

Florya Chronicles of Political Economy



İSTANBUL AYDIN UNIVERSITY

Journal of Faculty of Economics and Administrative Sciences

Year 6 Number 1 - April 2020

Genel DOI: [10.17932/IAU.FCPE.2015.010](https://doi.org/10.17932/IAU.FCPE.2015.010)

Cilt 6 Sayı 1 DOI: [10.17932/IAU.FCPE.2015.010/2020.601](https://doi.org/10.17932/IAU.FCPE.2015.010/2020.601)

Florya Chronicles of Political Economy

ISSN : 2149-5750
E-ISSN : 2717-7629

Proprietor

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Publication Period

Published twice a year
October and April

Language

English - Turkish

Academic Studies

Coordination Office (ASCO)

Administrative Coordinator

Tamer BAYRAK

English Redaction

Nur Emine KOÇ

Turkish Redaction

Süheyla AĞAN

Graphic Desing

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Printed

Armoninuans Matbaa Tavukçuyolu
Cd. Palas Sk. No:3 Y.Dudullu

Ümraniye - İstanbul

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The Florya Chronicles Journal is the scholarly publication of the İstanbul Aydın University, Faculty of Economics and Administrative Sciences. The Journal is distributed on a twice a year basis. The Florya Chronicles Journal is a peer-reviewed in the area of economics, international relations, management and political studies and is published in both Turkish and English languages. Language support for Turkish translation is given to those manuscripts received in English and accepted for publication. The content of the Journal covers all aspects of economics and social sciences including but not limited to mainstream to heterodox approaches. The Journal aims to meet the needs of the public and private sector employees, specialists, academics, and research scholars of economics and social sciences as well as undergraduate and postgraduate level students. The Florya Chronicles offers a wide spectrum of publication including

- Research Articles*
- Case Reports that adds value to empirical and policy oriented techniques, and topics on management*
- Opinions on areas of relevance*
- Reviews that comprehensively and systematically covers a specific aspect of economics and social sciences.*

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10.17932/IAU.FCPE.2015.010/fcpe_v06i1003

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10.17932/IAU.FCPE.2015.010/fcpe_v06i1004

Türkiye ve Seçilmiş Ülkelerde Mevduat Kabul Eden Kuruluşların Finansal Sağlık İlık Göstergelerinin Entropi ve Edas Yöntemi ile Değerlendirilmesi

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10.17932/IAU.FCPE.2015.010/fcpe_v06i1005

Türkiye'de Para Talebi Fonksiyonu Ve Faiz Oranının Simetrik Etkisi

Mortaza OJAGHLOU

10.17932/IAU.FCPE.2015.010/fcpe_v06i1006

From the Editor

This issue of Florya Chronicles of Political Economy includes powerful six articles. These articles are covering some cutting edge research on topical issues such as finance and environment.

The first article by Demirkale examines a variety of selected indicator and by using Granger causality calculations explores how these interact. Data for her study comes from Istanbul Stock Exchange's BIST100 index. Demirkale focuses on Foreign Exchange and interest rates as the main determinants of the index performance by applying one-unit shock to these around VAR model. This study concludes that USD/TL variable presents itself as the main cause of the stock market index that in turn significantly effects Euro/TL exchange rates and interest rate volatility.

In the following second article by Eren investigates environmental sustainability of Turkey vis a vis BRICS and MINT countries. This study uses UN developed Environmental Sustainable Index which categorizes countries under four different categories as "Very High Developed", "High Developed", "Medium Developed" and "Low Developed". According to 2019 environmental sustainable index value, Turkey is located in "very high developed" segment. Eren pursue some of the claims about Turkey that she will become an economic giant by 2050, in order to question whether economically viable efforts will be achieved in the sphere of environment too. Eren uses k-NN (Nearest Neighbor) algorithm technique to examine Turkey's environmental sustainability position vis a vis BRIC (Brazil, Russia, India, China) and MINT (Mexico, Indonesia, Nigeria, Turkey) countries.

The third article by Aydođdu and Bađcivan examines transformation of Human Resources Management (HRM) towards a more information based society. This investigation recognizes human aspect as the dynamic element of working life and foresees that it will continue its rapid transformation into the future. Accordingly, past practices of employee record keeping, social service duties, personnel management and industrial relations are no longer going to be part of HRM as fundamental changes are taking place. This article managed to reveal these new practices of HRM under

ongoing changes. This article extends its coverage of the applications and transformations of HRM from agricultural society to information society. This study also informs us with the problems encountered with information society transformations.

Following fourth article by Faqiri and Can is on the determinants of commercial bank internal auditing systems and on the factors determining its effectiveness at Herat region of Afghanistan. This article recognizes that internal audit plays a major role in enabling a bank to achieve its goals provided that it is implemented properly and managed. It is argued that, thirteen banks operating in Herat, can become more efficient if corrective measures and strengthen procedures are implemented and managed in their internal auditing systems, since this would enable them to tackle with their business threats and inefficiencies. Hence, this paper aims to highlight and recognize the factors influencing the effectiveness of internal audit. This study of commercial banks of Herat-Afghanistan aims to carry out a field work based research with the total number of 158 internal auditors. These auditors were approached by using quantitative methods of research using quantitative terminology through self-administered questionnaires. The investigation finds that management commitment and support has positive relationship between efficacy of the internal auditing systems and improving departmental performance and improving organizational efficiency. These are proven with clear and statistically significant consequences.

The fifth article by Selimler and Karadağ examines Financial Soundness Indicators (FSI) that are compiled to monitor the health and soundness of financial institutions and markets and their corporate and household counterparts. This study uses twelve financial soundness indicators of the IMF. These indicators are accepted as the basic set for deposit taking institutions. This paper examines by using the 2018 year-data of total nineteen countries including the candidates and potential candidates of the EU as well as the members of the EU in 2004 and the following years, and Turkey. This study uses weighs of the twelve main criteria determined by Entropy method and then EDAS method. These are used to execute performance ranking according to financial soundness indicators of selected countries. The first three places in Romania, Hungary and Poland, while Turkey was ranked 7th.

The final article by Ojaghlou examines the asymmetrical effects of interest rates on Money demand in Turkey. In order to develop an effective monetary policy Central Banks desire to establish a stable and predictable money demand function. This study checks out money demand function of Turkish Central by looking at the asymmetric effects of interest rates over the period 2005Q04-2019Q03. This paper uses a non-linear autoregressive distributed lag approach (NARDL) to find that there exists a positive effect of interest rates and income on the long run money supply, while negative impact of interest rates are recorded. Additionally, the paper finds that the money demand function in Turkey is a stable one in alliance with the monetarist approach that accepts a stable money demand function as the precondition for an effective monetary policy.

Finally, I would like to reiterate that this edition is also a product of a teamwork. We need to forward our gratitude to Associate Prof. Dr. Mustafa Aydın, the President of the Board of Directors and our Rector. Prof. Dr. Yadigar İzmirli for their continued support. Prof. Dr Celal Nazım İrem, Dean of the Faculty of Economics and Administrative Sciences (FEAS) has been the main dynamo underlying the strength of teamwork and making this issue possible. We are grateful to him for his persistent energy.

Prof. Dr. Sedat AYBAR
Editor

Mutual Interaction Analysis Between Stock Market Index and Financial Indicators By Granger Causality Method

Özge DEMIRKALE¹

ABSTRACT

This study aims to measure the mutual relationship between exchange rates and interest rate and the BIST100 index. For this purpose, the relationship between the variables used in the study was analyzed using the VAR model method. The relationship between the stock market index, dollar/TL, Euro/TL, and the interest rate was evaluated at the level of 5% and 10% significance with the VAR method. The reaction of the stock market index against a one-unit shock to be applied to exchange rates and interest rate were examined by the effect-reaction analysis. January 2005-March 2019 period based on monthly data, Dollar/TL, Euro/TL, interest rate, and BIST100 index variables were used in the study. According to the results obtained from the analysis, it was determined that the Dollar/TL variable is the cause of the stock market index variable. The study also found that the Dollar/TL variable is the cause of the Euro/TL and interest rate variables.

Keywords: *Stock Market Index, Exchange Rates, Interest Rate, VAR Method.*

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Doi Num: 10.17932/IAU.FCPE.2015.010/fcpe_v06i1001

Borsan Endeksi İle Finansal Göstergeler Arasındaki Karşılıklı İlişkinin Granger Nedensellik Yöntemi İle Analizi

ÖZ

Bu çalışma, döviz kurları ve faiz oranı ile BIST100 endeksi arasındaki karşılıklı ilişkiyi ölçmeyi amaçlamaktadır. Bu amaçla çalışmada kullanılan değişkenler arasındaki ilişki VAR modeli yöntemi ile analiz edilmiştir. VAR yöntemi ile borsa endeksi, Dolar/TL, Euro/TL ve faiz oranı arasındaki ilişki %5 ve %10 anlamlılık düzeyinde değerlendirilmiştir. Etki-tepki analizi ile döviz kurları ve faiz oranına uygulanacak bir birimlik şok karşısında borsa endeksinin tepkisi incelenmiştir. Ocak 2005-Mart 2019 dönemi aylık verilerinin esas alındığı çalışmada Dolar/TL, Euro/TL, faiz oranı ve BIST100 endeksi değişkenleri kullanılmıştır. Analizden elde edilen sonuçlara göre Dolar/TL'nin borsa endeksi değişkeninin nedeni olduğu tespit edilmiştir. Çalışmada ayrıca; Dolar/TL değişkeninin Euro/TL ve faiz değişkenlerinin nedeni olduğu saptanmıştır.

Anahtar Kelimeler: *Borsa Endeksi, Döviz Kurları, Faiz Oranı, VAR Yöntemi*

INTRODUCTION

Due to the effects of financial liberalization policies, the reduction of governments' control over capital movements has led to the deepening of the financial system. The liberalisation of capital movements has led to the development of the mutual relationship between stock markets and exchange rates. The risk of stock markets being higher than other investment instruments may cause investors to evaluate their savings in different investment instruments such as exchange, interest, and gold.

Exchange rates are one of the important macroeconomic indicators in the economy. Exchange rates, especially in developing countries, are affected by many factors including economic, political and social factors. An increase in exchange rates may cause the investor to keep his savings in foreign currency. In this context, exchange-denominated financial assets are becoming more attractive (Central Bank, Monetary Policy Report, 2002,8).

In the literature, the relationship between exchange rates and stock prices have been studied by many researchers. Studies show that there is a directional relationship between exchange rates and stock market. However, when the causality relationship between the two variables is analyzed, it is observed that there is not exactly a consensus. Granger-Huang et al. (2000), Şentürk and Dücan (2014), Delgado et al. (2018) concluded that exchange rates affect on the stock market. In contrast, Tabak (2006), Ghazali-Ismail et al. (2008) et al. concluded that the stock market affects on exchange rates. There are studies in which there is no causality Nieh and Lee (2001) relationship between the two variables.

In the literature, it is observed that there is no consensus in studies examining the relationship between interest rate and stock market index. Some studies have shown a positive relationship between the two variables, while some studies have identified a negative relationship. Stock markets are an investment vehicle. The performance of the markets as an investment instrument may be negatively affected if the investor wishes to evaluate his savings in assets with high interest rate returns.

This study covers the relationship between BIST100 index and financial indicators in Turkey. January 2005-March 2019 based on the monthly data, the study aims to measure the mutual sensitivity and degree of interaction between Dollar/TL, Euro/TL, and interest rate with BIST100 index. In this context, first studies in the literature examining the relationship between capital markets and exchange rates and interest rate were examined. The results obtained from the analysis were given after the section where the method and data set were determined.

LITERATURE

In literature, the relationship between the stock market index and financial and macroeconomic indicators have been studied by many researchers. When the relationship between the capital market index and exchange rates is examined, it is seen that no consensus can be reached. Likewise, in some studies, a causal relationship was determined between interest rate and shares, while in some studies no causal relationship was determined. Some of the works in literature are summarized as follows.

Aggarwall (1981) examined the relationship between the U.S. Dollar and stock prices between 1974 and 1978. According to the results of the study, there was a positive correlation between stocks and the U.S. Dollar. Soenen-Hennigar (1988), in their analysis for the years 1980-1986, concluded that there was a negative relationship between the stock market index and the exchange rates in the United States.

Granger-Huang et al. (2000) analyzed the causal relationship between stock market indices and exchange rates of Asian countries between 1986-1998. According to the results from the study, In South Korea, the exchange rate was found to be the cause of the stock market index. In the Philippines, a one-way causality relationship was determined from the stock market index to the exchange rate.

Nieh and Lee (2001) studied the relationship between shares and exchange rates of the G7 countries between the years 1993 and 1996, and found that, there was no significant relationship between these variables in the long run.

Tabak (2006) examined the relationship between the shares and exchange rates in Brazil between the years 1994 and 2002 with the Granger causality analysis method. According to the findings obtained in the analysis, it was determined that the stock market index was the cause of the exchange rates.

Ghazali-Ismail et al. (2008) examined the relationship between exchange rates on the capital market index, i.e. in Malaysia between the years 2005 and 2007, and they conclude the existence of one-way causality relationship from the stock market index to the exchange rates.

Akbaş (2013) examined the relationship between stock market index and interest rate for Turkey. According to the results obtained from the analysis, it was determined that there was a long-term relationship between the stock market index and the interest rate.

Şentürk and Dücan (2014) examined the relationship between stock market index, exchange rate and interest rate in Turkey between the years 1997 and 2013 using VAR method. The result was that the exchange rate was found to be the cause of the stock market index. In addition, there is a relationship from interest rate to exchange rate.

Topaloğlu and Karakozak (2018) investigated the relationship between BIST bank return and macroeconomic and financial indicators using panel data analysis. According to the results obtained from the analysis, there was a significant and negative relationship between exchange rate, interest rate and money supply.

Delgado et al. (2018) examined the relationship between the stock market and exchange rates, oil prices in Mexico using the VAR method, taking into account monthly data from 1992-2017. The result was that the exchange rate had a negative impact on the stock market.

DATA SET AND METHOD

January 2005 – March 2019 monthly data were analyzed in the study. The variables included in the study are the BIST100 index, Dollar/TL, Euro/TL and monthly interest rate of 1-year bond interest. The data set used in the study includes the Capital Markets Board, the Central Bank of the Republic of Turkey, investing.com compiled from their website.

The most commonly used method to check whether the data-set is stationary or not is the Augmented Dickey-Fuller (ADF) unit root test developed by Dickey and Fuller. Static analysis of the variables included in the study was investigated with the help of ADF unit root test. The following regression equation is used in this analysis. The ADF test consists of adding constant term, trend-constant term to the following regression equation (Gujarati and Porter, 2014: 757).

Lag length in ADF testing is determined using Akaike (AIC), Schwarz (SC) and Hannan-Quinn (Hannan-Quinn information criterion) information criteria. In this study, it was preferred to use the Schwarz information criterion. The probability value of the statistical result should be less than 0.05 according to the ADF test applied to the variables.

VAR model was developed by C. Sims in 1980 (Sims, 1980, s. 1-49). The VAR model is an econometric model for explaining the mutual relations between variables. Sims stated that each variable can affect another without requiring the internal and external separation of the variables contained in the econometric model.

A simple VAR model consisting of two variables such as X and Z can be shown as (Çakmak et al. 2002, 35-36).

$$x_t = \alpha_{10} + \sum_{i=1}^p \alpha_{11.i} X_{t-1} + \sum_{i=1}^p \alpha_{12.i} Z_{t-1} + \varepsilon_{it} \quad (1)$$

$$z_t = \alpha_{20} + \sum_{i=1}^p \alpha_{21.i} X_{t-1} + \sum_{i=1}^p \alpha_{22.i} Z_{t-1} + \varepsilon_t \quad (2)$$

The VAR model provides an opportunity to examine and determine the interaction between two variables. In addition, the effects of one standard deviation shock on other variables and/or variables in one of the variables can be examined with effect-response functions. The equation expressed above for the VAR model can also be estimated for more than two variables.

In order for VAR analysis to be valid, some assumptions must be provided. The appropriate lag length should be determined in the model, and it should also be determined that the appropriate lag length is not an autocorrelation and changing variance problem in the model. With the AR roots table, it can be tested whether the model shows a stable structure. If all modules are located within the unit circle, then the calculated VAR model can be said to have a stationary (Hendry ve Juselius, 2000, s. 10). Lagrange Çarpanı (Lagrange Multiplier –LM) test developed by Breusch and Godfrey was used in the model created for Granger causality analysis to test whether an autocorrelation problem exists. The Granger causality test developed by Granger was applied to determine the direction of the relationship between variables (Granger, 1969, s. 424-438).

EMPIRICAL FINDINGS AND EVALUATIONS

ADF unit root test was performed in E-views 7 to examine the stock market index, Dollar/TL, Euro/TL and interest rate series. As shown in Table 1, there are unit roots in the original time series of variables whose average values are taken according to the unit root test results. To solve the unit root problem in the study, natural logarithms were taken (Benninga, 2000: 18-21). To obtain significant results and to solve the unit root problem of the analysis, natural logarithms were taken. By taking natural logarithms of the data-sets, the structure of the data-sets remains same properties and

they become stationary which means more significant analysis results would be obtained.

Table 1: Results of ADF Unit Root Tests

Series					Logarithm of Series			
	Constant		Trend-Constant		Constant		Trend-Constant	
Variable	Standard Error	Sig.	Standard Error	Sig.	Standard Error	Sig.	Standard Error	Sig.
Borsa	-1.746.841	0.4059	-3.173.084	0.0935	-5.687.711	0.0000	-5.722.467	0.0001
Faiz	-1.626.787	0.4666	-1.146.084	0.9171	-4.437.016	0.0004	-4.592.159	0.0015
Dolar/ TL	-1.232594	0.9983	-0.891053	0.9537	-11.87507	0.0000	-12.05157	0.0000
Euro/ TL	-0.456207	0.9847	-1.568559	0.8014	-14.30639	0.0000	-14.47641	0.0000

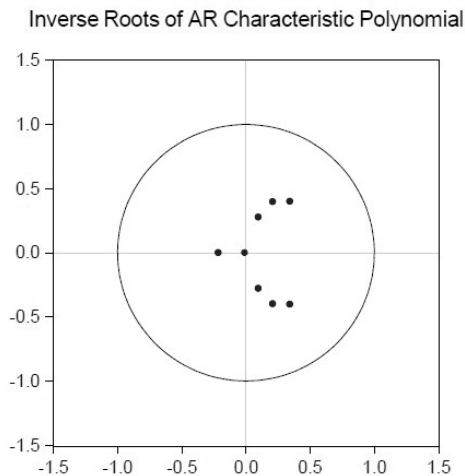
- The appropriate number of lag length for the VAR model established in the study was determined with the help of 2, AIC, FPE test.

Table 2: Lag Interval Tests

Lag	LR	FPE	AIC	SC	HQ
0	NA 177.3907	2.83e-11	-12.93549	-12.85957	-12.90467
1	37.59959	1.12e-11	-13.86189	-13.48229*	-13.70778*
2	25.56764	1.07e-11*	-13.90973*	-13.22645	-13.63232
3	18.75785	1.10e-11	-13.88386	-12.89690	-13.48316
4	30.54096	1.18e-11	-13.81602	-12.52538	-13.29203
5	30.30758	1.16e-11	-13.83478	-12.24045	-13.18750
6	26.43512*	1.14e-11	-13.85808	-11.96007	-13.08751
7	12.57843	1.14e-11	-13.85904	-11.65735	-12.96518
8		1.27e-11	-13.75948	-11.25411	-12.74232

As illustrated in Graph 1, the points represent the roots of the variables and are located within the unit circle.

Graph 1: AR Unit Root Results



- The LM probability value (prob: 0.0681) was found to be greater than 0.05.

Table 3 illustrates the results of the causality relationship for the stock market index. Accordingly, the H_0 hypothesis at the level of 5% significance was rejected for the Dollar/TL variable. In this context, the causality relationship between Dollar/TL variable to BIST100 variable was determined. These results, with Granger-Huang et al. (2000), Şentürk and Dücan (2014), Delgado et al. (2018), show similarity.

Table 3: Causality Test Result of BIST100 Variable

Dependent Variable: Stock Market Index		
Not Included	DF	Prob.
DOLLAR_TL	2	0.0146
EURO_TL	2	0.4589
Interest	2	0.1901
All	6	0.0445

According to the results of the causality relationship established for Dollar/TL variable, there was no correct relationship between the variables in the model to the Dollar/TL variable (Table 4). In this context, it can be said

that there is a one-way causality relationship between the stock market index and the Dollar/TL variable.

Table 4: Causality Test Result of Dollar/TL

Dependent Variable: Dollar/TL		
Not Included	DF	Prob.
BIST100	2	0.2502
Euro/TL	2	0.7566
Interest	2	0.3626
All	6	0.5768

A one-way causality relationship from Dollar/TL to Euro/TL was determined at 10% significance level according to the causality relationship results for Euro/TL variable (Table 5).

Table 5: Causality Test Result of Euro/TL

Dependent Variable: Euro/TL		
Not Included	DF	Prob.
BIST100	2	0.2689
Dollar/TL	2	0.0688
Interest	2	0.3895
All	6	0.0582

Table 6; the test results for the interest rate variable. According to results, it was determined that the dollar/TL variable at the level of 5% significance was the cause of the interest rate variable. These results are similar to those of Topaloğlu and Karakozak (2008), Şentürk and Dücan (2014).

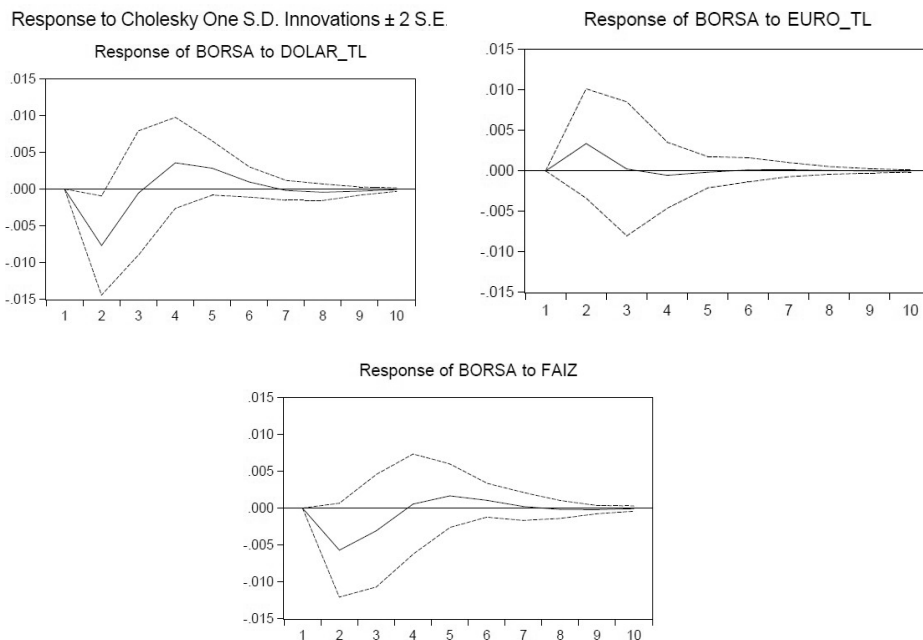
Table 6: Causality Test Result of Interest Rate

Dependent Variable: Interest Rate		
Not Included	DF	Prob.
Stock Market	2	0.7922
Dolar/TL	2	0.0038
Euro/TL	2	0.2317
All	6	0.0000

With the effect-response function, the reaction of the BIST100 index variable over time against a unit shock applied to one of the Dollar/TL, Euro/TL, and interest rate variables were analyzed. In this analysis, confidence intervals required for effect-response functions were obtained using Monte Carlo simulations (± 2 for standard error). As shown in Figure 1, the reaction of BIST100 index variable to a shock in the Dollar/TL variable was negatively until the third period. It approaches zero equilibrium by taking positive values from the fourth period.

The reaction of the BIST100 index variable to a shock in the Euro/TL variable was positive until the third period. Although it showed a decline of -0.0005 in the fourth period, it was found to be approaching its equilibrium value from this period. The reaction of the stock market index against the shock of a standard error in the interest rate variable is negative until the fourth period, while positive values from this period are observed.

Figure 1: The Results of Impulse-Response Functions



CONCLUSION

In this study, mutual interaction of Dollar/TL, Euro/TL and interest rates affecting the stock market index for 01/2005 – 03/2019 period were analyzed. The causality relationship between variables in the model with VAR method was evaluated at 5%, and 10% significance levels. The 10-year reaction of the stock market index against the sudden shock of exchange rates and interest rate were examined with the effect-reaction function.

There are many studies in both national and international literature that examine the impact of financial and/or macroeconomic factors on stock market indices. Studies examining the causality relationship between exchange rates and the stock market index show that there is not a consensus. As stated in the introduction and literature parts of the study, while some studies show that there is a mutual and meaningful relationship between two variables, some studies have found that there is a one-way relationship. The relationship between the interest rate and the stock market index studies examined shows that there is a significant relationship between the two variables. According to causality analysis results in the study, it was determined that there is a one-way causality relationship from Dollar/TL to BIST100 index variable. This result, Granger-Huang et al.(2000), Şentürk and Dücan (2014), Delgado et al. (2018), shows similarities with his work. The study also found that there is a one-way causality relationship from Dollar/TL to Euro/TL and from Dollar/TL to interest rate variable.

With the effect-response function, the reaction of the BIST100 index variable over time against a unit shock applied to one of the Dollar/TL, Euro/TL and interest rate variables were analyzed. While the stock market variable reacted negatively to a standard error shock in the Dollar/TL index until the third period, it was observed that it received positive values from this period. It was determined that the reaction of the BIST100 index variable to a shock in the Euro/TL variable was positive until the third period, although it showed a decline of -0.0005 in the fourth period, it approached the balance value after from this period. The reaction of the BIST100 index against the shock of a standard error in the interest rate variable was negative until the fourth period, while positive values were taken from this period.

