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OPENING SPEECHES | SESSION 1.1. | ROOM 1

09.00-09.10	Prof. Suat Teker, Welcome Speech by the Congress President
09.10-09.40	Keynote Speaker I - Prof. M. Kabir Hassan University of New Orleans The Crossroads of Environmental, Social and Governance (ESG) Scores and Religious Screening on Firm Risk
09.40-10.10	Keynote Speaker II - Prof. Oner Guncavdi Istanbul Technical University Evaluating the Impacts of the COVID-19 Pandemic on Unemployment, Income Distribution & Poverty in Turkey

PARALEL SESSIONS

10.30 - 14.30	SESSION 2.1 ROOM 1	SESSION 2.2 ROOM 2
10.30 - 10.50	THE EFFECT OF THE BANKING SECTOR PERFORMANCE ON THE ECONOMIC GROWTH: EVIDENCE FROM THE WEST AFRICAN ECONOMIC AND MONETARY UNION Adalessossi Kokou	IMPROVE PRODUCTIVITY IN A BEARING INDUSTRY USING VALUE STREAM COSTING Mahmoud Al-Odeh
10.50 - 11.10	NONLINEAR IMPACT OF CREDITS ON CURRENT ACCOUNT BALANCE: THE CASE OF TURKEY Dincer Dedeoglu	MILITARY SPENDING AND GROWTH: THE POST-COVID-19 NEW NORMAL IN JORDAN Ahmad Tarawneh, Mohammad Khataybeh, Ghassan Omet
11.10 - 11.30	SYSTEMIC RISK OF TUNISIAN FINANCIAL SYSTEM: MEASURING AND PREDICTING FUTURE UNEMPLOYMENT RATE Dorsaf Azouz Ghachem, Aymen Khamessi	PROFITABILITY DETERMINANTS OF NEPALESE COMMERCIAL BANKS Bishnu Prasad Neupane
12.10 - 12.30	PUBLIC FINANCE IN JORDAN: A LESSON FROM COVID-19 Muhanned Obeidat, Mohammad Khataybeh, Ghassan Omet	CURRENT MACHINE LEARNING APPLICATIONS IN ACCOUNTING AND AUDITING Derya Ucoglu
12.30 - 12.50	THE INTERACTION BETWEEN CORPORATE GOVERNANCE AND FINANCIAL PERFORMANCE: AN IMPLEMENTATION FOR UK BANKS Ibrahim Almusattar, Dilek Teker	ANALYSIS OF THE EFFECTS OF EFFICIENT INFORMATION SHARING AND INVENTORY MANAGEMENT IN THE SUPPLY CHAIN MANAGEMENT ON FIRM'S PERFORMANCE Diriba Gebisa
12.50 - 13.10	A COMPARATIVE-NONPARAMETRIC ANALYSIS ON CRYPTO CURRENCY EXCHANGE RATE RETURNS Neslihan Fidan Kececi	THE COVID 19 EFFECTS ON MACROECONOMIC INDICATORS Asena Elvan Deniz, Dilek Teker
13.10 - 13.30	THE ROLE OF FINANCIAL DEVELOPMENT, HUMAN CAPITAL AND GROWTH ON ENVIRONMENTAL SUSTAINABILITY: AN EMPIRICAL ANALYSIS OF CAMEROON Aboubakary Nulambheh Ndzebanteh	THE EFFECT OF CORPORATE GOVERNANCE ON FINANCIAL REPORTING QUALITY OF NON-FINANCIAL FIRMS LISTED IN AMMAN STOCK EXCHANGE Mohammad Alahmad, Dilek Teker
13.30 - 13.50	THE NEXUS BETWEEN OIL PRICES AND AIRLINES STOCK RETURNS IN BORSA ISTANBUL DURING THE COVID-19 PANDEMIC Caner Ozdurak	THE NON-LINEAR RELATIONSHIP BETWEEN VOLATILITY AND SOVEREIGN CREDIT RISK: EVIDENCE FROM EMERGING COUNTRIES Fatih Yigit, Fuzuli Aliyev
13.50 - 14.10	THE NEW TREND IN DIGITAL ASSET MANAGEMENT: ROBO-ADVISORS Ciydem Catak	SOFTWARE DEVELOPERS' PERCEPTION OF PROJECT SUCCESS Nilüfer Alan Anac, Murat Onuk
14.10 - 14.30	ECONOMIC EVALUATION OF TRANSPORTATION PROJECTS BASED ON DIFFERENT FINANCING METHODS: AT THE FRAMEWORK OF FINANCIAL COMPUTABLE GENERAL EQUILIBRIUM MODEL Metin Piskin	REVISITING DISCOUNTED CASH FLOWS MODEL AS A CAPITAL BUDGETING DECISION TOOL Suat Teker
14.30 - 14.50	ANALYSIS OF THE RELATIONSHIP BETWEEN THE ANNOUNCEMENTS OF DIVIDEND PAYOUT DECISIONS OF FOOTBALL CLUBS AND THE RETURNS OF SHARES USING THE EVENT ANALYSIS METHOD Mustaf Kevser, Mesut Dogan	THE IMPORTANCE OF TIMING OF INTERNATIONALIZATION FOR MULTINATIONAL ENTERPRISES Fulya Tasel
15.00 - 17.20	SESSION 3.1 ROOM 1	SESSION 3.2 ROOM 2
15.00 - 15.20	ÇIKTI AÇIĞI, ENFLASYON VE PARA ARZI ARASINDAKİ İLİŞKİNİN MODELLENMESİ: FIVAR VE VARFI MODEL KARŞILAŞTIRMASI Aysu Yasar	SWAP İŞLEMLERİ VE KÂRLILIK İLİŞKİSİ: TÜRK BANKACILIK SEKTÖRÜ ÜZERİNE AMPİRİK BİR ARAŞTIRMA Besir Alakusu, Ayben Koy
15.20 - 15.40	MAKİNE ÖĞRENMESİ VE EKONOMİ: BIBLYOMETRİK ANALİZ Ebru Çağlayan Akay, Tuba Yılmaz Soydan, Burcu Kocarık Kacar	TÜRKİYE PİYASALARINDA PAY GETİRİSİ ANOMALİLERİ Doruk Gunaydin, Yigit Atilgan
15.40 - 16.00	ESG VERİLERİNİN FİRMALARIN FİNANSAL PERFORMANSINA ETKİSİ: HAVAYOLU SEKTÖRÜ ÜZERİNE BİR ÇALIŞMA Muhammet Emin Sisman, Serkan Cankaya	PAY PİYASALARINDA SÜRÜ DAVRANIŞININ TEST EDİLMESİ: BİST 30 ENDEKSİ ÖRNEĞİ Tuba Nur Topaloglu
16.00 - 16.20	FİNANSAL PİYASALARDA ALGORİTMA UYGULAMALARI: PYTHON PROGRAMLAMA İLE GETİRİ ANALİZİ, KIYASLAMA VE KARŞILAŞTIRMA Selahaddin Bilal Ozgur, Ayben Koy	HİSSE SENEDİ YATIRIM FONLARININ PERFORMANSININ ÇOK KRİTERLİ KARAR VERME YÖNTEMLERİ İLE DEĞERLENDİRİLMESİ Selim Baha Yıldız, Musa Ovalı, Bercim Berberoglu
16.20 - 16.40	GENEL MÜDÜR DEĞİŞİMLERİNİN FİNANSAL PERFORMANSA ETKİSİ: BİST 30 ŞİRKETLERİ ÜZERİNE BİR ÇALIŞMA Mehmet Yusuf Gungor, Ayben Koy	ENTELEKTÜEL KATMA DEĞER KATSAYISI ÜZERİNE ULUSLARARASI YAYINLAR Suleyman Sen, Volkan Demir
16.40 - 17.00	MAKİNE ÖĞRENMESİ ALGORİTMALARININ SINIFLAMA PROBLEMLERİ ÜZERİNDEN KARŞILAŞTIRILMASI: SATIŞ TAHMİNİ Gizem Dilki	SÜRDÜRÜLEBİLİR TEDARİK ZİNCİRİ YÖNETİMİNDE MALİYET ETMENLERİNİN BELİRLENMESİ VE KURUMSAL PERFORMANS ÖLÇÜMÜ Deniz Ozbay
17.00 - 17.20	DOĞRUDAN YABANCI YATIRIMLARIN TÜRKİYE EKONOMİSİ ÜZERİNDEKİ ETKİLERİNİN İNCELENMESİ: 2005-2020 DÖNEMİ Fatih Kiliç, Dilek Teker	FİNANSAL İÇERME DÜZEYİ VE BELİRLİYİCİLERİ ÜZERİNE AMPİRİK BİR ARAŞTIRMA: TÜRKİYE ÖRNEĞİ Abdul Musawer Rahimyar, Suna Akten Çuruk
17.20 - 17.40	BİR FİNANSAL İSTİKRAR ARACI OLARAK REZERV OPSİYON MEKANİZMASININ ETKİNLİĞİNİN ANALİZİ Zahide Ayyıldız Onaran, Sina Derin Tuncay	TÜRK TİCARET KANUNU HÜKÜMLERİNE GÖRE ANONİM ŞİRKETLERDE YÖNETİM KURULU ÜYELERİNİN GENEL HUKUKİ SORUMLULUĞU Seniha Dal
17.40 - 18.00	ŞİRKETLERDE KREDİ RİSKİ YÖNETİMİ SÜRECİNİN KURGULANMASI Selda Eke, Ozlem Toprak	ANALYSIS OF THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL AND FIRM PERFORMANCE: AN EMPIRICAL RESEARCH ON BORSA ISTANBUL Mesut Doğan, Mustafa Kevser
18.00 - 18.20	PANDEMİNİN KARGO SEKTÖRÜ ÜZERİNDEKİ EKONOMİK ETKİSİ Salih Kayıkcıoğlu, Dilek Teker	



CONTENT

Title and Author/s	Page
1. Current machine learning applications in accounting and auditing <i>Derya Ucoglu</i> 1-7 DOI: 10.17261/Pressacademia.2020.1337 PAP-IFC- V.12-2020(1)-p.1-7	
2. The Covid-19 effect on macroeconomic indicators <i>E.Asena Deniz, Dilek Teker</i> 8-10 DOI: 10.17261/Pressacademia.2020.1338 PAP-IFC- V.12-2020(2)-p.8-10	
3. Modeling the relation among output-gap, inflation and money supply: comparison of FIVAR and VARFI model <i>Çikti büyüklüğü, enflasyon ve para arzı arasındaki ilişkinin modellenmesi: FIVAR ve VARFI model karşılaştırması</i> <i>Aysu Yasar, M.Kenan Terzioğlu</i> 11-15 DOI: 10.17261/Pressacademia.2020.1339 PAP-IFC- V.12-2020(3)-p.11-15	
4. Cost management and corporate performance measurement in sustainable supply chain <i>Sürdürülebilir tedarik zincirinde maliyet yönetimi ve kurumsal performans ölçümü</i> <i>Deniz Ozbay</i> 16-20 DOI: 10.17261/Pressacademia.2020.1340 PAP-IFC- V.12-2020(4)-p.16-20	
5. Analysis of the relationship between intellectual capital and firm performance: an empirical research on Borsa Istanbul <i>Mesut Dogan, Mustafa Kevser</i> 21-26 DOI: 10.17261/Pressacademia.2020.1341 PAP-IFC- V.12-2020(5)-p.21-26	
6. The impact of foreign direct investments on Turkish economy <i>Doğrudan yabancı yatırımların Türkiye ekonomisi üzerindeki etkisinin incelenmesi</i> <i>Fatih Kilic, Dilek Teker</i> 27-30 DOI: 10.17261/Pressacademia.2020.1342 PAP-IFC- V.12-2020(6)-p.27-30	
7. Analysis of the relationship between the announcements of dividend payout decisions of football clubs and the returns of shares using the event analysis method <i>Mustafa Kevser, Mesut Dogan</i> 31-34 DOI: 10.17261/Pressacademia.2020.1343 PAP-IFC- V.12-2020(7)-p.31-34	
8. A comparative nonparametric analysis on crypto currency exchange rate returns <i>Kriptopara döviz kuru getirileri üzerine karşılaştırmalı nonparametrik bir analiz</i> <i>Neslihan Fidan Kececi</i> 35-39 DOI: 10.17261/Pressacademia.2020.1344 PAP-IFC- V.12-2020(8)-p.35-39	



9. Profitability determinants of Nepalese commercial banks	
<i>Bishnu Prasad Neupane</i>	40-45
DOI: 10.17261/Pressacademia.2020.1345	
PAP-IFC- V.12-2020(9)-p.40-45	
10. Public finance in Jordan: a lesson from Covid-19	
<i>Muhanned Obeidat, Ahmad Tarawneh, Mohammad Khataybeh, Ghassan Omet</i>	46-49
DOI: 10.17261/Pressacademia.2020.1346	
PAP-IFC- V.12-2020(10)-p.46-49	
11. Testing for herding behavior in stock market: BIST30 index example	
<i>Pay piyasalarında sürü davranışının test edilmesi: BIST 30 endeksi örneği</i>	
<i>Tugba Nur Topaloglu</i>	50-54
DOI: 10.17261/Pressacademia.2020.1347	
PAP-IFC- V.12-2020(11)-p.50-54	
12. Military spending and growth: the post-covid-19 new normal in Jordan	
<i>Ahmad Tarawneh, Muhanned Obeidat, Mohammad Khataybeh, Ghassan Omet</i>	55-59
DOI: 10.17261/Pressacademia.2020.1348	
PAP-IFC- V.12-2020(12)-p.55-59	
13. Revisiting discounted cash flows model as a capital budgeting decision tool	
<i>Suat Teker</i>	60-63
DOI: 10.17261/Pressacademia.2020.1349	
PAP-IFC- V.12-2020(13)-p.60-63	
14. The interaction between corporate governance and financial performance: an implementation for the UK banks	
<i>Ibrahim Almusattar, Dilek Teker</i>	64-69
DOI: 10.17261/Pressacademia.2020.1350	
PAP-IFC- V.12-2020(14)-p.64-69	
15. Evaluation the performance of stock funds using multi-criteria decision-making methods	
<i>Hisse senedi yatırım fonlarının performansının çok kriterli karar verme yöntemleri ile değerlendirilmesi</i>	
<i>Selim Baha Yildiz, Musa Ovalı, Bercim Berberoglu</i>	70-71
DOI: 10.17261/Pressacademia.2020.1351	
PAP-IFC- V.12-2020(15)-p.70-71	
16. Swap transactions and profitability relationship: an empirical research on the Turkish banking sector	
<i>Swap işlemler ve kârlılık ilişkisi: Türk bankacılık sektörü üzerine ampirik bir araştırma</i>	
<i>Besir Alakusu, Ayben Koy</i>	72-74
DOI: 10.17261/Pressacademia.2020.1352	
PAP-IFC- V.12-2020(16)-p.72-74	
17. The nexus between oil prices and airlines stock returns in Borsa Istanbul during the Covid-19 pandemic	
<i>Caner Ozdurak</i>	75-76
DOI: 10.17261/Pressacademia.2020.1353	
PAP-IFC- V.12-2020(17)-p.75-76	

- 18. The new trend in digital asset management: robo- advisors**
Ciydem Catak 77-78
DOI: 10.17261/Pressacademia.2020.1354
PAP-IFC- V.12-2020(18)-p.77-78
- 19. Nonlinear impact of credits on current account balance: the case of Turkey**
Dincer Dedeoglu 79-79
DOI: 10.17261/Pressacademia.2020.1355
PAP-IFC- V.12-2020(19)-p.79-79
- 20. Systemic risk of Tunisian financial system: measuring and predicting future unemployment rate**
Dorsaf Azouz Ghachem, Aymen Khamessi 80-81
DOI: 10.17261/Pressacademia.2020.1356
PAP-IFC- V.12-2020(20)-p.80-81
- 21. Comparison of machine learning algorithms over classification problems: sales forecasting**
Makine öğrenmesi algoritmalarının sınıflama problemleri üzerinden karşılaştırılması: satış tahmini
Gizem Dilki 82-83
DOI: 10.17261/Pressacademia.2020.1357
PAP-IFC- V.12-2020(21)-p.82-83
- 22. Effect of general manager changes on financial performance: a study on BIST 30 companies**
Genel müdür değişimlerinin finansal performansa etkisi: BIST 30 şirketleri üzerine bir çalışma
Mehmet Yusuf Gungor, Ayben Koy 84-86
DOI: 10.17261/Pressacademia.2020.1358
PAP-IFC- V.12-2020(22)-p.84-86
- 23. Economic evaluation of transportation projects based on different financing methods: at the framework of financial computable general equilibrium model**
Metin Piskin 87-88
DOI: 10.17261/Pressacademia.2020.1359
PAP-IFC- V.12-2020(23)-p.87-88
- 24. Improve productivity in a bearing industry using value stream costing**
Mahmoud Al-Odeh 89-89
DOI: 10.17261/Pressacademia.2020.1360
PAP-IFC- V.12-2020(24)-p.89-89
- 25. Software developers' perception of project success**
Nilufer Alan Anac, Murat Onuk 90-90
DOI: 10.17261/Pressacademia.2020.1361
PAP-IFC- V.12-2020(25)-p.90-90
- 26. Testing for herding behavior in stock market: BIST30 index example**
Pay piyasalarında sürü davranışının test edilmesi: BIST 30 endeksi örneği
Tugba Nur Topaloglu 91-91
DOI: 10.17261/Pressacademia.2020.1362
PAP-IFC- V.12-2020(26)-p.91-91



