. For the short run, coefficients and error variances differ for each country. We can make a comparative analysis for each country; it can be said that for the short run the variable total factor productivity is significant for Italy which is it's coefficient is %2.94 positive impact on growth. Since it is less informative we didn't use mean grıup estimation seperately. Intercepts are positive and significant which shows the technology parameter.

5. DISCUSSION AND IMPLICATIONS FOR FUTURE RESEARCH

At this point, the data fails to meet the asymptotic assumption of Hausman test. This can be a sign of bad fit of the H0 model, then one can use diagnostic rules or as an alternative, the absolute value of the static could be preferred (Mizon and Richard, 1986). The model supports the pmg estimator with the assumption of the absolute values of the statistics. According to these results; where the human capital variable has a positive and significant effect in explaining economic growth. In the short-run, the physical capital variable has a significant and positive impact on growth.

From a cross-country perspective, in this panel covering the period (1950-2018) for G-7 countries, it is concluded that human capital has a positive impact on economic growth. In the short-run, it is concluded that physical capital has a significant positive effect on economic growth.

The contribution of this paper is that the intercept or mainly the technology parameter is significant and positive for each country and the variable of human capital is also positive 0.44% for the full panel in the long run. Our results are in line with previous studies of Pelinescu (2015), Sarkar (2007), and Hussain (2016). Future research may analyze a broader spectrum set of variables and secondly, can look for local differences.

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IN MEMORIAM: PROF. DR. ADEM EFE[1]

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The COVID-19 Pandemic continues to hit humanity. We are losing scholars, scientists, artists, and thinkers one by one every other day. Our human capital is weakening day by day due to the pandemic. Most recently, we sacfied Prof. Dr. Adem EFE, the Head of Social Services Department at Süleyman Demirel University to COVID-19. Dr. Efe was one of the most valuable, productive and productive theologians, sociologists and academicians of Turkey.

He lived a life devoted to academia, research, traveling, learning, writing and exploring. Immediately recording what he read, researched and saw, Dr. Efe left behind a rich and fruitful academic and intellectual legacy. Dr. Efe, who passed away at the age of 53, always worked and ran to research, write and learn more.

Since the beginning of our research career in early 1990's, we have had a very close friendship for over 25 years. We would have long conversations on literature, philosophy, science, art and history with him, with whom I shared the same office for a long time. The views distilled from his world of emotions, thoughts and intellectual capacity have been a constant source of nourishment for me and enriched me, for sure. There are always some people that you want to be a part of your life and enjoy having time when you are together. He was such a person for me. Dr. Efe was someone who added enthusiasm, shining and dynamism to people with his joy, sympathy, kindness and love.

He was an intellectual scholar who devoted his life to knowledge, learning, research and writing. As an academic and intellectual, he was a model person in ethics and academia. He kept away from anyone and anything that wanted to poison, pollute and corrupt life and people with ignorance, malice and hostility. Instead of consuming his energy with the dirty and dark souls that wanted to defile him, Dr. Efe always turned to nature, science and human beings. The writings he left behind describe a deep love of humanity and life against ignorance, shallowness and fanaticism. Creating a magical attraction power in the environments he was in, with his humanity, embracing and warmth, Dr. Efe tried to establish an efficient relationship and communication with everyone.

Dr. Efe left behind important reference works in the fields of modernization and Islamism and the sociology of religious groups. His study, in which he examines religious groups in the example of Isparta, shows that in order to reveal a sociological picture of religious life, one must go through concrete examples that exist locally. Dr. Efe, who applied the approaches of social sciences to religious life, was a complete social scientist. He was not simply a sociologist. He was also a multi-disciplinary academic who tried to study and understand religious phenomena in a versatile and interdisciplinary approach, drawing on philosophy, literature, theology, history and culture.

Dr. Efe has brought important historical texts on Islamic thought to the present day. For instance, his work about Sebilürreşad magazine ise very valuable. His study about Hasan Hikmet Demirbağ, one of the important writers of Sebilürreşad magazine, also adds invaluable contribution to the literature. His study about Basiret newspaper, published by Ali Efendi in Istanbul, has made an important contribution to the fields of media history as well as sociology. This study, published by Ibn Haldun University, sheds light on Ottoman-Malay relations.