According to the results obtained from the study, the BIST100 index was found to be sensitive to the Dollar/TL variable. The constraints of research provide opportunities for future studies. It is thought that it would be useful to extend the analysis period to include different variables in the analysis, and to compare Turkey with countries with similar levels of development.

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Evaluating Environmental Sustainability Position of Turkey Via Bric and Mint Countries With K-Nn Algorithm

Özge EREN¹

ABSTRACT

Environmental sustainability is one of the biggest difficulties met by humanity. It is also one pillar of sustainable development purposes required to be executed. For evaluating and comparing all world countries with respect to this perspective, an index is derived from the United Nations. With this index, the countries of the world are divided into four categories, such as “Very High Developed (VHD)”, “High Developed (HD)”, “Medium Developed (MD)” and lastly, “Low Developed (LD)”. According to the 2019 environmental sustainable index value, Turkey is located in the VHD category. Some of the experts put forward that Turkey will compete with economic giants in 2050. Our hope economically continued efforts will be achieved environmentally also. These thoughts became the starting point of this study. With this aim, the position of Turkey is predicted with the BRIC and MINT countries data regarding to environmental sustainability with the k-NN (Nearest Neighbor) algorithm technique.

Keywords: *k-NN Algorithm; Environmental Sustainability; BRIC and MINT Countries.*

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Doi Num: 10.17932/IAU.FCPE.2015.010/fcpe_v06i1002

Türkiye'nin Çevresel Sürdürülebilirlik Kategorisinin Bric ve Mint Ülkeleri Yardımıyla K-Nn Algoritması Üzerinden Değerlendirilmesi

ÖZ

Çevresel sürdürülebilirlik, insanlığın günümüz dünyasında yüzleştiği en büyük sorunlardan biridir. Ayrıca sürdürülebilir kalkınmanın tüm yönleriyle yürütülmesi açısından oldukça önemli bir parçasıdır. Tüm dünya ülkelerini çevresel sürdürülebilirlik açısından değerlendirmek ve karşılaştırmak için Birleşmiş Milletler bir endeks türetmiştir. Çevresel sürdürülebilirlik indeksi olarak oluşturulan bu indeks ile ülkeler “Çok Yüksek Gelişmiş”, “Gelişmiş”, “Orta Gelişmiş” ve son olarak da “Düşük Gelişmiş” olmak üzere dört farklı kategoride sınıflandırılmaktadır. 2019 çevresel sürdürülebilir endeks değerine göre, Türkiye son sıralarda da olsa Çok Yüksek Gelişme göstermiş ülke kategorisinde yer almaktadır. Türkiye'nin 2050'li yıllarda ise ekonomik devletlerle rekabet edeceğini öne sürülmektedir. Umudumuz ekonomik olarak devam eden çabalarımızın çevresel olarak da sağlanması yönündedir. Bu düşünceler bu çalışmanın başlangıç noktası olmuştur. Bu amaçla, Türkiye'nin çevresel sürdürülebilirlik kategorisi, k-NN (k-En Yakın Komşu) algoritma tekniği ile BRIC (Brezilya, Rusya, Hindistan, Çin) ve MINT (Meksika, Endonezya, Nijerya, Türkiye) ülkeleri verileri yardımıyla tahmin edilmiştir.

Anahtar Kelimeler: *k-NN Algoritması, Çevresel Sürdürülebilirlik, BRIC ve MINT Ülkeleri.*

INTRODUCTION

The term of sustainable development was built on the three pillars of sustainability including social, economic and environmental perspective. It is certain that all the pillars will be achieved for the real achievement on sustainable development goals. In this study, it is focused on one pillar that is environmental sustainability. It is defined as “Current needs of us without anyway compromising the quality of environment/ecosystem thus it will be able to support future generations equally remains” (Ferranti et al., 2018). One another about the concept of environmental sustainability was developed from Goodland (Goodland, 1995). According to his explanations, environmental sustainability “Seeking to improve human welfare by preserving the all needed sources of raw materials used for

human needs and ensuring that the swamps for human wastes are not exceeded, in order to restrain harm to humans”.

United Nations for the world countries created an index to measure and rank them. This index is called Environmental Sustainability Index. It contains twelve indicators that cover environmental sustainability and its threats. Indicators related to environmental sustainability are energy consumption of fossil fuel, fresh water withdrawals, carbon dioxide emissions, renewable energy consumption, forest area, and natural resource depletion with percentage calculation of GNI (Gross National Income). Indicators used for environmental threats are the rates of mortality attributed to hygiene services and sanitation, degraded land, domestic and environmental air pollution, and unsafe water, and lastly, Nature’s Red Index, which counts up extinction risks of species.

In this study, it was aimed to perform classification efforts of Turkey’s position by using BRIC (Brazil, China, India, and Russia) and MINT (Mexico, Turkey, Nigeria, Indonesia) countries’ data which covers environmental sustainability and environmental threats. BRIC is an acronym used to represent four countries that have similar economic development, also known as the BRIC’s or the Big Four, including Brazil, Russia, India, and China. MINT is also another acronym, first used in 2001 by Jim O’Neill, including Mexico, Indonesia, Nigeria, and Turkey. They have been predicted to be gigantic economies by 2050. The BRIC and MINT countries changed direction the economic weight from developed counties to emerging ones. It is obvious that they will continue to grow with their young population and gross national income, which could also refer to environmental changes (Hawksworth and Cookson, 2006). Population with in a larger and richer form may initiate environmental collapse (Bradshaw et al., 2010; Scherer et al., 2018; Ward et al., 2016; Scherer, 2019). To make a prediction for Turkey’s position with the k-NN (Nearest Neighbor) algorithm by using BRIC and MINT countries’ data is that reason.

LITERATURE REVIEW

In the literature review, it can be seen that lots of different application areas including the attempts to progress the methodology going on related to the k-NN algorithm. Especially, it is widely used in text classification area.

Text classification is the process of determining the class to which any document belongs. Soucy and Mineau in 2001 propose to use a smooth non-weighted features k-NN algorithm for text classification efforts. Using feature interaction, it has been found the relevant features for the learning task (Soucy & Mineau, 2001).

The conventional k-NN has a very big defect that computing the steps causes huge time, as the k-NN algorithm is applied to text classification with the high size and big samples. The paper from Wang and Wang at 2007 is progressed to search the exact k nearest neighbors quickly which is called TFK-NN (Tree-Fast-K-Nearest-Neighbor) (Wang and Wang, 2007). According to some studies, k-NN text categorization can be effective, but less efficient method. Jiang and others at 2021 proposed an improved k-NN algorithm for text categorization, which constructs the new classification model by combining constrained one pass clustering algorithm and k-NN text categorization (Jiang et al., 2012).

Another important application area is related to the choice of k parameter. Lee and others in 2003 prepared a study about the choice of the parameter k. It is very likely that a constant k value will be ended in a bias on large categories. Nearest neighbors can be used for assigning whether a test document should be classified into a category in the training set, which has more samples (Li et al., 2003). Zhang et al. studied an example-driven k-parameter calculation, which assigns different k values for different test samples in k-NN prediction practices including classification, regression. The proposed approach shows that this algorithm is better than the primitive *k-NN* algorithms in terms of data mining tasks (Zhang et al., 2018). Deng et al. firstly proposed k-means clustering technique to split the whole dataset into small parts, and then conducted k-NN classification. It has been conducted lots of experiments on medical big data. According to experimental efforts, the proposed technique works better in terms of accuracy and efficiency (Deng et al., 2016).

The paper progressed from Alkhatib et al. in 2013 related to the financial application of the k-NN algorithm; they applied non-linear regression k-NN algorithm in order to estimate stock prices for on a sample of companies listed on the Jordanian stock market to help investors, decision makers. One important finding is depending on the actual stock prices data

the estimated results were so close, and almost parallel to actual stock prices (Alkhatib et al., 2013). In 2019, Li and others achieved a research in power energy load prediction method, based on the k-NN algorithm. The results verify the validity and accuracy of the prediction method (Li and Jin,2019).

Another study is to evaluate the position of Lebanon compared to other Middle East countries in terms of sustainable development. For this purpose, it has been adopted an integrated of data mining techniques like a tool to study the link between these indicators. By using K-means clustering in this study defined the different levels of living. In order to extract the most relevant indicators, feature selection technique was applied. Finally, k-NN classification technique was used to estimate the model (Katat et al., 2019). The study of Katat et al., is base study for us because of some similarities like trying to make classification of the any country with k-NN algorithm.

METHODOLOGY

In pattern recognition area k-NN is one of the most important statistical methods. The original k-NN algorithm was introduced in 1967 by T. M. Cover and P. E. Hart. It is called also very simple nonparametric classification algorithm in which you choose the k closest neighbors to a point, and for its label each of the neighbors constitutes a “vote”. Then, it can be assigned the point the label with the most votes. k-NN depends to a case-approach, because this is essentially predicting an input’s label based on similar samples. In the below, it can be seen clearly all the steps:

- 1- It must be loaded with the training as well as test data.
- 2- Determine “k” (must be any integer number) number, which represents the number of nearest neighbors
- 3- Calculate distance (which distance it depends to you) one by one between the query-instance, and all the training samples.

It is certain that the result of k-NN algorithm depending on the distance type can be changed. Usually, in the literature, Euclid distance can be preferred (Kurniadi et al.,Ali et al., Todeschini, R.).

Euclid Distance
$$d(x, y) = \sqrt{\sum_{i=1}^n (x_i - y_i)^2}$$

Minkowski Distance
$$d(x, y) = \sqrt[p]{\sum_{i=1}^n (x_i - y_i)^p}$$

Manhattan Distance
$$d(x, y) = \sum_{i=1}^n |x_i - y_i|$$

4- Sort in ascending order by distance value

5- It will choose the best“k” rows from the sorted array.

6- It will assign a class to the test point according to the most frequently class of these rows.

7- End

FINDINGS

This index normally includes 12 indicators, but two indicators (Degraded land and Fresh water withdrawals) are missing in the lots of countries (UNDP/Dashbord/Environmental Sustainability), so these are ignored. It is also one limitation of study.

Table 1: Indicators of Environmentally Sustainability Index

Notation	Definition
K ₁	Fossil fuel energy consumption (% of total energy consumption)
K ₂	Renewable energy consumption (% of total final energy consumption)
K ₃	Carbon dioxide emissions (Per capita (tons))
K ₄	Carbon dioxide emissions (kg per 2010 US\$ of GDP)
K ₅	Forest area (% of total land area)
K ₆	Forest area (Change (%))
K ₇	Natural resource depletion (% of GNI)
K ₈	Household and ambient air pollution (per 100,000 population)
K ₉	Unsafe water, sanitation and hygiene services (per 100,000 population)
K ₁₀	Red List Index

The indicators formed environmental sustainability index can be seen at Table 1. It contains a selection of ten indicators that cover environmental sustainability and its threats. Table 2 and Table 3 also show the MINT and BRIC countries also raw indicators’ values. According to Table 2, Mexico

and Indonesia are located in HD Segment. Turkey's position is located VHD Segment for the years 2019. In the Table 3, only Russia is only in VHD segment, Brazil and China in HD segment, and lastly India attends MD segment also.

Table 2: MINT Countries

Country	K ₁	K ₂	K ₃	K ₄	K ₅	K ₆	K ₇	K ₈	K ₉	K ₁₀	Category
Mexico	90.4	9.2	3.6	0.21	33.9	-5.5	2.2	37	1.1	0.677	HD
Indonesia	66.1	36.9	1.7	0.17	49.9	-23.8	1.9	112	7.1	0.754	HD
Nigeria	18.9	86.6	0.5	0.09	7.2	-61.8	4.4	307	68.6	0.874	LD
Turkey	86.8	13.4	4.2	0.18	15.4	22.8	0.2	47	0.3	0.875	VHD

Table 3: BRIC Countries

Country	K ₁	K ₂	K ₃	K ₄	K ₅	K ₆	K ₇	K ₈	K ₉	K ₁₀	Category
Brazil	59.1	43.8	2.0	0.15	58.9	-9.9	1.9	30	1.0	0.902	HD
India	73.6	36.0	1.6	0.26	23.8	10.8	1.0	184	18.6	0.678	MD
Russian Federation	92.1	3.3	9.9	0.45	49.8	0.8	5.8	49	0.1	0.955	VHD
China	87.7	12.4	6.4	0.47	22.4	33.6	0.9	113	0.6	0.744	HD

When we check Turkey's position by using MINT countries data as illustrated in Table 4, first and second neighbor categories are HD, and the third one is LD, which means that if the value of k is equal to one, two and three, the prediction for Turkey is High HD. Since none of the MINT countries other than Turkey is in High HD category, it is obvious that we could not make the right prediction for Turkey with the knowledge of MINT Countries. Maybe, economically they can be seen in the same segment, but from the side of environmental sustainability, not.

Table 4: k-NN Results for MINT Countries

Country	K ₁	K ₂	K ₃	K ₄	K ₅	K ₆	K ₇	K ₈	K ₉	K ₁₀	Distance	Neighbor	Category
Mexico	90.4	9.2	3.6	0.21	33.9	-5.5	2.2	37	1.1	0.677	35.78	First	High HD
Indonesia	66.1	36.9	1.7	0.17	49.9	-23.8	1.9	112	7.1	0.754	92.89	Second	High HD
Nigeria	18.9	86.6	0.5	0.09	7.2	-61.8	4.4	307	68.6	0.874	299.18	Third	Low HD
Turkey	86.8	13.4	4.2	0.18	15.4	22.8	0.2	47	0.3	0.875			

When we check Turkey’s position by using BRIC’s countries data as illustrated in Table 5, first and second neighbor categories are VHD, and third and fourth categories are HD, which means that if the value of k is equal to one, two and three, the prediction for Turkey is Very High HD. If the value of k is four, no prediction is obtained from the analysis.

Table 5: k-NN Results for BRIC Countries

Country	K ₁	K ₂	...	K ₈	K ₉	K ₁₀	Distance	Neighbor	Category
Brazil	59.1	43.8	...	30	1.0	0.902	70.44	43.19	Very High HD
India	73.6	36.0	...	184	18.6	0.678	141.48	43.19	Very High HD
Russian Federation	92.1	3.3	...	49	0.1	0.955	43.19	67.28	High HD
China	87.7	12.4	...	113	0.6	0.744	67.28	70.44	High HD
Turkey	86,8	13,4	...	47	0,3	0,875			

CONCLUSION

According to some studies for the future prediction with the year of 2050, Turkey will be the giant economy in the world. Even one idea asserted that, Russia and Turkey are both expected to be larger than present-day China’s status (Dadush and Stancil., 2010). In this study, BRIC and MINT countries, including Turkey, that are considered to be in the same segment in terms of some economic indicators. With this study, it has been wondered whether the economic similarity can be achieved in terms of environmental sustainability indicators. The main idea of this study depends this hypothesis. With k-NN algorithm by using separately BRIC and MINT countries data checked again the possibility of Turkey’s real position to make prediction. With the help of k-NN algorithm the results are not meaningful. One reason should be Turkey compared with the others really better (environmentally sustainability). For further studies,

this effort should be progress with different countries and with different techniques.

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Changes in Human Resources Management (Hrm) in Transition From Past Towards Today's Information Society

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ABSTRACT

Human Resources Management (HRM), which is based on human as a dynamic element of working life, has undergone a rapid transformation. In the past, practices known as employee record keeping, social service duties, personnel management, and industrial relations have become a phenomenon of HRM along with the processes of change and transformation. Today, HRM has become a part of strategic management. The aim of this study is to reveal the changes that human resources management has undergone since its emergence, and to shed light on its future. In this respect, the applications and transformations of HRM from agricultural society to information society are investigated, based on the results of this theoretical research and the problems encountered with information society transformations, the future of human resources management is projected.

Keywords: *Personnel Management, Human Resources Management (HRM), Strategic Human Resources Management (SHRM), Change, Information Society.*

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Doi Num: 10.17932/IAU.FCPE.2015.010/fcpe_v06i1003

Geçmişten Günümüze Bilgi Toplumuna Geçişte İnsan Kaynakları Yönetiminde Yaşanan Değişim

ÖZ

Çalışma hayatının dinamik bir unsur olarak insanı temel alan insan kaynakları yönetimi (İKY) hızlı bir dönüşüm yaşamıştır. Geçmişte çalışanların kayıtlarını tutma, sosyal hizmet görevi, personel yönetimi ve endüstri ilişkileri olarak bilinen uygulamalar, değişim ve dönüşüm süreçleriyle birlikte İKY olgusuna dönüşmüştür. Günümüzde ise İKY, stratejik yönetimin bir parçası haline gelmiştir. Bu çalışmanın amacı, insan kaynakları yönetiminin ortaya çıkışından itibaren günümüze kadar geçirdiği değişimleri ortaya koymak ve geleceğine ışık tutmaktır. Bu açıdan, İKY'nin tarım toplumundan, bilgi toplumuna kadar uygulamaları ve yaşadığı dönüşümler araştırılmakta; bu kuramsal araştırmanın sonuçları ve bilgi toplumu dönüşümleriyle karşılaşılan sorunlardan hareketle, insan kaynakları yönetiminin geleceğine ilişkin projeksiyon yapılmaktadır.

Anahtar Kelimeler: *Personel Yönetimi, İnsan Kaynakları Yönetimi (İKY), Stratejik İnsan Kaynakları Yönetimi, Değişim, Bilgi Toplumu.*

INTRODUCTION

Since the last quarter of the 20th century, our world has come under the influence of the phenomenon of change. Change radically changes all the dynamics of organizations. The basic resource that gives life to organizations is human. Therefore, every process related to change and development affects the person in the working life in some way. Human Resource Management (HRM) is the branch of science responsible for improving the productivity and quality of the working life of the human. It is not a coincidence that the idea of human resources management and the processes of change and development are simultaneous. On the contrary, because the target group of change and development is human, human resources management is placed at the center of change and development.

In this article, the emergence of the practices that started with the record keeping process for the employee in business life, the transformation of the social service task, the emergence of the phenomenon of personnel management, the inclusion of trade union movement and industrial relations in the process, the rediscovery of human resources and the human

resources management process, the expansion of the concept and scope of human resources, taking it to strategic dimension, the new dimensions that information society processes have brought to human resource management and, are likely to bring in the future, are all investigated within corporate research methods. It is assumed that the study will shed some theoretical light on the work to be done about the history and future of human resources.

HISTORICAL PROGRESS OF HUMAN RESOURCES MANAGEMENT

Pioneers of Human Resources Management in Agricultural Societies

It is a general approach to take the beginning of the sciences to the early ages of history. This approach also applies to personnel management; because it is possible to base management thought and personnel management on human history. However, management science, which is a systematic collection of information about management and organizations, is the result of the 20th century (Baransel, 1979:5).

Management is the sum of efforts to ensure the unity of purpose of people, and to lead them towards this goal. In other words, the sum of the activities of achieving the goals or making others work through others constitutes the management process (Tosun, 1990:161). In every organization, where people come together to produce work, there are both human-specific relationships and management relationships. In general, all employees in an organization constitute human resources (Aktan, 2003:227). It can be proposed that human resources management is also in every place where people and organizations exist (Akdemir et al., 2001:15). Early in history, it is possible to find examples of practices that can be associated with human resources. Hunting, fishing, leadership strength, endurance, talent, loyalty to the clan, age and gender discrimination in doing business, and the effectiveness of traditions achieved together in the Paleolithic and early Neolithic periods can be evaluated in this context. Likewise, in the late Neolithic, Bronze and Iron Age, apprenticeship, father-to-son occupation, simple record keeping and payments can be seen as early examples of human resources management (Bass, 1994:3-5).

More concrete examples include the management and organization in the construction of pyramids in Ancient Egypt, the contributions of Socrates

and Aristotle in ancient Greece to the management idea in terms of universality and science (Yozgat, 1992:4), also military organizations in Roman civilization. More recently, Adam Smith's mention of the division of labour in his 1776 book "The Wealth of Nations" (Türkel, 1998:67-70) forms the building blocks for the emergence of the idea of management as well as the idea of human resources management.

By using the sources known in the history of management, we can say that there is a human resources management function on the basis of "record keeping" (Yüksel, 2000:10) in the agricultural society and in the periods when small workshop-style enterprises are common and that they are involved in organizations as such. It is the business owners who take on the task of keeping records in small businesses. Sometimes one of the employees, or a senior employee, is tasked with keeping records. As the number of employees gradually increased, an accountant who was also concerned with wages became involved in organizations tasked with keeping records of employees.

Pre-Industrial Revolution and Social Worker

The Industrial Revolution, which started in England in the middle of the 18th century and then spread to Europe and the whole World (Köksal, 2005:7), led to many changes in business and social life. The importance of personnel issues is due to this change. The change has revealed the first examples of HRM practices in today's sense. In this respect: the work of Adam Smith in 1776 to simplify things; the first strike of the Philadelphia printing workers in 1786 for a wage increase; the implementation of the first profit-sharing scheme in America in 1794 and the adoption of laws regulating work life; the developments following the opening of the London Industrial Exhibition in 1850 are examples of pioneering formations in HRM (Baysal, 1993: 59).

The age of mechanization (1870s), which formed the early stages of the industrial revolution, led to the growth of workshops and small businesses and the emergence of factories. Thus, there has been a transformation from agricultural labor to factory labor. During this period human resources management functions such as hiring, dismissal and keeping records were carried out by line managers.

In parallel with the growth of enterprises and the growth of factories in the same period, organizational problems arising from growth also began to gain importance (Ülgen, 1993:11). The workers' search for unity intensified due to extraordinarily poor working conditions during this period. Unionism, as a result of these pursuits, first appeared in Britain and spread to other countries as well (Pannekoek, 2006).

With these developments, some socially conscious employers, seeing the difficulty of having a close personal relationship with a large number of their employees in their overgrown factories, began to implement the "social worker" idea proposed by the American Institute of Social Services in the United States (USA) in 1889. Employment of social workers, who may be considered the first specialized human resources officer, became widespread in the early industrial period (Demirkaya, 2004).

Social workers have a moderator role between managers and employees. These officers on one hand helped to solve the problems such as employees' health, housing, finance etc., they also represented the value that management gave them. The practice of social worker is accepted by both employees and employers and has brought professionals who perform human resources management functions of the period into the business life. Although the profession did not initially have a set criteria, the first social workers' conference was held in America in 1893, the first Social Workers' Association was established in England in 1913, and the profession of social workers' expertise entered the institutionalization process (Baysal, 1993:59).

Birth of Personnel Management

The second phase of the Industrial Revolution and the developments in the field of management and organization have taken the human resources management function to new dimensions beyond social worker practices. The scientific management movement that emerged towards the end of the 19th century contributed to the professional development of personnel management (Bingöl, 1997:10). Frederick W. Taylor, one of the pioneers of this idea summarized the work he had done until then with his work "Scientific Management" in 1911 (Eren, 1991:16). By using concepts such as division of labour into departments, standardization, work-employee compliance, selection of suitable employees, training, incentive pay

systems (Koçel, 1989:122), this has revealed the need for professionals to increase employee productivity. As a result of this need, for the first time in 1912, the “personnel department” took part in organizations as a separate department (Bingöl, 1997:12). The use of tests for the first time in the selection of personnel for the U.S. Army in World War I conditions was a development that revealed the importance of organizing the personnel department as a separate department. The publication of the book “personnel administration” in 1920 was an important step that contributed to the development of personnel management (Baysal, 1993:60). With these developments, the concept of “personnel management” has taken its place in the management literature.

HUMAN RELATIONS PERIOD AND INDUSTRIAL RELATIONS PROCESS

In 1920s and 1930s, Harvard University researchers Elton Mayo and F.J. Roethlisberger's studies and experiments at the Hawthorne plant of the Western Electric Company revealed the view that “organization is a social system and human beings are the most important factor in this system” (Davis, 1988:11). This idea, which emerged as a result of Hawthorne studies, was initially “human relations approach”, then “management of human resources”, and today it has been continued as “organizational behavior”.

These studies prioritized perception, attitudes, motivation, leadership, change and development in the organization (Koçel, 1989:81), emphasizing the contribution of behavior and organizational environment to individual productivity, so personnel management function has given new dimensions moving it to “working relations” position. In addition, low wages, long working hours, social explosions caused by the abuse of women and child laborers forced the states to intervene in the industrial relations system (Köksal, 2005:8). Thus, “industrial relations”, which initially focused on labour problems (Kauffman, 2001:7), along with all the problems related to trade unionism and trade unions that had been founded before, became involved in the activities of the personnel departments.

The fact that productivity and quality are indispensable brought about by the developments in the Second World War and its aftermath has brought to the fore the idea of taking maximum efficiency from human resources, too. In addition, since productivity and quality are associated with training,

the phenomenon of “employee-employee training” is also included in the personnel departments’ area of responsibility.

As a result of these developments in the 1940s in the USA, the concept of “personnel manager”, which has expertise in education, employment, performance evaluation, wage management, employee-employer relations, and insurance, has started to be used. The 1940s also witnessed the approach of human relations, which, after the classical understanding of management, centered on human beings, was expressed through concepts such as organizational rationality and open door policy. In all these progresses, it is necessary to take into account the positive contributions of the trade union movement. With the same developments, in 1946 the name of the British Institute of Labour Management (ILM) was changed to Institute of Personnel Management (IPM) (Baysal, 1993:60). With these and similar developments, it has become common for personnel management or personnel management- industrial relations professionals to take functional roles in the organizations.