- 27. An empiric research on the level and determinants of financial inclusion: the case of Turkey**
Finansal içerme düzeyi ve belirleyicileri üzerine ampirik bir araştırma: Türkiye örneği
Abdul Musawer Rahimyar, Suna Akten Curuk 92-94
DOI: 10.17261/Pressacademia.2020.1363
PAP-IFC- V.12-2020(27)-p.92-94
- 28. Algorithm examples in financial markets: assets income analysing, benchmark and backtesting with python programmimg**
Finansal piyasalarda algoritma uygulamaları: python programlama ile getiri analizi, kıyaslama ve karşılaştırma
Selahaddin Bilal Ozgur, Ayben Koy 95-97
DOI: 10.17261/Pressacademia.2020.1364
PAP-IFC- V.12-2020(28)-p.95-97
- 29. Effect of ESG data on the financial performance of companies: a study on the airline sector**
ESG verilerinin firmaların finansal performansına etkisi: havayolu sektörü üzerine bir çalışma
Muhammet Emin Sisman, Serkan Cankaya 98-100
DOI: 10.17261/Pressacademia.2020.1365
PAP-IFC- V.12-2020(29)-p.98-100
- 30. Literature on the value added intellectual capital**
Entelektüel katma değer katsayısı üzerine uluslararası yayınlar
Suleyman Sen, Volkan Demir 101-103
DOI: 10.17261/Pressacademia.2020.1366
PAP-IFC- V.12-2020(30)-p.101-103
- 31. Machine learning and economics: bibliometric analysis**
Makine öğrenmesi ve ekonomi: bibliyometrik analiz
Ebru Caglayan Akay, N. Tuba Yilmaz Soydan, Burcu Kocarik Gacar 104-105
DOI: 10.17261/Pressacademia.2020.1367
PAP-IFC- V.12-2020(31)-p.104-105
- 32. The non-linear relationship between volatility and sovereign credit risk: evidence from emerging countries**
Fatih Yigit, Fuzuli Aliyev 106-107
DOI: 10.17261/Pressacademia.2020.1368
PAP-IFC- V.12-2020(32)-p.106-107
- 33. Equity return anomalies in Turkish markets**
Türkiye piyasalarında pay getirisi anomalileri
Yigit Atilgan, A. Doruk Gunaydin 108-109
DOI: 10.17261/Pressacademia.2020.1369
PAP-IFC- V.12-2020(33)-p.108-109
- 34. The importance of timing of internationalization for multinational enterprises**
Fulya Tasel 110-110
DOI: 10.17261/Pressacademia.2020.1370
PAP-IFC- V.12-2020(34)-p.110-110



35. General liabilities of the members of the board of directors in joint stock companies under the provisions of Turkish commercial law

Türk ticaret kanunu hükümlerine göre anonim şirketlerde yönetim kurulu üyelerinin genel hukuki sorumluluğu

Seniha Dal 111-113

DOI: 10.17261/Pressacademia.2020.1371

PAP-IFC- V.12-2020(35)-p.111-113

36. Economic effects of the pandemic on consumer behavior and cargo sector

Pandeminin tüketici davranışlarına ve kargo sektörüne ekonomik etkileri

Salih Kayıkcıoğlu, Dilek Teker 114-115

DOI: 10.17261/Pressacademia.2019.1045

PAP-IFC- V.12-2020(36)-p.114-115

CURRENT MACHINE LEARNING APPLICATIONS IN ACCOUNTING AND AUDITING

DOI: 10.17261/Pressacademia.2020.1337

PAP- V.12-2020(1)-p.1-7

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ABSTRACT

Purpose- Machine learning is an area of computer science that learns from large amounts of data, identifies patterns, and makes predictions about future events. In the accounting and auditing professions, machine learning has been increasingly used in the last few years. Therefore, this study aims to review the current machine learning applications in accounting and auditing with a concentration on Big Four companies.

Methodology- In this study, the machine learning tools and platforms developed by Big Four companies are examined by conducting a content analysis.

Findings- It has been identified that Big Four companies developed several machine learning tools that are used for consistent audit coordination and management, fully automated audits (only in certain areas, such as cash audit), data analysis, risk assessment, and extracting information from documents.

Conclusion- To benefit from the advantages, the Big Four companies are still expanding their portfolio of machine learning projects. On the other hand, the ethical problems and potential risks of security and violating privacy regulations by using machine learning applications in accounting and auditing should also be considered. This rapid transformation in the profession also creates a need for ethical and regulatory guidance and oversight for accounting and auditing companies.

Keywords: Machine learning, accounting, auditing, big four companies, artificial intelligence

JEL Codes: M40, M41, M42

1. INTRODUCTION

The technological developments such as machine learning that enable processing data fast and without any errors or bias are widely employed in many different areas. Thus, the potential for machine learning algorithms to provide accountants and auditors with enhanced data analysis is accordingly high.

Machine learning tools designed by humans can perform many tasks that can help auditors and accountants. For instance, instead of sampling data, an entity's entire ledger may be audited with automation (Shimamoto, 2018).

In this study, the advantages and disadvantages of implementing machine learning techniques were identified through a literature review and by integrating insights from previous studies. The current machine learning technologies developed by Big Four accounting companies were examined and summarized.

2. MACHINE LEARNING

2.1. Introduction to Machine Learning

Machine learning is an area of computer science which studies learning computer algorithms that use statistics for determining patterns in huge amount of data and making accurate predictions for unknown future events. Machine learning techniques have been used in many different fields, such as education, health, biology, and finance (Dogan & Birant, 2021, p.1).

In the 1930s, Thomas Ross worked on a machine that simulated a living creature's behavior, which can be considered the first study in the area. Thomas Ross and his professor Stevenson Smith developed a Robot Rat that can find the way through an artificial maze. Their study demonstrated methods to program a computer to behave like animals or human beings in the learning process (Bhavsar et al., 2017, Chapter 12, p.283). But the term "machine learning" was introduced by Arthur Samuel in 1959 and was defined as "a field of study that gives

computers the ability to learn without being explicitly programmed". In 1997, Tom M. Mitchell provided a broader definition of machine learning as being concerned with developing computer programs that can automatically improve with experience. Both definitions included the idea of computers being able to learn patterns and trends from historical data and predict the future with accuracy by enhancing their learning performance. Machine learning aims to identify the model that provides the most repeatable and accurate prediction of future data. For that purpose, algorithms are deployed to construct mathematical models based on sample data (training data). Then the accuracy of the predictive ability of models is evaluated (testing data) (Cho et al., 2020, p.1).

Machine learning involves both general and domain knowledge. General knowledge is not dependent on the data or the task and is related to the basis of machine learning such as statistics, computer science, or neural science. On the other hand, domain knowledge is about the field of data like engineering, finance, health, or chemistry. Domain knowledge has an essential role in machine learning as it helps designing better datasets (Deng et al., 2020, p.2).

Since its first introduction, machine learning techniques became very popular and are currently used by many businesses. Based on previous viewings on a website, you may be suggested a book or a show that you may like, or your bank may inform you because of a suspicious transaction that does not fit your usual spending pattern (Ahmed, 2020, pp.2022-2023). These are some examples of machine learning applications that we face very often in our daily life. Machine learning can analyze many data points related to a given set of situations to determine which ones are relevant. Then it can apply the results to another similar set of data to predict the outcomes (Shimamoto, 2018).

In the following years, similar to many other areas, accounting and auditing will go through more significant changes due to machine learning, artificial intelligence, big data usage, blockchain, and other technological developments, and will be supported more by automation. (Türegün, 2019, p.91)

2.2. Literature Review

There are many studies in the literature about how to use machine learning techniques in accounting and auditing. The purposes and results of some of the studies are summarized below.

Anandarajan & Anandarajan (1999) focused on comparing machine learning techniques for the going concern reporting of auditors. The results of the study showed that the artificial neural network model had a better predictive ability in determining the type of going concern audit report compared to expert systems and multiple discriminant analysis.

Kotsiantis et al. (2006) explored the effectiveness of machine learning techniques for identifying firms that presented fraudulent financial statements. They performed several experiments using representative learning algorithms and determined that the proposed stacking variant methodology achieved better than other methods.

Song et al. (2014) studied how to assess the financial statement fraud risk by applying machine learning methods. The experimental results obtained from implementing the back-propagation neural network, C5.0 decision tree, logistic regression, and support vector machine demonstrated that non-financial risk factors and a rule-based system provided lower error rates. Thus, they concluded that the proposed approach could decrease the financial risks of stakeholders.

In the study by Ding, Peng, and Wang (2019), K-medians clustering, a machine learning-based peer selection method, was employed to companies' key financial ratios related to specific research objectives. Based on the sample, including 598 bankruptcies and 48,536 nonbankrupt firm-year observations, the K-medians clustering technique was combined with material misstatement detection and bankruptcy prediction models. The study indicated that employing a machine learning technique contributed to enhancing the models by including information about K-medians clustering-based peer firms.

Lokanan and Tran (2019) used machine learning algorithms (a dynamic anomaly detection method) to detect any anomalies in the financial statements of Vietnamese listed firms by rating the creditworthiness of each firm's quarterly financial report. The findings showed that the model is capable of ranking quarterly financial reports in terms of creditworthiness. The implemented model also indicated that while the financial statements of most of the Vietnamese listed firms are trustworthy, about a quarter of them are highly questionable.

Lahann, Scheid & Fettke (2019) researched machine learning techniques to show how they can be utilized to minimize risks and increase VAT compliance. In the study, real-world data set of a leading company in the chemical industry was exported from the company's ERP system. The results showed that machine learning algorithms could identify anomalies that would have led to compliance violations and offered promising opportunities to integrate tax compliance requirements into IT systems.

To predict fraud, Bao et al. (2020) proposed a model that used readily available raw financial data extracted from financial statements rather than calculated financial ratios. As a powerful machine learning tool, the ensemble learning method, which combines the predictions of a set of base estimators to improve the generalization ability and robustness, was applied. The results indicated that the ensemble learning model based on the 28 raw financial data items outperformed the Dechow et al. and Cecchini et al. models which were identified as a benchmark.

3. ADVANTAGES AND DISADVANTAGES OF APPLYING MACHINE LEARNING TECHNIQUES

Based on the review of prior literature, the advantages and disadvantages of implementing machine learning techniques in accounting and auditing are summarized below:

Advantages:

- Consistency in decision-making
- Ability to process huge amounts of structured and unstructured data (ICAEW, p.6)
- Shorten the data processing cycle (IAA, 2017, p.3)
- Increased efficiency and effectiveness
- Error reduction and increased reliability of financial information (Zemankova, 2019, p.149)
- Models being continuously updated with less effort due to constant changes in fraud patterns (PwC, Machine learning: what every risk and compliance professional needs to know)

Disadvantages:

- Ethical problems
- Risk of bias and logical errors in the model design (IAA, 2017, p.3)
- Potential risks of security and violating privacy regulations (Alarcon, Fine & Ng, 2019, pp.3-4)
- Need for a complete, well-balanced, and large dataset to assure prediction accuracy (Taniguchi, Sato & Shirakawa, 2018, p.1)
- High cost of development

4. CURRENT APPLICATIONS OF MACHINE LEARNING IN ACCOUNTING AND AUDITING

Most of the accounting and auditing tasks have a mechanic and repetitive nature, making them suitable for machine learning applications. (Zemankova, 2019, p.149) Routine accounting processes such as accounts receivable and accounts payable management, preparation of expense reports, and risk assessment can easily be automated by machine learning. For instance, machine learning algorithms can match an invoice received with the related purchase order, determine the correct expense account for recognition, and place it in a payment pool where a human worker can examine and submit the payment request to the payment queue (Haq, Abatemarco & Hoops, 2020, p.8)

Because of the advantages of implementing machine learning techniques, Big Four accounting firms have made massive investments in technological innovations and developed several platforms or tools that used machine learning and artificial intelligence algorithms (Kokina & Davenport, 2017, p.116). In addition to these platforms and tools developed, there are smaller projects for accounting outsourcing services in which machine learning tools are employed for bookkeeping or tax declaration purposes.

As Big Four companies follow the latest innovations in the field of accounting and audit (Zemankova, 2019, p.151), the current applications of machine learning have been reviewed by focusing on the tools and technologies developed by Big Four:

4.1. Ernst and Young (EY)

Machine learning techniques are employed by EY to analyze and extract data from unstructured data to gain further audit evidence and to analyze large datasets for assessing material misstatement risks due to fraud. Machine learning applications increase the number of documents analyzed in addition to increased accuracy and speed.

Canvas: is the first online platform that connects audit professionals with their clients and enables consistent audit coordination and management regardless of size, location, or complexity. Canvas provides real-time monitoring of the audit and critical milestones in the audit process, quick customization of the audit approach due to the changes in the regulatory environment, and instant reporting of findings (EY, EY Canvas).

Helix: is a global analytics platform that is available to all audit teams and can handle data of any size and embed the analytical audit approach into the company's methodology. The platform analyzes journal entries, revenue and expenses, trade receivable and payable activities, inventory movements and records, assesses the riskiness of a client's mortgage portfolio, and identifies any hidden patterns, trends, and anomalies. By Helix, rather than spending their time on data collection, the auditors can focus on conducting a high-quality audit (EY, EY Helix).

Blockchain Analyzer: provides increased transparency on the blockchain transactions of clients as support to audit processes (EY, Audit Innovation).

4.2. PwC

GL.ai: is a revolutionary bot that uses machine learning algorithms to examine vast amounts of data such as uploaded transactions, the users, the amounts, and accounts in each transaction to identify potential errors or fraud without any bias. GL.ai is the first module of PwC's Audit.ai, and the other modules are being developed to enhance audit quality, efficiency, and client service (PwC, Harnessing the power of AI to transform the detection of fraud and error).

Cash.ai: is a new tool that uses artificial intelligence and machine learning techniques to conduct a fully automated cash audit by analyzing cash balances, bank reconciliations and confirmation letters, foreign exchange and financial condition of the bank (PwC, Harnessing AI to pioneer new approaches to the audit).

Halo: is a data auditing technology that analyzes huge volumes of data and provides improved risk assessment. It highlights patterns and unusual relations and specifies high-risk transactions by graphical visualizations (PwC, The PwC Audit). "Halo for Employee Expenses" detects anomalies, aligns policies to reduce costs, and provides an accurate classification of expenses for tax purposes (PwC, Halo for Employee Expenses).

4.3. Deloitte

Argus: is Deloitte's first cognitive audit application that uses advanced machine learning techniques to identify and extract key financial information from electronic documents (Davenport, 2016, p.6). With the virtual eyes of Argus, instead of sampling, data extracted from the entire population can be used to determine potential risks, anomalies, and trends (Deloitte, Delivering smarter audits - Insights through innovation, 2017, p.6).

Cortex: is a cloud-based analytics application that was initially designed for audit and tax clients but now is also being used for consulting, risk, and financial advisory services. Cortex provides centralized data storage, big data management, advanced analytics, algorithms, models, and patterns (Deloitte, CortexAI).

Omnia DNAV: is a digital solution that revolutionizes the audit of securities and investments by combining digital technologies, machine learning, data science with auditor judgment to deliver high-quality audits. Omnia DNAV transforms client data and external vendor data to establish a new way of performing valuations using intelligent algorithms (Deloitte, Press releases).

Optix: provides advanced data analysis for large journal entry datasets to identify the transactions that can attract the interest of auditors (Deloitte, Delivering smarter audits - Insights through innovation, 2017, p.4).

Signal: is a risk analytics software that examines publicly available financial information to identify potential risks so that a comprehensive risk assessment can be provided to clients (Deloitte, Delivering smarter audits - Insights through innovation, 2017, p.4). By Signal, the audit teams can identify potential risks of failure, material misstatement, and other risk factors (Deloitte Signal, Empowers more informed risk assessment, 2018, p.1).

Reveal: is a tool to test account balances and identify relationships for providing predictive modeling that can help auditors identify particular areas of audit interest (Deloitte, Delivering smarter audits - Insights through innovation, 2017, p.4).

Sonar: is a tool that helps to check quickly and accurately the information entered by humans, such as a client database containing product description, the VAT rate for each product, commodity code, the barcode, and any other necessary information and identifies labeling errors in databases (Deloitte, 16 Artificial Intelligence projects from Deloitte - Practical cases of applied AI, 2018, pp.14-15).

GRAPA (Guided Risk Assessment Personal Assistant): works as an assistant for determining a risk strategy based on the pooled expertise of all auditors. By GRAPA, it is possible to mark out the chosen risk strategy by an auditor against all other strategies that have been used in previous audits (Deloitte, 16 Artificial Intelligence projects from Deloitte - Practical cases of applied AI, 2018, pp.18-19).

HR Agent Edgy: is a cognitive chatbot that can interact with employees and potential candidates. Besides, Edgy can resolve employee queries, assist employees with submitting expense claims, record the sickness reports of employees, or match candidates to a current vacant position (Deloitte, 16 Artificial Intelligence projects from Deloitte - Practical cases of applied AI, 2018, pp.24-25).

DocQMiner: is a machine learning application specifically developed for contract analysis. Concerning the provisions of IFRS 16, all lease contracts should be listed on the balance sheet. By DocQMiner, it is possible to extract the relevant information (i.e., the start date of the contract) from those contracts (Deloitte, 16 Artificial Intelligence projects from Deloitte - Practical cases of applied AI, 2018, p.31).