Dr. Efe was a person who was passionately attached to the antique items. His office at the university was like a museum. Adam would collect antique objects from wherever he went and proudly show them in his office to the visitors. The conversations we had in his museum-like office with deliciously brewed hot tea will remain unforgettable memories for me.

He was not an scholar who limited himself to time and space. He was an intellectual who was always on the road to contribute to academic and intellectual life. He left his travel notes to his readers

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[1] The Turkish version of this article was published in the Milat Newspaper on 23 October 2020.

as timeless documents that show the richness of his literary aspect. Adem Hodja was a star that represented research, learning and writing in the sky of Isparta and shed light around. Unfortunately, with the slipping of that star in the skies of Isparta, the Mediterranean, the Aegean, and the world have become much poorer. I will always remember him with love. I wish God's mercy to Dr. Efe. Rest in the light, dear Adem!

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DECENTRALIZATION

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We hear a new technology emerging every day. Each day, we run into a lot of technology related issues. We ask ourselves what the new technologies will bring. The answer to all these questions is decentralization. I believe everyone will remember the data collection incident of Cambridge Analitica happened last week and still in effect. Let's look at the incident from another angle. Facebook, Twitter, LinkedIn, YouTube, Google and even Apple of Tim Cook, who had a spat with Mark over press about the incident… All these companies have a database surrounded by a software as a structure. This structure is the one which became common with databases appeared in technology stand. The most important reason of this structure is the need of using the resources in the most effective way. If all data is in one place, storage, access, index and reaching the results will be easy. This structure belongs to a world before internet.

The Internet is a military project designed the networked computers' unable to make connections. The goal is to keep the damage to minimum by making configuration on a Spiderweb like structure to keep potential damages to computers from outer world minimum. In the pre-internet period, connections were very important due to a straight, worm like network structure were used. In this period, if two computers in the middle of the network are disconnected from the network, two different networks are formed; for this reason, the structure of the network was disrupted. In order to solve this problem, the solution network in the military sense was made in the network as form of network (web).

Although this seemed like a technical solution at first, it was the beginning of an idea that would change the world's upcoming 30-40 years. The fact that structures don't have a center strengthen that structure. In later periods, we see that all the network technologies on the internet have put into practice in different forms. Some events have even

accelerated the adoption of this idea. The best example of this is Clinton's sex scandal, I think. Those who remember this period will understand what I'm talking about when I say cigar, oval office

and Monica Lewinsky. The conversation between Clinton and Lewinsky revealed in the case file then fell into Press' hands. Without knowing that a very small text file of 100 KB would be a breaking point in the history of the World of the Internet, the CNN Informatics Department put the text file on web servers so that people could download it. It was not possible to reach CNN's servers that day and the next few days. When millions of people wanted to get the file from the servers at the same time, the servers became unresponsive. This was the collapse of centralized web servers. Afterwards, the CNN Informatics Team separated the servers from each other to never be merged again and transferred such content to the CDN (Content Delivery Network). CDNs are also one of the best examples of a content reaching with a decentralized structure. As a matter of fact, in the last period when world says "Bitcoin", experts such as İsmail Hakkı Polat says "blockchain", that's why. Blockchain brings decentralized security instead of a centralized authentication. This will cause security to change from the root in all areas, especially on the Internet. I do not know if it is a correct narration, but after the blockchain technology on the internet, we will change to a structure that can instantly identify the fraudsters in an instant, instead of thousands waiting for control of their identity in front of a door and on a queue. In fact, one of the issues that bothered CPU time in Bitcoin is the delay in the system of giving the task of validation to a structure which is always accustomed to revealing the identity. We will see that it also changes in other sub-coins. My suggestion to those who are interested in the philosophy instead of its technology, I can give example of Russian diplomats' deport in many countries around the world. If something like this happened 20 to 30 years ago, it would be the justification for the new world war. But now everyone is reacted with a smile. Because now, you do not have to be close to the center to establish a diplomatic link with a country. In fact, it is not clear what is the center of what in this world. I would like to say that the most influential idea of the next decade will be decentralization.

This architecture will change the way we all do business, manage and even learn and communicate. We've already begun to see how it changed the payment options, do not you?