Historically, the title and duty of the personnel department manager, who first emerged as a record-keeping clerical officer, has changed in accordance with developments over time. In this sense, there have been developments regarding the position of senior manager in charge of establishing systems related to the productivity of the employee, from overseer carrying out personnel affairs to lower level manager dealing with the daily problems of the employees, from mid-level manager developing relationships with the employees (Palmer and Winters, 1993:23). These developments are important milestones on the road to Human Resource Management in today’s understanding.

TRANSFORMATION TO HUMAN RESOURCES MANAGEMENT

Rising of Human Resources Management

As the development of human resources management is examined historically, even though until the 1980s “personnel management”, “personnel management and industrial relations” and other concepts have been widely used, it has also been seen that from the beginning of the 1950s there has been quests of new approaches (Baysal: 1993:64).

In this sense, since the late 1950s, some industrial relations and economic experts such as Myers and Harbison began to use the phrase “human resource” in their studies on labor (Özkaplan and Selamoğlu, 2005:3).

The 1960s, when modern organizational theories began to emerge, witnessed the transformation of the process of personnel management and industrial relations. Within the framework of the “system approach”, which is a manifestation of these theories, individual-organization fit, organization-environment fit and the ability to change have been seen as the condition of success.

In order to achieve this fit and transform change into success, the search for full use of human resource potential has arisen. These pursuits have paved the way for the end of traditional personnel management. It is possible to say that a human-oriented approach was seen in all the works written at that time. As a result of this approach that takes people to the center, “human resources management”, which is a more comprehensive concept than personnel management, has been introduced (Akyüz, 2001:55). In the same period (1960), Human Resources Management Magazine came into publication in the United States as a movement supporting the transformation of human resources management. Some other developments that contribute to the transformation from personnel management to human resources management are also summarized:

- * Achievements in Japan with the contribution of quality control philosophy since the 1960s,

- * The enactment of the industrial Education Act in the UK in 1964 and the view of institutional training and development as an integral part of human resources management (Lee and Stead, 1998:299),

- * Again, ethics, moral values, participatory management, industrial democracy and the quality of working life have gained importance since the middle of 1960 and employers' social responsibilities have been brought to the agenda (Woods, 1997: 392),

- * Rediscovery of human from the 1980s,

- * The need to look at human facts comprehensively,

* Entering a period of productivity and development and starting to focus on human productivity criteria,

* Increase in thoughts that mere personnel affairs or industrial relations are insufficient to ensure the efficiency of human resources.

With these developments, personnel management has transformed into a structure that provides added value to the organization by showing a great change; as a result, the concept of human resources has been adopted both in the academic field and in practice (Selamoğlu, 1998:571). The concept of human resources management, which is a more comprehensive concept than personnel management, has also taken place in the field of education. These developments in the direction of transformation into human resources management have also been reflected in the field of professionalization and education of the profession. In this sense, the first human resources management course was opened at Harvard Business School in 1981. All these developments have had very positive results for the professional staff. At first, human resources management has become the focus of attention as an exciting and dynamic profession.

The new understanding of human resources management has been met with excitement in all over the world. Businesses began to establish human resources departments as if they were competing with each other. It can be argued that these departments actually assume and perform human resources functions. In the beginning, the conversion to human resources was usually a signage change. “Director of Personnel”, “Director of Personnel and Industry Relations” etc. the signs were removed and replaced with a “Human Resources Manager” sign. This situation is far from reflecting a meaningful transformation. In order to be able to talk about a real transformation of human resources management, a structure in accordance with human resources philosophy must be realized. It has been suggested that an organization capable of performing such a structuring should be able to answer “yes” to most of the following questions (Akdemir, 1999:358-359). These questions are:

* Is the title of human resources manager one of the highest titles after the general manager?

* Does the human resources manager depend directly on the top manager?

* Is the human resources manager at the highest level in the wage rankings according to its precedents?

* Is human resources general agenda item in senior management meetings?

* Are human resources employees more qualified than other departments?

* Are human resources taken into account when making strategic decisions?

* Is the human resources market closely monitored?

* Is the contribution to the organization first, then the wages are evaluated in hiring?

* Is it understood that not only hiring the best personnel, but also investing in best personnel in order to keep them as best is vital?

* Is the education and development budget higher than the market?

* Are human resources well known, their weaknesses are strengthened and their strengths are fully encouraged?

* Do supervisors take time and think about how to develop their personnel at all levels going forward?

* Is the plan ready to replace the departed person immediately?

* Is human resource not an expense (passive) element, but an asset (active)?

An organization that can say “yes” to most of these questions means that it understands the philosophy of human resources management and succeeds in organizational change. Otherwise, the change will only be a sign change. However, in our opinion, even a construction that started with a sign exchange at the beginning should be considered a positive step in terms of change.

The Effects of The Perception of Human as a Strategic Resource on Human Resources Management

Although the development aspect of human resources today is oriented towards strategic human resources management (Wimbush, 2005:463), it is not too old to consider human resources as a strategic resource. It should be met as natural. In 1965, strategic thinking, which laid the foundation for modern organizational theories, gained its first written document with Ansoff's book "Corporate Strategy" (Beagrie, 2004:22). Quality has been more of a role for organizations to look at human resources as strategic resources. The human resources of the organization are important in order to take part in Total Quality Management (TQM) understanding in organizations, to establish systems related to total quality, to share vision, mission and values, to implement unconditional customer satisfaction philosophy. More importantly, the satisfaction of external customers is possible to a large extent and primarily through the satisfaction of internal customers. This has given strategic importance to employees and therefore to human resources management. With these approaches, human resources management has entered a period of high performance since the late 1970s. In addition to financial motivations, that provides psychological satisfaction to employees mental motivation, learning organization, flexible organization, the ability to change profit-sharing system, business expansion and job enrichment, autonomous work groups, small business units (Langbert, 2002:935) has entered the literature concepts. These concepts have been used to create a workforce with a high power of achievement.

The strategic approach to human resources management as academic way was introduced by Fombrun in the early 1980s. His book "Strategic Human Resources Management" was published in 1984 (Miller, 2006:99).

On the other hand, the relentless competition environment after 1980, the customer being the determining power, the establishment of customer-oriented systems and the concept of continuous development (Langbert, 2000: 14), the discovery of the term "empowerment" in 1983 with concepts such as downsizing, rightsizing, reengineering, SWOT analysis with the concept of "competitive strategy" that has come to the fore since the beginning of the 1990s; preparation of organizational vision and mission statements; strategic plan implementation (Aktan, 2003:11), strategic

talent management and organization to ensure maximum contribution to the development of the skills of the employees (Jensen and Spencer, 2004:31), and a lot of businesses and other organizational changes by increasing multinationalism of human factor and the strategic importance of human resources, “strategic management of human resources” has led to the establishment of the concept. As a result of the strategic management of human resources and the perception of human resources as a strategic resource, human resources management, which is defined as the critical factor of superiority in competition, has started to be seen as a “strategic business partner”. This point of view is first described as a “full partner” (Kaynak et al, 2000:25) by providing human resources management with a voice in the formation of business policy and decisions, and later paved the way to having a seat at the top management table of organizations. Indeed, today, human resources managers are included in the top management of organizations, especially multinational corporations.

Strategic human resources management process in conjunction with corporate culture, commitment, loyalty, coaching, mentoring, guidance, counseling, attitude-based training, managing diversity, change management (Brockbank, 2003:229), strategic talent management such as concepts and methods all has taken place in the literature. On the other hand, as a strategic partner, the role of the human resources manager was redefined in line with the organization’s mission and strategy (Sheehan, 2005:193).

As a result, the 1990s were a period when human resources management supported and developed all the functions of the organization with the strategic concept of “human resources management” and demonstrated its decisive role in organizational performance and competitive superiority (Barutçugil, 2004:41-42). This is reflected in its position in the organization as a more competent human resource management than other functions. More importantly, strategic human resources management has also become an important instrument of the new economy (Werbel and DeMarie, 2005:247). This is because human resources are the main component of gaining a competitive advantage in the new economy as well.

Roles And Responsibilities of Contemporary Human Resources Management And Managers

Today, the other name of human resources management is “change and development management “(Demirkaya, 2001:69). HRM with the dimension of change and development:

- * Provides synergies between departments,
- * Works for making internal communication in a healthy way, (Ersen, 1997: 44)
- * Warns of behavior development,
- * Establishes the education system and provides educational resources,
- * Rewards employees’ suggestions in accordance with the system,
- * Works to ensure internal Justice,
- * Contributes to the development of organizational structure,
- * Places the awareness that all employees are customers of each other,
- * Tries to ensure the placement of corporate culture (Fındıkçı, 2000: 18),
- * Tries to uncover the potential of all employees,
- * Compiles and combines all information about employees,
- * Direct all employees to achieve the common goals of the organization,
- * Establishes the necessary human resources systems for institutionalization.

Human resources management performs all these responsibilities in cooperation with other departments. Because it is not possible for human resources management to achieve success without the participation of other departments.

Human resources management coordinates the execution of all relevant affairs such as training within the organization, administrative affairs, industrial relations, personnel affairs etc. While performing these functions, it also establishes systems to ensure effective management of human resources. The systems that human resources management is responsible for establishing are:

- * Human resources planning system,
- * Role definition, qualification and job analysis systems,
- * Personnel recruitment, selection, placement and orientation system,
- * Education system,
- * Proposal and reward system,
- * Performance evaluation and waging system,
- * Career planning and organizational backup system,
- * Industrial relations system.

All of these systems are necessary to establish and operate effectively in order for the organization to fulfill its mission and achieve its purpose. But installing these systems requires expertise. Therefore, today, the human resources manager's job specification is based on the fact that he/she has these specialized qualifications.

Looking at human resources management as one of the professions of the future, Özsoy also mentions that the human resources manager should use all of his employees effectively in line with organizational goals, taking into account all the factors. Moreover, determining how people work together more efficiently, managing change, and establishing effective roles in processes related to total quality (Özsoy, 2002:143-146). Indeed, there are important roles and responsibilities of human resources management at every stage, from the placement of total quality understanding to the acceptance of continuous development as a philosophy of life.

One of the new management approaches, reengineering (change engineering) such as Total Quality Management (TQM), brings new dimensions to the management and business world, changing the department of human resources management. Finally, within the scope of the phenomenon of productivity from caring values change (Hammer and Champy, 1994:59-68), human resources management reveals the necessity of change and look at events with new and different perspectives. The reengineering approach also imposes new roles and responsibilities on the human resources manager with the change obligation that it sets forth for human resources management.

These new roles and responsibilities to the human resources manager also require new skills. In this sense, the human resources manager needs three types of skills:

- * Human resources management skills,
- * Business management skills,
- * Change management skills.

Human resources management skills are already a mandatory criteria. In addition, business management skills and change management skills have been among the business specifications of human resources experts. A human resource manager to be just the expert of human resources practices are no longer enough, however, strategic planning, process technology, and information to be armed with the financial analysis; business management skills, data analysis, persuasion and change management skills, effective leadership are also required.

Depending on these skill criteria, human resources managers also climb to the top positions in the organizations. There are general manager-level titles in the public sector. In the private sector, titles such as coordinator and deputy general manager have started to become common. This trend is also directly proportional to the strategic importance of human resources. The integration of business strategies and human resources is only possible if human resources managers participate in the high-level decision process (Erdut, 2002:66). It can be said that the escalation of human resources managers to the top management of organizations and their participation in the strategic decision process will facilitate both the development of strategy and the formation of structural links with human resources.

The human resources research conducted by the Arthur Andersen human resources consultancy towards 2001 also reveals some findings that support this claim. According to some summary results of the study, human resources are now seen as an integral part of strategic management. Human resources managers are in the top management. Apart from the well-known areas of human resources responsibilities, creating corporate culture, corporate communication and developing the competencies of employees are the areas that should be given the most importance (Arthur Andersen Human Resources Consultancy, 2000: 13-238).

Besides, how much the conditions of our country in many organizations, the human resources department is the only “fashion” started to be conducted without the scientific basis of many applications, and claimed that many practitioners didn't have sufficient knowledge (Ergin, 2002:199), Arthur Andersen Human Resources Consultancy research in our country shows that human resources management has changed dramatically the way the organizations look at.

CHANGE IN INFORMATION SOCIETY AND HUMAN RESOURCES

Human in Information Society

As a global paradox in economic, organizational and individual terms, globalization is changing both employees, organizations, and human resources management; at the same time, it offers new opportunities than ever before in human history (Naisbitt, 1994:216). Removing barriers to global information sharing along with information society processes affects organizations and business processes. The information economy, which is pronounced with the processes of the information society; information organization, information employee concepts as well as information processes have put an end to the thought of known management (Stewart, 1997:1-56). This also applies to the understanding of human resources management. Therefore, as revealed in Alvin Toffler's “Third Wave”, “Future Shock”, and “Power Shift”, human resources management is on the eve of moving to different dimensions with the gains of the information society.

In fact, placing people at the centre of the information society, Peter Drucker (Beatty, 1998:227), the most important of the intellectual capital in the focus of successful business-minded, inquisitive, creative people (Duren, 2000: 100), to be the mainstay of the people on the eve of the 2000s and has become the most valuable resource of the knowledge economy (Stewart, 1997:37).

The fact of having intellectual capital, holding, developing and using it effectively, which is also the critical factor of superiority in competition, is associated with the effectiveness of human resources management. This has brought competence-based human resources management to the forefront in information societies, from recruitment-selection process to performance management and retention practices.

Indeed, the information society has increased the information content of all businesses, thus making the educated, knowledgeable, creative person a symbol of the information society. Therefore, the wave of change faced by information society processes and human resources management is radically incomparable to the past. The concept of human being, which is the goal of human resources management at the beginning, has changed with the information society. Because the information society, where communication technologies carry information sharing to unimaginable dimensions, and where knowledge and skill preclude all kinds of resources, is built on knowledge worker and knowledgeable human resources. While the critical competitive factor for businesses, even nations, is still human resources, it has become the human resource that dominates, produces, and uses knowledge.

Organizational Change of Human Resources Management in Information Society

Information society processes have led to many changes in organizational context. The reasons for this are computerization, robotics and worldwide web opportunities, which have reached incredible dimensions in the information society, have brought many innovations to human resources management (Beagrie, 2004:26). Another reason for change is the increasing downsizing and outsourcing practices in the field of human resources (Davis, 2003:242). These facts have brought human resources management to new dimensions in individual and organizational terms.

The most tangible result of the new dimensions reached by human resources management along with information society processes has been the introduction of human resources management into a process of renewal. Within the scope of the renewal process, the organization of human resources, number of levels, number of employees, areas of expertise, duties-authorities and responsibilities are questioned and changed. In particular, the change affects the organizational dimensions of human resources management. The shrinking phenomenon necessitated by change refers to the decrease in human resources management levels. Human resources management's approach to specialization also has a major role in the reduction of levels. At the end of this impossible to avoid process, human resources management departments are expected to evolve from one level to a structure consisting of experts, each of whom is an

expert in his / her field, but all of whom aim to develop human resources. As a matter of fact, this is essential for more effective human resources management.

Human resources management departments by re-structuring to maximize their efficiency have ceased to establish systems for making things better, or to be a place that prepares forms; in addition, they have become centers of change and development. For this reason, human resources professionals have turned into exchange experts in addition to their existing expertise.

Due to this transformation, department members have to rewrite their department's job descriptions, taking into account the changing department information, organization, duties, authorities and responsibilities. At the end of these processes, the aim is to create a new human resources department, which is equipped to be the partner of senior management, to be ambitious and expert in raising competitiveness.

The new department consists of experts who determine the corporate responsibility in line with the vision, mission, and values of the business and who produce information with a philosophy of continuous development. The information produced in the department will also have a value, a market. Considering that many human resources services are available from outsourcing today, it has become possible to share or sell the information produced in the specialized human resources department.

Opening up Human Resources Management

Depending on the specialization, human resources departments are opened out. In other words, for human resources departments, people have not only become business employees, but also customers have become the area of interest of the department.

Along with specialization and opening-up processes, professionals in human resources specialization were required having to come forward the leadership style, management intuition, foreign trade competition and financial knowledge, communication competency, and ability to work with their line managers (Selmer and Chiu, 2004:326). These are also key to effective business management. With these qualification criteria, it is revealed that human resources managers are candidates for business management.

In fact, the human resources management and managers who want to embody their contribution to the business must be involved in every process that contributes to the success of the business, including purchasing, production, sales and after-sales services. In other words, human resources experts have to get out of their offices and get down to the field. Therefore, the common language of the human resources department is the strategy and its common goal is to increase the organization's competitiveness.

Globalization of Human Resources Management

The opportunities provided by the phenomenon of globalization and the information society unite nations and cultures as well as commercial integration. Therefore, as a global business instrument, human resources management has to understand the culture around the world, think globally and produce global business (Joy and Howes, 2003:168). Therefore, human resources have a duty to adapt people to competitive areas that are expanding due to globalization as a thought.

In addition, human resources management, with all these pioneering and strategic qualities, human knowledge and mastery of human resources, is also among the promising branches of science for the new economy where people are in focus. Indeed, new economy which covers information acquisition, processing, converting and distribution of information (Aktan, 2006) with its specialties as digitalization, research and development, globalization, and the radical changes in human resources are all associated with human resources management.

On the other hand, for multinational companies, the achievement of the objectives of the education funds to adapt to the social and cultural characteristics of the host countries (Gürün, 2001:185) also makes human resources management strategic in terms of educational and cultural cohesion. Indeed, human resources management, especially in multinational companies, management and human resources system to be applied as universal principles, rather than an approach that takes account of cultural differences by introducing cultural differences and local features of the disadvantage turns into an advantage.

In short, the importance attributed to human beings through information society processes enables the reinterpretation of human resources functions

in all goods and services producing companies, strengthening respect for human rights, increasing freedoms starting from working life, and deepening democracy in all areas from family to society. In addition, it is preparing the ground for a more humane climate of the work life, for the improvement of the quality of the work life and for the improvement of the quality of life. With all these developments, human resources professionals are rapidly promoting to the top management of organizations.

THE QUESTIONS THAT NEED TO BE ANSWERED BY HUMAN RESOURCES MANAGEMENT IN INFORMATION SOCIETY

Motivation

It is human who makes the difference in the information society. What makes people different is their creativity and their contribution to the organization. Mobilizing the power to make this difference will continue to be a challenge in the information society as it has been in the past. In this sense, in addition to classical theories of motivation, there is a need for methods to motivate and stimulate the creativity and potential of the next generation of information employees. In the information society dominated by computers and robots, given the changing business and workplace concepts and the techniques of doing business, how to keep the golden collars, how to motivate them, how to measure performance, how to systematize wage and additional earnings, and what rewarding methods to apply are important problems, especially in the environments and spaces that are determined by themselves, will be a real new challenge facing the organizations.

Education and Development

Education and development is a must-have concept of the information society. The organization and educated employees should be in agreement on the strategic importance of education and continuous development. Theorists suggest lifelong education. This is also mandatory for organizations; but who will want it (Casey, 2003:632) is a question that needs to be answered. For this reason, education and development is an important problem in execution for whom, where, how and in what dimensions to do.

Considering the globalization of the resources to which information people will be provided, how to program education and development; how to

neutralize cultural differences for human resources from different nations and regions, and melt them into the crucible of corporate culture; or how to make organizational gains by turning cultural differences into wealth, and how to substitute a function for career plans will continue to be problems for the organizations.

Despite this, web-based programs are heavily used to increase and expand human resources training and development programs. Websites created for this purpose provide extensive information and provide guidance to practitioners. They also facilitate adaptation to rapidly changing working life conditions and contribute to professional development (Kohl et al., 2004: 342).

E-HRM and Outsourcing

It is difficult to predict long-term effects of using software programs for many human resources functions, increasingly using of electronic human resources (E-HR) applications (Perrin, 2002:7), web-based testing and personnel selection (Wimbush, 2005:466), and the provision of critical functions through outsourcing.

Nowadays, because of increasingly more questioning of the value HR adds to the organization, human resources are faced to obligation of proving themselves. At the same time it is still a discussion point for the new structure of HRM in the future since web-based applications are increasingly used, the operational services and responsibilities are taken from HRM and transferred to the operational units, HRM is downsized in the organizations. On the other hand, it is difficult to predict how the information produced in the department that is expected to be specialized will be sold in global markets and what the individual or institutional outcome of this sale will be.

In the light of all these assessments, the most critical question is how the future of human resources management will be shaped; whether developments can destroy human resources management as other developments eliminated previous concepts. More clearly, will all these developments lead to a new management approach by destroying human resources management; or, by strengthening human resources further with its current practice, will open the way for Chief Executive Officer CEOs (Dagnon, 2003:281). This is already a very difficult question to answer.

CONCLUSION

It is commonly said that human resources also exist on every ground where business, people and organization exist. In general, all employees (including managers, employers) in an organization make up human resources. However, it coincides with the period of the industrial revolution when organizations start considering human as an employee. Since the scientific management and ongoing periods, it is seen that classical personnel management takes place in organizations, from record-keeping to mid-level management.

The 1980s brought forth the concept of human resources management along with the phenomenon of change and transformation. Total quality processes have also contributed significantly to this. However, it is after the 1990s that the real breakthrough developments emerged. Human resources management is identified with change management because of the perception of change as an unchanging rule and the fundamental change in human perspective.

Today, the dimensions reached by the desire for change and institutionalization also shed light on the future of human resources management. On the one hand, human resources management, which is obliged to prove its contribution to the organization despite its downsizing, and on the other hand, organizations under pressure to shrink and become more effective due to relentless competitive conditions, meet in common interests. Organizations use every means to obtain the maximum benefit from human resources. This situation also imposes more strategic roles and responsibilities on human resources management, making it the most vital function for the organizational survival.

This importance brings human resources management, which is essentially an exciting and dynamic profession, to the forefront and brings human resources managers to the top management and decision mechanisms of organizations.

The information society processes that are taking place also raise many questions about the future of human resources management. Although these questions have not yet been answered, human resources management

remains indispensable for organizations because of the importance given to human beings.

The predictions through all the developments show that human resources management, which is undergoing major changes from the agricultural society to the information society, will continue to be an important instrument of business management in the information society by changing to adapt, and by shrinking-to-become-more-effective.

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Factors Determining Effectiveness of Internal Audit in Commercial Banks: The Case of Study (Commercial Banks of Herat-Afghanistan)

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ABSTRACT

Internal audit plays a major role in enabling an institution to achieve its goals when properly implemented, operated, and managed. To take corrective measures and strengthen procedures, companies that implemented, operated and managed internal auditing successfully became more able to recognize their business threats and inefficiencies in the system. The overall goal of the paper is to recognize factors influencing the effectiveness of internal audit in commercial banks of Herat-Afghanistan. At the moment, 13 banks are operating in Afghanistan including DAB (Central Bank of Afghanistan) DAB (2020), three state-owned banks (Bank Millie Afghan, Pashtany Bank, New Kabul Bank), seven private or commercial banks (Azizi Bank, Afghanistan International Bank, Islamic Bank of Afghanistan, Maiwand Bank, Afghan United Bank, The First MicroFinance Bank, Ghazanfar Bank) and two branches of foreign banks (Bank Alfalah ltd, National Bank of Pakistan) with the total number of 158 internal auditors. Therefore, internal auditors of Afghanistan commercial banks are the population for this research. 158 questionnaires were allocated to 12 commercial banks for the purpose; the analysis followed a form of research by using quantitative methods of research. The study tool used in quantitative terminology through self-administered questionnaires. These questionnaires were prepared on a 5 point Likert-scale, distributed to the Afghanistan Commercial Banks' internal auditors and analyzed using the SPSS statistical software. Based on the research

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Doi Num: 10.17932/IAU.FCPE.2015.010/fcpe_v06i1004

results; Management commitment and supports had a positive relationship with the efficacy of the internal audit regarding value-adding, improving departmental performance, and improving organizational efficiency, with clear and statistically significant consequences. In this respect, the only determining factor of the effectiveness of the Internal Audit of commercial banks in Herat-Afghanistan was management support.

Keywords: *Internal Audit, Internal Audit Effectiveness, and Afghanistan Commercial Banks.*

Ticari Bankalarda İç Denetimin Etkinliğini Belirleyen Faktörler: Araştırma (Herat-Afganistan’ın Ticari Bankaları)

ÖZ

İç denetim, uygun şekilde uygulandığında ve yönetildiğinde kurumun hedefine ulaşmasını sağlamada önemli rol oynar. Düzeltici önlemler almak ve prosedürleri etkinleştirmek amacıyla iç denetim uygulayan kurumlar, iş tehditlerini ve sistem verimsizliklerini daha iyi belirleyebilir. Bu çalışmanın amacı, Herat-Afganistan’daki ticari bankalarda iç denetim etkinliğini belirleyen faktörleri ortaya koymaktır. Çalışmada, “amaçlı örnekleme” yaklaşımı kullanılmış olup Afganistan Ticari Bankalar genel merkezi iç denetçilerini kapsamaktadır. Analiz, nicel araştırma yöntemleri kullanılarak yapılmıştır. Çalışmada araç olarak nicel araştırma terminolojisinde yer alan “anket yöntemi” uygulanmıştır. Afganistan Ticaret Bankası’nın iç denetçilerinden 147’si tarafından doldurulan bu anketlerde 5’li Likert ölçeği kullanılmış ve SPSS istatistik yazılımı kullanılarak sonuçlar analiz edilmiştir. Araştırma sonuçlarına göre; katma değer yaratma, departman performansını iyileştirme ve örgütsel verimliliği artırma konularında yönetim desteğinin, iç denetimin etkinliği üzerinde açık ve istatistiksel olarak anlamlı sonuçlarla olumlu bir etkisinin olduğu tespit edilmiştir. Bu bağlamda, Herat Afganistan’daki ticari bankaların iç denetiminin etkinliğini belirleyen tek faktör yönetim desteğidir. Araştırmacının ana önerisi; üst yönetimin iç denetim personelini desteklemesi iç denetim departmanının genişletilmesi ve iç denetim ekibinin gereksinmelerinin karşılanmasıdır.