Eagle Eye: is a tool designed to search the internet for identifying whether a company is likely to encounter financial distress soon. Traditional monitoring systems review financial statements, credit transfers, or bank accounts. On the other hand, Eagle Eye looks for early warning signals by collecting vast volumes of data, analyzing and correlating them, and recognizing specific patterns before the financial statement-based distress indicators are observed (Deloitte, 16 Artificial Intelligence projects from Deloitte - Practical cases of applied AI, 2018, p.32).

BrainSpace: is a self-learning tool used to assist in legal cases. BrainSpace uses machine learning and cluster analysis to search through unstructured data to identify what can be used as evidence for supporting the client's defense. It also provides visually appealing formats for presenting the relevant data (Deloitte, 16 Artificial Intelligence projects from Deloitte - Practical cases of applied AI, 2018, p.38).

4.4. KPMG

Clara: is a smart audit platform that adopts the latest machine learning and artificial intelligence solutions to analyze data, provide meaningful patterns, and identify risks and anomalies (KPMG, KPMG Clara).

The following table summarizes some of the tools and platforms developed by Big Four companies based on their initial application area.

Table 1: Platforms/Tools Developed by Big Four Accounting Companies

	EY	PwC	Deloitte	KPMG
Tax & Legal			Sonar	
Audit	Canvas	GL.ai	Argus	Clara
	Helix	Cash.ai	Optix	
	Blockchain Analyzer	Halo	Signal	
			Cortex	
			Reveal	
			Omnia DNAV	
Consulting			GRAPA	
Risk Advisory			HR Agent Edgy	
			DocQMiner	
Financial Advisory			Eagle Eye	
			BrainSpace	

The Digital Accountancy Forum & Awards is a prestigious event organized by International Accounting Bulletin since 2012. Deloitte and PwC won the last six awards for the "Audit Innovation of the Year" at the Digital Accountancy Forum & Awards, which shows the interest of Big Four companies in technological innovations.

Table 2: The Digital Accountancy Forum & Awards of International Accounting Bulletin - Audit Innovation of the Year

Year	Award Winner	Innovation
2015	Deloitte	Argus
2016	PwC	Halo
2017	PwC	GL.ai
2018	Deloitte	Cortex
2019	PwC	Cash.ai
2020	Deloitte	Omnia DNAV

<http://www.internationalaccountingbulletin.com/events-archive>

As examined, it seems that Big Four accounting companies have already developed several platforms or tools concerning machine learning algorithms and have integrated them into their audit and consultancy processes. Due to heavy competition and the advantages of implementing such technologies, it appears that these companies will employ more automation in the following years (Faggella, 2020).

5. CONCLUSION

The new technologies, such as machine learning, gave rise to different ways of accomplishing tasks, which also affected the accountancy and auditing professions. Despite the drawbacks, implementing machine learning tools has many advantages, such as increased efficiency and effectiveness by faster data analysis, high-quality audit, error reduction, early identification of risks, and creating a competitive advantage. Therefore, the Big Four companies have developed various tools and are still expanding their portfolio of machine learning projects.

There are projections that 30% of corporate audits will be performed by machine learning and artificial intelligence platforms by 2025. This rapid transformation in the profession also creates a need for ethical governance in terms of implementation. Additionally, regulatory guidance and oversight are also required concerning machine learning and artificial intelligence tools used in the processes by accounting and auditing companies (Munoko, Brown-Liburd & Vasarhelyi, 2020, p.2).

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THE COVID 19 EFFECT ON MACROECONOMIC INDICATORS

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ABSTRACT

Purpose- From the moment covid 19 started to spread in the world, its effects began to be seen simultaneously in financial markets and economy. The purpose of this study is to observe Covid 19 effect on EURO/USD, gold, oil and wheat prices.

Methodology- The database includes the Daily prices of EUR/USD, wheat, gold, brent oil prices and COVID 19 numbers between the period of 31.12.2019-04.09.2020 which consist of 180 daily data. Natural logarithm for each indicator is used. First, the stationarity of the series were analyzed with ADF (Augmented Dickey Fuller) unit root test. Lag lengths are determined. Interactions between the series were analyzed by the ARDL, Impulse- Response Function and Variance Decomposition method.

Findings- The series are found out to not to be stationary as a result of Unit root test. After, the lag length criteria using VAR models were checked and this lag length criteria for them were determined as one. According to the ARDL test result, cointegration could not be found between our data. Impulse response graphs indicate that all variables respond in a reducing way to reducing shocks occurred in each indicator. Shocks have lost their effect on average in 2 days.

Conclusion- The results indicate that the effect of COVID 19 on EUR/USD, gold, brent oil and wheat prices do not have a strong effect. The results may be beneficial for only literature.

Keywords: Covid-19, pandemic, ARDL test, stationary test, impulse-response function, variance decomposition

JEL Codes: G10, G15, I10

1. INTRODUCTION

COVID-19, which started in China at the end of 2019 and spread all over the world, was defined as a global epidemic by the World Health Organization (WHO). The global epidemic was thought to threaten human life and the health system. A virus known as the corona was enough to change the entire balance of the world. The coronavirus pandemic has caused numerous deaths globally. This epidemic causes serious damage to the economic life as well as its deadly effects on public health. The pandemic is straining the health systems and economies of the most developed countries. The precautions taken due to the epidemic especially affected the economies of developing countries. Almost all of the sectors has been affected economically by COVID 19. It has adversely affected the welfare of individuals and society with the loss of income it caused. The COVID-19 outbreak seriously affects worldwide economic activities. It is expected that the epidemic will spread very rapidly all over the world, leading to a significant economic crisis in the global economy. In this study, the relationship between the COVID 19 numbers and gold, brent oil, EUR/USD and wheat daily closing prices in the financial market is analyzed using the VAR model. ARDL tests are conducted to evaluate the relationships between the criteria. As a result of the study, the most noticeable effect Covid 19's is on wheat prices

2. LITERATURE REVIEW

The COVID-19 outbreak is likely to cause bankruptcy for many well-known brands in many industries as consumers stay at home and economies are shut down (Tucker, 2020). The outbreak of the novel coronavirus Covid-19 pandemic, which is accepted as the third serious coronavirus outbreak in less than 20 years (Yang et al., 2020), COVID-19 has severely affected the real economy, with a negative impact on trade, tourism, and transport industry, generating local food shortages (Albulescu, 2020). Ramelli and Wagner and Schoenfeld (2020) explore the impacts of Covid-19 on American firms. Takahashi and Kazuo (2020) perform another firm-based analysis with Japanese firms. Al-Awadhi et al., (2020) analyze the effects of the coronavirus disease on Chinese stock market firms. Baldwin and Tomiura (2020) analyze the trade effect of the pandemic for most hard-hit countries (China, Korea, Italy, Japan, US, and Germany) McKibbin and Fernando (2020) analyze the effects of COVID-19 on macroeconomic variables and financial markets using a CGE model for 20 countries including

Turkey. They found a significant impact of the outbreak in the short run under seven different scenarios. Zeren and Hizarcı (2020) examine the effects of the outbreak on financial markets of five countries (China, South Korea, Germany, Italy and Spain) using Makki co-integration test with a daily data. They found a cointegration between COVID-19 and SSE, KOSPI and IBEX35 markets, but no co-integration with FTSE, MIB, CAC40, DAX30. Recent studies indicate that the risk level of all countries increased dramatically in March when COVID-19 spread to more than 200 destinations (Gormsen and Koijen, 2020; Zhanget al., 2020). By late March, however, governments and central banks have adopted a wide range of economic policies (Elgin et al., 2020; Nicola et al., 2020; Carlsson-Szlezak et al., 2020; among others) in order to slow down the impact of the lockdown and the sparking fear caused by the pandemic. In the US, famous companies such as Sears, J.C Penney, Neiman Marcus, Hertz, and J. Crew are under enormous financial pressure. The travel industry is deeply affected; 80% of hotel rooms are empty (Asmelash & Cooper, 2020).

3. DATA AND METHODOLOGY

The study was carried out with daily data of Covid 19 numbers and EUR/USD, gold, Brent oil and wheat prices between the periods December 31, 2019 to September 04, 2020 that consist 180 data. Natural logarithms of all series were used in the analysis. These data are obtained from www.investing.com, www.nasdaq.com/market-activity/commodities/zw/historical, and ourworldindata.org/coronavirus-data. In this study, the stationarity of the series were analyzed with ADF (Augmented Dickey Fuller) unit root tests. Interactions between the series were analyzed by the ARDL Bounds Test, Impulse-Response Function and Variance Decomposition methods based on the VAR (Vector Autoregressive) method. The fact that the series used in the analysis are not stationary leads to misleading results. For this reason, the stationarity of the series should be examined first and the predictions should be made on the series that are stationary. Unit Root Tests is basically checking whether the series is stationary or not. The hypotheses for unit root tests areas:

H_0 : Series are not stationary.

H_1 : Series are stationary.

The unit root test is a common procedure to determine whether a financial variable follows a random walk. If the existence of a unit root for a series cannot be rejected, then the series is said to follow a random walk. In 1981, Dickey and Fuller developed this test and reorganized it as an ADF test. In the study, the stationary level of the series was tested with ADF Test. Table 1 indicates the outputs of ADF unit root tests.

Table 1: Unit Root Test Results

Variable	ADF Test Statistics	Mac-Kinnon Critical Values			Level	Probability
		1%	5%	10%		
Covid19	-5,449,695	-3,469,451	-2,878,618	-2,575,954	1st Dif.	0,0000
Eurusd	-1,368,147	-3,467,205	-2,877,636	-2,575,430	Level	0,0000
Gold	-1,404,901	-3,467,205	-2,877,636	-2,575,430	Level	0,0000
Oil	-1,071,903	-3,467,205	-2,877,636	-2,575,430	Level	0,0000
Wheat	-1,555,659	-3,467,205	-2,877,636	-2,575,430	Level	0,0000

The ability of variables to affect each other and to act is created by the vector autoregressive (VAR) model in econometrics. The basic assumption of the model is that there is no need to distinguish between internal and external variables. With the VAR model, the reliability of causality tests is increased and the problems other than the problems caused by the choice of variables are greatly reduced. There are many criteria used in the literature to determine the lag length criteria. Criteria that have been evaluated in this study are as follows: Akaike's information criterion (AIC), Schwarz information criterion (SIC), Hannan-Quinn criterion (HQC), Final prediction error (FPE). The methods specified according to the assumptions of the model created and the sample size can give different lag length criteria. The outputs for the lag length criteria figures out the length as one periods.

The ARDL test developed by Pesaran, Shin and Smith, which can be used in samples with limited number of observations and enables variables to be analyzed without the need for integration as in the Johansen-Juselius and Engle-Granger cointegration tests, is an effective method to predict short and long term relationships. With this method, a variable at the level of variables, at the first level or at the level of a variable can be included in the analysis as a constant at the first level. ARDL method can be performed without the need for any unit root test. ARDL approach can test the existence of cointegration relationship between series with different degrees of stationarity. If the calculated F statistic is greater than the upper limit, there is a cointegration. If the calculated F statistic is between the upper and the lower limit, it is considered indefinite so that there is no cointegration. If the calculated F statistic is less than the lower limit, there is no cointegration.

Impulse-response functions are obtained after the appropriate lag lengths are found in the VAR system. Impact-response functions reveal the effects of shocks on variables and at what time, with the help of tables or graphics. With this process, it is understood in which variable the shocks occur and how the variables react to these shocks. The columns express the variables in which shocks occur, while the rows show the responses of the variables to these shocks. (Tari, 2010). Looking at all charts, the effects of each on itself are more volatile than other data. Covid 19's effect on itself shows a decreasing slope. However, contrary to what is expected of covid 19, the impact response graph on

wheat is remarkable. Covid 19 has a negative effect on wheat for the first 2 months. The effect of shock is significant and as a statistically meaningful over 2 months for all variables.

Variance decomposition investigates what percentage of the change in a variable is caused by itself and what percentage is caused by other variables. If it explains a value close to one hundred percent of the change in variance, it is considered as an exogenous variable. It is very important to order the variables in this analysis. Sorting is done from external to internal. Variance decomposition is the second function targeted in VAR. In Covid 19, wheat appears to be the variable with the highest power to explain the change in time. While close to 92 % of the shock from Covid 19 was self-explanatory in the second period, during the period, 90% of the shock itself is explained by 0.5% of EUR/USD, 0.03% of Gold, 1.7% of Brent oil and 7.5% of Wheat. While close to 100% of the shock from EUR/USD was self-explanatory in the first period, during the period, 99% of the shock itself is explained by 0.5% of Brent oil, 0.2% of wheat, 0.09% gold and 0.1% of Covid 19. While close to 100% of the shock from Gold was self-explanatory in the first period, during the period, 97.6 % of the shock itself is explained by 1.3% of Brent oil, 0.01% of wheat, 0.69% EUR/USD and 0.4% of Covid 19. While 95% of a shock coming to Oil is announced from the first period, 92.5% of the shock above Oil is explained by itself and 3.24% of Covid 19, 2.93% of it is from EUR/USD, 1.32% of Wheat and 0.003% of gold in the last period. Looking at the table of wheat variance decomposition, 98% of it was explained by itself in the first period, and as the period progressed, the ability to be explained by Covid 19 consistently increased.

4. CONCLUSION

Based on the findings from this study, it can be understood that there was no significant interaction between Covid 19, EUR/USD, Bitcoin, Gold, Brent Oil and Wheat. The series were examined by ADF and PP unit root tests and all series were observed to be stationary. Since VAR analysis can be done using stationary series; the data set is modeled. After the lag lengths were determined as 1st degree, the ARDL test was performed. Interactions between the series were analyzed also by the Impulse-Response Function. Shocks have lost their effect on average in 2 months. Next Variance Decomposition method is based on the VAR (Vector Autoregressive) method. Based on the findings from this study, it can be understood that there was no significant interaction between Covid-19 numbers and the closing prices of EUR/USD, Gold, Oil, Wheat. The result may be beneficial for only literature. The results may change when applied with other macroeconomic values.

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MODELING THE RELATION AMONG OUTPUT-GAP, INFLATION AND MONEY SUPPLY: COMPARISON OF FIVAR AND VARFI MODEL

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ABSTRACT

Purpose- It is aimed to reveal the interaction of the output-gap, inflation and money supply variables within 1987: Q2 and 2020:Q2 periods for Turkey.

Methodology- The model structure between variables are determined in the scope of FIVAR and VARFI models by using the Exact Maximum Likelihood (EML), Maximum Likelihood, and Whittle estimators.

Findings- Monetary and fiscal policies should be used effectively and in a coordinated manner to take under control in devastating effect of inflation on economies and ensuring stability in prices and economy are among the targets of macroeconomic policies. Central Banks uses money supply and interest rates to be effective on income, employment and prices in the economy during the crisis periods. Since changes in money supply affect investments through interest rates, they have an impact on the output-gap and sustainability.

Conclusion- Although the VARFI and FIVAR models seems to be similar, there are differences in the results. While one of these models leads to series with different integration orders, the other one leads to series with the same order of integration and a relation such as cointegration. Considering the modeling structure between variables, it is determined that the best performance occurs in structures where long memory structure continuity is modeled. When the rates of return to average are examined, it is concluded that the returns to the average determined at an exponential rate is due to the improved performance of long memory models.

Keywords: FIVAR model, VARFI model, Exact Maximum Likelihood, Whittle estimator, Economic growth

JEL Codes: C22, C50, C58

ÇIKTI BÜYÜKLÜĞÜ, ENFLASYON VE PARA ARZI ARASINDAKİ İLİŞKİNİN MODELLENMESİ: FIVAR VE VARFI MODEL KARŞILAŞTIRMASI

ÖZET

Amaç- Çalışma kapsamında, 1987:Q2 ve 2020:Q2 çeyreklik dönemlerinde, Türkiye’de çıktı büyüklüğü ile enflasyon ve para arzı değişkenlerinin birbirleri üzerindeki etkisinin ortaya çıkartılması amaçlanmaktadır.

Yöntem- Sowell algoritması çerçevesinde Kesin(Tam) Maksimum Olabilirlik (EML), Maksimum Olabilirlik ve Whittle tahmin edicileri kullanılarak FIVAR ve VARFI model yapılarından faydalanılarak değişkenler arasındaki model yapısı belirlenmektedir.

Bulgular- Ekonomilerde yıkıcı etkiye sahip olan enflasyonun kontrol altına alınabilmesi, fiyatlarda ve ekonomide istikrarın sağlanabilmesi makroekonomi politikalarının hedefleri arasında yer almaktadır. Bu hedeflere ulaşmak için para ve maliye politikalarının etkin ve koordineli bir şekilde kullanılması gerekmektedir. Herhangi bir kriz anında Merkez Bankaları ekonomide gelir, istihdam ve fiyatlar üzerinde etkili olabilmek için para arzı ve faizleri kullanmaktadır. Para arzında meydana gelen değişiklikler faiz oranları aracılığıyla yatırımları etkilediğinden çıktı büyüklüğü ve istikrarın sürdürülebilirliği üzerinde etkili olmaktadır.

Sonuç- VARFI ve FIVAR modelleri benzer görünse de, sonuçlarında farklılıklar görülmektedir. Bir model, farklı bütünleşme sıralarına sahip serilere yol açarken, diğeri aynı bütünleşme sırasına ve aralarında eşbütünleşme gibi bir ilişkiye sahip serilere yol açmaktadır. Değişkenler arasındaki modelleme yapısı ele alındığında en iyi performansın uzun bellek yapısı sürekliliğinin modellendiği yapılarda ortaya çıktığı belirlenmektedir. Ortalamaya dönüş hızları incelendiğinde, üssel bir oranda belirlenen ortalamaya geri dönüşlerin uzun bellek modellerinin gelişmiş performansından kaynaklandığı sonucu ortaya çıkmaktadır.

Anahtar Kelimeler: FIVAR model, VARFI model, Kesin(Tam) Maksimum Olabilirlik, Whittle tahmin edici

JEL Kodları: C22, C50, C58

1. GİRİŞ

Arz-talep dengesizliği ve parasal nedenlere bağlı olarak fiyatlar genel düzeyindeki yüksek ve sürekli artışlar ekonomik, sosyal ve siyasi dengeler üzerinde etkili olduğundan enflasyonun makul düzeylerde tutulması istikrar ve sürdürülebilirlik açısından önemli olmaktadır. Enflasyonun temel nedenleri ve işleyişi açısından kuramlara bağlı olarak farklı görüşler olmakla birlikte, temel varsayımlar ve ekonomik politika önerileri bakımından birbirleriyle uyum göstermektedirler. Enflasyonla mücadele edebilmek ve uygun politika araçlarını seçebilmek için enflasyonun belirleyicilerinin tespit edilmesi gerekmektedir. Enflasyonun reel geliri düşürmesi, finansal sektörün gelişimini engellemesi ve belirsizliği artırması göz önüne alındığında para politikasının asıl amacının fiyat istikrarı olduğu söylenebilmektedir (Qayyum, 2006). Para politikası yaklaşımı ile Merkez Bankaları ekonomik sistem içinde paranın miktarını, maliyetini ve kullanılabilirliğini etkilemek için para arzı ve faiz oranlarını kullanabilmektedir (Nadar, 2013). Paranın yansızlığı ve ekonomideki tam istihdam varsayımı Keynesyen görüş tarafından eleştirilerek, para miktarının sadece enflasyonla değil işsizlik, yatırım, faiz oranları, çıktı büyüklüğü, bütçe açığı gibi değişkenlerle olan ilişkisini de analiz ederek para arzını, para talebi şeklinde değerlendirilerek, para talebinin klasiklerin aksine sadece işlem amaçlı değil ihtiyat ve spekülasyon amacıyla da talep edildiğini ortaya koymaktadır. Klasik miktar teorisinde, para arzındaki artış mal fiyatlarında orantılı artışa yol açmaktadır. Keynes sonrası, tahvillere yönelik para talebinin yüksek esnekliğe sahip olması nedeniyle artan para miktarı elde tutulursa fiyatlar yükselmemektedir (Robinson, 1970). Elde tutulmak istenen para talebi nominal gelirin bir oranı olarak değişebildiğinden para miktarındaki artış (azalış) paranın dolaşım hızında bir azalma (artışa) ile dengelenirse fiyatlar genel seviyesi etkilanmemektedir. Klasik yaklaşımın aksine ekonomi eksik istihdamda ise para arzındaki bir artış, faiz oranlarını düşürerek planlanan yatırımları ve toplam talepte artışa yol açmakta, mal ve hizmet miktarında oluşan bir artışla dengelenirse de fiyatlar genel seviyesi artmamaktadır. Monetaristler, miktar teorisinde olduğu gibi paranın dolaşım hızının genelde istikrarlı olduğunu, nominal gelirin büyük ölçüde para arzının bir fonksiyonu olduğunu savunmaktadır (Hayes, 1989). Klasik miktar teorisinde para arzı ölçümü nakit ve vadesiz mevduattan oluşan dar parasal büyüklük (M1), modern miktar teorisinde ise daha geniş bir büyüklüğü temsil eden (M2) ve (M3) ölçümleri ile ifade edilmektedir. Merkez Bankası faiz oranlarında istikrar sağlayıcı politikaya öncelik verdiğinde, bütçe açıklarının faiz oranlarını artırıcı etkisi olduğundan faiz oranlarındaki artış önlemek için para stokun ve parasal tabanın artırılmasına gidilerek enflasyona zemin hazırlanabilmektedir. Enflasyon ve çıktı büyüklüğü ilişkisi ele alınan döneme, ülke grubuna, dikkate alınan enflasyon oranı ve yapılan ekonometrik yöntemlere göre farklılıklar gösterebilmektedir. Enflasyonun çıktı büyüklüğünü pozitif etkilediği görüşü, gelişmiş ve gelişmekte olan ülkelerde uygulanan Keynesyen politikaların sonucu olarak toplam talep ve buna bağlı üretim artışının enflasyon artışlarıyla aynı döneme gelmesi nedeniyle etkili olmaktadır. Enflasyon ve çıktı büyüklüğü arasındaki pozitif ilişkinin temeli, enflasyon artışının yatırım portföyünün finansal sektörden reel sektöre kaymasına neden olması, bireylerin reel tasarruf düzeylerini korumak için ellerinde daha fazla para tutmalarını sağlaması, senyora geliri ya da enflasyon vergisinin artmasına yol açması vb. gibi nedenlerle enflasyonun zorunlu tasarrufları artırdığı yönündeki yaklaşımlara ve enflasyon oranının nispeten düşük ya da belirli bir eşik değerin altında olmasıyla pozitif ilişkinin gerçekleştiği sonucuna; negatif ilişkinin temeli ise enflasyonun ekonomik belirsizliğe ve değişkenliğe yol açması, ulusal paranın değer kazanmasına neden olması, etkin kaynak dağılımını olumsuz etkilemesi vb. gibi sebeplerle yatırımları azalttığı yönündeki görüşlere dayanmaktadır (Pyndick ve Solimano, 1993: 261, Bruno ve Easterly, 1995: 9).

2. LİTERATÜR

Tun Wai (1959), enflasyon oranlarının ekonomik büyümeyi pozitif etkilediğini tespit etmektedir. Thirwall ve Barton (1971), enflasyon oranı % 8'in altında olan gelişmekte olan ülkelerde enflasyonun ekonomik büyümeyi pozitif ve enflasyon oranı % 10'dan fazla olan GOÜ'lerde ise negatif etkilediği yönünde bulgular elde etmektedir. Togan (1987), para talebi fonksiyonunu tahmin ederek (M2) para arzının ve faiz oranının enflasyon üzerinde etkili olduğu sonucuna ulaşmaktadır. Öniş ve Özmucur (1990), döviz kuru, fiyatlar genel düzeyi ve para arzı arasındaki ilişkiyi incelemektedir. Alper ve Ucer (1998), yüksek enflasyonun neredeyse tamamen ataletten kaynaklandığını, para arzının (M1, M2, M2Y) veya döviz kurunun enflasyon üzerinde önemli bir etkisinin bulunmadığı sonucuna ulaşmaktadır. Dibooğlu ve Kıbrıçoğlu (2001), yüksek enflasyonun büyük bir kısmının toplam talep kaynaklı olduğunu, parasal şokların da enflasyon üzerinde etkili olduğunu ve parasal şokların akabinde yükselen enflasyonun uzun vadede tekrar düşmediğini ve enflasyonda atalet gözlemlendiğini ifade etmektedir. Chang ve Black (2002), enflasyonun ekonomik büyümeyi pozitif etkilediği yönünde bulgular elde etmektedir. Kesbiç ve ark. (2005), enflasyonun nedeninin para arzı olduğunu tespit etmektedir. Nalbatoğlu (2006), enflasyon ile faiz oranı arasında uzun dönemli ilişkinin var olduğunu göstermektedir. Çatalbaş (2007), enflasyonun para arzını arttırdığına yönelik bulgular elde edilmektedir. Altıntaş ve ark. (2008), enflasyon ile parasal büyüme arasında hem uzun hem de kısa dönemde pozitif ve anlamlı bir ilişki olduğunu ifade etmektedir. Mercan (2013), enflasyon ve faiz oranı arasında pozitif yönlü ilişki olduğunu tespit etmektedir. Özdemir ve Saygılı (2009), parasal faktörlerin enflasyon düzeyi üzerinde etkili olduğu sonucuna ulaşmaktadır. Koyuncu (2014), bütçe açığının ve para arzının enflasyon üzerinde etkili olduğunu göstermektedir. Şahin ve Karanfil (2015), para arzı, bütçe açığı ve reel döviz kurunun enflasyon üzerinde uzun dönemli ilişkisi olduğunu tespit etmektedir.

3. EKONOMETRİK METODOLOJİ VE UYGULAMA

Tek değişkenli kesirli bütünleşik modellerde(ARFIMA) spektral yoğunluk, belirli bir frekanstaki zaman serilerinin hareketlerini ölçerken, çok değişkenli zaman serilerinde ise çapraz spektral yoğunluk belirli bir frekansta iki zaman serisi arasındaki ilişkiyi ölçmektedir. Tek bir model kullanarak birden çok zaman serisi değişkenini tahmin etmek için Vektör Otoregresif(VAR) model kullanılırken, çok değişkenli yapıların tahmininde; modelin maksimum bir kesirli değerde bütünleşik olduğu VARFI modeli ve modelde yer alan her birleşenin ayrı ayrı kesirli bütünleşik olan K-boyutlu beyaz gürültü serileri için FIVAR modeli kullanılmaktadır. VARFI ve FIVAR modellerinde, $A(L) = A_0 + A_1L + \dots + A_pL^p$ ve I_K , $K \times K$ boyutlu bir birim matris olup $|A(L)|$ 'nin tüm kökleri birim çemberin dışında yer almaktadır. $D(L)$, köşegen değerleri $(1-L)^{d_1}, \dots, (1-L)^{d_K}$ olan köşegen matrisi olmakta ve durağanlık ve ters çevrilebilirliği sağlamak için $d_1, \dots, d_K \in (-\frac{1}{2}, \frac{1}{2})$ şeklinde tanımlanmaktadır. $\{\epsilon_t\}$, $t \neq s$ ve $E(\epsilon_t \epsilon_s') = \Sigma$ olduğunda $E(\epsilon_t \epsilon_s') = 0$ ile Σ pozitif tanımlı K-değişkenli beyaz gürültü dizi olmak üzere, Lobato (1997), $D(L)$, $A(L)$ ve Σ parametreleri göz önüne alındığında VARFI ve FIVAR modelleri,

$$A(L) D(L) X_t = \epsilon_t \quad \epsilon_t \sim Normal(0, \Sigma) \quad X_t = \begin{pmatrix} x_{1t} \\ x_{2t} \\ \vdots \end{pmatrix} \quad (1-L)^d = \sum_{j=0}^{\infty} (-1)^j \binom{d}{j} L^j$$

$$\binom{d}{j} = \frac{d(d-1)\dots(d-j+1)}{j!} \quad D(L) = \begin{pmatrix} (1-L)^{d_1} & 0 & \dots & 0 \\ \vdots & \ddots & \ddots & \vdots \\ 0 & \dots & (1-L)^{d_k} & \end{pmatrix}$$

şeklinde tanımlanmaktadır. Maksimum bir kesirli değerde bütünleşik beyaz gürültü VARFI modeli, $A(L)X_t = D(L)^{-1} \epsilon_t$ şeklinde gösterilirken, FIVAR model gösterimi, $X_t = D(L)^{-1}(A(L)^{-1} \epsilon_t)$ şeklinde olmaktadır. Bu iki model yapısı eşit gibi görülmekte aynı yapıya sahip olmamaktadır. FIVAR model yapısında, $A(L)D(L)X_t = \epsilon_t$ eşitliğinde yer alan X_t dizisi iki adımda ele alınmaktadır. İlk olarak $X_t = D(L)^{-1}Z_K \epsilon_t$ ve $X_t = (1-L)^{d_k}Z_K \epsilon_t$ olarak tanımlanmakta ve ikincisinde eşitlikte yer alan $\{Z_K\}$ vektörün, otoregresif model olarak hareket ettiği varsayılarak, $A(L)Z_K = \epsilon_t$ şeklinde tanımlanmaktadır. Bu durumda, X_t 'nin kesirli olarak bütünleşik vektör otoregresif olduğu görülmektedir. Ek olarak, FIVAR modelinde k. zaman serisi d_k ile bütünleşik olup, seriler arasında eş bütünleşik bir ilişki bulunmamakta, VARFI modelinde ise her bir seri maksimum bir d kesirli değerinde bütünleşik olabilmektedir. Çalışma kapsamında, gayrisafi yurtiçi hasıla ve para arzında meydana gelen dalgalanmaların tüketici fiyat endeksi üzerindeki yayılma etkisi FIVAR ve VARFI modelleriyle incelenmektedir. İlk olarak 1987:Q2 ve 2020:Q2 çeyreklik dönemlerinde gayrisafi yurt içi hasıla, M2 ve tüketici fiyat endeksi serilerinden elde edilen çıktı büyüklüğü (ÇB), para arzı (PA) ve enflasyon (ENF) veri setlerinin logaritmaları alınarak, değişkenlere ilişkin birim kök varlığı incelenmektedir. İncelenen birim kök testlerinin (ADF, PP, KPSS), serilerin durağanlığına ve uzun dönem bağımlılığına sahip olup olmadığına karar verebilmek için yeterli olmaması nedeniyle FIVAR-GPH testi ile kesirli bütünleşme parametresi olan d 'nin tahmin edilerek uzun dönem bağımlılığın varlığı incelenmektedir. Seriler, uzun hafıza davranışı sergilediği için tek değişkenli ARFIMA model yapısı Maksimum Olabilirlik yöntemi ile incelenmekte olup modele ait katsayılar, FIVAR ve VARFI model tahmininde başlangıç değeri olarak kullanılmaktadır. Çalışmada kullanılan örneklerin büyüklüğü 133 olup, Whittle yaklaşımı küçük örneklem gruplarında ($T < 100$) daha doğru sonuçlar verirken büyük örneklem için sapmalı sonuçlar vermesi dolayısıyla bu uygulamada uygun bir tahminci olmamaktadır. MLE yaklaşımı Bayesyen bir yaklaşıma dayanırken, EML yaklaşımı ise kesirli model tahminleri için geliştirilmiş olup Sowell yaklaşımına dayanmaktadır. Bu kapsamda, değişkenler arasındaki ikili ilişkinin ortaya çıkartılması için uzun hafıza özelliği sağladığından dolayı FIVAR ve VARFI model yapısının kullanılması önerilmekte olup Kesin Maksimum Olabilirlik (EML), Maksimum Olabilirlik ve Whittle tahmin edicileri kullanılmaktadır.

Tablo 1: Modelde Kullanılan Değişkenlere İlişkin Birim Kök Test Sonuçları ve FIVAR-GPH Testi

	ADF		PP		KPSS	
	Düzey	1.Fark	Düzey	1.Fark	Düzey	1.Fark
ENF	-1.585286	-12.30409**	-4.408153**	-	1.142880**	-
ÇB	-0.782082	-3.631702**	-1.852939	-18.92001**	1.403267**	-
PA	-0.674131	-7.291568**	-0.483235	-7.625894**	0.358870**	-
FIVAR-GPH (0.50) d Tahmin Değeri						
ENF	0.4462900					
ÇB	0.8540172					
PA	0.3445626					

*, **, ***, %, %5 ve %10 önem düzeyini ifade etmektedir. $m = T^{\lambda}$ Ordinat düzeyi 0.50 alınmaktadır.

Tablo 2: Modele İlişkin Tahmin Değerleri (MLE-ARFIMA)

MLE- ARFIMA	ENF	ÇB	PA
A_1	-0.1741756	0.2404983	-0.03210894
Σ	14.64638	0.02168501	22.35528
D	0.4759988	0.487996	0.4044424
Log-Olabilirlik	-246.5218	186.1542	-273.9184

Tablo 3: Farklı Tahminçiler ile Elde Edilen FIVAR ve VARFI Model Tahminleri

	ENF-ÇB FIVAR Model					
	Maksimum Olabilirlik		Tam Maksimum Olabilirlik		Whittle Yaklaşımı	
A_1	-0.64478608	0.1623548	-0.7444241	0.1427973	-0.58813621	0.3726467
	0.02598619	-0.9601884	0.0333821	-0.9564159	0.07850296	-0.8422969
Σ	34.585103	-1.8147810	22.4635163	-0.9820794	3.4096634	-0.4517938
	1.814781	0.1828301	-0.9820794	0.1516687	-0.4517938	0.2635059
D	0.41987	0.4628024	0.4628024	0.4900000	0.4900000	0.1981188
	0.49000	0.4900000	0.4900000	0.4900000	0.1981188	0.1981188
Log-Olabilirlik	-201.7448	-197.9546*	-197.9546*	-197.9546*	-107.9248	-107.9248
ENF-PA FIVAR Model						
A_1	-0.02279877	0.98941078	-0.07885529	0.98685449	0.06354583	0.98795753
	0.65899416	0.03003173	0.65605588	0.05242719	0.63058902	-0.04070216
Σ	16.707739	-3.021233	17.611124	-2.895594	3.4535842	-0.87100896
	-3.021233	10.906688	-2.895594	10.032656	-0.87100896	2.1525983
D	0.4777207	0.4900000	0.4900000	0.4900000	0.4730555	0.4900000
	0.4234611	0.3400794	0.3400794	0.3400794	0.4900000	0.4900000

Log-Olabilirlik	-482.4931	-479.2131*	-257.318
ENF-ÇB VARFI Model			
A_1	-0.68028338 0.1801176 0.03988826 -0.9464704	-0.79456339 0.1075174 0.02735841 -0.9657038	-0.55377293 0.3487489 0.06527543 -0.8745387
Σ	28.260563 -1.4752018 -1.475202 0.1504751	21.8441572 -0.64890013 -0.6489001 0.06568194	3.3002830 -0.4297289 -0.4297289 0.2647297
D	0.4110406 0.4900000	0.483384 0.4900000	0.4900000 0.2430146
Log-Olabilirlik	-188.7102	-140.3912*	-107.5357
ENF-PA VARFI Model			
A_1	0.09333886 0.98428625 0.67318341 -0.02918646	0.05049422 0.98871144 0.66769702 -0.03408046	0.02161748 0.98971447 0.65190859 -0.01112168
Σ	21.142147 -3.067152 -3.067152 9.754649	18.202645 -2.187864 -2.187864 9.806310	3.3496284 -0.8289657 -0.8289657 2.1944429
D	0.4316033 0.4861409	0.4593713 0.4858421	0.49 0.49
Log-Olabilirlik	-486.014	-480.7723*	-257.1772

*, uygun model seçimini ifade etmektedir.