Anahtar Kelimeler: İç Denetim, Afganistan Ticari Bankaları ve İç Denetimin Etkinliği.

INTRODUCTION

With the division of ownership and management between businesses that are supposed to lead to interest tensions between agents and administrators, the importance of auditing has increased in the modern economy Adams (1994). The development of disciplined corporate firm governance is one of the most effective ways of controlling and fostering corporate worthy governance structures Belay (2007). Internal assessment is an integral aspect of the system of business management within a company and involves auditor tasks performed for boosting financial statements accuracy system by the board of directors and audit committee. The popularity of internal audit expanded due to the organizational crisis that began at the close to the end of the 20th century.

William, Brierley and Al-Twajjry, (2003) state that it has two benefits to have an IAD³ for organizations. First of all, it improves the everyday activities of companies and control risk. Second, it allows a company to avoid and track mistakes and fraud to protect assets. In different laws such as the Moeller (2004) and the Corporate Governance Principle of OECD⁴ the significance of IA⁵ was confirmed. Developing world organizations may not identify the usage and value of IA as demonstrated by studies carried out in Libya, Tanzania, Kenya, and Ethiopia.

Researchers nowadays have more emphasis on the role of the organization's IA and internal auditor than ever before Changwony and Rotich, (2015); George, (2015); Ibrahim M. S., Shokiyah, A., and Baharud-din (2014). Meanwhile, greater attention has been paid to matters like performance assessment, and IA efficiency. IAF⁶ in a constantly changing economic, and business climate takes into account operational dynamics and focuses on an advisory approach to the performance of an enterprise, and productivity rather than tracking accuracy Willborn and Karapetrovic (2000). IA has shifted from an accounting quality appraisal program to a value-adding feature Rupsys and Staciokas (2005). The value-adding role allows the business to obtain economy, efficiency, productivity as well as good performance. Although, different

³ Internal Audit Department

⁴ Organization for Economic Cooperation and Development

⁵ Internal Audit

⁶ Internal Audit Functions

investigators say IAF is not always successful Ramachandran, et al., (2012); Wubishet and Dereje (2014). Auditing works have historically been carried out and viewed according to the empirical dimension of agency theory Hanefah and Endaya (2013); Gilchrist, D. Pilcher, R. and Singh (2011). As a result, some of the researchers suggested using institutional theory Abu-Azza (2012); Mihret (2008). The research investigated to incorporate and analyze the study conclusions from a different perspective relying on the theoretical basis of Hanefah and Endaya (2013) to assess the efficacy of IA as opposed to previous studies. The combination of three theories is another approach adopted by Endaya and Hanefa (2013), institutional, agency and communication. Though agency theory is specifically used in this analysis to know the scientific passion that finds the internal auditors aim, while they are against the wishes of the members of the administrative agendas, to pursue their goals. The synthesis of three hypotheses is a new path adopted by Hanefah and Endaya (2013). The theory of communication describes the importance of efficient contact with business internal and external auditors.

Objectives of the Study

- Examining of the internal auditor's competence to ensure that internal auditing is successful in ACBs⁷.
- Analyzing, the level of the independence of the inner auditor in the performance of internal audit in ACBs.
- Measuring the degree to which the internal audit quality of ACBs is successful.
- To investigate the extent of IA operation under adequate management support in ACBs.

Research Hypotheses

H₁: The competence of the IA department is directly related to the IA effectiveness in ACBs.

H₂: The IA efficiency in Afghanistan Commercial Banks is strongly connected to IA's independence.

H₃: IA work quality is well correlated with IA efficiency in Afghanistan Commercial Banks.

H₄: The effectiveness of the IA in ACBs is positively related to management support.

⁷ Afghanistan Commercial Banks

LITERATURE REVIEW

A detailed description of auditing is as follows:

Auditing is the collection and review of information details to assess the degree of correlation between the data and the standards defined and the report. Arens (2012). Arens notes that audit can be divided into two, depending on the main beneficiary for the audit: External Audit and Internal Audit. Auditors acting in such a way that audits are known respectively as internal and external auditors.

As per Arens, external auditors are not staff of the audited entity and send a financial report to ensure that the report gives a real, and accurate representation of the firm's financial health description. Internal auditing from the other side seems to be an independent and objective assessment with a great balance of monitoring and advisory activity of business operations, usually by their staff, although seldom by outside experts in risk management, supervision, consulting and governance. Domestic auditors have the opportunity to easily obtain data, rapidly identify issues and provide a report on problems Xiangdong (1997). As a consequence, IA has an additional benefit over the external audit. Although, in comparison with external audit, inadequate attention has been paid to internal audit in prior studies William, et, al. (2003), Yismaw, A.W., and Mihret, D.G., (2007).

Internal Audit in Commercial Banking Sector

As a result of the companies' collapse that started around the later part of the 20th century, IA importance increased Moeller (2004). In the commercial banking sector, the financial disaster was also similar. A total absence of effectiveness in its review function was the primary reason for a CBs inability in different areas of the world (e.g. Kenya and Nigeria). As a result, the experiences of such a disaster in these countries called for the development and strength of IA Changwony, M. K., and Rotich, D. G., (2015). This is critical since active IAD⁸ is necessary for the success of powerful CBs. Commercial Banking offers various types of services by holding large sum amount of funds for clients Tandon, B., Sudharsanam, S., and Sundharabahu, S. (2010). In this respect, it is the lifeblood of the national economy Keatinge, T., (2014). Because of this evidence,

⁸ Internal Audit Department

it is not necessary to compromise IA in CBs; the efficiency of IA in the safe and sound financial system of CBs would be positive Fernando, A., Lock, K. L., and Gamage, C. (2014). This will assist CBs in protecting their resources, producing accurate financial records and following the legislation Fernando, A., Lock, K. L., and Gamage, C., (2014). Thus, it improves IAD and the organizations overall performance Tandon, B., Sudharsanam, S., and Sundharabahu, S., (2010).

Xiangdong (1997) explained the role of IA over an economy through agency theory. Similarly, in respect of agency theory, Fadzil, F. H., Haron, H., and Jantan, M. (2005) talked about binding costs paid to internal auditors for the achievement of organizational interests.

The Internal Auditing Standard

Domestic audit is one of the bank's main units, the internal revenue board is aware that the income amount on which tax is not manipulated, according to Nagy, A. and Cenker, W., (2002) and that at the end; the accountant reports approves steps for better and effective future performance. Internal audit investigates and measures the overall accuracy of the domestic control process, its suitability, and its efficiency. Nagy, A., and Cenker, W., (2002) "external audit detects and avoids mistakes, frauds, and results based on economic records honesty and fairness".

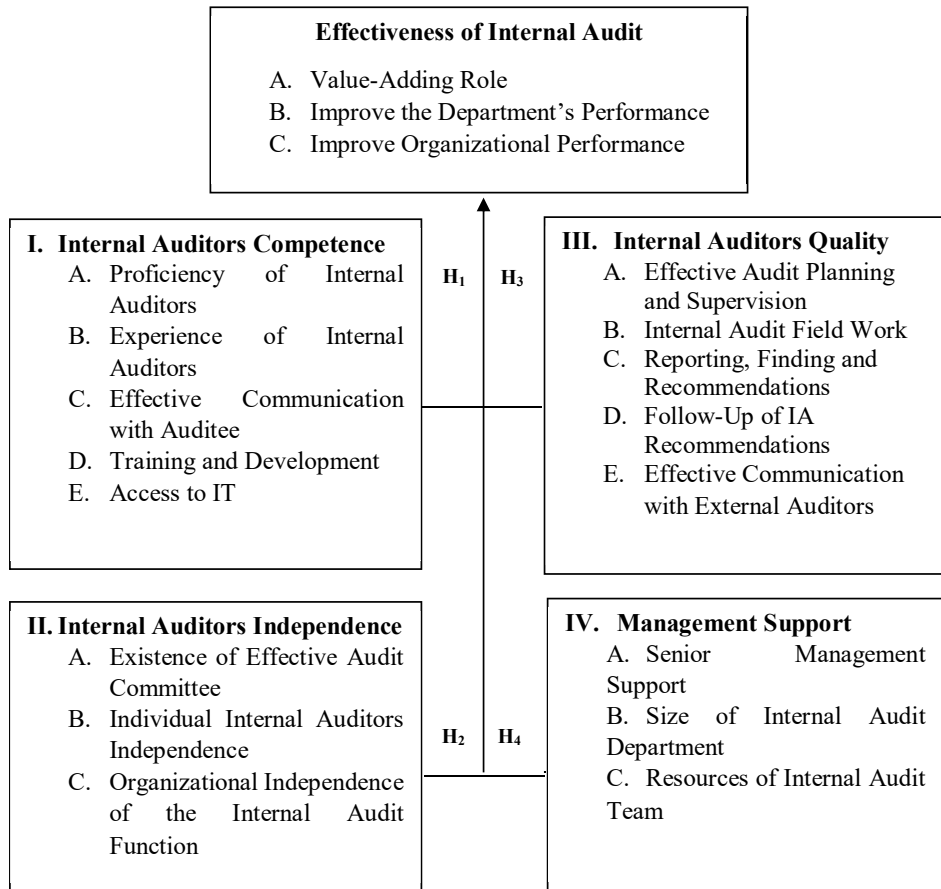
Financial institutions like to create a powerful interior auditing structure since that makes analyzing and evaluating the bank's actual performance the easiest and best way for the panel of the director. Basel internal auditing criteria are most recommended for understanding and strengthening bank audit performance. It is best to conform to the system defined in the United States in 2018 by IIA⁹. All the operations of the bank should be protected by the IA, to obtain the expected benefits of the auditing pointed to above. Professional and unbiased internal auditing teams are very essential as audits can be used to track the general operation of the firm by the top management board. In 2012 the Basel Banking Supervisory Committee provided the internal audit position in banks.

⁹ Institute of Internal Audit

Conceptual Framework

Based on Abu-Azza (2012), Hanefah, M. M., and Endaya, K. A., (2013), and George (2015) studies on IA; in determining IA effectiveness, the researcher attempts to try the following conceptual framework:

Figure 1: Conceptual Model for Effectiveness of Internal Audit in ACBs¹⁰



Source: Shewhart, W. A. and Wilks, S. S., (2004)

¹⁰ Afghanistan Banks

RESEARCH METHODOLOGY

Four theoretical ideologies prevail primarily in science, such as realism, positivism, pragmatism and interpretivism Saunders, et. al. (2009) and Creswell (2009). The four theories in science look different in the world Creswell (2003). Over the past years, scholars have built and extended their knowledge based on the diverse views of the world. For example, the following are the types of philosophy of research they follow. Wubishet and Dereje (2014) positivism (post-positivism), Mihret (2008) constructivism and Abu-Azza (2012) pragmatism. The researcher tried to develop knowledge-based on a pragmatic claim of knowledge in this study. Creswell (2003) defined pragmatism as “a worldview arises out of actions, situations, and consequences rather than antecedent conditions”.

Pragmatism is not restricted to a specific form of study; since pragmatists look around the world from different directions and not in absolute terms Creswell (2009). It comprises of quantitative and or qualitative, deductive, inductive, subjective or objective, value biased, therefore, offers the best work through recognizing aspects of analysis hypotheses Saunders, et. al. (2009); the same refers to the compilation and analysis of data.

Population and Sampling

Most of Afghanistan Banks do not have internal auditors in a local office level. In this analysis, the investigator used the purposive and convenient method of sampling. The purposive sampling method is related to the nature of the research and is prescribed for the nature of the study Mihret (2008).

Even if the variation is not assumed to be strong in the analysis, since the population is not large in number, all banks in the sample frame have been identified by their head office. The total number of the staff of the IADs of the ABs¹¹, is currently numbered around 195 in the head offices; since DAB is the central bank of Afghanistan therefore, the number of population decrease by $195 - 37 = 158$.

Research Methods

This research is conducted through a quantitative study; the quantitative objective of the analysis is to classify the data required for the population to be generalized Marczyk, et al. (2005). Data collection on this survey is

¹¹ Afghanistan Banks

done through a self-administered questionnaire to attain the objective of this research.

Survey Design

This analysis involves a cross-sectional survey when cross-sectional surveys are used, data cannot be collected at some point as longitudinal overtime but just the data is collected at once Creswell (2009). Forms of surveys include self-administrated questionnaires, interviews, structured record reviews, and organized observations according to Creswell (2009). The researchers used self-administered surveys as useful in this analysis. Many advantages may be like the cheaper option, enable participants to learn more about the problems, which are more confidential and easily gathered data Cooper and Schindler (2006). The survey is, therefore, conducted to decide the factors that determine IA's effectiveness concerning IA team competence, independence, job quality, and management support. There are essentially three ways to handle self-administered questionnaires, including face to face, telephone, and Email Marczyk, et al. (2005). Due to the return rate and intellectual honesty is high in the face to face approach when filling a questionnaire Marczyk, et al. (2005), the investigator used a face to face survey.

Survey Instrument

George (2015), created the self-administered questionnaire and the investigator used it for this paper. The study is linked to the hypotheses of the research and aims of this study. Nonetheless, the researcher takes up and modifies some questions concerning their contents and explains the claims of the respondents easily. The survey is arranged in two sections. The first section relates to the profiles of the participants. The basic information part contains five questions related to the backstory and current status of the respondent and demographic features. The second section includes twenty-one questions of the Likert scale aimed at achievable, homogeneous, and objective analysis of research hypotheses. The second part consisted of groups.

The first group consists of six questions of scale on Likert, which deal with IA team competence; The second group comprises of three questions on Likert scale of IA independence; The third group consists of six questions of Likert scale concerning the quality of IA; The fourth group consists

of three questions of Likert scale relating to management support; The fifth category comprises three questions of Likert scale which involve IA effectiveness. The language of the questionnaire is Persian and English. Appendix 1 includes a sample of the whole instruments. Mostly, questions on the Likert scale are of five degrees namely strongly agree, agree, neutral (undecided), disagree, and strongly disagree. In the analytics process, these are merged into a single aggregated variable Kothari (2004); Boone Jr and Boone (2012). Combined elements are used to get a quantitative measure of a personality or character trait Boone and Boone Jr. (2012). A “reasonable” Likert-scale is a scale that is balanced by a neutral choice on both sides, providing a less biased metric. Both the actual scale labels and the numerical scale can vary Vanek (2012). The investigator interpreted Likert scales in five points to show the following values: (1) indicated strongly agree, (2) agree, (3) neutral, (4) disagree and (5) strongly disagree. In the inquiries given, the numbers indicate ordinary scale calculation and the creation of data suitable for quantitative analysis Boone Jr and Boone (2012). In this respect, the mean answer less than 3.00 was considered an acceptance with the questionnaire argument. Whereas, the mean answer above 3.00 is seen as disagree with the questionnaire statement Boone Jr and Boone (2012). Though, the standard deviation findings of less than 1.00 indicate that the views of the respondent are similar to each other. However, the standard deviation of over 1.00 demonstrated that the perceptions of the participant varied. Shewhart and Wilks (2004).

Data Collection Procedure

First, the investigator asked a recommendation letter from Istanbul Aydin University, College of Business Administration; Department of Social Science. It is meant to be accepted and to improve participants confidentiality. The questionnaires were then distributed to internal auditors of voluntary ACBs main offices in Herat, Afghanistan. Since the study participants were individual, they maintained their right to participate or not and nothing in addition to ethical considerations were performed without ethical consideration. As Cooper and Schindler (2006) states participants’ perceptions subtly influence the results of the research; nobody was obligatory to be involved.

Data Analysis

Analysis of the data also includes exploring the main purpose of research, categorizing, tabulating, and recombining data collected Yin (2003). Data analyzed in the quantitative method of analysis. In this paper, the investigator has used the SPSS (Statistical Social Science Package) software to analyze the collected data. The investigator used ordinal sort (ranked) of categorical data based on the chosen survey instrument, which is the basis of the Likert questionnaire. The data collected in this regard was converted using a questionnaire to describe the hypotheses variables. This is by taking mean values for each construct of the item responses. Mean values are selected because the answer to items ranged from “Strongly Agree” to “Strongly Disagree” generate ordinal data Mihret (2008). Using the demographic characteristics and descriptive statistics, mainly frequency count, percentage central tendency calculation (mean), dispersion measurement (standard deviations) have been used to summarize and define the observation results. Moreover, other statistics analyze such as the reliability analysis (Cronbach’s Alpha), autocorrelation assessment (Durbin-Watson), regression analysis (ANOVA), and finally hypotheses testing were then presented according to the data collected by questionnaire. The following structure for evaluation of regression was used to assess the effectiveness variables IA.

$$EIAiACBs = \beta_0 + \beta_1 COIAt + \beta_2 INIA + \beta_3 QUIA + \beta_4 MGS + \varepsilon$$

EIAiACBs = Effectiveness of Internal Audit in Afghanistan Commercial Banks

B_0 = Constant Term

$B_1 - \beta_4$ = coefficients of independent variables and

COIAt= Competence of IA teams

INIA= Independence of IA

QUIA= Quality of IA Work

MGS=Management Support

ε = error term

INTERPRETATION AND DATA RESULTS

The results of the quantitative data assessment in this section are presented. The hypotheses study is used to assess the major effect of independent variables on the dependent variable Field Survey (2020). Hypotheses are tested in this study for a major influence of IA competency, independence, work quality, and management supports over the effectiveness of IA, which was calculated by adding value to a company, improving departmental performance, and improving corporate efficiency. Table 4 shows that the p-value of management support was statistically significant in terms of management supports ($p < 0.05$); which suggests excellent support for the fourth hypothesis. Whereas at ($P < 0.05$), which lacks support for hypotheses 1, 2 and 3, the p-value for independence, competence, and quality of IA was statistically insignificant.

Reliability Analysis

The accuracy of the questionnaire or its reliability is important in a Likert-scale questionnaire. In previous IA studies, reliability review was used to adopt the questionnaire throughout the Likert scale Mihret (2008); George (2015); Ababa (2016). The most famous test of the reliability scale is Cronbach's Alpha (α) when evaluating such a reliability study. A value (α) greater than 0.600 in reliability measurement (Cronbach's, 1951) is acceptable. According to the Field survey (2020), a value (α) higher than 0.800 is extremely acceptable for reliability analyzes. Based on Table 1, the Cronbach Alpha (α) reliability measurement value of this study reveals that all variables have 0.876. The responses produced in this research were therefore extremely acceptable to data analyses (reliable).

Table 1: Reliability Statistics

Cronbach's (α)	Cronbach's (α) Based on Standardized Items	N of Items
.876	.876	21

Source: Field Survey, 2020

Autocorrelation Assessment

As per Brooks (2008) they can be considered as autocorrelated if there are patterns in the residuals from a model. The DW¹² is an autocorrelation test of the first order. This assumes the connection of an error to the previous of

¹² Durbin-Watson

an error. In such a type of analysis, when the DW result is close to 2 the null hypothesis cannot be rejected Hair, et al. (1998). Because it demonstrates that there is little or no evidence of autocorrelation. There is a positive correlation when it is less than two and when it is more than two there is a negative correlation. The statistical significance of this analysis from DW is 2.161 which is higher than 2 based on Table 2. Therefore, there is negative evidence of autocorrelation among error terms in this survey.

Table 2: D-W Test Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.646 ^a	.417	.323	.621	2.161

a: IV¹³: (Constant), Competence of Internal Audit, Independency, Work Quality and Management Support

b: DV¹⁴: Effectiveness of Internal Audit

Source: Field Survey, 2020.

Regression Results (ANOVA) for Internal Audit Effectiveness

This survey influences on how the participant perceives the questionnaire. So, r-squared can be respectable and good to match, more than 25 percent Reisinger, (1997); Thompson (2002). The regression results investigate the appropriate IA efficiency indicators by using the model variables Hair, et al. (1998). The relevant tests for the variables used to illustrate the efficiency of IA were explored based on Table 2. It means that 41.7 percent (0.417) of the differentiation in the efficiency of internal audit was responsible for the overall contribution of competency of internal audit groups, independence of internal audit, quality of internal audit work and management support. Table 3, ANOVA highlights the importance of the F-statistics (P=.000) and F=21.289 model, which demonstrates that a strong relationship exists between the forecasts and the effects of the variables of regression. The model is ideally adapted to estimate the efficacy of IA in ACBs.

¹³ Independent Variable

¹⁴ Dependent Variable

Table 3: ANOVA^a

Source: Field Survey, 2020.

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	19.321	4	4.830	21.289	.000 ^b
	Residual	31.764	140	.227		
	Total	51.085	144			

DV: Effectiveness of Internal Audit

IV: (Constant), Independency, Competency, Work Quality and Management Support

Regression Test Results Coefficients

The beta (β) symbol containing a positive (+) or negative (-) sign. It indicates how the IVs influence the DV Field (2020). Table 4 includes a positive (+) beta sign for all independent variables. Therefore, IVs (IA competence, IA independence, IA work quality, and management support) had a positive influence on the forecasting DV (effectiveness of IA). Any improvement in IV contributes to the improvement of the DV. The above outcome is in line with previous IA literature William, et al., (2003); Wubishet and Dereje (2014); Mihret and Yismaw (2007); Ramachandran, et al., (2012); Cohen and Sayag (2010).

The independent variable with a significance level (sig.) of less than 5 percent will make a significant influence on the DV's expected value. Indeed, a variable beyond this significance level (sig.) cannot contribute significantly to the expected value of the DV Hair, et al., (1998); Brooks (2008). Based on table 4, the independent variables' statistical significance over the DV at 5% of significance; three of the IVs (IA competence, independence and work quality) over the dependent variable (effectiveness of IA) were not significantly contributed. However, for the DV (effectiveness of IA), the IV (management support) had a significant contribution.

Table 4: Regression Results Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig.	Tolerance	VIF
(Constant)	.239	.182		1.312	.192		
Competency of IA	.160	.101	.146	1.584	.116	.526	1.901
Independence of IA	.136	.088	.125	1.557	.122	.686	1.458
Work Quality of IA	.117	.116	.096	1.009	.315	.488	2.050
Management Support	.416	.089	.392	4.670	.000	.632	1.583

a:Dependent Variable: Effectiveness of IA

Source: Field Survey 2020

Competence of the Internal Audit Team

This segment addresses participants' opinions on the competence of the IA staff as a variable that might impact IA efficiency. In this respect, the investigator studied the competence of IA from the perspective of competence, efficient communication, experience, training and development and access to IT.

H_1 : Competence of the IA team is positively related to the efficacy of IA in ACBs.

The first hypothesis analyzed the IA team's competence in a positive association with IA's success in ACBs. The figure shows IA team competence weak linkages to IA effectiveness in ACBs at a statistical importance mark of ($P < 0.05$). The magnitude (β), which influenced IA effectiveness, was 0.160 and the T-value was 1.584 respectively. The sign of a positive scale and a t-value of less than 2 imply that the independent and dependent variables are not strongly linked Hair, et al., (1998). Adequate awareness requires a minimum first-grade standard, qualified membership, and

qualification in specific fields, such as CIA¹⁵ Mihret (2008); Abu-Azza (2012); IIA (2018). Communication theory suggests that inappropriate information or communication complexity can lead to an inability to communicate effectively Hanefah and Endaya (2013). A small and large amount of information is not sufficient for effective communication.

The researcher, therefore, rejects the hypothesis that the competence of the IA team is positively linked to the efficacy of IA in ACBs. The result has shown that the capabilities of the IA teams do not play a significant role in the effectiveness of IA concerning their competence. This skill has not had a significant impact on IA efficiency in ACBs, as well as internal audit experience, effective communication with the auditees, training, and development, and access to IT. The result is not aligned with the previous research Misganaw (2016) but matched with Cohen and Sayag (2010).

Independence of the Internal Audit Team

The core issue for IA productivity is independence because, without IAD autonomy, IA output cannot be attained Cohen and Sayag (2010); Santagato, L. & Vanasco, R. Skousen (1996). This section assesses participants' views on IA freedom as a feature that can affect the efficiency of the IA. The study tested, in this regard, the liberation of IA from the presence of an efficient AC, the independence of individual in-house auditors and organizational independence from the perspective of IA function.

H₂: Independence of IA is positively linked with the efficacy of IA in ACBs.

The second hypothesis tested IA's positive correlation independence with IA's efficacy in ACBs. The result shows the IA independence at a statistical significance level of (P<0.05) had not significantly connected with the efficiency of IA in ACBs. The magnitude (β) of this variable's effect on IA's efficacy was 0.136 and the t-value of 1.557. The positive sign of magnitude and t-value of less than 2 shows a weak interaction between DV and IVs. Hair, et al., (1998). Thus, the researcher does not support the study's hypothesis that IA independence is positively correlated with IA efficacy in ACBs. The result shows that IA independence performs a less influential position in the

⁸ Certified Internal Auditors

effectiveness of IA in ACBs. This means that the existence of an active AC; the individual IA liberation and the organizational independence of IA have had an insignificant effect on the efficacy of IA in the ACBs. The finding doesn't conform to previous studies Subramaniam, (2010); George (2015); Goodwin-Stewart (2001).

Quality of the Internal Audit Team

The quality of IA can be demonstrated through the office of internal auditors and the capacity of fieldwork to fulfill their obligation to provide valuable findings and feedback Mihret and Yismaw (2007). This research examined audit quality from the viewpoint of efficient audit planning and monitoring Prawit, et al. (2010), IA fieldwork, finding and reporting follow-up on IA advice, and good communication with external auditors.

H₃: Quality of IA work is positively associated with the effectiveness of IA in ACBs.