4. BULGULAR

Tablo 1.'de değişkenlere ilişkin birim kök varlığı incelenmekte olup GPH test istatistiği, kısa dönem bağımlılık sıfır hipotezi ($H_0:d=0$) altında uzun dönem bağımlılığın tahminini yapmaktadır. Tahmin edilen d kesirli bütünleşme katsayıları serinin durağan olmadığı ancak uzun dönemde ortalamaya dönme davranışı sergilediğini göstermektedir. Tablo 2'de enflasyon için ARFIMA(1, 0.4759988, 0), çıktı büyüklüğü için ARFIMA(1, 0.487996, 0) ve para arzı değişkeni için ARFIMA(1, 0.4044424, 0) olduğu görülmektedir. ARFIMA modeli katsayıları, kesirli VAR modeli tahmininde başlangıç değeri olarak kullanılarak değişkenler arasındaki ikili ilişki değişkenlerin uzun hafıza özelliği sağladığından FIVAR ve VARFI yapıları incelenmektedir. Kesin Maksimum Olabilirlik (EML), Maksimum Olabilirlik ve Whittle tahmin edicileri kullanılarak elde edilen modele ait çıktılar Tablo 3.'te yer almaktadır. VARFI ve FIVAR modelleri incelendiğinde para arzının ve çıktı büyüklüğünün enflasyon üzerinde pozitif yönlü ve istatistiksel olarak anlamlı etkiye sahip olduğu görülmektedir. Kullanılan tahmin yöntemlerine göre uygun model seçiminde log-olabilirlik değeri en büyük olan tercih edilmekte olup Enflasyon-Para Arzı modeli için uygun yapı FIVAR modeliyken, Enflasyon-Çıktı Büyüklüğü için VARFI model yapısının uygun olduğu görülmektedir.

5. SONUÇ

Durağan ve durağan olmayan zaman serilerinde gözlemlenebilen uzun hafıza, kesirli bütünleşik modellerle modellenmektedir. Enflasyon oranı gibi serilerde, birim kök sınama istatistikleri farklılık göstermektedir. Bütünleşme derecesinin reel sayı olma ihtimali ve birim kök testlerinin farklı sonuçlar vermesinden dolayı ARFIMA modeli ve kesirli VAR model yapılarının kullanımı daha uygun olmaktadır. Çalışma kapsamında, çıktı büyüklüğünün enflasyonu arttırdığı belirlenmektedir. Türkiye'de hedeflenen çıktı büyüklüğü rakamlarına ulaşılsa bile üretim performansının ithalata olan bağlılığı ve artan döviz kuru, enflasyonu beraberinde getirmektedir. Enflasyon belirli bir düzeyde olması hanehalkının tüketimlerini ertelememesine ve günümüzdeki yatırımların gelecekteki yatırımlardan daha avantajlı olduğu fikrini oluşturmaktadır. Enflasyonla beraber oluşan alış-veriş döngüsü üreticiler için hareketlilik ve canlılık yaratarak ekonomik büyümeyi de beraberinde getirmektedir. Ek olarak, çıktı büyüklüğü ile enflasyon arasındaki pozitif ilişki, bütçe açığı sonucunda yapılan borçlanma dolayısıyla anapara ve borç faizi ödemelerinin parasal büyüme üzerindeki genişletici etkisine bağlanabilmektedir. Emisyon hacmindeki artış dolayısıyla para arzındaki artış, faiz oranları ve döviz kurlarındaki yükselme, fiyatlar genel seviyesindeki yükselmenin temel faktörleri arasında gösterilmektedir. Bu nedenle, enflasyonla mücadele için para arzı artış hızını azaltmak ve dolayısıyla paranın enflasyonist etkisini ortadan kaldırmak gerekmektedir. Para arzı ile enflasyon arasındaki ilişki, para arzı artış hızının piyasadaki mal ve hizmet üretimi artış hızı ile uyumlu olması gerektiğini ifade etmektedir. Ülkemizde enflasyonla mücadele, para arzını arttıracak faktörlerin kontrol edilmesi ve para arzı artış hızının yavaşlatılmasından geçmektedir.

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COST MANAGEMENT AND CORPORATE PERFORMANCE MEASUREMENT IN SUSTAINABLE SUPPLY CHAIN

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ABSTRACT

Purpose- The purpose of the study is to propose a model to measure the success performance of businesses which have adopted Sustainable Supply Chain Management (SSCM) practices.

Methodology- A literature review was carried out based on some concepts such as SSCM, sustainability and business performance, social performance and financial performance, and sustainable cost management.

Findings- When the literature is examined, it is seen that SSCM is considered to be more of a business's practices for reducing environmental impact. In addition, In many studies which examine the relationship between SSCM and firm performance, cost savings are often used as financial performance indicators. But, the fact that sustainability-based practices will generate many different cost factors has been overlooked in many studies. On the other hand, It is seen that the number of studies on cost management and performance measurement in SSCM practices is quite limited.

Conclusion- Considering the effects of sustainability-based practices in measuring business performance is important for the definition of long-term success indicators and accurate performance measurements.

Keywords: Sustainable supply chain management, sustainability performance, corporate performance, cost management, sustainable balanced scorecard.

JEL Codes: M14, M40, L25

SÜRDÜRÜLEBİLİR TEDARİK ZİNCİRİNDE MALİYET YÖNETİMİ VE KURUMSAL PERFORMANS ÖLÇÜMÜ

ÖZET

Amaç- Çalışmanın amacı Sürdürülebilir Tedarik Zinciri Yönetimi (STZY) uygulamalarını benimsemiş işletmelerde, başarı performansını ölçmeye yönelik bir model önerisi sunmaktır.

Yöntem- STZY, sürdürülebilirlik ve işletme performansı, sosyal performans ve finansal performans, sürdürülebilir maliyet yönetimi gibi kavramlar baz alınarak literatür taraması yapılmıştır.

Bulgular- Literatür incelendiğinde, STZY'nin, genel olarak, işletmenin çevresel etkiyi azaltmaya yönelik uygulamaları olarak değerlendirildiği görülmektedir. Bunun yanında, STZY ve işletme performansı arasındaki ilişkinin incelendiği birçok çalışmada, finansal performans göstergesi olarak maliyet tasarruflarının kullanıldığı görülmektedir. Ancak, sürdürülebilirlik temelli uygulamaların çok sayıda farklı maliyet unsurunu da ortaya çıkaracak olması birçok çalışmada göz ardı edilmiştir. STZY uygulamalarında maliyet yönetimini ve performans ölçümlerini konu alan çalışmalarının sayısının ise oldukça sınırlı kaldığı görülmektedir.

Sonuç- İşletme performansını ölçmede sürdürülebilirlik temelli uygulamaların etkilerini de dikkate almak, uzun vadeli başarı göstergelerinin tanımlanması ve performans ölçümlerinin doğru yapılması adına önem taşımaktadır.

Anahtar Kelimeler: Sürdürülebilir tedarik zinciri yönetimi, sürdürülebilirlik performansı, kurumsal performans, maliyet yönetimi, sürdürülebilir balanced scorecard.

JEL Kodları: M14, M40, L25

1. GİRİŞ

Günümüzde çevresel sürdürülebilirlik, atık yönetimi, kaynakların etkin kullanımı gibi konular, gelişmiş ya da gelişmekte olan tüm ekonomilerin ortak problemi haline gelmiştir. Kaynakların sınırlı oluşu ve etkin bir şekilde yönetilmesi gerekliliği toplumsal baskıyı artırmakta, işletmeler de bu baskı karşısında duyarsız kalamamaktadır. Çevresel etkileri ve kaynak tüketimleri dikkate alındığında, sürdürülebilirlik stratejisi belirlemek adına imalat işletmelerine de önemli sorumluluklar düşmektedir (Esfahbodi, et. al. 2016: 352). Çalışmanın amacı “Sürdürülebilir Tedarik Zinciri Yönetimi (STZY)” uygulamalarını benimsemiş işletmelerde, uygun maliyet yönetim tekniklerini belirlemek ve kurumsal performansı ölçmeye yönelik bir model önerisi sunmaktır. Bu bağlamda çalışma üç alt başlıktan oluşmaktadır. İlk olarak, STZY dinamiklerinin belirlenmesi amaçlanmaktadır. İkinci olarak, STZY'nin uygulama aşamalarında ortaya çıkan maliyetlerin belirlenmesi ve maliyet yönetimi için uygun tekniklerinin tartışılması hedeflenmektedir. Son olarak, çalışma kapsamında, STZY bileşenlerini de dikkate alarak işletme performansını ölçmeyi amaçlayan, “Sürdürülebilir Balanced Scorecard” modeli önerilmektedir.

2. SÜRDÜRÜLEBİLİR TEDARİK ZİNCİRİ YÖNETİMİ

Lee ve Billington'a (1992: 62) göre tedarik zinciri, hammaddelerin temin edilmesi, bunların yarı mamul ve nihai mamule dönüştürülmesi ve bir dağıtım kanalı vasıtasıyla ürünlerin müşterilere ulaştırılmasını sağlayan bir ağıdır. Tedarik zinciri içinde tedarikçiden nihai müşteriye kadar birbirine bağımlı bir süreçten bahsedilmektedir. Bu sürecin yönetilmesi Tedarik Zinciri Yönetimi (TZY) kavramıyla ifade edilmektedir. TZY, üreticilerin, depoların ve müşterilerin verimli bir şekilde entegre edilmesi için kullanılan ve ürünlerin doğru miktarda, doğru yere ve doğru zamanda üretilip dağıtılmasını en az maliyetle gerçekleştiren yaklaşımların tümüdür (Khan vd., 2010: 404). Sürdürülebilir tedarik zinciri ise tedarik zincirinin her sürecine, sürdürülebilirlik bakış açısı ve uygulamalarının entegre edildiği bir sistemi ifade etmektedir. Dolayısıyla, önce sürdürülebilirliği kısaca tanımlamakta fayda bulunmaktadır. Sürdürülebilirlik; toplumsal, sosyal, kültürel, bilimsel, doğal vb. tüm kaynakların ihtiyatlı kullanımını sağlayan ve buna saygı gösterme yönünde sosyal bir bakış yaratan katılımcı bir süreçtir (Gladwin, vd. (1995:877). Bu tanımdan hareketle, Sürdürülebilir tedarik zinciri yönetimi (STZY); uzun vadeli bir ekonomik performans ile sosyal, çevresel ve ekonomik hedeflerinin başarımı için, tedarik zincirlerinde yer alan tüm yapılarıdaki iş süreçlerin sistematik koordinasyonu ve şeffaf entegrasyonu olarak tanımlanmaktadır (Carter and Rogers, 2008:368). Esfahbodi, vd. (2016: 353), STZY'ni dört süreçte ele almaktadır. Bunlar; sürdürülebilir tedarik, sürdürülebilir üretim, sürdürülebilir dağıtım ve tersine lojistik faaliyetleridir. Bu çalışma kapsamında STZY, Esfahbodi, vd. (2016) ile benzer şekilde, bu dört süreç altında değerlendirilecektir.

3. SÜRDÜRÜLEBİLİR TEDARİK ZİNCİRİNDE MALİYET YÖNETİMİ

STZY ve finansal performans arasındaki ilişkiyi inceleyen çoğu çalışmada, STZY ile azalan maliyetlerin finansal performansı arttırdığı ileri sürülmekle birlikte, STZY'nin farklı bir çok maliyet unsurunu da ortaya çıkardığı, bu nedenle maliyetleri artırdığı ve dolayısıyla finansal performansı olumsuz olarak etkilediği görüşünü savunan araştırmacılar da mevcuttur (Ortas, vd., 2014). Günümüzde işletmeler bir yandan yüksek bir STZY performansına ihtiyaç duyarken, diğer yandan da maliyet maksimizasyonu sağlama ihtiyacı duymaktadır (Jakhar, 2015). Bu nedenle STZY'de maliyetleri en aza indirecek tekniklerin kullanılması gerekmektedir. Öte yandan, STZY ya da yeşil tedarik zinciri yönetimini konu alan birçok çalışmada, maliyetlendirme ve performans değerlendirmesinin sistematik ve kapsamlı bir şekilde entegre edilmediği görülmektedir. Maliyet ve fayda ölçülerinin değer zincirine entegre edilmesi, performansı daha net ortaya çıkacaktır (Tsai & Hung, 2009). Dolayısıyla, STZY'de maliyet – fayda analizlerinin yapılabilmesi için ilk olarak süreç içinde ortaya çıkacak maliyetlerin ve maliyet tasarruflarının belirlenmesi gerekmektedir. Tablo 1, STZY'de ortaya çıkması beklenen maliyetler ile zaman içinde azalması öngörülen maliyetler özetlemektedir.

Tablo 1: Sürdürülebilir Tedarik Zinciri Maliyetleri ve Maliyet Tasarrufları

STZY MALİYETLERİ	KAYNAK
1. Sürdürülebilir Tedarik Maliyetleri	
Tedarikçi seçim süreci / ölçme ve değerlendirme	Lin, vd. 2001; Ortas, vd. 2014; Wang & Dai, 2018
Gecikme / iptal	Ortas, vd. 2014
Tedarikçi denetimleri	Ortas, vd. 2014; Zhu, vd. 2005
2. Sürdürülebilir Üretim Maliyetleri	
Sürdürülebilir tasarım	Zhu, vd. 2005
Sürdürülebilir ilk madde ve malzeme	Seuring, 2001; Zhu, vd. 2005
İşgücü eğitimi	Jakhar, 2015; Zhu, vd. 2005; Wang & Dai, 2018
Sürdürülebilir ücret uygulaması	Wang & Dai, 2018
Operasyonel maliyetler	Pettersson & Segerstedt, 2013; Zhu, vd. 2005
Kalite denetimleri	
Sürdürülebilir ambalajlama	Zhu, vd. 2005; Wang & Dai, 2018
Sürdürülebilir depolama	Lin, vd. 2001
3. Sürdürülebilir Dağıtım Maliyetleri	
Ulaşım/transfer maliyetleri	Lin, vd. 2001; Seuring, 2001
Dağıtım kanallarının denetimi	
Müşteri ilişkileri yönetimi	
4. Tersine Lojistik Maliyetleri	Esfahbodi, vd. 2016
5. Sürdürülebilir Yapı Maliyetleri	
Sertifikasyon maliyetleri	Ortas, vd. 2014; Wang & Dai, 2018
Aritma, filtreleme, geri dönüşüm sistemi yatırım maliyetleri	Zhu, vd. 2005
Sürdürülebilir ar-ge sistemi	

Sürdürülebilirlik temelli teknoloji yatırımları kurulum ve iyileştirme maliyetleri (MIS, ERP)	Tsai & Hung, 2009
Sosyal sorumluluk temelli yatırımlar	
STZ MALİYET TASARRUFLARI	KAYNAK
Enerji kullanımında azalma	Jakhar, 2015; Prasad, vd. 2020; Zhu, vd. 2005; Wang & Dai, 2018
Su kullanımında azalma	Zhu, vd. 2005
Malzeme israfında azalma	Zhu, vd. 2005
Hatalı ürün oranında azalma	Jakhar, 2015
Depolama maliyetlerinde azalma	Jakhar, 2015; Zailani, vd. 2012; Seuring, 2001; Zhu, vd. 2005
Atık/imha maliyetlerinde azalma	Jakhar, 2015; Zailani, vd. 2012; Tsai & Hung, 2009; Zhu, vd. 2005
Kaynakların verimli kullanımıyla operasyonel maliyetlerin azalması	Zailani, vd. 2012
Kapasite kullanım maliyetlerinde azalma	Seuring, 2001
Sevkiyat maliyetlerinde azalma	Seuring, 2001