The investigator rejects the third hypothesis evaluating IA's quality of work positively linked with IA's success in ACBs. The paper shows a weak association at a statistical significance level of ($P < 0.05$) between the quality of IA work and efficacy of IA in ACBs. The magnitude (β) of this variable's effect on IA's effectiveness was 0.117, and the t-value was 1.009. The positive sign of magnitude with a t-value of less than 2 suggests a poor interaction between IV and DV Hair, et al., (1998).

The finding shows that the quality of IA work in ACBs has not had a significant effect on IA efficiency. That means efficient audit scheduling and supervision; IA exploration; recording analysis, and recommendations; the pursue of IA recommendations; and effective communication with outdoor inspectors have had an insignificant influence on the efficacy of IA in ACBs. The finding is consistent with earlier studies Ramachandran, et al., (2012); Abu-Azza (2012), but differs with Wubishet and Dereje (2014); Mihret and Yismaw (2007).

Management Support

Management support is the factor in determining the effectiveness of IA Mihret and Woldeyohannis (2008); Ababa (2016); Mihret and Yismaw (2007). Because IA activities are carried out in a dynamic and supportive environment; the internal auditors expect the top management to support them. Organizational autonomy to successfully do their jobs; according to SPPIA interior assessors should be assisted by top management, BOD IIA (2017). Top management support is therefore needed to enhance efficient work performance. The researcher focused on senior management assistance.

H₄: Management supports are positively linked with the effectiveness of IA in ACBs.

Finally, the last hypothesis evaluated management supports which shows a positive association with the success of IA in ACBs. The result shows that management supports strongly correlated with the efficacy of IA in the ACBs at a statistically significant point ($P < 0.05$). The magnitude (β) of this variable's effect on IA's effectiveness was 0.416, and the t-value was 4.670. The positive sign of magnitude and t-value greater than 2 proposes a strong relation between IV and DV Hair, et al., (1998).

Abu-Azza (2012) explains management support as a motivation given to internal auditors by the top management. Financial support may be reflected in providing the IAD with an appropriate budget and providing financial benefits (remuneration and bonuses) to IA teams Abu-Azza (2012). The nature and standard of audit research are greatly influenced by the adequate budget.

Therefore, the investigator confirms the results of the study hypothesis that supports from management are positively correlated with IA effectiveness in ACBs. The result shows that supports from management play a critical role in IA's effectiveness. This means that top management knowledge of IA's requirements and helps across financial and non-financial assistance has an important impact on IA's effectiveness in ACBs. The observation is aligned with earlier research. Cohen and Sayag (2010); Gortiz (2004); Stocks, Schueler, and Albercht, (1988); George (2015); Mihret and Yismaw (2007); Paape (2007).

CONCLUSION AND RECOMMENDATION

Conclusion of the Study

IA has a crucial role to play in assisting a firm reaches its goals while it is successfully managed, executed, and functioned. Organizations that coped, implemented, and operated IA efficiently were better able to recognize their organizational threats and system inefficiencies to take corrective actions and improve the process. The following relevant results are listed based on the survey.

The IA personnel's competence, independence, and quality in the efficacy of IA in ACBs do not play a vital role. The reliability of the IA in ACBs has not been significantly affected by the competence and the expertise of interior inspectors, efficient interaction with the auditors, education, training, and access to IT. The challenges and weaknesses of ACBs' IAD in this regard are not related to the above issues. There was no lack of sufficient certified individuals in ACBs relevant to the expertise of IA teams, there was no lack of good interaction skills with the head level and auditees neither lack of IA software for audit management activities in ACBs. Also, the strength can be described as the capacity of auditors to access the use of information technology and attract personnel with at least B.A degree and two years of practice in auditing, efficient interaction and support through branch-level assessments and a positive commitment to external training and development. In conclusion, the IA team competency at a statistical significance point of ($P < 0.05$) is not positively associated with the efficacy of IA in ACBs.

In the efficiency of IA for ACBs, the independence of IA has not got any critical role. This means that there were no major impacts on IA's effectiveness in ACBs due to the presence of an efficient audit committee, individual IA, independence, and organizational independence. To conclude, IA independence is not linked positively with the efficacy of IA in ACBs at a statistically significant ($P < 0.05$) level.

The IA quality functions had no significant influence on the performance of IA in ACBs. The effectiveness of IA in ACBs is not affected by effective audit scheduling and observation; IA information-gathering; recording,

results, and recommendations; follow-up on IA recommendations; and efficient interface with exterior assessors. To conclude, the quality of the IA function shows a poor correlation between the output of IA quality and the success of IA in ACBs at a statistically significant point ($P < 0.05$).

By comparison to the independence, competence, and quality of the IA teams; management commitment and supports play a critical role. This indicates a significant effect on IA efficiency in ACBs through senior management awareness on IA needs and support through financial and non-financial objects. The concern with management support linked to ACBs was a smaller sum fund given to the IA team as rewards and incentives. In conclusion, management supports strongly affect the effectiveness of IA in ACBs at a statistical significance point of ($P < 0.05$). Management supports have therefore significant and statistically relevant effects on the efficacy of IA in value-adding role, improving department performance, and improving organizational performance. So, the factor which affected the IA in ACBs was management support. Whereas IA independence, IA competence, and IA quality have not significantly affected IA efficiency. It implies that IA independence, IA team competence, and quality of IA are not determinants of IA's efficiency in ACBs.

Recommendation of the Study

The ultimate intention of the research is to recognize IA efficacy factors in ACBs. In this respect, quantitative data analysis was performed. The investigator provides the following recommendations to the relevant parties, based on the research objective and the data analysis.

- Senior management should support IAD's staff through non-monetary and monetary incentives.
- To effectively carry out the daily works, top management authorities should expand the IAD.
- Needs and requirements of in-house inspection team should be positively responded, by the senior management authorities.

Sarens, G. and Debeelde, I. (2006) from the other side, consider that the firm's complete recognition and appreciation of IA rely heavily upon the consideration of the top management.

Eventually Abu-Musa (2008) clarified management support as an encouragement for top management to provide internal auditors. Therefore, adequate IAD allocation, IA Project incentives, rewards, and IA feedback are recognized and adopted. Financial support for an appropriate budget allocation for the IAD and competitive opportunities for the IA team should be presented.

Suggestion for further studies

The investigator inspires more studies to maximize and improve the outcomes of the research by reducing the study's restriction. The investigator, therefore, propose the following potential areas of research:

- Research will be validated through analysis in different sectors and countries.
- This research will be further suggested by replicating the analysis regarding the members of the BODs, the Administrative Operations Department, Financial Managers, and the Organizations' CEO reliance.

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Türkiye ve Seçilmiş Ülkelerde Mevduat Kabul Eden Kuruluşların Finansal Sağlık Göstergelerinin Entropi ve Edas Yöntemi ile Değerlendirilmesi

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ÖZ

Finansal Sağlık Göstergeleri (Financial Soundness Indicators: FSI), finansal kurumlarla piyasaların ve bunların şirket ve hane halkı benzerlerinin sağlık ve sağlamlığını izlemek için derlenen göstergelerdir. Bu çalışmada, IMF tarafından oluşturulan ve mevduat kabul eden kuruluşlar için temel set olarak kabul edilen 12 finansal sağlık göstergesi dikkate alınmıştır. Türkiye ile 2004 yılı ve sonrası Avrupa Birliği'ne üye olan, aday olan ve potansiyel aday toplam 19 ülkeye ait 2018 verileri kullanılmıştır. Çalışmada, 12 temel kriterin ağırlıkları Entropi yöntemi ile tespit edilmiş, daha sonra EDAS yöntemi ile ülkelerin finansal sağlık göstergelerine göre performans sıralaması yapılmıştır. İlk üç sırayı Romanya, Macaristan ve Polonya alırken, Türkiye 7. sırada yer almıştır.

Anahtar Kelimeler: *Finansal Sağlık Göstergesi, Avrupa Birliği, Performans, EDAS, Entropi Yöntemi, Banka*

JEL Sınıflaması: G15, G17, G21,

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Doi Num: 10.17932/IAU.FCPE.2015.010/fcpe_v06i1005

Evaluation of Financial Soundness Indicators of Deposit Institutions by ENTROPY and EDAS Methods in Turkey and Selected Countries

ABSTRACT

Financial Soundness Indicators (FSI) are indicators compiled to monitor the health and soundness of financial institutions and markets and their corporate and household counterparts. In this study, 12 financial soundness indicators created by the IMF and accepted as the basic set for institutions accepting deposits are taken into consideration. The study was carried out by using the 2018 year-data of total 19 countries including the candidates and potential candidates of the EU and the members of the EU in 2004 and the following years, and Turkey. In this study, weights of 12 main criteria were determined by Entropy method and then EDAS method was used to execute performance ranking according to financial soundness indicators of selected countries. The first three places in Romania, Hungary and Poland, while Turkey was ranked 7th.

Keywords: *Financial Soundness Indicators, European Union, Performance, EDAS, Entropi Method, Bank*

JEL Classification: G15, G17, G21,

GİRİŞ

Finansal istikrar, finansal sistemin parçası olan ekonomik işlevlerin beklenmeyen bir durum karşısında ortaya çıkabilecek şoklara karşı dayanıklılığını ve sağlıklı şekilde sürdürülmesini ifade etmektedir (TCMB,2014:2). Böylece, sağlıklı ve güçlü finansal sistemler fonları verimli yatırım projelerine tahsis ederek ve ödeme hizmetleri sağlayarak ekonomik faaliyet ve refah seviyesinin artmasına katkıda bulunurlar. Ancak mevcut deneyimler göstermiştir ki, finansal sistemler finansal faaliyetlere zarar veren ve ekonomiye çok büyük tutarlı ve geniş çaplı maliyetler yükleyen istikrarsızlık ve krizlere de eğilimlidirler. (IMF,2006:1) Finansal sistemde en büyük paya bankalar sahip olduğundan, bankaların sağlamlığı da ayrı bir öneme sahiptir.

Lindgren, Garcia ve Saal (1996)'e göre banka sağlamlığı, çoğunlukla olumsuz olaylara dayanabilme becerisini ifade etmek için kullanılan bir kavramdır. Sağlam bir bankacılık sistemi ise bankaların çoğunun yeterli ödeme gücüne sahip oldukları ve muhtemelen de bu şekilde kalacakları bir sistemi ifade etmektedir (Lindgren vd., 1996:9). Sağlıklı bir finansal sistemin ekonomik büyüme ve gelişme üzerindeki rolü büyüktür. Finansal sistemlerin etkin bir şekilde işlemediği, finansal istikrarsızlığın olduğu durumlarda ise verimli yatırım projelerine kaynakların aktarılması güçleşecek, ekonomik faaliyetler gerileyecek; sonuçta hem finansal piyasalar hem de genel olarak ekonominin bütününde geniş çaplı olumsuz sonuçlar meydana gelebilecektir.

Bankacılık sektörü kaynaklı bir kriz hem kendisi hem de diğer sektörleri önemli ölçüde etkilemektedir. Bu nedenle, bankacılık sektörünün sağlamlığını ölçecek çalışmalar, endeks geliştirme çalışmaları, düzenleyici ve denetleyici kurumların finansal sağlamlık göstergesi olarak kabul edebileceği oranlar oluşturulmaya çalışılmaktadır. Finansal sağlamlık göstergeleri de bankacılık sektörünün genel sağlamlık durumunu izlemek için yararlı araçlar arasındadır (Navajas and Thegeya, 2013:3).

Ülkelerin mevcut verileri 2018 yılına ait olup, entropi yöntemi ile ağırlık belirlenmiş ve EDAS yöntemi ile sıralama yapılmıştır. Farklı bir yıl verilerinin dikkate alınması, sübjektif olarak uzman görüşü ile ağırlıkların belirlenmesi, farklı bir Çok Kriterli Karar Verme yöntemi kullanılması durumunda farklı sıralamalar oluşabilir.

FİNANSAL SAĞLAMLIK GÖSTERGELERİ

Finansal Sağlamlık Göstergeleri (Financial Soundness Indicators: FSI), hem finansal kurumlar hakkında toplu bilgileri hem de finansal kurumların faaliyet gösterdiği piyasaları temsil eden, bunların sağlık ve sağlamlığını izlemek için derlenen göstergeleri içermekte olup (Sundararajan vd., 2002:2), ulusal finans sistemlerinin finansal risklerini ve kırılma noktalarını izlemek için daha iyi veri ve araçlara olan ihtiyaçtan çıkmıştır (Jose and Georgiou, 2009:277).

1999 yılında Uluslararası Para Fonu (IMF) ve Dünya Bankası (Worldbank) tarafından ülkelerin finansal sistemlerini kapsamlı ve derinlemesine analiz etmek için Finansal Sektör Değerlendirme Programı (The Financial Sector Assessment Program (FSAP) oluşturulmuştur. FSAP, iki temel bileşeni içermektedir: Birincisi, Uluslararası Para Fonu (International Money Fund-IMF)'nin sorumluluğunda olan finansal istikrar değerlendirmesi; ikincisi, Dünya Bankası'nın (Worldbank – WB) sorumluluğunda olan finansal gelişmenin değerlendirmesidir. Bugüne kadar, üye ülkelerin dörtte birinden fazlası değerlendirmeye tabi tutulmuştur (IMF, 2017). Amacı, ülkelerin finansal sistemlerinin zayıflıklarının saptanması ve gerekli tedbirlerin alınmasına katkıda bulunmaktır.

1990'lı yılların sonlarında yaşanan Asya finansal krizi ve 2008'deki küresel finansal kriz nedeniyle finansal sektörün finansal gösterge setlerine dayalı olarak güçlü ve zayıf yanlarının değerlendirmesi giderek daha da önem kazanmıştır. Bu değerlendirmeye finansal sektörde bir kırılma yol açmak suretiyle finansal krizlere neden olabilecek potansiyel sorunların tanımlanması için de ihtiyaç duyulmuştur (Asian Development Bank, 2015:vii).

Ülkelerin finansal kuruluşlarının sağlığı ve sağlığına dair bir fikir sağlamak amacı ile IMF Yürütme Kurulu tarafından Haziran 2001'de temel ve önerilen finansal sağlık göstergesi listesi oluşturulmuştur. Finansal sağlık göstergelerinin IMF üyeleri tarafından derlenmesi için kavram ve tanımlar konusunda standart bir referans oluşturma amacıyla da IMF tarafından Finansal Sağlık Göstergeleri Derleme Kılavuzu hazırlanmıştır (IMF, 2015).

Finansal sağlık göstergeleri, finansal sistemlerin güçlü ve kırılma yönlerini değerlendirme ve izlemeye yardımcı olmak amacıyla oluşturulmuş olup (IMF, 2006:11), bu göstergeler, makro ihtiyatı analizi desteklemek amacıyla hesaplanmakta ve yaygınlaştırılmaktadır (IMF, 2006:1). Makroihtiyatı analiz, bir bütün olarak finansal sistemde ortaya çıkan riskleri tanımlamaya odaklanmaktadır (IMF, 2006:2). Bu göstergelerden yararlanılmak suretiyle finansal sistemin sağlığı ölçülebilir

(Navajas and Thegeya,2013:3), finansal riskler gözlemlenerek finansal krizleri engellemek için gerekli tedbirler alınabilir.

Finansal sağlık göstergeleri temel seti; sermaye yeterliliği, aktif kalitesi, getiriler ve kârlılık, likidite ve piyasa riskine olan duyarlılık olmak üzere 5 gruptur. Mevduat kabul eden kuruluşlar dışında, diğer finansal kuruluşlar, finansal olmayan kuruluşlar, hane halkları, piyasa likiditesi ve gayrimenkul piyasaları ile ilgili 27 önerilen set ayrıca yer almaktadır. Zorunlu setleri ülkeler derlemek zorundadırlar, önerilen setleri ise kendi durumlarına göre seçebilirler. IMF'nin mevduat kabul eden kuruluşlar için 12 göstergeden oluşan temel finansal sağlık göstergeleri Tablo 1'de yer almaktadır:

Tablo 1: IMF Finansal Sağlık Göstergeleri: Temel Set

	Göstergeler
Sermaye Yeterliliği	Yasal Öz kaynak / Risk Ağırlıklı Varlıklar Birinci Kuşak Sermaye / Risk Ağırlıklı Varlıklar Net Takipteki Alacaklar / Sermaye
Aktif Kalitesi	Takipteki Alacaklar / Toplam Krediler Kredilerin Sektörel Dağılımı
Getiriler ve Karlılık	Net Kâr / Toplam Aktifler Net Kâr / Öz kaynaklar Faiz Marjı / Toplam Gelir Faiz Dışı Giderler / Toplam Gelir
Likidite	Likit Varlıklar / Toplam Aktifler (Likit Varlık Oranı) Likit Varlıklar / Kısa Vadeli Yükümlülükler
Piyasa Riskine Duyarlılık	Yabancı Para Net Açık Pozisyon / Sermaye

Kaynak: IMF, 2006, Financial Soundness Indicators Compilation Guide, s.2

Ülkemizde de TCMB ve BDDK tarafından finansal sağlık konusunda benzer çalışmalar yapılmış olup, ayrıntılarına aşağıda yer verilmiştir.

TCMB Finansal Sağlık Endeksi

Türkiye'de bankacılık sektörünün finansal sağlık ve kırılabilirliklerinin genel hatlarıyla tespit edilebilmesi ve tek bir göstergede özet bir şekilde

izlenebilmesi amacıyla, seçilmiş bazı rasyolardan yararlanılarak TCMB tarafından 2005 yılından itibaren finansal sağlık endeksi hesaplanmaya başlanmıştır (TCMB, 2005:1). Finansal Sağlık Endeksi (FSE), bankacılık sektörünün finansal yapısının sağlamlığının ne yönde hareket ettiğine ilişkin bir bileşik gösterge oluşturmak amacıyla hesaplanmaktadır (TCMB, 2010:80). Bu endeksin oluşturulmasında aktif kalitesi, likidite, kur riski, karlılık ve sermaye yeterliliği endekslerinin yer aldığı 5 alt gösterge kullanılmıştır. 2006 yılında TCMB finansal sağlık endeksinin oluşturulmasında yararlanılan göstergelere faiz riskini de dahil etmiştir (TCMB, 2006:112). Tablo 2’de endeksin hesaplanmasında kullanılan finansal sağlık göstergeleri yer almaktadır.

Tablo 2: TCMB Tarafından Kullanılan Finansal Sağlık Göstergeleri

Finansal Sağlık Göstergeleri		Endekse Etkinin Yönü	Ağırlık
Aktif Kalitesi	Brüt Takipteki Alacaklar / Brüt Kredi	Negatif	0,33
	Net Takipteki Alacaklar / Öz kaynaklar	Negatif	0,33
	Duran Aktifler / Toplam Aktifler ¹	Negatif	0,33
Likidite	Likit Aktif / Toplam Aktif ²	Pozitif	1,00
Kur Riski	Bilanço İçi Yabancı Para Pozisyonu / Öz kaynaklar ³	Negatif	0,50
	Yabancı Para Net Genel Pozisyonu / Öz kaynaklar ⁴	Negatif	0,50
Faiz Riski	(1 Aya Kadar Faize Duyarlı TP Cinsi Aktifler – 1 Aya Kadar Faize Duyarlı TP Cinsi Pasifler) / Öz kaynaklar ⁵	Negatif	0,50
	(1 Aya Kadar Faize Duyarlı YP Cinsi Aktifler – 1 Aya Kadar Faize Duyarlı YP Cinsi Pasifler) / Öz kaynaklar ⁵	Negatif	0,50
Kârlılık	Net Kâr / Toplam Aktif	Pozitif	0,50
	Net Kâr / Öz kaynaklar	Pozitif	0,50
Sermaye Yeterliliği	Serbest Sermaye / Toplam Aktif ⁶	Pozitif	0,50
	Sermaye Yeterliliği Rasyosu	Pozitif	0,50

¹Duran Aktifler, iştirak, bağlı ortaklık, elden çıkarılacak kıymetler, sabit kıymetler ve net takipteki alacaklar toplamından oluşmaktadır.

²Likit Aktifler; nakit değerler, Merkez Bankası, piyasalar, bankalar ve ters repo işlemlerinden alacaklar toplamından oluşmaktadır.

³Öz kaynaklar, yasal öz kaynak tanımı olup, bilançonun pasifinde yer alan öz kaynak tanımından farklıdır. Hesaplama mutlak değer olarak yapılmıştır.

⁴Bilanço içi yabancı para pozisyonu ile bilanço dışı kalemlerin toplanması ile yabancı para net genel pozisyonu elde edilmektedir. Hesaplama mutlak değer olarak yapılmıştır.

⁵Hesaplama mutlak değer olarak yapılmıştır.

⁶Serbest sermaye, öz kaynak tutarından duran aktiflerin çıkarılmasıyla hesaplanmaktadır.

Kaynak: TCMB (2010), Finansal İstikrar Raporu (Mayıs 2010)

Ayrıca Tablo 2’de, finansal sağlamlık endeksini oluşturan alt endeksler ile bu alt endeksleri oluşturan değişkenlerin (rasyoların) ağırlıkları ve endeksi ne yönde etkiledikleri de (pozitif ya da negatif) yer almaktadır. Pozitif değer değişkenler yükseldiğinde endeksin yükseleceğini; negatif değer ise değişkenler yükseldiğinde endeksin düşeceğini belirtmektedir. Diğer bir ifade ile endeksi pozitif veya negatif etkileyen rasyolar belirtilmiştir. Tablodaki her bir ağırlık, alt endeksleri oluştururken değişkenlere verilen ağırlıkları göstermektedir.

BDDK- Bankacılık Sektörü Performans Endeksi

Bankacılık Düzenleme ve Denetleme Kurumu (BDDK) tarafından da bankacılık sektörü performansının takibi amacıyla Bankacılık Sektörü Performans Endeksi (BDDK-PE) oluşturulmuş ve bu endeks aylık olarak hesaplanmaya başlanmıştır (BDDK, 2004:35).

Bankacılık Sektörü Performans Endeksinde sektör performansının temel ölçütleri olarak belirlenen likidite, öz kaynak yeterliliği, kur (döviz) riski, karlılık ve aktif kalitesi bloklarına ilişkin olarak seçilen 10 adet gösterge kullanılmıştır. Seçilen göstergeler öncelikle ait oldukları blokta endekse dönüştürülmekte, sonraki aşamada ise bu endekslerin ağırlıklı ortalamaları alınarak bileşik endeks hesaplanmaktadır. BDDK-PE aylık frekansta hesaplanmakta olup TMSF bankaları hariç mevduat bankalarını kapsamaktadır. Endeks için baz dönem olarak 2003 Aralık ayı seçilmiştir (BDDK, 2004:35-36).

BDDK'nın hazırladığı Eylül 2008 Finansal Piyasalar Raporu'nda finansal sağlık göstergelerine, bankaların borç ödeme kabiliyetlerinin izlenmesi amacıyla sıklıkla kullanılan borç ödenabilirlik rasyosu ve kaldıraç oranı da eklenmiştir. Borç ödeyebilirlik rasyosu toplam öz kaynakların toplam yabancı yükümlülükler, kaldıraç oranı ise toplam öz kaynakların toplam aktiflere oranıdır (BDDK, 2008:21).

BDDK, IMF'nin finansal sağlık göstergelerinde mevduat kabul eden kuruluşlara ait 25 göstergeden temel set olarak adlandırılan ve tüm ülkelerce takip edilerek IMF'ye gönderilen temel sette yer alan 12 göstergeyi 2010 yılında Türk Bankacılık sektörü için hesaplamıştır. Sonraki dönemlerde BDDK bankacılık sektörünün finansal sağlık göstergelerini; bankacılık faaliyetleri, sermaye yeterliliği, aktif kalitesi, gelir-gider ve kârlılık olmak üzere dört temel başlık altında ele alarak raporlarına yansıtmıştır. Bu temel başlıklara ilişkin rasyolar Tablo 3'te yer almaktadır.

Tablo 3: BDDK Tarafından Kullanılan Finansal Sağlık Göstergeleri

Bankacılık Faaliyetlerine İlişkin Rasyolar	
Etkinlik Rasyoları Krediler / Toplam Aktif Yıllık Kredi Büyüme Oranı Menkul Kıymetler / Toplam Aktif Öz kaynaklar / Toplam Pasif Mevduat / Toplam Pasif Krediler / Mevduat Bilanço Dışı İşlemler / Toplam Aktifler Türev İşlemler / Bilanço Dışı İşlemler	Likidite Rasyoları Yabancı Kaynaklar / Toplam Aktif Yabancı Kaynaklar / Öz kaynaklar Öz kaynaklar / Toplam Aktif 1 aylık Likidite Yeterlik Oranı YP Krediler / Toplam Krediler YP Mevduat / Toplam Mevduat YP Aktifler / Toplam Aktifler
Sermaye Yeterliliğine İlişkin Rasyolar Sermaye Yeterliliği Rasyosu Ana Sermaye / Risk Ağırlıklı Varlıklar (Net) Ana Sermaye / Öz kaynaklar Serbest Öz kaynak / Toplam Öz kaynaklar Aktifler / Öz kaynaklar Takipteki Alacaklar (Net) / Öz kaynaklar Yab. Para Net Genel Poz. / Öz kaynaklar	Aktif Kalitesine İlişkin Rasyolar Takipteki Alacaklar (Brüt) / Krediler TGA Karşılığı / Takipteki Alacaklar 1 Milyon TL'den Büyük Nakdi Kredi / Kredi (Bireysel Kredi + Kredi Kartı) / Kredi Konut Kredileri / Nakdi Krediler Teminatsız TGA / TGA

Gelir – Gider ve Kârlılık Rasyolar	
Gelirler / Ortalama Aktifler	Faiz Gelirleri / Faiz Giderler
Kredilerden Alın. Faizler / Ortalama	Faiz Dışı Gelirler / Faiz Dışı Giderler
Nakdi Krediler	Giderler / Gelirler
Menkul Değ. Alınan Faizler / Ortalama	Ücret, Kom. ve Bank. Hiz. Gel. / Gelirler
MDP	Vergi Sonrası Aktif Kârlılığı (ROA)
Mevduata Verilen Faizler / Ortalama	Vergi Sonrası Öz kaynak Kârlılığı
Mevduat	(ROE)
Net Faiz Marjı	(Operasyon Giderleri: Personel Giderleri
Spread	+ Kıdem Tazminatı Karşılık Gideri +
Faiz Gelirleri / Gelirler	Diğer İşletme Giderleri + Amortisman
Faiz Giderleri / Giderler	Giderleri)
Operasyon Giderleri / Giderler	
Personel Giderleri / Giderler	

Kaynak: BDDK (2012), Finansal Piyasalar Raporu (Eylül 2012)

LİTERATÜR TARAMASI

Bankacılık sektörü, Avrupa Birliği ülkeleri, Entropi ve EDAS yöntemleri hakkında çeşitli veri ve oranlarla, çok kriterli karar verme yöntemleri kullanılmak suretiyle çeşitli çalışmalar yapılmıştır. Bu çalışmanın konusu içinde yer alan mevduat bankaları, IMF finansal sağlık göstergeleri, Avrupa Birliği ülkeleri, Entropi ve EDAS yöntemleri dikkate alınarak, literatürde bu başlıkların bir arada yer aldığı çalışma tespit edilememiştir. Ancak, bu başlıkların ayrı ayrı yer aldığı veya farklı konularda Entropi ve EDAS yönteminin kullanıldığı çalışmalar mevcut olup, ilgili olanlara aşağıda yer verilmiştir.