La Londe ve Pohlen (1996), tedarik zinciri maliyetlerinin açıkça ölçülmediğine işaret eden ilk kişilerdir (Hoffman & Boshshard, 2017:718). Geleneksel muhasebe sistemleri, ürünlerin gerçek maliyetlerini belirlemek adına yetersiz kalmaktadır (Hoffman & Boshshard, 2017:718). Bu nedenle, STZY için stratejik maliyet yönetim tekniklerinin kullanılması daha uygun olacaktır. Literatür incelendiğinde, STZY’de maliyet yönetimi konusunu ele alan çalışmaların oldukça kısıtlı olduğu görülmektedir. Tedarik zincirinde maliyet yönetimi konulu çalışmalarda ise en çok yer verilen maliyet yönetimi yaklaşımı “Faaliyet Tabanlı Maliyetleme – FTM” olarak karşımıza çıkmaktadır (Dekker & Van Goor, 2000; Lin, vd., 2001; Seuring, 2001; Tsai & Hung, 2009; Askarany, vd., 2010; Hoffman & Boshshard, 2017). FTM, özellikle tedarik zincirinin sürdürülebilir üretim aşamasında, katma değer yaratan ve yaratmayan faaliyetleri birbirinden ayırarak, gereksiz maliyetlerin ortadan kaldırılması için önemli bilgiler sunmaktadır. Yine üretim aşamasında, “Tam Zamanında Maliyetleme- TZM”nin önemine vurgu yapan çalışmalar da bulunmaktadır. TZM, stokların en aza indirilmesi için üretim faaliyetinin büyük bir hassasiyetle hesaplanması ve tasarlanması gerektiği fikrine dayanmaktadır. Stoklarda minimum düzeyde hammadde, malzeme ve mamullerin bulundurulması, üretim hacminden bağımsız olarak genel maliyetleri düşürmektedir (Abusef & Rathi, 2013: 100). Sürdürülebilir tedarik zincirini bir değer zinciri olarak ele alıp, “Hedef Maliyetleme”, “Toplam Kalite Yönetimi”, “Yalın Üretim”, ve “Mamul Yaşam Süresince Maliyetleme” gibi tekniklerin de ayrı ayrı kullanımı mümkünken, tüm bu teknikleri sürece entegre etmek de mümkündür. Bazı araştırmacılar, ürün maliyetlerinin yüzde 80’inin tasarım aşamasında gerçekleştirildiğini savunmaktadır (Abusef & Rathi, 2013: 97). Tasarım aşamasında malzeme seçimi, üretim yöntemi, üretme veya satın alma ile ilgili önemli kararlar verilmekte olup, tüm bu kararlar, bir ürünün faaliyetleri üzerinde büyük bir etkiye sahiptir. Pazarlama ve dağıtım verimlilikleri vasıtasıyla elde edilen maliyet kazançları, daha iyi ürün planlama ve tasarım yoluyla elde edilen maliyet kazançlarından önemli ölçüde daha küçüktür (Abusef & Rathi, 2013: 97). Dolayısıyla hedef maliyetlemenin en etkin kullanılabileceği aşamalardan biri tasarım aşamasıdır. Ancak tüm bu yöntemlerin başarılı olabilmesi için sistemin tedarikçilerle entegre bir şekilde çalışması gerekmektedir. Başka bir ifadeyle, sürdürülebilir tedarik aşamasının da aynı yaklaşımlar çerçevesinde şekillenmiş olması gerekir. Öte yandan TKY, sadece üretim süreçlerinde kaliteye odaklanmamaktadır. Satış sonrası, müşteri ilişkileri dahil, tüm sürecin iyileştirilmesi için gerekli işlemlerin tamamını kapsamaktadır (Basık, 2012). Dolayısıyla, sürdürülebilir dağıtım ve tersine lojistik faaliyetlerin verimliliği artırmak için, TKY uygun bir yaklaşım olmaktadır. Bu yöntemler aslında birer felsefe olarak görülmekte olup, amaç maliyet kontrolü değil, maliyetlerin düşürülmesidir (Basık, 2012). İşletmelerin; kendi iç işleyişlerine, sektörlerine ve çalışma koşullarına bağlı olarak, sürdürülebilir tedarik zincirinin her aşamasında uygun maliyet yönetimi tekniklerini kullanmaları, sürdürülebilirlik yönetimini çok da verimli bir şekilde gerçekleştirmeleri adına önem arz etmektedir.

4. STZY’DE BAŞARI PERFORMANSININ ÖLÇÜLMESİ

“Balanced Scorecard (BSC)” ilk olarak 1992 yılında Robert Kaplan ve David Norton tarafından sunulmuştur. BSC, işletmenin finansal performansı yanında finansal olmayan performansını da dikkate alarak başarıyı ölçmeyi hedeflemektedir. Başarıdan kasıt, işletmenin hedeflediği stratejik amaçlara ne kadar yaklaştığı ya da ne kadarını başardığıdır (Basık, 2012:189-190). BSC; finansal boyut, müşteriler boyutu, iç süreçler boyutu ve öğrenme ve gelişme boyutu olmak üzere, 4 boyuttan oluşmakta olup, her bir boyut altında belirlenen amaçlar, ölçüm yöntemleri, nihai hedefler ve bu konudaki girişimler baz alınarak performans değerlendirilmektedir. BSC, en çok tercih edilen performans değerlendirme araçlarından biri olmasına rağmen, birçok araştırmacı tarafından sosyal sorumluluk ya da sürdürülebilirlik performans göstergelerini kapsamamış olması nedeniyle eleştirilmektedir (Epstein & Wisner, 2001; Figge, vd., 2002; Higgins & Currie, 2004; Van der Woerd & Van den Brink, 2004). Sürdürülebilirliğin ekonomik, sosyal ve çevresel boyutu birçok disiplin altında incelenmekte ve literatürde geniş yer tutmaktadır. Bazı araştırmacılar sürdürülebilirlik uygulamalarını çevresel ve sosyal hassasiyetler boyutunda değerlendirirken, bazı çalışmalarda, özellikle ekonomik nedenler ön plana çıkmaktadır. İster çevresel, ister sosyal, isterse de ekonomik nedenlerle olsun, günümüzde, küresel piyasalarda aktif rol oynamak isteyen işletmelerin, sürdürülebilirlik uygulamalarından uzak kalarak varlığını devam ettirme şansları oldukça düşük görünmektedir. Bu nedenle sürdürülebilirlik uygulamalarının, işletme performansını içinde değerlendirilmesi gerektiği yönündeki görüşler yaygınlaşmaktadır. Literatürde yer alan görüşler ve model önerileri çerçevesinde, Tablo 2’de İşletme performansı ölçmede sürdürülebilirlik yaklaşımlarını da dikkate alan “Sürdürülebilir BSC” modeline yer verilmiştir.

Tablo 2: Sürdürülebilir BSC Modeli

FİNANSAL BOYUT	İÇ SÜREÇLER BOYUTU
<ul style="list-style-type: none"> • Kârlılık • Enerji maliyetlerinde azalma • Kaynak kullanım maliyetlerinde azalma • Malzeme israflarında azalma • Atık/imha maliyetlerinde azalma • Geri dönüşümden sağlanan kazanç • Satış gelirlerinin artışı 	<p>Tedarik Süreçleri:</p> <ul style="list-style-type: none"> • Sürdürülebilir tedarikçi ağında artışı, • Tedarikçi denetimleri <p>İmalat Süreçleri:</p> <ul style="list-style-type: none"> • Karbon salınım oranının azaltılması

<ul style="list-style-type: none"> • Ekolojik ürünlerin satışlar içindeki payında artış • Stok maliyetlerinde azalma • Hatalı ürün oranında azalma • Geri dönen ürün oranında azalma • Transfer maliyetlerinde azalma 	<ul style="list-style-type: none"> • Su tüketim oranının azaltılması • Enerji sarfiyatının azaltılması • Kalite denetimleri • Sertifikasyon denetimleri • Malzeme israfının azalması • Kullanılan kaynaklarda geri dönüşüm oranının artışı • Süreç verimliliği • Zaman verimliliği
<p>MÜŞTERİLER BOYUTU</p> <ul style="list-style-type: none"> • Toplumsal amaca yönelik pazarlama • Ekolojik ürünlerin artışı • Şikâyet oranında azalış • Ürün güvenliğinde artış • İade sayısında azalış • Müşteri memnuniyet oranında artış • Geri dönüşebilir ürün sayısında artış • Sosyal sorumluluk faaliyetleri • Sosyal raporlama • Güvenilir marka yaratma 	<p>Dağıtım Süreçleri:</p> <ul style="list-style-type: none"> • Dağıtım kanallarının denetimi • Dağıtım kanallarının verimliliği • Müşteri ilişkileri yönetim sisteminin etkin kullanımı <p>Sürdürülebilirlik ve Sosyal Sorumluluk Süreçleri:</p> <ul style="list-style-type: none"> • Ekolojik çalışma ortamı • İş sağlığı ve güvenliği denetimleri • Politika oluşturma/gözden geçirme/denetleme • Sürdürülebilirlik/sosyal sorumluluk raporlarının oluşturulması ve geliştirilmesi
<p>ÖĞRENME VE GELİŞME BOYUTU</p> <ul style="list-style-type: none"> • Çalışma standartlarının iyileştirilmesi • Adil çalışma standartlarının sağlanması • Çalışan motivasyonunun artırılması • Temel meslek eğitimleri • Çalışan becerilerinin artırılması • Sürdürülebilirlik eğitimleri • Kurum kültürüne dönük eğitim ve uygulamalar • Çalışan memnuniyet araştırmaları • Bilgi sistemlerinin yenilenmesi/geliştirilmesi • Teknoloji kullanımının artırılması • Teknolojinin verimli kullanımı • Yeni fikirlerin teşvik edilmesi 	

5. SONUÇ

Kurumsal sürdürülebilirlik, günümüzün en çok ilgi gören araştırma konularından biridir. Bu popülerliğin nedeni günümüz rekabetçi iş dünyasında sadece kısa vadeli finansal başarı odaklı olan işletmelerin varlığını sürdüremeyecek olmasıdır. Bununla birlikte, işletme performansını kısa vadeli finansal performansa indirgemek, paydaş beklentilerini dikkate alan günümüz iş dünyası dinamikleriyle bağdaşmamaktadır. STZY'de başarılı bir performans için, süreç içindeki maliyetlerin tespiti ve stratejik amaçlar doğrultusunda yönetimi önem arz etmektedir. İşletme performansını ölçmede sürdürülebilirlik temelli uygulamaların etkilerini de dikkate alan sürdürülebilir BSC kullanımı, uzun vadeli başarı göstergelerinin tanımlanması ve performans ölçümlerinin doğru yapılması adına önem taşımaktadır.

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ANALYSIS OF THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL AND FIRM PERFORMANCE: AN EMPIRICAL RESEARCH ON BORSA ISTANBUL

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ABSTRACT

Purpose- The purpose of this research is to reveal the effect of firms' intellectual capital on financial performance. Firms invest in intangible assets as well as tangible assets in order to gain competitive advantage (Atan ve Tuncer, 2019). Within the scope of intangible fixed assets, the most investment is made to intellectual capital. Intellectual capital has three basic dimensions: human capital, structural capital and customer capital (Soylu, 2020). In the 21st century, where technology changes and develops very rapidly, companies create added value by using their intellectual capital and turn the added value into profit. In this respect, intellectual capital is knowledge that can turn into profit (Çetin, 2005).

Methodology- The intellectual capital levels of companies operating in the Borsa Istanbul Industrial Index were measured by the Intellectual Value Added Coefficient (VAIC) method for the period of 2015-2019. The relationship between the obtained coefficient and financial performance indicators, return on assets ratio (ROA), return on equity (ROE) and Tobin's Q ratio, was analyzed by panel data method.

Findings- According to the results of the research, there is a statistically significant and positive relationship between the intellectual capital coefficient and profitability rates and Tobin's Q ratio.

Conclusion- The results obtained show the positive effect of intellectual capital on firm performance. Companies can focus on intellectual capital investments and increase their productivity for sustainable financial performance.

Keywords: Intellectual capital, ROA, ROE, Tobin's Q, intellectual value added coefficient.

JEL Codes: C61, E22, G30

1. INTRODUCTION

Intellectual capital is information and information-based intangible assets that provide a competitive advantage by improving the innovation and creativity of the enterprise. The most important main elements of intellectual capital; human capital, structural capital and relational capital (Atan ve Tuncer, 2009). Marr et al. (2003) argue that a firm's value is often partly based on the intangible intellectual capital (IC) that it possesses. By intellectual capital, it is meant the specific and valuable knowledge that belongs to the organization. This qualification of intellectual capital as a strategic asset rests on a potential link between intellectual capital on one hand and firm performance on the other hand (Belkaoui, 2003). There are very few studies investigating the relationship between IC and firm performance bu using VAIC method especially in the context of Turkey. Accordingly the purpose of this study is to examine the effect of IC on Turkish industrial firms which are operating in Borsa Istanbul (BIST).

2. LITERATURE REVIEW

Different results have been obtained from studies analyzing the relationship between intellectual capital and firm performance. Maditinos et al. (2011) found only a statistically significant relationship between human capital efficiency and financial performance. Clarke et. al. (2011) found a direct relationship between value added intellectual capital (VAIC) and performance of Australian publicly listed firms, particularly with capital employed efficiencies (CEE) and to a lesser extent with human capital efficiencies (HCE). A positive relationship between HCE and structural capita efficiencies (SCE) in the prior year and performance in the current year is also found. However evidence also suggests

the possibility of an alternative moderating relationship between the intellectual capital (IC) components of HCE and SCE with physical and financial capital (CEE) which impacts on firm performance. According to Wang et. al., (2014) three dimensions of intellectual capital enhance both operational and financial performance of firms. Also the effect of knowledge sharing (KS) on firm performance is mediated by IC. Gülcemal and Çıtak (2017) stated that intellectual capital levels measured with VAIC correlate with the performance of firms and can be considered as a leading indicator of performance.

3. DATA AND METHODOLOGY

The intellectual capital levels of companies operating in the Borsa Istanbul Industrial Index were measured by the Intellectual Value Added Coefficient (VAIC) method for the period of 2015-2019. The relationship between the obtained coefficient and financial performance indicators, return on assets ratio (ROA), return on equity (ROE) and Tobin's Q ratio, was analyzed by panel data method. We also used unit root tests, Hausman tests, auto-correlation tests, inter unit correlation tests, multiple variance tests and Beck-Katz (1995) robust estimator.

4. FINDINGS

Before developing a model in a panel data analysis, it is necessary to look at the stationarity of the series, in other words, the stability of the process that creates those series over time. When statistical analysis is performed with unit root data, misleading regression can occur with results, that is, traditional F, R² and t test values give results in a deviating way. Therefore, unit root tests should be done first (Tatoğlu, 2013).

Table 1: PP Fisher Test Panel Unit Root Test Results

VARIABLE	PP Fisher Test	
	Statistics	P
ASSET	331,55	0,000
ROA	642,34	0,000
TOBIN	531,97	0,000
LEVERAGE	1092,11	0,000
ROE	1023,63	0,000
VAIC	531,32	0,000

The following hypotheses have been developed while determining the stationarity of dependent and independent variables.

H₀: There is a general unit root in the series (H₀: $\rho_i = \rho = 1$).

H₁: There is no general unit root in the series (H₀ = $\rho_i = \rho < 1$).

Table 1 examines the stationarity of the variables. In order to find a significant relationship between series in statistical analysis, variables should not have a unit root. If there is a trend in the time series for the variable, the relationship may be false. For this reason, whether it is a false relationship or a real relationship in regression models is related to the stability of the variables (Sevinç, 2013). Unit root tests are divided into 2 groups as second and first generation tests. Authors such as Pesaran (2004), Philips and Sul (2003), Moon and Bai and Ng (2004), Perron (2004) developed second-generation tests. The first generation tests were derived by Haris and Tzavalis (1999), Levin, Lin and Chu (LLC) (2002), Fisher Philips and Perron (PP-Fisher ADF), Im, Pesaran, and Shin (1997). As it can be understood from Table 1, the tested unit root test results indicate that there is no unit root in the variables, that is, it is stationary. In other words, the null hypothesis (H₀) claiming that the series are unit roots due to the stationarity of the variables is not accepted.

Table 2: Hausman Test

Models	Chi ² test	P
Model 1	29,53	0,000
Model 2	21,74	0,000
Model 3	27,32	0.000

H₀: There are random effects.

H₁: There are no random effects.

In the analysis, Hausman Test was used to decide which of the random effects and fixed effects methods to be decided. As a result of the said Hausman test, the coefficients determined in the random effects model are compared with the coefficients determined in the fixed effects model, if a significant relationship ($p > 0.05$) between the coefficients cannot be determined, the random effects model is used. However, if there is a significant relationship ($p < 0.05$), it is suggested that the fixed effects model should be used (Ocak, 2013). Fixed effects models perceive their effects as a fixed term specific to the company, incorporating some individual characteristics and their fixed properties over time and these remain constant over time. In order to benefit from the fixed effects technique, some effects must be found and the effects must remain constant over time (Greene, 2000). In the random effects technique, different from the fixed effects technique, the

mean and variances of the effect belonging to the horizontal section come from the distribution. In the random effects technique, the horizontal cross section effects are assumed to come from the random distribution (Uludağ and Gökmen, 2010).

In Table 2, Hausman test was used to decide whether there are random or fixed effects in the panel data analysis model. In general, random effects and fixed effects techniques give similar results. When looking at the results of Hausman test, it states that choosing the fixed effects model will give more valid and accurate outputs since the determined p value is less than 0.05. In other words, the null hypothesis, stating that the effects of firms and years used in the models are random and stating that there is no correlation between explanatory variables and ϵ , was rejected. The companies used in the fixed model and the hypothesis that the effect of years is fixed and that there is a correlation between the explanatory variables and ϵ was accepted. Since the null hypothesis is rejected, fixed effects model should be used instead of random effects model.