Işık, O. (2019) çalışmasında mevduat bankalarının 2008-2017 yılları arasındaki finansal performansını değerlendirmeyi amaçlamıştır. Sektörün performansı 8 değerlendirme kriteri (sermaye yeterlilik oranı, mevduat-varlık oranı, kredi-varlık oranı, takibe düşen krediler oranı, likit varlık oranı, aktif kârlılığı, faiz dışı gelirler oranı ve etkinsizlik oranı) kullanılarak, çok kriterli karar verme (ÇKKV) yöntemleriyle değerlendirilmiştir. Kriterlerin ağırlıklar Entropi yöntemine göre hesaplanmış ve yıllara ilişkin performans değerlendirmesi için ise ARAS yöntemi kullanılmıştır. Değerlendirme sonucunda performans değerlendirmesinde en yüksek ağırlığa sahip kriter faiz dışı gelirler oranı olmuştur.

Kandemir ve Özari (2019), çalışmalarında, Avrupa Birliği üyesi ülkeler ve Türkiye'nin yer aldığı toplam 29 ülkenin 2007-2017 yılları temel makroekonomik göstergelerine dayalı ekonomik durumları Çok Kriterli Karar Verme Tekniklerinden TOPSIS ve EDAS yöntemleri ile değerlendirilerek, iki analizden elde edilen bulgular Kendall Tau korelasyon katsayısı ile karşılaştırılmıştır. Elde edilen bulgularda yöntemlerden elde edilen sonuçların uyumlu olduğu ancak sıralamada belirgin farklılıklar olduğu ifade edilmiştir.

Akbulut (2019) çalışmasında, Türk bankacılık sektöründe faaliyette bulunan İş Bankası'nın 2009-2018 yıllarına ait finansal performansı CRITIC ve EDAS yöntemleri ile değerlendirmiş, yıllara ilişkin başarı sıralamasının tespit edilmesinde EDAS yönteminden yararlanılmıştır.

Demireli, Ural ve Çalık (2018) çalışmalarında Entropi ve WASPAS yöntemleri kullanılarak Türkiye'de faaliyet gösteren 3 kamu sermayeli bankanın performanslarını, 2012-2016 dönemine ait temel finansal tablolarından sağlanan veriler ile incelemiştir.

Akçakanat, Eren vd. (2017), çalışmasında, aktif büyüklüklerine göre küçük, orta ve büyük ölçekli bankaların performansları çok kriterli karar verme yöntemlerinden ENTROPI ve WASPAS ile değerlendirilmiş, Forbes Dergisi Bankalar Raporu 2016 ve Türkiye Bankalar Birliği'nin 2016 yılı ilk 9 aylık verilerinden yararlanılarak; toplam aktifler, toplam krediler ve alacaklar, toplam mevduat, toplam öz kaynaklar, şube sayısı ve personel sayısı kriterleri belirlenmiş, kriter ağırlıkları ENTROPI yöntemi ile hesaplanmış, daha sonra da WASPAS yöntemiyle bankaların performans sıralaması yapılmıştır.

Eyüboğlu (2016) çalışmasında, 2009-2013 dönemine ilişkin olarak 7 gelişmekte olan ülkenin (Arjantin, Brezilya, Endonezya, Polonya, Rusya, Güney Afrika ve Türkiye) bankacılık sektörünün performansının TOPSIS yöntemi kullanarak karşılaştırması ve sıralanması amaçlamış, performans ölçümünde ise IMF Finansal Sağlık göstergeleri içerisinde yer alan 10 finansal rasyodan yararlanılmıştır.

Akkoç ve Vatansever (2013) çalışmalarında, Türkiye’de faaliyette bulunan 12 ticari bankanın verilerini kullanarak, sermaye oranları, aktif kalitesi, likidite, kârlılık, gelir harcama yapısı, faaliyet oranları, şube oranları başlıklarında sınıflandırılan 17 kriterden yararlanarak, Bulanık AHP ve Bulanık TOPSIS yöntemlerini ayrı ayrı kullanmak suretiyle bankacılık sektörünün finansal performans ölçülmüştür. Çalışmanın sonucunda, bankaların performans sıralamasının her iki yöntem için de benzer olduğu gözlemlenmiştir.

ARAŞTIRMANIN AMACI

Çalışmada, IMF tarafından oluşturulan ve mevduat bankaları için temel set olarak kabul edilen 12 finansal sağlamlık göstergesi dikkate alınmış, Türkiye dahil 2004 yılı ve sonrası Avrupa Birliği’ne üye olan, mevcut aday ve potansiyel aday toplam 19 ülke verileri dikkate alınarak çalışma yapılmıştır. Türkiye’nin aday olması, üyeliğe kabul sürecinin uzatılması nedeniyle adaylık sürecimiz içinde aday olan ve bizden sonra aday olup AB’ye kabul edilen ülkelerin bankacılık sektörlerinin karşılaştırılması amaçlanmıştır. Çalışmada 12 temel kriterin ağırlıkları Entropi yöntemi ile tespit edilmiş, daha sonra EDAS yöntemi ile ülkelerin IMF tarafından saplanan 2018 yılı verileri kullanılmış ve performans sıralaması yapılmıştır. Ülkeler ve AB’ye katılma tarihleri ve mevcut bilgileri şöyledir;

Tablo 4: 2004 Yılı ve Sonrasında AB Üyesi ve Aday Ülkeler

	Ülkeler	AB Katılma Tarihi		Ülkeler	AB Katılma Tarihi
1	Arnavutluk	*	11	Litvanya	2004
2	Bosna Hersek	**	12	Malta	2004
3	Bulgaristan	2007	13	Karadağ	*
4	Hırvatistan	2013	14	Polonya	2004
5	Çek Cumhuriyeti	2004	15	Romanya	2007
6	Kıbrıs	2004	16	Sırbistan	*
7	Estonya	2004	17	Slovakya	2004
8	Macaristan	2004	18	Slovenya	2004
9	Kosova	**	19	Türkiye	*
10	Letonya	2004			

*Aday Ülkeler, **Potansiyel Aday Ülkeler

ANALİZ

IMF tarafından oluşturulan ve mevduat bankaları için temel set olarak kabul edilen 12 finansal gösterge dikkate alınmış ve IMF web sitesinden toplu ve ülke bazında yayımlanan 2018 yılı verileri elde edilmiştir. Kriter ağırlıkları Entropi yöntemi ile tespit edilmiş, daha sonra bu kriterler EDAS yöntemi ile ülkelerin performans sıralaması yapılmıştır. Finansal sağlamlık göstergeleri, kodları, min. ve mak. bilgileri aşağıda yer alan Tablo 5'te gösterilmiştir.

Tablo 5: Değerlendirme Kriterleri, Kodları ve Ağırlıkları

	Kodlar	Kriterler		Kriter Ağırlığı*
Sermaye Yeterliliği	A ₁	Yasal Öz kaynak / Risk Ağırlıklı Varlıklar	MAK	0,0049
	A ₂	Birinci Kuşak Sermaye / Risk Ağırlıklı Varlıklar	MAK	0,0067
	A ₃	Net Takipteki Alacaklar / Sermaye	MİN	0,2516
Varlık Kalitesi	A ₄	Takipteki Alacaklar / Toplam Krediler	MİN	0,1206
	A ₅	Kredilerin Sektörel Dağılımı (Yerleşik)	MAK	0,0043
Gelir ve Kârlılık	A ₆	Net Kâr / Toplam Aktifler	MAK	0,0287
	A ₇	Net Kâr / Öz kaynaklar	MAK	0,0227
	A ₈	Faiz Marjı / Toplam Gelir	MAK	0,0099
	A ₉	Faiz Dışı Giderler / Toplam Gelir	MİN	0,0094
Likidite	A ₁₀	Likit Varlıklar / Toplam Aktifler (Likit Varlık Oranı)	MAK	0,0295
	A ₁₁	Likit Varlıklar / Kısa Vadeli Yükümlülükler	MAK	0,0736
Piyasa Riskine Duyarlılık	A ₁₂	Yabancı Para Net Açık Pozisyon / Sermaye	MİN	0,4379

*Kriter ağırlıkları Entropi Yöntemi sonucu bulunan ağırlıklardır.

VERİ VE METODOLOJİ

Karar verme, uygulanabilir alternatifler arasında en iyi seçeneği bulma sürecidir. Çok Kriterli Karar Verme (ÇKKV), çoklu çatışma kriterlerinin değerlendirilmesine dayalı karşılaştırma için etkili bir çerçeve sunmakta (Vahdani vd., 2010:1231), birbiriyle çelişen çoklu amaçları olan problem çözme yöntemi olup (Zionts, 1979:94), birçok seçenek arasından birbirini etkileyebilen kriterler dikkate alınarak en uygun seçenek ya da seçeneklerin belirlenmesi olarak ifade edilmektedir. Çok kriterli seçme, sıralama ve değerlendirme yöntemleri, basit analitik tekniklerden, çok kriterli karmaşık yöntemleri kapsayacak şekilde literatürde yer almıştır (Özbek ve Engür, 2019:3).

Bir karar vericinin sorunu, en iyisini bulabilmek, en iyiden en kötüye doğru sıralayabilmek, onları önceden tanımlanmış homojen gruplara ayırabilmek ya da her bir alternatifin tüm kriterleri aynı anda nasıl karşıladığını açıklayabilmek için sınırlı bir alternatifler dizisini değerlendirmeyi içermektedir (Zavadskas ve Turskis, 2010:160). ÇKKV Yöntemleri birden çok etkenin bulunduğu, alternatifler arasında karar verme süreci ile ilgilenirler. Farklı özelliklere sahip olan alternatifleri, belirlenen birçok kritere göre değerlendiren karar vericiler, alternatifin seçimi ve sıralanmasında bu yöntemlerden yararlanmaktadır. Yapılan değerlendirme sonucunda alternatiflerin kriterlere ilişkin performans değerleri kriter ağırlıkları ile çarpılarak alternatiflere ilişkin skorlar elde edilmektedir (Özden, 2009: 63-64). Bazen amaçlar birbiriyle çatışabilmektedir. Bir başka ifadeyle bir amaç için optimal çözüm değeri diğerleri için optimal olmayabilmektedir (Akkoç ve Vatansever, 2013:57).

YÖNTEM

Alternatiflerin değerlendirilmesinde, her bir kriterin ağırlığı uzman ve karar vericiler tarafından sübjektif olarak belirlenebilmektedir (Özden, 2009, 63-64). Herhangi bir karar vericinin kişisel görüşlerine ihtiyaç duyulmaksızın, objektif olarak kriter ağırlıklarının belirlendiği ve hesaplanması kolay olduğundan (Apan vd., 2016; Erol vd., 2011) bu çalışmada kriter ağırlıkları Entropi yöntemi ile belirlenmiştir. Daha sonra karar matrisi ve belirlenen ağırlıklar, EDAS Yöntemi kullanılarak ülkelerin performans sıralamaları tespit edilmiştir.

Entropi Yöntemi

Her kriterin farklı bir anlamı olduğu için hepsinin eşit ağırlığa sahip olduğu varsayılmaz ve sonuç olarak her kriter için uygun ağırlığı bulmak ÇKKV'deki en önemli hususlardan biridir. Ağırlıkları bulmak için farklı yöntemler vardır ve bunların çoğu iki gruba ayrılabilir: öznel ve nesnel ağırlıklar. Öznel ağırlıklar, yalnızca tercih karar vericilere göre belirlenir. AHP yöntemi, ağırlıklandırılmış en küçük kareler yöntemi ve Delphi yöntemi bu gruba girmektedir. Nesnel yöntemler, karar vericinin tercihlerini dikkate almadan matematiksel modelleri çözerek ağırlıkları belirler; örneğin entropi yöntemi, çok amaçlı programlama (multiple objective programming) yöntemi olup, gerçek problemlerde karar vericinin uzmanlığı ve yargısı yani öznel ağırlık tercih edilebilir, ancak güvenilir öznel ağırlıkların elde edilmesi zor olduğunda, objektif ağırlıkların kullanılması yararlı olacaktır.

Araştırmacılar tarafından önerilen nesnel ağırlıklandırma ölçütlerinden biri Shannon entropi konseptidir. Entropi kavramı çeşitli bilimsel alanlarda kullanılmıştır. Shannon'un entropi kavramının bilgi teorisinde önemli bir rolü vardır ve genel bir belirsizlik ölçüsünü belirtmek için kullanılmaktadır (Lotfi ve Fallahnejad,2010: 54).

Karar matrisinde negatif değerlerin bulunması hesaplamayı zorlaştırmaktadır. Z-Skor standardizasyon yöntemi, maksimum ve maksimumun net olmadığı veya değer belirli bir aralığı aştığı ayrı veriler için uygulanır. Bu dönüşümün kullanıldığı geliştirilmiş entropi (improved entropy) yönteminden yararlanmak mümkündür (Xianqi, Wang, Li ve Xu, 2014;3). Z-Skor standardizasyonunda formül şu şekilde ifade edilebilir;

$$X_{ij} = \frac{(X_{ij} - \bar{X}_i)}{S_i}$$

Negatif değerlerin yanlış hesaplamalarından kaçınmak için, standart karar matrisinde her bir X_{ji} kriterin standart sapması ve ortalaması bulunarak, yukarıdaki eşitlikle koordinat dönüşüm yöntemi ile değerlerin (X_{ij}) pozitif olması sağlanır.

Entropi yöntemi ile, herhangi bir karar vericinin kişisel görüşlerine ihtiyaç duyulmaksızın, objektif olarak kriter ağırlıkları belirlendiği ve hesaplanması kolay olduğundan oldukça kullanışlıdır. Entropinin güçlü yönü karar vericilerin değerlendirmelerine ve kişisel görüşlerine ihtiyaç duymadan alternatiflere ilişkin veriler kullanılarak objektif sonuçlar sağlanması ve hesaplanmasının kolay olmasından dolayı oldukça kullanışlıdır. Bu yöntemde değeri yüksek olan veri grubunda belirsizlik daha fazla olmaktadır (Ayçin, 2019:122).

Çalışmada, kriter ağırlıklarını belirlemede kullanılan Entropi yönteminin işlem adımları ve yer alan değişkenlere ilişkin tanımlara aşağıda verilmiştir (Ayçin, 2019:122-123; Kenger ve Organ, 2017: 154-156; Tunca vd. 2016: 7-10; Bakır ve Atalık,2018 :621-623)

- i = karar alternatifi ($i = 1,2,\dots, m$)
- j = değerlendirme kriteri ($j = 1,2,\dots,n$)
- r_{ij} = normalize edilmiş değerler
- x_{ij} = j . değerlendirme kriterine göre i . alternatifinin aldığı değer
- k = entropi katsayısı
- r_{ij} = normalize edilmiş değerler
- e_j = entropi değeri
- w_j = ağırlık değeri, ($j = 1,2,\dots,n$)
- d_j = farklılaşma derecesi

Adım 1: Karar Matrisinin Oluşturulması

Entropi yönteminde de diğer çok kriterli karar verme problemlerinde olduğu gibi öncelikle X_{ij} değerlerinden oluşan ve X ile simgelenen karar matrisi Eşitlik (1)'de gösterilen şekilde oluşturulur.

$$x = \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \dots & x_{mn} \end{bmatrix} \dots\dots\dots(1)$$

Eşitlik (1) ile oluşturulan ve 19 ülkeye (alternatif) ait 12 kriterin yer aldığı karar matrisi Tablo 6'da yer almaktadır.

Tablo 6: Karar Matrisi

2018 Verileri	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂
Arnavutluk	18,24	16,99	15,01	11,08	86,00	1,20	12,96	100,82	77,65	14,77	19,93	7,78
Bosna Hersek	17,53	16,49	12,15	8,77	98,41	1,31	9,65	58,83	74,00	29,74	44,66	2,24
Bulgaristan	20,38	19,41	28,22	7,80	94,60	1,59	11,83	65,07	44,84	28,89	35,78	0,22
Hırvatistan	22,90	21,83	12,90	9,71	97,01	1,40	9,62	56,62	54,30	34,36	47,07	5,07
Kıbrıs	17,32	16,38	100,71	19,52	78,09	0,55	6,40	51,73	51,91	37,00	47,10	0,10
Çek Cumhuriyeti	18,29	17,78	11,41	3,14	90,47	1,10	17,34	64,85	47,10	15,20	29,97	1,04
Estonya	28,51	28,07	1,90	0,45	97,30	1,76	13,31	43,57	47,51	22,51	33,32	23,61
Macaristan	18,46	16,69	3,19	2,47	91,83	1,95	19,38	47,71	70,06	26,99	41,64	1,05
Kosova	16,96	15,45	1,45	2,52	94,10	2,31	18,30	78,41	48,16	28,98	40,00	3,84
Letonya	22,31	20,30	21,73	5,29	84,49	1,18	9,54	46,37	67,90	29,98	37,15	0,91
Litvanya	18,58	18,45	17,95	2,27	100,00	1,51	16,78	54,68	54,00	25,52	31,32	0,02
Malta	18,13	16,00	16,78	3,35	79,38	0,71	8,39	67,59	59,17	28,31	37,48	0,01
Karadağ	15,63	14,36	8,63	7,43	95,17	1,01	8,49	56,07	76,35	22,57	35,43	0,02
Polonya	18,34	16,31	9,42	3,85	96,07	0,71	7,55	62,84	60,19	14,37	25,16	0,13
Romanya	20,71	18,64	12,30	4,96	91,25	1,55	14,59	65,42	53,17	52,62	170,65	0,66
Sırbistan	22,30	21,10	9,70	5,70	49,10	2,20	11,30	52,70	58,40	50,50	35,70	4,30
Slovakya	18,43	16,73	6,93	3,08	93,43	1,06	10,11	72,79	59,62	26,99	35,38	0,77
Slovenya	17,95	17,63	2,71	1,84	88,03	1,44	11,32	53,21	83,69	32,28	50,99	8,40
Türkiye	17,30	13,99	5,93	3,69	97,49	1,78	16,95	67,42	41,95	47,05	64,01	1,52

Not: Estonya, Macaristan ve Malta'nın 12.kriter değerleri negatiftir. Mutlak değerleri alınmıştır. Çünkü, bu oranın sıfıra yakın olması tercih edilir. Dolayısıyla açık pozisyon döviz varlıkları ile döviz yükümlülükleri arasındaki fark olup, negatif ve pozitif her iki durum açık pozisyonu ifade etmektedir. Örneğin -1 ile +1 aynı oranda açıkpozisyonu ifade eder. Pozitifte döviz varlıkları, negatifte döviz yükümlükleri fazladır.

Adım 2: Karar Matrisinin Normalizasyonu

Karar problemlerinde yer alan farklı birimlere sahip kriterlere ilişkin değerler, normalizasyon işlemiyle (0,1) aralığında değer alacak şekilde Eşitlik (2)'den yararlanarak standart hale getirilir. Bu aşamada, her bir kriterin (A₁, A₂, ..., A₁₂) toplamı alınır, her bir kriter (Arnavutluk A₁) kriter toplamına (A₁ toplamı) bölünür, tüm kriterler için bu uygulandıktan sonra normalize edilmiş karar matrisi elde edilir.

$$r_{ij} = \frac{X_{ij}}{\sum_1 x_{ij}} \dots\dots\dots (2)$$

Eşitlik (2)'den yararlanarak elde edilen normalize edilmiş karar matrisi Tablo 7'de yer almıştır.

Tablo 7: Karar Matrisinin Normalizasyonu

2018 Verileri	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂
Arnavutluk	0,050	0,050	0,050	0,104	0,051	0,045	0,055	0,086	0,069	0,026	0,023	0,126
Bosna Hersek	0,048	0,048	0,041	0,082	0,058	0,050	0,041	0,050	0,065	0,052	0,052	0,036
Bulgaristan	0,055	0,057	0,094	0,073	0,056	0,060	0,051	0,056	0,040	0,051	0,041	0,004
Hırvatistan	0,062	0,064	0,043	0,091	0,057	0,053	0,041	0,049	0,048	0,060	0,055	0,082
Kıbrıs	0,047	0,048	0,337	0,183	0,046	0,021	0,027	0,044	0,046	0,065	0,055	0,002
Çek Cumhuriyeti	0,050	0,052	0,038	0,029	0,053	0,042	0,074	0,056	0,042	0,027	0,035	0,017
Estonya	0,077	0,082	0,006	0,004	0,057	0,067	0,057	0,037	0,042	0,040	0,039	0,383
Macaristan	0,050	0,049	0,011	0,023	0,054	0,074	0,083	0,041	0,062	0,047	0,048	0,017
Kosova	0,046	0,045	0,005	0,024	0,055	0,088	0,078	0,067	0,043	0,051	0,046	0,062
Letonya	0,061	0,059	0,073	0,049	0,050	0,045	0,041	0,040	0,060	0,053	0,043	0,015
Litvanya	0,050	0,054	0,060	0,021	0,059	0,057	0,072	0,047	0,048	0,045	0,036	0,000
Malta	0,049	0,047	0,056	0,031	0,047	0,027	0,036	0,058	0,052	0,050	0,043	0,000
Karadağ	0,042	0,042	0,029	0,069	0,056	0,038	0,036	0,048	0,068	0,040	0,041	0,000
Polonya	0,050	0,048	0,032	0,036	0,056	0,027	0,032	0,054	0,053	0,025	0,029	0,002
Romanya	0,056	0,054	0,041	0,046	0,054	0,059	0,062	0,056	0,047	0,093	0,198	0,011
Sırbistan	0,061	0,062	0,032	0,053	0,029	0,084	0,048	0,045	0,052	0,089	0,041	0,070
Slovakya	0,050	0,049	0,023	0,029	0,055	0,040	0,043	0,062	0,053	0,047	0,041	0,012
Slovenya	0,049	0,051	0,009	0,017	0,052	0,055	0,048	0,046	0,074	0,057	0,059	0,136
Türkiye	0,047	0,041	0,020	0,034	0,057	0,068	0,073	0,058	0,037	0,083	0,074	0,025

Adım 3: Kriterlere İlişkin Entropi Değerlerinin Bulunması

Bu adımda, her bir değerlendirme kriterinin entropi değerleri (e_j) Eşitlik (3) yardımıyla bulunur:

$$e_j = -k \sum_{j=1}^m r_{ij} \ln(r_{ij}) \quad (i = 1, 2, \dots, m \text{ ve } j = 1, 2, \dots, n) \dots\dots(3)$$

$k = (\ln(m))^{-1}$ olarak tanımlanan sabit bir katsayıdır ve $0 \leq e_j \leq 1$ olacak şekilde değer alır. e_j değeri, j . kriterin belirsizlik ölçüsü ya da diğer bir ifadeyle entropi değeri olarak tanımlanır. Eşitlik (3)'den yararlanarak bulunan entropi değerleri Tablo 8'de yer almıştır.

Tablo 8: Kriterlere İlişkin Entropi Değerlerinin (e_j) Bulunması

2018 Verileri	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂
Arnavutluk	-0,149	-0,149	-0,150	-0,235	-0,151	-0,141	-0,160	-0,212	-0,184	-0,095	-0,087	-0,261
Bosna Hersek	-0,145	-0,146	-0,130	-0,205	-0,165	-0,149	-0,132	-0,151	-0,179	-0,154	-0,153	-0,120
Bulgaristan	-0,160	-0,163	-0,223	-0,191	-0,161	-0,170	-0,151	-0,161	-0,128	-0,151	-0,132	-0,020
Hırvatistan	-0,173	-0,175	-0,136	-0,218	-0,163	-0,156	-0,131	-0,147	-0,146	-0,170	-0,159	-0,205
Kıbrıs	-0,144	-0,145	-0,367	-0,310	-0,141	-0,081	-0,098	-0,138	-0,142	-0,178	-0,159	-0,010
Çek Cumhuriyeti	-0,149	-0,154	-0,125	-0,104	-0,156	-0,133	-0,193	-0,161	-0,132	-0,097	-0,117	-0,069
Estonya	-0,198	-0,205	-0,032	-0,023	-0,164	-0,181	-0,163	-0,123	-0,133	-0,128	-0,126	-0,368
Macaristan	-0,150	-0,147	-0,048	-0,087	-0,158	-0,193	-0,206	-0,131	-0,172	-0,145	-0,146	-0,069
Kosova	-0,142	-0,140	-0,026	-0,088	-0,160	-0,214	-0,199	-0,181	-0,134	-0,152	-0,142	-0,173
Letonya	-0,170	-0,167	-0,191	-0,149	-0,149	-0,139	-0,131	-0,128	-0,169	-0,155	-0,135	-0,062
Litvanya	-0,151	-0,157	-0,169	-0,082	-0,167	-0,164	-0,189	-0,143	-0,145	-0,139	-0,120	-0,003
Malta	-0,148	-0,143	-0,162	-0,109	-0,143	-0,097	-0,119	-0,165	-0,154	-0,149	-0,136	-0,001
Karadağ	-0,134	-0,133	-0,102	-0,185	-0,161	-0,125	-0,120	-0,146	-0,182	-0,128	-0,131	-0,003
Polonya	-0,149	-0,145	-0,109	-0,120	-0,162	-0,098	-0,111	-0,157	-0,156	-0,093	-0,103	-0,013
Romanya	-0,162	-0,158	-0,131	-0,142	-0,157	-0,167	-0,173	-0,162	-0,144	-0,220	-0,321	-0,049
Sırbistan	-0,170	-0,172	-0,111	-0,156	-0,102	-0,207	-0,146	-0,140	-0,153	-0,215	-0,132	-0,186
Slovakya	-0,150	-0,147	-0,087	-0,102	-0,159	-0,130	-0,136	-0,173	-0,155	-0,145	-0,131	-0,055
Slovenya	-0,147	-0,153	-0,043	-0,070	-0,153	-0,159	-0,147	-0,141	-0,193	-0,163	-0,167	-0,271
Türkiye	-0,144	-0,131	-0,078	-0,116	-0,164	-0,182	-0,190	-0,165	-0,122	-0,206	-0,193	-0,091
TOPLAM	-2,934	-2,930	-2,419	-2,692	-2,935	-2,884	-2,897	-2,924	-2,925	-2,883	-2,791	-2,029
In (m)	0,3396											
e_j	0,9965	0,9953	0,8214	0,9144	0,9969	0,9796	0,9839	0,9930	0,9933	0,9790	0,9477	0,6892

Adım 4: Farklılaşma Derecelerinin (d_j) Hesaplanması

Adım 3'te hesaplanan entropi değerleri kullanılarak, farklılaşma dereceleri olan d_j değerleri her bir kriter için Eşitlik (4) yardımı ile aşağıda gösterilen şekilde hesaplanır.

$d_j = 1 - e_j \quad i = 1, 2, \dots, m \quad \text{ve} \quad j = 1, 2, \dots, n \dots\dots\dots(4)$
Eşitlik (4) yardımıyla elde edilen ve Tablo 9'da gösterilen d_j değerlerinin yüksek olması, kriterlere ilişkin alternatif skorları arasındaki uzaklığın veya farklılaşmanın fazla olduğunu göstermektedir.

Tablo 9: Farklılaşma Derecesinin (d_j) Hesaplanması

	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂
TOPLAM	-2,934	-2,930	-2,419	-2,692	-2,935	-2,884	-2,897	-2,924	-2,925	-2,883	-2,791	-2,029
In (m)	0,3396											
e_j	0,9965	0,9953	0,8214	0,9144	0,9969	0,9796	0,9839	0,9930	0,9933	0,9790	0,9477	0,6892
d_j	0,0035	0,0047	0,1786	0,0856	0,0031	0,0204	0,0161	0,0070	0,0067	0,0210	0,0523	0,3108

Adım 5: Entropi Kriter Ağırlıklarının Hesaplanması

Adım 5'te, Eşitlik (5)'ten yararlanarak, her bir kriterin farklılaşma derecesini, toplam farklılaşma derecesine oranlayarak kriterlerin ağırlık değerleri (w_j) elde edilir ($d_j=1- e_j$).

$$w_j = \frac{1 - e_j}{\sum_{i=1}^n (1 - e_j)} \dots\dots\dots(5)$$

Yukarıdaki formülde yer alan e_j değeri, kriterlere ait Entropi değerlerini gösterirken, w_j değeri kriterlerin önem düzeylerinin göstergesi olan ağırlık değerlerini ifade etmekte ve değerlerin toplamı daima 1'e eşittir (Çatı vd., 2017:204).

$$w_j + w_j + w_j + \dots + w_j = 1$$

Eşitlik (5)'den yararlanarak hesaplanan entropi kriter ağırlıkları Tablo 10'da yer almıştır.

Tablo 10: Entropi Kriter Ağırlıklarının (w_j) Hesaplanması

	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂
In (m)	0,33 96											
e_j	0,99 65	0,99 53	0,82 14	0,91 44	0,99 69	0,97 96	0,98 39	0,99 30	0,99 33	0,97 90	0,94 77	0,68 92
d_j	0,00 35	0,00 47	0,17 86	0,08 56	0,00 31	0,02 04	0,01 61	0,00 70	0,00 67	0,02 10	0,05 23	0,31 08
W_j	0,00 49	0,00 67	0,25 16	0,12 06	0,00 43	0,02 87	0,02 27	0,00 99	0,00 94	0,02 95	0,07 36	0,43 79
Ağırlık Sıralaması	11	10	2	3	12	6	7	8	9	5	4	1

EDAS Yöntemi

İlk olarak Keshavarz-Ghorabae vd. tarafından çok kriterli envanter sınıflaması problemleri için Ortalama Çözüm Uzaklığına Dayalı Değerlendirme (Evaluation Based on Distance from Average Solution-EDAS) yöntemidir. Yöntemde, alternatiflerin her bir kriterine göre ortalama çözüm (average solution – V_j) uzaklıkları hesaplanarak en iyi alternatif bulunmaktadır. Ancak EDAS yönteminde en iyi ve en kötü değerlerin hesaplanmasına gerek yoktur. Kabul edilebilirliğine dair iki ölçü bulunmaktadır. Bunlardan birincisi, ortalamadan pozitif uzaklık (positive distance from average - PDA_{ij}) ve ikincisi ortalamadan negatif uzaklık (negative distance from average- NDA_{ij})'tır. Alternatiflerin değerlendirilmesi, daha yüksek PDA değerlerine ve daha düşük NDA değerlerine göre yapılmakta, daha yüksek PDA değerleri ve / veya daha düşük NDA değerleri, çözümün (alternatif) ortalama çözümden daha iyi olduğunu göstermektedir (Keshavarz-Ghorabae vd.,2015:438-439). Yöntemi geliştirenler, EDAS yöntemini diğer çok kriterli karar verme yöntemleri ile karşılaştırmışlar, geçerliliğini test etmişler ve birçok problemin çözümünde başarılı olarak uygulandığını görmüşlerdir (Özbek ve Engür, 2019:8).

EDAS yönteminin uygulama adımları aşağıda gösterilmiştir. (Çakır, 2018:1913-1914; Özarı ve Kandemir, 2019:467-470; Ulutaş, 2018:172-177)

Adım 1: Karar matrisinin oluşturulması:

Karar matrisi Entropi Adım 1’de yer alan Tablo 6 ile aynıdır.

Adım 2: Tüm kriterlere göre ortalama çözüm (AV_j) belirlenir: Bütün kriterlerin (A_1, A_2, \dots, A_{12}) değerlerinin ortalaması alınarak ortalama değer matrisi oluşturulur. Karar matrisinde (Tablo 5) her bir kriterin ortalamasını oluşturan ortalama değerler (AV_j) aşağıda yer alan Tablo 11’de verilmiştir.

Tablo 11: Ortalama Değerler (AV_j)

	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂
ORTALA	19,3	18,0	15,7	5,62	89,5	1,38	12,3	61,4	59,4	29,9	45,4	3,24
MA	82	32	37	7	91	5	05	06	71	27	08	7

Adım 3: Ortalamadan pozitif uzaklık matrisi (PDA) ve ortalamadan negatif uzaklık matrisi (NDA)’nin oluşturulması: $PDA = [PDA_{ij}] m \times n$ ve $NDA = [NDA_{ij}] m \times n$ matrislerinin boyutları karar matrisinin boyutu ile aynıdır. Her bir kriter için hesaplanır. Kriterlerin fayda esaslı (Mak) ya da maliyet esaslı (Min) olmasına göre bu değerlerin hesaplanması değişiklik gösterir.

Eğer kriter fayda esaslı ise aşağıdaki Eşitlik (6) uygulanır.

$$PDA_{ij} = \frac{\max(0, (Y_{ij} - AV_j))}{AV_j} \quad NDA_{ij} = \frac{\max(0, (AV_j - Y_{ij}))}{AV_j} \quad \dots\dots\dots(6)$$

Eğer kriter maliyet esaslı ise aşağıdaki Eşitlik (7) uygulanır.

$$PDA_{ij} = \frac{\max(0, (AV_j - Y_{ij}))}{AV_j} \quad NDA_{ij} = \frac{\max(0, (Y_{ij} - AV_j))}{AV_j} \quad \dots\dots\dots(7)$$

Eşitliklerde gösterilen PDA_{ij} ve NDA_{ij} sırasıyla i . alternatifin j . kriterdeki ortalama çözüme olan pozitif ve negatif uzaklıkları göstermektedir. Tablo 12’de 2018 yılı için Eşitlik (6) yardımı ile elde edilen ortalamadan pozitif uzaklık matrisi (PDA) ve her bir kriterin entropi yöntemi ile tespit edilen ağırlıkları (w_j) ile çarpılması sonucu bulunan değerlerin toplanması ile elde edilen SP_i değerleri yer almaktadır.

Tablo 12: Ortalamadan Pozitif Uzaklık Matrisi (PDA) ve Ağırlıklı SP_i Değerinin Bulunması

	MAK	MAK	MIN	MIN	MAK	MAK	MAK	MAK	MAK	MIN	MAK	MAK	
	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂	SP_i
Arnavutluk	0,0000	0,0000	0,0116	0,0000	0,0000	0,0000	0,0012	0,0063	0,0000	0,0000	0,0000	0,0000	0,0192
Bosna Hersek	0,0000	0,0000	0,0574	0,0000	0,0004	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,1358	0,1936
Bulgaristan	0,0003	0,0005	0,0000	0,0000	0,0002	0,0042	0,0000	0,0006	0,0023	0,0000	0,0000	0,4082	0,4164
Hırvatistan	0,0009	0,0014	0,0454	0,0000	0,0004	0,0003	0,0000	0,0000	0,0008	0,0044	0,0027	0,0000	0,0562
Kıbrıs	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0012	0,0070	0,0027	0,4244	0,4353
Çek Cumhuriyeti	0,0000	0,0000	0,0692	0,0533	0,0000	0,0000	0,0093	0,0006	0,0020	0,0000	0,0000	0,2976	0,4320
Estonya	0,0023	0,0037	0,2212	0,1109	0,0004	0,0077	0,0018	0,0000	0,0019	0,0000	0,0000	0,0000	0,3499
Macaristan	0,0000	0,0000	0,2007	0,0678	0,0001	0,0116	0,0131	0,0000	0,0000	0,0000	0,0000	0,2963	0,5895
Kosova	0,0000	0,0000	0,2285	0,0665	0,0002	0,0192	0,0111	0,0027	0,0018	0,0000	0,0000	0,0000	0,3300
Letonya	0,0007	0,0008	0,0000	0,0073	0,0000	0,0000	0,0000	0,0000	0,0000	0,0001	0,0000	0,3152	0,3241
Litvanya	0,0000	0,0002	0,0000	0,0720	0,0005	0,0026	0,0083	0,0000	0,0009	0,0000	0,0000	0,4352	0,5195
Malta	0,0000	0,0000	0,0000	0,0488	0,0000	0,0000	0,0000	0,0010	0,0000	0,0000	0,0000	0,4366	0,4864
Karadağ	0,0000	0,0000	0,1137	0,0000	0,0003	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,4352	0,5492
Polonya	0,0000	0,0000	0,1010	0,0381	0,0003	0,0000	0,0000	0,0002	0,0000	0,0000	0,0000	0,4204	0,5600
Romanya	0,0003	0,0002	0,0550	0,0144	0,0001	0,0035	0,0042	0,0006	0,0010	0,0224	0,2031	0,3489	0,6537
Sırbistan	0,0007	0,0011	0,0965	0,0000	0,0000	0,0169	0,0000	0,0000	0,0002	0,0203	0,0000	0,0000	0,1358
Slovakya	0,0000	0,0000	0,1409	0,0546	0,0002	0,0000	0,0000	0,0018	0,0000	0,0000	0,0000	0,3341	0,5316
Slovenya	0,0000	0,0000	0,2083	0,0812	0,0000	0,0011	0,0000	0,0000	0,0000	0,0023	0,0090	0,0000	0,3019
Türkiye	0,0000	0,0000	0,1568	0,0416	0,0004	0,0082	0,0086	0,0010	0,0028	0,0169	0,0302	0,2329	0,4993

Tablo 13'te 2018 yılı için Eşitlik (7) yardımı ile elde edilen ortalamadan negatif uzaklık matrisi (NDA) ve her bir kriterin entropi yöntemi ile tespit edilen ağırlıkları (w_j) ile çarpılması sonucu bulunan değerlerin toplanması ile elde edilen SN_i değerleri yer almaktadır.

Tablo 13: Ortalamadan Negatif Uzaklık Matrisi (NDA) ve Ağırlıklı SN_i Değerinin Bulunması

	MAK	MAK	MIN	MIN	MAK	MAK	MAK	MAK	MAK	MIN	MAK	MAK	
	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂	SN_i
Arnavutluk	0,0003	0,0004	0,0000	0,1170	0,0002	0,0039	0,0000	0,0000	0,0029	0,0150	0,0413	0,6114	0,7923
Bosna Hersek	0,0005	0,0006	0,0000	0,0674	0,0000	0,0015	0,0049	0,0004	0,0023	0,0002	0,0012	0,0000	0,0790
Bulgaristan	0,0000	0,0000	0,1995	0,0466	0,0000	0,0000	0,0009	0,0000	0,0000	0,0010	0,0156	0,0000	0,2637
Hırvatistan	0,0000	0,0000	0,0000	0,0875	0,0000	0,0000	0,0050	0,0008	0,0000	0,0000	0,0000	0,2459	0,3391
Kıbrıs	0,0005	0,0006	1,3588	0,2978	0,0006	0,0173	0,0109	0,0016	0,0000	0,0000	0,0000	0,0000	1,6880
Çek Cumhuriyeti	0,0003	0,0001	0,0000	0,0000	0,0000	0,0060	0,0000	0,0000	0,0000	0,0145	0,0250	0,0000	0,0459
Estonya	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0029	0,0000	0,0073	0,0196	2,7464	2,7762
Macaristan	0,0002	0,0005	0,0000	0,0000	0,0000	0,0000	0,0000	0,0022	0,0017	0,0029	0,0061	0,0000	0,0136
Kosova	0,0006	0,0010	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0009	0,0088	0,0800	0,0913
Letonya	0,0000	0,0000	0,0958	0,0000	0,0002	0,0042	0,0051	0,0024	0,0013	0,0000	0,0134	0,0000	0,1225
Litvanya	0,0002	0,0000	0,0354	0,0000	0,0000	0,0000	0,0000	0,0011	0,0000	0,0043	0,0228	0,0000	0,0639
Malta	0,0003	0,0008	0,0167	0,0000	0,0005	0,0140	0,0072	0,0000	0,0000	0,0016	0,0129	0,0000	0,0540
Karadağ	0,0010	0,0014	0,0000	0,0386	0,0000	0,0077	0,0070	0,0009	0,0027	0,0073	0,0162	0,0000	0,0827
Polonya	0,0003	0,0006	0,0000	0,0000	0,0000	0,0140	0,0088	0,0000	0,0001	0,0154	0,0328	0,0000	0,0719
Romanya	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Sırbistan	0,0000	0,0000	0,0000	0,0016	0,0019	0,0000	0,0019	0,0014	0,0000	0,0000	0,0157	0,1420	0,1646
Slovakya	0,0002	0,0005	0,0000	0,0000	0,0000	0,0067	0,0041	0,0000	0,0000	0,0029	0,0163	0,0000	0,0306
Slovenya	0,0004	0,0001	0,0000	0,0000	0,0001	0,0000	0,0018	0,0013	0,0038	0,0000	0,0000	0,6950	0,7026
Türkiye	0,0005	0,0015	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0020

Adım 4: Bütün alternatiflerin SP_i ve SN_i değerleri hesaplanır. SP_i , i . alternatifin ağırlıklı toplam pozitif değerini ve SN_i ise i . alternatifin ağırlıklı toplam negatif değeri olarak tanımlanır ve aşağıdaki gibi hesaplanır. Adım 4 kapsamında ve Eşitlik (6) ile hesaplanan SP_i değerleri Tablo 12'de ve Eşitlik (7) ile hesaplanan SN_i değerleri Tablo 13'te, Eşitlik (8) yardımı ile kriter ağırlıkları (w_j) ile çarpılarak tablolarda yer almıştır.

$$SP_i = \sum_{j=1}^m w_j \times PDA_{ij} , \quad SN_i = \sum_{j=1}^m w_j \times NDA_{ij} , \quad \dots\dots\dots(8)$$

Adım 5: Bu adımda 4. adımda tüm alternatifler için hesaplanan SP_i ve SN_i değerleri aşağıdaki Eşitlik (9) ile normalize edilir.

$$NSP_i = \frac{SP_i}{\max_i (SP_i)} , \quad NSN_i = \frac{SN_i}{\max_i (SN_i)} \quad \dots\dots\dots(9)$$

Bir başka ifade ile NSP_i ve NSN_i değerleri sırasıyla i . alternatifin normalize edilmiş ağırlıklı toplam pozitif ve negatif değerlerini gösterir. (Adım 5 kapsamında hesaplanan NSP_i ve NSN_i değerleri Tablo 14’te yer almıştır.)

Adım 6: Bu adımda her alternatif için değerlendirme skorları (AS_i), Eşitlik (10) yardımıyla hesaplanır. Bu değer her zaman 0 ile 1 arasında değer alır ve en büyük AS_i değerine sahip alternatif en iyi alternatif olarak belirlenir.

$$AS_i = \frac{1}{2} \times (NSP_i + NSN_i) \quad \dots\dots\dots(10)$$

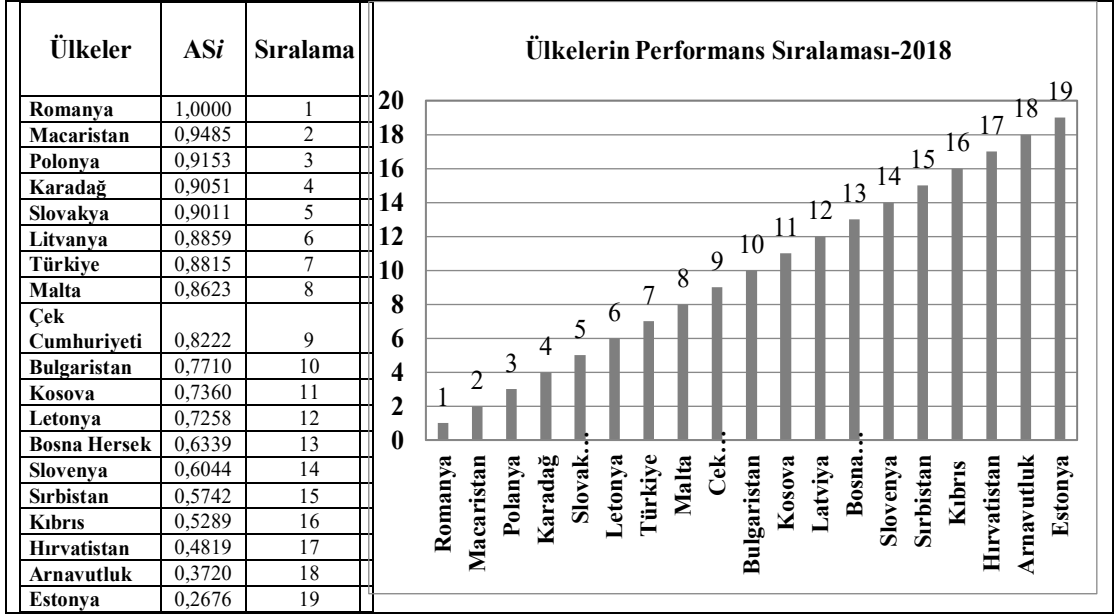
Tablo 14: NSP_i , NSN_i ve AS_i Değerlendirme Skorları ve Sıralama

	SP_i	SN_i	NSP_i	NSN_i	AS_i	SIRALAMA
Arnavutluk	0,0192	0,7923	0,0294	0,7146	0,3720	18
Bosna Hersek	0,1936	0,0790	0,2962	0,9715	0,6339	13
Bulgaristan	0,4164	0,2637	0,6369	0,9050	0,7710	10
Hırvatistan	0,0562	0,3391	0,0860	0,8779	0,4819	17
Kıbrıs	0,4353	1,6880	0,6659	0,3920	0,5289	16
Çek Cumhuriyeti	0,4320	0,0459	0,6608	0,9835	0,8222	9
Estonya	0,3499	2,7762	0,5353	0,0000	0,2676	19
Macaristan	0,5895	0,0136	0,9018	0,9951	0,9485	2
Kosova	0,3300	0,0913	0,5048	0,9671	0,7360	11
Letonya	0,3241	0,1225	0,4957	0,9559	0,7258	12
Litvanya	0,5195	0,0639	0,7947	0,9770	0,8859	6
Malta	0,4864	0,0540	0,7440	0,9806	0,8623	8
Karadağ	0,5492	0,0827	0,8400	0,9702	0,9051	4
Polonya	0,5600	0,0719	0,8566	0,9741	0,9153	3
Romanya	0,6537	0,0000	1,0000	1,0000	1,0000	1
Sırbistan	0,1358	0,1646	0,2077	0,9407	0,5742	15
Slovakya	0,5316	0,0306	0,8132	0,9890	0,9011	5
Slovenya	0,3019	0,7026	0,4618	0,7469	0,6044	14
Türkiye	0,4993	0,0020	0,7638	0,9993	0,8815	7
MAKSİMUM	0,6537	2,7762				

ARAŞTIRMA BULGULARI

Şekil 1’de ülkelerin AS_i değerlerine göre sıralaması yer almaktadır. 12 Temel Finansal Sağlık göstergesine dayanarak, seçilen ülkelerin 2018 yılı verilerinin EDAS yöntemi ile yapılan performans sıralamasına göre; Romanya’da faaliyet gösteren mevduat kabul eden kuruluşlar (bankalar) performans sıralamasında 1.sırada yer almış, Türkiye 7.sırada, 19. ve son sırada ise Estonya yer almıştır.

Şekil 1: Ülkelerin Performans Sıralaması 2018



Tablo 15’te, ülkelerin performans sıralamasında dikkate alınan 12 temel finansal sağlamlık göstergelerinin (kriterler), her birindeki sıralaması yer almaktadır. Romanya’nın 3 kriterde ilk 5’te, 9 kriterde ilk 10’da yer aldığı ve 19 Ülke arasında en fazla 12. Sıraya kadar düştüğü görülmektedir. Türkiye’nin ise 8 kriterde ilk 5’te, 9 kriterde ilk 10’da yer aldığı, A₁ ve A₂ kriterlerinde de sırasıyla 17. ve 19. Sırada yer aldığı görülmektedir. Türkiye’nin sıralamasında etkili olan A₁₂ kriteri olup, bu kriterin ağırlığı %43’tür ve Türkiye bu kriterde 12.sırada yer almıştır.

İlk 10 içerisinde yer alan ülkelere, 8 ülke halen AB’ye üyesi ülkeler olup, 4.sıraya yer alan Kosova ile 7. sırada yer alan Türkiye aday ülke konumundadır. Diğer aday ülkeler Arnavutluk 18. ve Sırbistan 15. Sırada yer almıştır. Potansiyel aday ülkeler Bosna Hersek 13. ve Kosova da 11. sırada yer almıştır.

Sıralama ile ülkelerin kriterlerdeki sıralaması arasındaki korelasyon incelendiğinde, sıralama ile A_{12} kriteri arasındaki korelasyon %64 çıkmış olup, en yüksek korelasyon bu kriterde olmuştur.

Tablo 15: Ülkelerin 12 Göstergedeki (Kriter) Performans Sıralaması

Ağırlık Sırası	Sıralama	11	10	2	3	12	6	7	8	9	5	4	1
Ağırlık (w)		0,0049	0,0067	0,2516	0,1206	0,0043	0,0287	0,0227	0,0099	0,0094	0,0295	0,0736	0,4379
Fayda / Maliyet		MAK	MAK	MIN	MIN	MAK	MAK	MAK	MAK	MIN	MAK	MAK	MIN
Kriter		A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	A_{10}	A_{11}	A_{12}
Arnavutluk	18	12	10	14	18	15	12	8	1	18	18	19	17
Bosna Hersek	13	15	13	11	16	2	11	13	10	16	8	6	13
Bulgaristan	10	6	5	18	15	8	6	9	7	2	10	11	6
Hırvatistan	17	2	2	13	17	5	10	14	11	9	5	5	16
Kıbrıs	16	16	14	19	19	18	19	19	16	6	4	4	4
Çek Cumhuriyeti	9	11	8	10	7	13	14	3	8	3	17	17	10
Estonya	19	1	1	2	1	4	5	7	19	4	16	15	19
Macaristan	2	8	12	4	4	11	3	1	17	15	13	7	11
Kosova	11	18	17	1	5	9	1	2	2	5	9	8	14
Letonya	12	3	4	17	12	16	13	15	18	14	7	10	9
Litvanya	6	7	7	16	3	1	8	5	13	8	14	16	2
Malta	8	13	16	15	8	17	18	17	4	11	11	9	1
Karadağ	4	19	18	7	14	7	16	16	12	17	15	13	2
Polonya	3	10	15	8	10	6	17	18	9	13	19	18	5
Romanya	2	5	6	12	11	12	7	6	6	7	1	1	7
Sırbistan	15	4	3	9	13	19	2	11	15	10	2	12	15
Slovakya	5	9	11	6	6	10	15	12	3	12	12	14	8
Slovenya	14	14	9	3	2	14	9	10	14	19	6	3	18
Türkiye	7	17	19	5	9	3	4	4	5	1	3	2	12

SONUÇ VE ÖNERİLER

Alternatiflerin değerlendirilmesinde kriterlerin ağırlıkları uzmanlarca ve karar vericiler tarafından sübjektif olarak belirlenebilmekte olup, bu çalışmada ise kullanılan kriterlerin ağırlıkları Entropi Yöntemi kullanılarak belirlenmiştir. Entropi yönteminin güçlü yönü karar vericilerin değerlendirmelerine gerek duymadan alternatiflere ilişkin veriler kullanılarak objektif sonuçlar sağlamasıdır. Daha sonra karar

matrisi ve belirlenen ağırlıklar, EDAS Yöntemi kullanılarak ülkelerin performans sıralamaları tespit edilmiştir.