Table 3: Auto-correlation Test Results

Models	Baltagi-Wu's Local Best Fixed Test (LBI)	Durbin Watson test of Bhargava, Franzini and Narendranathan
Model 1	2,74	2,29
Model 2	2,46	2,41
Model 3	2,51	2,31

The following hypotheses have been developed in order to test the auto-correlation of variables.

H_0 : There is no first order autocorrelation.

H_1 : There is first order autocorrelation.

One of the assumptions of the regression analysis is that there is no correlation between the same errors. Error in the model means that there is auto-correlation in the model if the terms are related. In other words, violation of the assumption that the correlations between successive error terms (u_t) are equal to 0 is stated as autocorrelation. If there is no auto-correlation between u_t and u_{t-1} , this means that the expected values and covariances are equal to 0. If there is autocorrelation in the model, the OLS estimators of the parameters are consistent and without bias, however, they lose their efficiency functions. Therefore, in case of autocorrelation, variance estimators of the error term are deviated. In this case, parameter estimators are not effective and their variances are deviated (Yildirtan, 2011).

It is not correct to use Durbin-Watson or Breusch-Godfrey tests in the model developed in panel data analysis to determine the presence of auto-correlation (Bhargava, Franzini, & Narendranathan, 1982). Instead of these techniques, Baltagi-Wu's Local Best Invariant Test (LBI) and Durbin Watson test of Bhargava, Franzini and Narendranathan, which were developed for panel data analysis, were used. The existence of auto-correlation in the model developed in Table 3 was determined by these techniques. According to these methods, if the values are smaller than two, it means that there is autocorrelation. As a result, the null hypothesis could not be rejected for the models.

Table 4: Results of the Inter-Unit Correlation Test

Models	Pesaran Test	
	Value	P
Model 1	20.511	0,0000
Model 2	20.542	0,0000
Model 3	19,672	0,0000

The following hypotheses have been developed as a result of the multiple cross-section dependency test for the variables.

H_0 : There is no cross section dependency.

H_1 : There is cross section dependence

It is one of the assumptions of the panel data model that error terms are independent of units. However, there may be simultaneous correlation of errors along the cross section units. In this case, there is heteroskedacty and autocorrelation and the correlation matrix prevents it from becoming an identity matrix. Therefore, it is necessary to test the non-correlation between units, which is its basic hypothesis (Tatoğlu, 2013). Pesaran Test was used to detect this non-correlation in the study. Pesaran (2004) proposes it as an alternative to the Breusch-Pagan test to determine the correlation between units under conditions where N is large and T is small.

In Table 4, Pesaran CD test was used to determine the correlation between units in the fixed effects model and to measure the cross-sectional dependency. When looking at the results, it is seen that the model has a cross-sectional dependency since the p value is less than 0.05, that is, there is a correlation between units. As a result, the H_0 hypothesis was rejected.

Table 5: Results of Multiple Variance Test

Models	Modified Wald Test	
	Chi2	P
Model 1	6732.43	0,001
Model 2	7841.12	0,000
Model 3	7034.31	0,001

The following hypotheses have been developed as a result of the multiple variance tests for the variables used in the study.

H₀: There is no changing variance.

H₁: There is varying variance.

Constant variance is one of the basic assumptions about the regression's error term. If the fixed variance assumption is not valid, this situation is expressed as changing variance. That is, if the variance of B_i increases as A increases in the model, it means that B_i does not have the same variance (Kutlar & Babacan, 2012). If the fixed variance assumption is not valid, there may be an effect on all issues related to the model starting from the parameter estimator (Güriş, Çağlayan, & Güriş, 2013). In case of varying variance, OLS estimators can be unbiased, but the hypothesis test may lose its validity because the covariance and variance estimators are not effective. However, prediction and estimation intervals may expand at a certain level of significance (Albayrak, 2008).

In Table 5, Modified Wald test was used to test the existence of multiple variance problem in the model. Standard Wald, LR, LM tests are used in panel data analysis only if the error is assumed to be normally distributed. On the other hand, Modified Wald Test is also used in the absence of normal distribution (Tatoğlu, 2013). Looking at Table 5, the H₀ hypothesis was rejected because the p value for the developed model was less than 0.05. In other words, there is a variance problem in the model. As a result, the variance varies according to the units and therefore it is heteroskedasite.

Table 6: Robust Estimator Results (Model 1)

Dependent Variable: ROA				
Years: 2015-2019				
Number of Years: 5				
Company Observations: 110				
Total Number of Observations: 550				
Variables	Efficiency	Std. Dev.	t-statistics	P Value
VAIC	.3211	.0210	9.43	0.000
ASSET	.1131	.032	7.33	0.000
LEVERAGE	-.3422	.0291	-11.02	0.000
Wald chi2	179.22			
P Statistics	0.0000			
R ²	0.1612			

In the regression model, in case of inter-unit correlation, auto-correlation and heteroskedasite, the variance of the unit matrix and error term is not equal to each other. This situation causes inconsistency in the model to be developed and affects the effectiveness of the model. Therefore, in the case of at least one of the problems of autocorrelation and heteroscedasticity, the correlation between units in the model should either be estimated by appropriate methods or standard errors should be corrected without touching the parameter estimates (Tatoğlu, 2013). Although the least-squares technique is popular in the regression model in the literature, robust estimators have been used in this study for these reasons. Robust estimators in the literature are Kmenta (1986), Driscoll and Kraay (1998), Eicker (1967), Newey-West (1994), White (1980), Froot (1989), Parks (1967), Huber (1967), Rogers (1993), Wooldridge (2002), Anselin (1988), Arellano (1987), Beck-Katz (1995) proposed authors. In the study, standard errors were corrected with the help of robust estimator developed by Beck-Katz (1995), since the correlation between units is resistant to the existence of autocorrelation and variance and can be applied in case of $T < N$ or increased predictive power. As a result, the Beck-Katz (1995) estimator prevents autocorrelation, correlation between units and variance problems.

In Table 6, robust estimator results showing the relationship between ROA and intellectual capital (VAIC) are shown. In this developed model, the data of 110 companies for the years 2015-2019 were used. As can be seen from Table 6, autocorrelation, inter-unit correlation and variance problems have been prevented by Beck-Katz (1995) estimator, and in this model, the F statistic level is statistically significant and the model has sufficient explanatory power. In addition, the changes in ROA are explained with 16% independent variables. However, 16% of the "coefficient of determination" (R²) was used to determine the relative efficiency of the model. When the relationships between the variables are examined, it is understood that there is a statistically positive and significant relationship between ROA and VAIC. In other words, as the intellectual capital of firms increases, their asset profitability increases. In addition, leverage, assets variables are effective on

ROA. There is a positive relationship between ROA and total assets (ASSET), which is the indicator of firm size, whereas there is a negative relationship with leverage ratio.

Table 7: Robust Estimator Results (Model 2)

Dependent Variable: ROE				
Years: 2015-2019				
Number of Years: 5				
Company Observations: 110				
Total Number of Observations: 550				
Variables	Efficiency	Std. Dev.	t-statistics	P Value
VAIC	.273	.0153	10.23	0.000
ASSETS	.1211	.0231	6.42	0.001
LEVERAGE	-.3477	.0521	-11.64	0.000
Wald chi2	161.75			
P Statistics	0.0000			
R ²	0.1434			

In Table 7, robust estimator results showing the relationship between ROE and intellectual capital (VAIC) are shown. When the relationships between the variables are examined, it is understood that there is a statistically positive and significant relationship between ROE and VAIC. In other words, as the intellectual capital of firms increases, their equity profitability increases. In addition, leverage, asset variables are effective on ROE. In addition, there is a positive relationship between ROE and total assets (ASSET), which is the indicator of firm size, whereas there is a negative relationship with leverage ratio.

Table 8: Robust Estimator Results (Model 3)

Dependent Variable: TOBIN				
Years: 2015-2019				
Number of Years: 5				
Company Observations: 110				
Total Number of Observations: 550				
Variables	Efficiency	Std. Dev.	t-statistics	P Value
VAIC	1.231	.0253	18.43	0.000
VARLIK	.043	.0231	.424	0.532
KALDIRAC	-.0023	.0363	-.132	0.702
Wald chi2	102.43			
P İstatistiği	0.000			
R ²	0.102			

In Table 8, robust estimator results showing the relationship between TOBIN and intellectual capital (VAIC) are shown. When the relationships between the variables are examined, it is understood that there is a statistically positive and significant relationship between TOBIN and VAIC. In other words, as the intellectual capital of the firms increases, the tobin's q ratio also increases. On the other hand, leverage, asset variables do not affect Tobin's q ratio.

5. CONCLUSION

According to the results of the research, there is a statistically significant and positive relationship between the intellectual capital coefficient and profitability rates and Tobin's Q ratio. The results obtained show the positive effect of intellectual capital on firm performance. According to the results of the research, there is a statistically significant and positive relationship between the intellectual capital coefficient and profitability rates and Tobin's Q ratio. The results obtained show the positive effect of intellectual capital on firm performance. Companies can focus on intellectual capital investments and increase their productivity for sustainable financial performance.

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THE IMPACT OF FOREIGN DIRECT INVESTMENTS ON TURKISH ECONOMY

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ABSTRACT

Purpose- In this study, inflation rate, unemployment rate and the index of industrial production, foreign direct investment coming to Turkey are examined on whether this is effective.

Methodology :The data analyzed are FDI, unemployment rate, inflation rate and industrial production index with the highest share in GDP. Monthly data covering the period between January 2005 and May 2020 were used. The data in the tests have been obtained from the CBRT EDDS, TURKSTAT and the World Bank.

Findings- The series are found out to be stationary at level. According to the cointegration test result, cointegration could be found between all our data. Impulse response graphs indicate that all variables respond in a reducing way to reducing shocks occurred in each indicator. Shocks have lost their effect on average in 3 days.

Conclusion- In the Turkish economy, it is seen that there is a close relationship between foreign direct investment and economic growth indicators inflation, unemployment, Industrial Production Index in the long term.

Keywords: Foreign direct investment, Turkey's economy, inflation, unemployment, industrial-production index,

JEL Codes: A10, E20, E24

DOĞRUDAN YABANCI YATIRIMLARIN TÜRKİYE EKONOMİSİ ÜZERİNDEKİ ETKİSİNİN İNCELENMESİ

ÖZET

Amaç- Bu çalışmada enflasyon oranı, işsizlik oranı ve sanayi üretim endeksinin, Türkiye'ye gelen doğrudan yabancı sermaye yatırımları üzerinde etkili olup olmadığı incelenmektedir.

Yöntem- Analize tabi tutulan veriler DYY, işsizlik oranı, enflasyon oranı ve GSYİH içindeki en yüksek paya sahip olan sanayi üretim endeksidir. Ocak 2005 - Mayıs 2020 arasındaki dönemleri kapsayan aylık veriler kullanılmıştır. Testlerdeki veriler TCMB EVDS, TÜİK ve Dünya Bankası'ndan alınmıştır.

Bulgular- Serilerimiz düzey değerde durağan çıkmıştır.Eş bütünleşme test sonucuna göre ,tüm değerlerimizin eş bütünleşik olduğu gözlemlenmiştir.Etki tepki grafiklerine göre tüm değişkenler, her göstergede meydana gelen şokları azaltmak için indirgeyici bir şekilde yanıt vermektedir. Şoklar etkisini ortalama 3 ayda kaybetmiştir.

Sonuç- Türkiye ekonomisinde doğrudan yabancı sermaye yatırımları ile ekonomik büyüme göstergeleri enflasyon, işsizlik, sanayi üretim endeksi arasında uzun dönemde sıkı ilişki içerisinde olduğu görülmektedir.

Anahtar Kelimeler: Doğrudan yabancı yatırımlar, Türkiye ekonomisi, enflasyon, işsizlik, sanayi-üretim endeksi.

JEL Kodları: A10, E20, E24

1. GİRİŞ

Yeni yatırım araçlarının yaratılması, bunların etkinliğini artıran haberleşme ve bilgi işlem teknolojilerinin hızla gelişerek rekabet rüzgârlarının global düzeye ulaşması ve uluslararası sermaye hareketlerinin serbestleşmeye başlaması küreselleşme kavramını ortaya çıkarmıştır. Gelişmiş ve gelişmekte olan ülkeler açısından bir fırsat niteliği kazanan bu sermaye hareketliliği o günlerden günümüze kadar dünya piyasalarında faaliyet alanı bulmaya devam etmiştir (Canbay, 2018). Başlangıçta mal ve hizmetlerin serbest dolaşımı yönünde atılan adımlar, 1980'lere gelindiğinde tüm dünyada baş gösteren küreselleşme akımları ile birlikte finansal sermayenin de ülkeler arasında çok hızlı bir şekilde hareket etmesi sonucunu doğurmuştur. 1980 sonrası dünyada hız kazanan küreselleşmeyle birlikte tüm ülkeler bu yapıya uyum sağlamak zorunda bırakıldı. Türkiye kötü ekonomik gidişatı durdurmak, ekonomide istikrarlı bir büyümeyi sağlamak, enflasyonu kontrol altına almak gibi dünya piyasaları ile bütünleşme amacı taşıyan "ekonomik istikrar programı" olarak da adlandırılan 24 Ocak 1980 Kararları ile serbest piyasa ekonomisine geçişte büyük adım atmıştır. 1980 yılından sonra Türkiye'ye gelen DYY' de ciddi oranda artışlar gerçekleşmiştir. Bu artışın altındaki temel sebep 24 Ocak 1980 Ekonomik İstikrar Kararlarıdır. Bu kararlar ile birlikte Türkiye tamamen dışa açık bir dış politika izlemeye başlamış, ülkede politik ve ekonomik istikrar yeniden kurulmuş, yabancı sermayenin dolaşımı tamamen serbest bırakılmış ve yabancı sermayeye, uygulanan politikalarla güven verilmiştir. Dışa açılma sürecine girmenin etkisiyle ülkeye gelen DYY zaman içinde artış sergilemiş ve bu da cari açığın azalarak 1988 ve 1989 yılında cari fazla vermesine olumlu katkı yapmıştır. 1980 yılında toplam ihracat 3.6 milyar usd iken gelen yatırımların etkisiyle 1989 yılında 11.6 milyar usd seviyelerine çıkmış ve yaklaşık 3 kat artmıştır. Ülke ekonomisine olumlu katkıları olan yatırımların enflasyon ve işsizlik üzerinde de etkisi de açıkça görülmektedir. 1980 yılında %93 enflasyon ve %94,30 olan işsizlik 1987 yılında yaklaşık 6,5 kat artan DYY nin etkisiyle %38 seviyelerine gerilemiştir. Bir diğer dikkat edilmesi gereken nokta ise GSYİH tutarındaki değişiklikler. 1980 yılında 94.7 milyar usd olan GSYİH, 1989 yılında gelen yatırımlarla birlikte 147.5 milyar usd seviyelerine çıkmıştır. 1980 istikrar programı, içe yönelik ithal ikameci kalkınma stratejisinden, dışa yönelik kalkınma stratejisine doğru önemli bir gelişme sağlarken, ticaret ve sermaye hareketleri liberasyonuna geçiş de mümkün kılmıştır

2. LİTERATÜR İNCELEMESİ

Alagöz vd. (2008), 1992-2007 yılları arasında çeyreklik veriler ile DYY ile GSYİH arasındaki ilişkiyi incelemişlerdir. Veriler TCMB EVDS' den alınmıştır. DYY verileri yalın halde durağan olmasına rağmen GSYİH verileri ise birinci dereceden durağan çıkmıştır. Değişkenlerin durağanlığının test edilmesinden sonra, DYY ile ekonomik büyüme (GSYİH) arasında bir nedenselliğin olup olmadığı çift yönlü analiz edilmiştir. Buna göre %1, %5 ve %10 anlamlılık düzeylerinde iki taraflı olarak nedensellik ilişkisi mevcut değildir. Mucuk vd. (2009), DYY ile ekonomik büyüme arasındaki nedensel bağıntıyı incelemişlerdir. Eş bütünleşme testi sonucunda DYY ile ekonomik büyüme değişkenlerinin uzun dönemde birlikte hareket ettikleri sonucuna ulaşılmıştır. Etki-tepki fonksiyonları ekonomik büyümenin DYY' ye ve DYY'nin de ekonomik büyümeye olumlu katkıda bulunduğunu göstermektedir. Varyans ayrıştırma ile ekonomik büyümenin doğrudan yabancı yatırımlar üzerindeki etkisinin daha zayıf olduğu anlaşılmaktadır. Yılmaz (2010), GSYİH, DYY ihracat ve ithalat değerleri arasındaki ilişkiyi test etmiştir. Çalışmada sonucunda DYY ile ekonomik büyüme arasında güçlü bir nedensellik ilişkisinin olmadığı ortaya çıkmıştır. Aslan vd. (2014), Türkiye ekonomisi için sermaye akımları ile ekonomik büyüme arasındaki ilişkiyi analiz etmişlerdir. Sermaye akımlarının GSYİH üzerinde etkisi olduğu sonucuna ulaşmışlardır. Acar (2016), 2001-2015 yılları arasında Türkiye'de yabancı sermaye yatırımları ile ekonomik büyüme arasındaki ilişkiyi araştırmıştır. Test sonuçlarında ekonomik büyüme ile doğrudan yabancı sermaye yatırımları arasında herhangi bir ilişki bulunamamıştır. Koyuncu (2017), Türkiye'de doğrudan yabancı yatırımlar ile ekonomik büyüme ve istihdam arasındaki ilişkiyi incelemiştir. Eş bütünleşme testinde %5 anlamlılık düzeyinde doğrudan yabancı yatırımlar, ekonomik büyüme ve istihdam serileri arasında uzun dönemli bir ilişkinin varlığı tespit edilmiştir. Karaçor vd. (2017), Türkiye'deki DYY ile ekonomik büyüme arasındaki ilişkiyi ortaya koyma amacıyla incelemelerde bulunmuşlardır. Johansen Koentegrasyon test sonuçlarına göre uzun dönemli bir ilişkiye rastlanmıştır. Sonrasında yapılan Granger nedensellik testine göre DYY ile ekonomik büyüme arasında bir ilişki bulunamamıştır. Ağır vd. (2019), Türkiye'ye gelen doğrudan yabancı yatırımların ekonomik büyüme üzerine etkisini zaman serileri ekonometrisiyle incelemişlerdir. Değişkenler arasında eş bütünleşme ve nedensellik ilişkisi bulunamamıştır. Canbay vd. (2020), Türkiye'de DYY'nin işsizlik oranına etkisini tespit etmek üzere incelemeler yapmışlardır. Yapılan testler sonucunda eş bütünleşme ilişkisinin olduğu tespit edilmiştir.