Çalışma sonuçlarına göre Romanya'nın 3 kriterde ilk 5'te, 9 kriterde ilk 10'da yer aldığı ve 19 ülke arasında en fazla 12. sıraya kadar düştüğü görülmektedir. Türkiye'nin ise 8 kriterde ilk 5'te, 9 kriterde ilk 10'da yer aldığı, A₁ ve A₂ kriterlerinde de sırasıyla 17. ve 19. sırada yer aldığı görülmektedir. Türkiye'nin sıralamasında etkili olan A₁₂ kriteri olup, bu kriterin ağırlığı %43'tür ve Türkiye bu kriterde 12.sırada yer almıştır.

İlk 10 içerisinde yer alan ülkelere, 8 ülke halen AB'ye üyesi ülkeler olup, 4.sırada yer alan Kosova ile 7. sırada yer alan Türkiye aday ülke konumundadır. Diğer aday ülkeler Arnavutluk 18. ve Sırbistan 15. sırada yer almıştır. Potansiyel aday ülkeler Bosna Hersek 13. ve Kosova da 11. sırada yer almıştır.

Türkiye'nin bu karşılaştırma ve sıralamalar dikkate alındığında, mevduat kabul eden kuruluşlara ilişkin 12 temel finansal gösterge açısından performans sıralaması, birçok Avrupa Birliği'ne üye, aday ve potansiyel aday ülkelere göre iyi düzeyde bulunmuştur. Ancak, farklı bir yıl verilerinin dikkate alınması ve/veya subjektif olarak uzman görüşü ile ağırlık belirlenmesi durumunda farklı sıralamalar oluşabileceğini de belirtmek gerekir.

Finansal Sağlık Göstergelerine göre sıralamanın yapıldığı bu çalışmada, Türkiye'nin bankacılık sektörünün daha üst sıralarda yer alabilmesi için Yabancı Para Net Açık Pozisyon / Sermaye (A₁₂) kriterinde, Sermaye Yeterliliği (A₁ ve A₂) ve Takipteki Alacaklar / Toplam Krediler (A₄) kriterinde öncelikle iyileşme sağlaması, ayrıca diğer kriterlerdeki konumunu da koruması gerekmektedir.

2020 yılındaki gelişmeler, Korona virüsünün ülke ekonomileri ve finansal kesim üzerindeki negatif etkileri, bankacılık sektöründe kredi kullandırım imkânlarının arttırılması, sorunlu kredilerin zaten yüksek düzeyde bulunması, tüm ülkelerin verilerinde paralel olarak olumsuz gelişmeler olabileceği dikkate alınarak sektörün sağlamlığının korunmasına yönelik önlemler alınmalı ve yakından izlenmelidir. Çünkü reel sektördeki negatif

gelişmelerin iyileştirilmesi, Merkez Bankası politikalarının ve hükümetlerin alacakları kararların etkin bir şekilde uygulanabilmesi için sağlam bir bankacılık sistemi gerekli ve önemlidir.

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Türkiye’de Para Talebi Fonksiyonu ve Faiz Oranının Simetrik Etkisi

Mortaza OJAGHLOU¹

ÖZ

Merkez bankalarının belirledikleri hedeflere ulaşabilmeleri için etkin bir para politikasına sahip olmaları gerekmektedir. Etkin bir para politikasına sahip olmak için de istikrarlı ve öngörülebilir bir para talep fonksiyonu gerekmektedir. Bu bağlamda, bu çalışmanın amacı doğrultusunda, 2005Q04-2019Q03 üç aylık verilerini kullanarak Türkiye’de faiz oranının para talebi fonksiyonuna olan asimetrik etkisi araştırılmıştır. Bu çalışmada (Greenwood-Nimmo, Shin, and Treeck 2010) ve (Shin, Yu, and Greenwood-Nimmo 2013) tarafından geliştirilen Çoğaltıcı Doğrusal Olmayan ve NLARDL sınır testi (Nonlinear Autoregressive Distributed Lag Bound Test) yöntemi kullanılmıştır. Sonuçlara göre uzun dönemdeki gelir, faiz^{pos} oranı doğrusal ve pozitif yönde etkiler bırakırken faiz^{neg} oranı ve döviz kuru negatif yönde etkilemiştir. Ayrıca, tahmin edilen model bulguları etkin bir para politikası için istikrarlı para talebi fonksiyonunun gerekliliğini savunan monetarist yaklaşımı desteklemektedir ve Türkiye’de para talebinin istikrarlı olduğunu onaylamaktadır. İstikrarlı bir para talebi, merkez bankasının para politikasını kontrol ederek reel ekonomiyi etkileyebileceğini göstermektedir.

Anahtar Kelimeler: *Para Talebi Fonksiyonu, Doğrusal Olmayan Otoresif Dağıtılmış Gecikme Yaklaşımı (NARDL), Faiz Oranı*

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Doi Num: 10.17932/IAU.FCPE.2015.010/fcpe_v06i1006

Asymmetrical Effects Of Interest Rates On The Money Demand Function In Turkey

ABSTRACT

Central banks need to have an effective monetary policy in order to achieve their goals. For having an effective monetary policy, a stable and predictable money demand function is required. In this context, purpose of this study is determined stability of money demand function and asymmetric effect of interest rates on the money demand function in Turkey over the period 2005Q04-2019Q03. For this goal we used non-linear autoregressive distributed lag approach (NARDL) developed by (Greenwood-Nimmo, Shin, and Treeck 2010) and (Shin, Yu, and Greenwood-Nimmo 2013). According to the results, the effect of interest rate^{pos} and income on long run money supply are positive. While interest rate^{neg} and exchange rate effect negatively. In addition, according the results money demand function in Turkey is stable and our finding and estimated function is consistent with monetarist approach which believes for having an effective monetary policy, a stable money demand function is required.

Keywords: *Money Demand Function, Non-Linear Autoregressive Distributed Lag Approach (NARDL), Interest Rate*

GİRİŞ

Faiz oranında meydana gelen değişiklikler piyasa temelli ekonominin önemli bir özelliğidir. Ulusal ve uluslararası meydana gelen herhangi bir ekonomik değişiklik faiz oranının değişimine sebebiyet verecektir (Gambacorta 2008a), (Chong, Liu, and Shrestha 2006). Bu bağlamda para talebi fonksiyonu tahmini, makroekonomik literatürde büyük önem taşımaktadır. Para politikasının başarısı para talebi fonksiyonu özellikleri ve istikrarına bağlıdır ve para talebi fonksiyonu para politikasının reel ve finans sektörü üzerinde nasıl etki bıraktığını açıklar (Poole 1970). Friedman (1966) çalışmasında faiz oranının, para talebi fonksiyonu ve para politikası üzerindeki önem ve etkisini incelemiştir. Parasalcı (Chicago) okulu para yaklaşımlarından sonra, para politikası ekonomide en önemli konulardan biri haline gelmiştir. Bu okula göre para politikası, gelir, enflasyon ve istihdam gibi reel ekonomi değişkenlerini etkileyen en etkili

araçtır. Chicago okuluna göre etkin ve güçlü para politikası için istikrarlı ve öngörülebilir para talebinin mevcut olması gerekmektedir (Driscoll and Ford 1980).

Teorik çerçevede, bazı faktörler faiz oranının ayarlanmasında önemli rol oynamaktadır. Bu faktörler para politikası yönelimi, serbest veya kontrollü ekonomik rejimi, finansal yapı, kalkınma düzeyi, bankacılık sektörü yoğunlaşması, banka büyüklüğü, finansal piyasanın açıklık derecesi, asimetrik bilgi ve diğer faktörlerin yanı sıra menü maliyetleri vb. olarak sayılabilir (Gambacorta 2008b).

Para talebi teorisi genellikle Klasik para talebi ve Modern para talebi teorileri üzerine kuruludur (Stern 2006).

KLASİK PARA TALEBİ TEORİLERİ

Klasik Miktar Teorisi; Klasik Miktar teorisi para talebi 19. ve 20. yüzyılın başlarında klasik iktisatçılar tarafından geliştirildi. Paranın miktar teorisi, toplam gelirin nominal değerinin nasıl belirlendiğine dair bir teoridir. Ancak klasik miktar teorisinin en önemli özelliği faiz oranlarının para talebi üzerinde bir etkisi olmamasıdır (Mishkin 2004).

Miktar teorisi $M.V = P.T$; olarak tanımlanmıştır. M nominal para arzı, V; işlem hızı ve P; fiyat seviyesi, T; işlem seviyesidir. Fisher (1911) kısa vadede T ve V'nin sabit olmasını destekler. Böylece para arzındaki bir artış, fiyat seviyesini de arttıracaktır. Döviz denklemi, işlemlerin seviyesi ile orantılıdır.

Cambridge Miktar Teorisi: miktarı teorisinin Cambridge yaklaşımı, Cambridge'deki Marshal (1920) ve Pigou (1917) gibi ekonomistler tarafından geliştirilmiştir. Laidler (1993)'a göre Fisher'in miktar teorisi ile Cambridge yaklaşımı arasındaki temel farklar, para talebinin farklı belirleyicileri olan bireysel davranışlardır. Cambridge yaklaşımında, insanlar için para tutmanın, belirli faktörlere, düşüncelere, kişisel servete, diğer varlıkların getirisine veya geleceğe ilişkin beklentilerine bağlı olarak bireyin para tutmayla elde ettiği faydaya bağlıdır.

Keynesyen Para Talebi Teorisi: Keynes (1936)’e göre Keynesyen para politikası ve aktarım mekanizması, faiz üzerinden dolaylı işlemektedir. Bu yüzden Keynesyen aktarım mekanizması dolaylı aktarım mekanizması olarak literatürde yer almaktadır. Bu yaklaşımda para politikası faiz oranlarına tesir ederek yatırım oranını etkilemektedir. Para talebi fonksiyonu likidite tuzağı yani faiz esnekliği sonsuz olduğu ve yatırımların faiz esnekliği sıfır olduğu durumda Keynesyen aktarım mekanizması işlevsiz hale dönüşecektir. Bu durumda faiz politikası reel ekonomiye etki etmeyecek ve reel etkiler doğurmayacaktır.

MODERN MİKTAR TEORİSİ

Milton Friedman (1956), “Paranın Miktar Teorisi: Yeniden Düzenleme” makalesinde klasik miktar teorisini tekrardan ele alarak modern para talebi teorisi geliştirmiştir. Friedman teorisinde Irving Fisher ve miktar teorisini ele almıştır. Ancak Friedman’ın para talebi analizi daha çok Keynes’in analizine benzemektedir. (Mishkin 2004).

Friedman para talebi şu şekilde yazılabilir:

$$M_d / P = f(Y_p, r_b - r_m, r_e - r_m, \pi_e - r_m)$$

M_d / P : reel para dengesi talebi,

Y_p : sürekli gelir,

r_m : Beklenen para getirisi,

r_b : Beklenen tahvil getirisi,

r_e : Beklenen öz kaynak getirisi

π_e : Beklenen enflasyon oranı

LİTERATÜR TARAMASI

Son yıllarda gerek ulusal gerekse uluslararası literatür incelendiğinde para talep fonksiyon tahminine yönelik çalışmalar daha fazla ilgi görmüştür. Bu çalışmalar genellikle VECM ve eşbütünleşik analizi ile analiz edilmiştir. Tablo 1’de gelişmekte olan ülkelerde para talebi ile ilgili literatürün kısa bir incelemesi bulunmaktadır;

Tablo 1: Literatür Özeti

Araştırmacı (lar)	Ülke	Metod
(Akinkunmi 2004)	Gelişmekte Olan Ülkeler	ARDL
(Komijani ve Nazarian 2004)	İran	Cointegration ve ECM
(Shahrestani ve Sharifi-Renani 2007)	İran	ARDL
(Akinlo 2006)	Nijerya	ARDL
(Tanku 2005)	Gelişmekte Olan Ülkeler (20 Adet)	ARDL
(Bahmani-Oskooee ve Rehman 2005)	Bazı Asya Ülkeleri	ARDL
(Al-Badi 2002)	Suudi Arabistan	ARDL & Granger-Causality
(Alsahafi 2009)	Suudi Arabistan	Cointegration ve ECM
(Liao 2005)	Kanada	Cointegration ve ECM
(Bahmani-Oskooee 1996)	İran	ECM
(Dritsakis 2012)	Yunanistan	Cointegration (JJ TEST)
(Halicioglu and Ugur 2005)	Türkiye	ARDL
(Akinkunmi 2004)	Gelişmekte Olan Ülkeler	ARDL

MODEL, VERİ SETİ VE YÖNTEM

Türkiye için para talebinin belirlenmesi ve faiz oranının bu fonksiyon üzerinde asimetrik etkisini analiz etmek üzere daha önce (Bahmani-Oskooee 2001), (Akinlo 2006) ve (Dritsakis 2012) tarafından kullanılmış olup model çalışmada aşağıdaki gibi ele alınmıştır:

$$Lm_2/p = (IGSYIH, faiz, Lkur)$$

Çalışma amacına ilişkin 1. modelle ilgili NARDL modeli:

$$Lm_2/p = (faiz^{POS}, faiz^{NEG}, LGSYIH, LEx)$$

Lm_2 ; m_2 Para Arzının Logaritması,

P: enflasyon oranı

Lm_2/p : Reel para arzı

Faiz: Kısa Dönem Faiz Oranı,

LGSYİH: GSYİH’nin logaritması,

LEx: Dolar/TL Nominal Döviz Kuru Logaritması,

Türkiye para talebi tahmin fonksiyonu için ele alınan model 1’de kullanılan seriler 2005Q4- 2019Q4 yıllarına ilişkin çeyrek veriler Türkiye Cumhuriyet Merkez Bankası’nın elektronik veri dağıtım sisteminin (EVDS)’den alınmıştır.

Birim Kök Testi

Literatürde çeşitli durağanlık testlerin arasında en çok ve yaygın olan test Genişletilmiş Dickey-Fuller (Augmented Dickey Fuller: ADF) ve Phillips-Pron: PP testidir.

Tablo 2: Birim Kök Testi Sonuçları

Değişken	ADF		PP	
	Sabitli	Sabitli ve Trendli	Sabitli	Sabitli ve Trendli
P	-1.57*	-1.83	-3.75***	-3.43**
GSYİH	-0.56	-2.01	-0.59	-2.01
Δ GSYİH	-6.4***	-6.42***	-6.50***	-6.44***
M2	5.28	1.61	10.00	2.64
ΔM2	-3.41**	-10.46***	-7.92***	-10.47***
Faiz	-5.3***	-3.32*	-4.83***	-3.16*
EX	5.452	3.123	6.98	2.61
ΔEX	-6.08**	-5.39***	-6.09***	-6.90***

***, ** ve * sırasıyla %99, %95 ve %90 güvenlik aralığını göstermektedir.

Bu testler sonucunda Tablo 2’de görüldüğü üzere serilerin tamamının I(0), I(1) seviyesinde durağan olması sebebiyle NARDL asimetrik testi yapılması yönünde hiç bir engel teşkil etmemektedir. NARDL yöntemi serilerin I (0) ve I (1) kombinasyonlarının aynı denklem içerisinde kullanılmasına izin verir. Bu nedenle, faiz oranının para arzı üzerinde asimetrik etkisini para talep fonksiyonu çerçevesinde NARDL modelini kullanarak analiz edeceğiz.

[(Greenwood-Nimmo, Shin, and Treck 2010)] ve (Shin, Yu, and Greenwood-Nimmo 2011) tarafından geliştirilen ve simetrik uzun ve kısa dönemli doğrusal olmayan ilişkiyi ve asimetrik hata düzeltmeyi birleştiren NARDL modeli ile yapılandırılmış kısmi toplam ayrışma aşağıdaki gibi sunulmaktadır:

$$y_t = \beta^+ x_t^+ + \beta^- x_t^- + u_t$$

x_t : $k \times 1$ temsil eden vektör ve $x_t = x_0 + x_t^+ + x_t^-$

ve terimler x ’deki pozitif terimler x ’deki pozitif ve negatif serilere ayrılmış değişkenlerdir;

$$x_t^+ = \sum_{j=1}^t \Delta x_j^+ = \sum_{j=1}^t \max(\Delta x_j, 0), x_t^- = \sum_{j=1}^t \Delta x_j^- = \sum_{j=1}^t \min(\Delta x_j, 0)$$

Modelle ilgili hata düzeltme terimi ise:

$$\Delta y_t = \rho y_{t-1} + \theta^+ x_{t-1}^+ + \theta^- x_{t-1}^- + \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=0}^q (\pi_j^+ \Delta x_{t-j}^+ + \pi_j^- \Delta x_{t-j}^-) + \varepsilon_t,$$

Ve Sıfır hipotez: $\rho = \theta \text{ pos} = \theta \text{ neg} = 0$

Sistemin uzun dönem asimetrik ve kümülatif dinamik çarpanlarına bağlı steady state ise

$$m_h^+ = \sum_{j=0}^h \frac{\partial y_{t+j}}{\partial x_t^+}$$

$$m_h^- = \sum_{j=0}^h \frac{\partial y_{t+j}}{\partial x_t^-} \quad h = 0, 1, 2, \dots$$

Model K da ilgili NARDL modeli ise

Bizim çalışmamızla ilgili olarak Asimetrik ARDL (NLARDL) aşağıdaki gibi yazılmaktadır:

$$\begin{aligned} \Delta IM_{dt} = & \\ = & \alpha_0 + \sum_{q=1}^{p1} \alpha_{1q} \Delta IM_{Si,t-q} + \sum_{q=0}^{p2} \alpha_{2q} \Delta i_{i,t-q}^{pos} + \sum_{q=0}^{p3} \alpha_{3q} \Delta i_{i,t-q}^{neg} + \sum_{q=0}^{p4} \alpha_{4q} \Delta GDP_{i,t-q} + \sum_{q=0}^{p5} \alpha_{5q} \Delta EX_{i,t-q} + \\ & \sum_{q=0}^{p5} \alpha_{6q} \Delta P_{i,t-q} + \beta_1 IM_{Si,t-1} + \beta_2 GDP_{i,t-1} + \beta_3 EX_{i,t-1} + \beta_4 P_{i,t-1} + \beta_5 i_{i,t-1}^{pos} + \beta_6 i_{i,t-1}^{neg} + \varepsilon_t \end{aligned}$$

Söz konusu denklemin tahmin sonuçları aşağıdaki tabloda özetlenmiştir.

Tablo 3: Para Talebine Direkt Kısa ve Uzun Dönem Etkisi

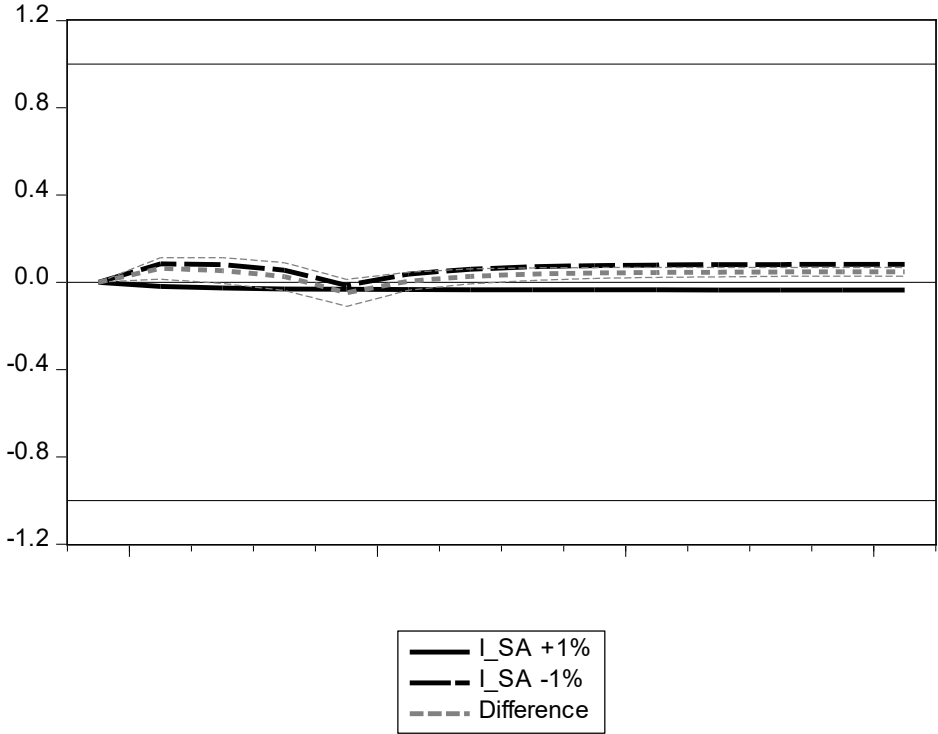
Değişkenler	NLARDL Model (3,0,0,0)	
	Uzun Dönem Katsayıları	Değişkenler ile M_d arasında kısa dönem ilişki (f-stat)
C	14.11***	--
i^{pos}	0.022	4.07** (kısa dönem ilişki mevcuttur)
i^{neg}	-0.059***	0.75 (kısa dönem ilişki yoktur)
LGSYİH	2.6*10-11*	11.58 (kısa dönem ilişki mevcuttur)
LEX	-0.26**	23.04*** (kısa dönem ilişki mevcuttur)
F-Bounds	5.52***	--
EC_{t-1}	-0.83***	--
Breusch- godfrey- Serial Correlation LM	F=1.44 (0.24)	--

***, ** ve * sırasıyla %1, %5 ve %10 anlamlılık düzeylerini ifade etmektedir.

Tablo 3’te özetlenen uzun ve kısa dönemli NARDL tahminleri bilgileri ışığında reel para talebi ile reel gelir, faiz ve döviz kuru değişkenleri arasında uzun ve kısa dönemli eşbütünleşme ilişkisinin mevcut olduğunu

göstermektedir. Elde edilen bulgulara göre (i^{pos} katsayısı hariç) katsayılar istatistiksel olarak anlamlıdır. Katsayı işaretleri ve etkileşim yönleri açısından döviz kuru katsayısı teorik beklentilerle uyum sağlamaz iken diğer katsayılarla uyum sağlamaktadır. Ancak faiz oranının çarpan (multiplier) NARDL etkisine baktığımızda i^{pos} reel para arzı üzerinde daha çok negatif iken i^{neg} etkisi daha çok pozitif olmuştur ancak i^{pos} - i^{neg} etkisi genelde pozitif olduğunu görmekteyiz.

Grafik 1: Faiz Oranının Para Talebi Fonksiyon Üzerinde Simetrik ve Multiplier Etkisi



Breusch- Godfrey- Serial Correlation LM test sonucuna göre modeller herhangi bir otokorelasyon içermemektedir. Ayrıca modeller CUSUM ve CUSUMSQ test sonuçlarına göre ele alınan modellerin istikrarlı olduğu tespit edilmiştir.

SONUÇ

Ekonomi, okullara göre faiz oranı para talebi üzerinde etkili olan en önemli faktörlerden birisidir. Bu çalışmada literatürde önemli çalışmalar baz alınarak M2 para arzı, GSYİH, döviz kuru, faiz oranı ve yıllık enflasyon oranını ele alınarak Türkiye için para talep fonksiyonu tahmin edilerek NARDL modeli kullanılmış ve faiz oranının para talebi üzerindeki simetrik etkisi analiz edilmiştir. Bu araştırmada 2005Q4-2019Q3 dönemini kapsayan Türkiye için para talebi fonksiyonu, faiz ile etkileşimini çeyrek veriler kullanılarak belirlenmeye çalışılmıştır. M₂ para arzı enflasyon oranına bölünerek reel para arzı elde edilmiş, para talebi fonksiyonu NARDL metodu çerçevesinde modellenmiş ve ele alınan değişkinler arasında uzun ve kısa dönemli eşbütünleşik ilişki tespit edilmiştir. Çalışmanın sonucunda elde edilen ampirik bulgulara göre uzun dönemki gelir, faiz^{pos} oranını doğrusal ve pozitif yönde etkilemişken faiz^{neg} oranı ve döviz kurunu negatif yönde etkilemiştir. Bu bulgular, etkin para politikası için istikrarlı para talebi fonksiyonu gerektiğini savunan monetarist yaklaşımı desteklemektedir. Türkiye’de para talebinin istikrarlı olduğunu söylenebilir. İstikrarlı bir para talebi, merkez bankasının para politikasını kontrol ederek reel ekonomiyi etkileyebileceğini göstermektedir.

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