3. VERİ VE YÖNTEM

İstatistik testlerde kullanılan verilerimiz doğrudan yabancı yatırımlar, enflasyon, işsizlik ve GSYİH içindeki en büyük paya sahip olan ve GSYİH açıklanmadan yorum yapabilmemizi sağlayan sanayi üretimi endeksidir. Testlerde kullanılan datalardan doğrudan yabancı yatırımları TCMB EVDS ve Dünya Bankası'ndan; işsizlik, enflasyon ve sanayi üretimi endeksi ise TÜİK'den alınmıştır. Tüm verilerimiz aylık frekansta olup Ocak 2005 – Mayıs 2020 arasındaki dönemleri kapsamaktadır. İşsizlik, enflasyon ve sanayi üretimi endeksi yüzdesel olarak değişim şeklinde açıklanırken, DYY rakamsal cinsten açıklanmaktadır. Durum böyle olunca tüm datalarda tek düzeliği sağlamak amacıyla bir önceki aya göre değişim alınarak yüzdesel hale getirilmiştir. Daha sonrasında değişkenlerin mutlak değerleri alınmış ve logaritmik değerleriyle testlere uygun hale getirilmiştir. Serilerin durağanlığının test edilmesi amacıyla ADF birim kök testi kullanılmıştır. ADF test istatistik sonucunun mutlak değerinin Mac-Kinnon mutlak kritik değerlerinden büyük olması ve olasılık değerinin 0,05 den küçük olması sonucu tüm değişkenlerimiz düzey değerde durağandır.

Tablo 1: Birim Kök Test Sonuçları

Değişken	ADF Test İstatistiği	Mac-Kinnon Kritik Değerleri			Olasılık
		1%	5%	10%	
FDI	-11,92087	-4,008706	-3,434433	-3,141157	0,0000

Sanayi Üretimi	-15,13649	-4,008706	-3,434433	-3,141157	0,0000
İşsizlik	-13,50835	-4,008706	-3,434433	-3,141157	0,0000
Enflasyon	-11,57522	-4,008706	-3,434433	-3,141157	0,0000

Seçilen bütün değişkenleri birlikte ele alan ve bir sistem bütünlüğü içinde inceleyen VAR modeli için, tahminlerin doğru biçimde yapılabilmesi açısından öncelikle optimal gecikme uzunluğunun belirlenmesini gerekmektedir. Gecikme uzunluklarının belirlenmesinde en yaygın yöntemler şunlardır; Olabilirlik Oranı Testi (Likelihood Ratio Test: LR), Akaike Bilgi Kriteri (Akaike Information Criterion: AIC), Hannan-Quinn Bilgi Kriteri (HQ), Son Öngörü Hatası (FPE), Schwarz Bilgi Kriteri (Schwarz Information Criterion). LR Test İstatistiği, Son Öngörü Hatası, Akaike Bilgi Kriteri, Hannan-Quinn Bilgi Kriteri ve Schwarz Bilgi Kriterine göre uygun gecikme uzunluğu 1 olarak gözükmektedir. Bu kriterleri minimum yapan gecikme uzunluğu, optimal olarak kabul edilmektedir.

Durağan oldukları tespit edilen değişkenler arasında uzun dönemde bir ilişkinin olup olmadığını anlayabilmek için Johansen Eş bütünlük testi yapılmıştır. Bu test, Trace (İz) İstatistiği ve Max-Eigenvalue (Maksimum Özdeğer) istatistikleri aracılığıyla yapılmıştır. 4 değişkene göre yapılan Trace (İz) İstatistiği ve Max-Eigenvalue (Maksimum Özdeğer) %5 anlamlılık düzeyinde kritik değerler arasında incelenmiştir. %5 anlamlılık düzeyinde hipotez reddedilmiştir. Buna göre DYY, Enflasyon, İşsizlik ve Sanayi Üretimi arasında uzun dönemde birlikte hareket ettikleri ve 4 değişken arasında eş bütünlük olduğu sonucuna ulaşılmıştır.

Bir makroekonomik yapının üzerinde herhangi bir değişkenin etkili olup olmadığını inceleyen diğer yöntemlerden biri de etki-tepki fonksiyonlarıdır. Etki-tepki fonksiyonlarının grafikleri ile ilk önce modeldeki değişkenlere verilen şoklara açıkların tepkisi bakımından daha sonra da açıklara verilen şoklara modeldeki değişkenlerin tepkisi bakımından incelenmektedir. Etki tepki grafiklerine göre tüm değişkenler, her göstergede meydana gelen şokları azaltmak için indirgeyici bir şekilde yanıt vermektedir. Şoklar etkisini ortalama 3 ayda kaybetmiştir.

Seçilmiş değişkenler arasında bir eş bütünlük ilişkisinin olup olmamasının sorgulanması kadar, bu değişkenlerin birbirlerini etkileme dereceleri de önemlidir. Literatürde bu yönde bulgulara ulaşmak için VAR modelinden hareketle "varyans ayrıştırması" hesaplamaları kullanılmaktadır. Varyans ayrıştırması ile ilgili yapılan hesaplamalar aşağıdaki tablolarda gösterilmektedir. Varyans ayrıştırması, değişkenlerden birindeki değişimi, tüm değişkenleri etkileyen ayrı ayrı şoklar olarak ayırmaktadır. Varyans ayrıştırmasıyla değişimdeki değişimlerin ne kadarının kendisinden, ne kadarının sistemdeki diğer değişkenlerden kaynaklandığı belirlenmeye çalışılmaktadır. 1. dönemde DYY'nin kendisi üzerindeki açıklama gücü %99,97 iken 10. döneme gelindiğinde %96,96 seviyelerine düşmektedir. Doğrudan yabancı yatırımlarda zaman içerisinde meydana gelen değişimi açıklama gücü en yüksek değişken enflasyon olarak gözükmektedir. Enflasyonun varyans ayrıştırmasına bakıldığında ilk dönemde sadece kendi üzerinde açıklama gücü vardır. 10. dönem periyoduna gelindiğinde ise %98'lik kısmı kendisinden kalan %2'lik kısmın en büyük payı %0,93 ile sanayi üretiminden açıklanmaktadır. Sanayi üretimi varyans ayrıştırması tablosuna bakıldığında ilk dönemde neredeyse tamamı kendisi tarafından açıklanmakta olup dönem ilerledikçe istikrarlı bir şekilde enflasyon ve işsizlik tarafından açıklanma gücünde artış yaşanmıştır. DYY'nin sanayi üretimi üzerindeki açıklama gücünün çok zayıf olduğu da dikkat çekmektedir. İşsizliğe gelen bir şokun %98,38 lik kısmı ilk dönem kendinden açıklanırken, 10 dönem sonra %93,35 lik kısmı kendinden yaklaşık olarak %6,65 lik kısımları ise DYY, sanayi ve enflasyon üzerinde açıklanmaktadır. İşsizliğin 10 dönemlik periyotta kendi üzerindeki etkisi %5 lik bir azalma göstermektedir.

4. SONUÇ

1930'lu yıllarda yaşanan Büyük Buhran ve sonrasında başlayan İkinci Dünya Savaşı, dünya ekonomisinde büyük hasarlara yol açmış ve çoğu ülkelerin batma noktasına gelmesine, krizlere neden olmuştur. Krizden çıkış yolları arayan ülkeler dünya ticaretinin serbestleşmesi yönünde adımlar atmaya başlamıştır. Gelişmiş ülkeler yeni pazarlara açılmak, ucuz hammadde sağlamak, daha ucuz iş gücüne yönelmek ve ölçek ekonomilerine geçebilmek; gelişmekte olan ülkeler ise büyüme ve kalkınmaları için gerekli olan fonlara erişebilmek amacıyla, sermaye akımlarının serbestleşmesini desteklemişlerdir. 1980'lerle birlikte gelişmiş ülkelerde finansal serbestleşme akımları hız kazanırken Türkiye'de bu akıma uymak zorunda kaldı. Sanayileşme amaçlı korumacı ve müdahaleci mekanizmaların ortadan kaldırılması, finansal piyasaların serbestleştirilmesi, dış ticaret üzerindeki kontrollerin gevşetilmesi ve uluslararası sermaye hareketlerinin serbestleştirilmesi ile bu akıma Türkiye'de katılmıştır. Türkiye ekonomisinde doğrudan yabancı sermaye yatırımları ile ekonomik büyüme göstergeleri enflasyon, işsizlik, sanayi üretim endeksi arasında uzun dönemde sıkı ilişki içerisinde olduğu görülmektedir. Yapılan analizlere göre yabancı sermaye yatırımlarının artırılması için uygun fiziki ortamın yaratılması, ülke içi ekonomik ve siyasi istikrarın sağlanması, teşvik edici düzenlemelerin gerçekleştirilmesi, özellikle ekonomik büyüme göstergeleri olan enflasyon ve işsizlik oranlarını düşürücü, sanayi üretimini arttırıcı politikaların izlenmesi gerekmektedir.

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ANALYSIS OF THE RELATIONSHIP BETWEEN THE ANNOUNCEMENTS OF DIVIDEND PAYOUT DECISIONS OF FOOTBALL CLUBS AND THE RETURNS OF SHARES USING THE EVENT ANALYSIS METHOD

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ABSTRACT

Purpose- Dividend is the share allocated by companies from the profit of the period to payout to their shareholder. The issue of dividend payouts seeks an answer to the question of how much of the profit obtained by companies in the fiscal year will be paid to shareholders. Investors act with two basic expectations when investing in stocks. The first is to earn dividend from the company's profit for the period, the second is to benefit from the increase in stock price and to earn capital gain. Joint stock companies may decide to payout dividends or not. In this context, announcing the decisions to payout or not to payout dividends is important for investors. Referred to as the four major football clubs in Turkey, Besiktas, Fenerbahce, Galatasaray and Trabzonspor's shares are traded on Borsa Istanbul (BIST). Like other BIST companies, clubs have investors and these investors deal with dividend payout decisions. The research aims to bridge the gap in the field. In the study, the relationship between the announcement of the dividend payout decisions of four big clubs operating in BIST and stock returns was examined.

Methodology- In the study, five days before and five days after the clubs' Public Disclosure Platform (PDP) notifications were made, stock returns were analyzed using the event analysis method. 2009-2010 / 2019-2020 season data of the clubs were used in the research.

Findings- According to the results obtained from the research, announcing that dividends will be payout has a significant and positive effect on stock returns, while announcing that no dividends will be payout has a significant and negative effect on stock returns.

Conclusion- Research results are important in terms of revealing the effect of public disclosure announcements on performance. Accordingly, club managers can play a role in increasing financial performance by making the announcements fully, completely and on time within the framework of effective corporate management.

Keywords: Dividend payout, BIST, football, event study, public disclosure platform

JEL Codes: G10, G14, G30

1. INTRODUCTION

Dividend decision of a company is an important area of financial management (Pandey, 1998). According to Miller and Modigliani (1961) dividend payout announcements are the indicators of the change in expectations for the future profitability of the firm. Hence, the dividend policy decision for a firm is very important thus the method that managers attain making dividend policy decisions and whether or not they follow an accurate set of guidelines or precise strategies to make these decisions will impact on the future performance of the firms (Suwanna, 2012). In the scientific literature dividend policies and their impact of stock prices mostly discussed in the context of signalling theory and efficient market hypothesis, however over the last decade researchers have started to investigate if those theories are still relevant and if the other theories such as agency and behavioral theories may be the better theoretical frameworks to explain the movements of stock price (Legenzova et.al, 2017). There are many studies in the previous literature investigating the effect of dividend announcements on stock prices (Borges, 2009; Dasilas and Leventis, 2011; Sulaiman and Migiro, 2015). Even though previous literature regarding stock prices' reaction to dividend announcements is rather broad, there are still few studies analyzing the effect of football club dividend announcements

on stock returns in the context of Turkey. The aim of this paper is to analyze the impact of dividend announcements of football clubs on stock returns for the period of 2009/2010-2019-2020 seasons in Turkey.

2. LITERATURE REVIEW

There are many studies examining the effect of dividend payout decisions on stock performance. However, there are a limited number of studies examining the relationship between dividend payout decisions of football clubs operating in BIST and stock returns. Bayazitli, Kaderli, and Gürel (2006) concluded that dividend payout announcements have an effect on firms' stock returns. Uddin (2008) examine the effect of dividend announcement on shareholders' value: evidence from Saudi Arabian stock exchange during 2001 and 2005. The results showed that dividend payments have no impact on the shareholders' value in the absence of taxes and other market imperfections. Pradhan (2014) investigate the effect of dividend announcement on share price during 2009 to 2011. The results show that there is an increase in the stock price after the announcement. Eraslan and Koç (2017) analyzed the annual financial data of 15 companies whose shares are traded in Borsa Istanbul and operating in the cement sector between 2005 and 2015, using panel data analysis methods, and concluded that dividend payments have a positive effect on earnings per share. Sakarya et. al (2018) stated that the dividend payout announcements affect the stock prices of the companies. Alaeto (2018) stated that dividend announcements do not convey information to investors and also share prices. The results obtained from the researches differs from each other.

3. DATA AND METHODOLOGY

In the study, five days before and five days after the clubs' Public Disclosure Platform (PDP) notifications were made, stock returns were analyzed using the event analysis method. 2009-2010 / 2019-2020 season data of the clubs were used in the research.

4. FINDINGS

In Table 1, the effect of dividend payout notifications on stocks for Fenerbahçe was examined by paired t-test. Fenerbahçe announced that it will payout dividends 8 times between 2009 and 2019. In the analysis, 5 days before and 5 days after the dividend payout notification are compared. According to the results, it was observed that after the dividend payout notification was made, Fenerbahçe's stock prices increased by 1.27%.

Table 1: Effect of Dividend Payout Notifications on Stocks (Fenerbahçe)

		N	Mean	Std. Deviation	t	Sig. (2-tailed)
Stock price	Before Notification	8	24,5588	1,55026	-,721	,473
	After Notification	8	24,8735	2,28622		

Table 2: Effect of Dividend Payout Notifications on Stocks (Galatasaray)

		N	Mean	Std. Deviation	t	Sig. (2-tailed)
Stock price	Before Notification	5	7,7908	2,22389	-,434	,666
	After Notification	5	8,0712	2,34670		

In Table 2, for Galatasaray, the effect of dividend payout notifications on the stock price was analyzed with the paired t-test. Galatasaray announced that it will payout dividends 5 times between 2009 and 2019. In the analysis, 5 days before and 5 days after the dividend payout notification are compared. According to the results, it was observed that after the dividend payout notification was made, Galatasaray's stock prices increased by 3.47%.

Table 3: Effect of Dividend Payout Notifications on Stocks (Trabzonspor)

		N	Mean	Std. Deviation	t	Sig. (2-tailed)
Stock price	Before Notification	10	5,8388	2,14744	,265	,792
	After Notification	10	5,7296	1,97416		

In Table 3, for Trabzonspor, the effect of dividend payout notifications on the stock has been analyzed by paired t-test. Trabzonspor announced that it will payout dividends 10 times between 2009-2019. In the analysis, 5 days before and 5 days after the dividend payout notifications are compared. According to the results, it is understood that Trabzonspor lost 1.91% value in stock prices after the dividend notification was made.

Table 4: The Effect of Not Paying Dividend Notifications on Stocks (Beşiktaş)

		N	Mean	Std. Deviation	t	Sig. (2-tailed)
Stock price	Before Notification	15	3,1484	1,08363	,101	,920
	After Notification	15	3,1307	1,07478		

In Table 4, for Beşiktaş, the effect of not paying out dividends notifications on the stock has been analyzed with the paired t-test. Beşiktaş announced that it would not payout dividends for 15 times between 2009 and 2019, and did not make a dividend payout notification within this period. In the analysis, 5 days before and 5 days after the non-dividend notification stock prices were compared. According to the results obtained from the analysis, it is understood that after the notification of not to payout dividends, there was a 0.57% depreciation in Beşiktaş's stock prices.

Table 5: Effect of Not Paying Dividend Notifications on Stocks (Fenerbahçe)

		N	Mean	Std. Deviation	T	Sig. (2-tailed)
Stock price	Before Notification	16	15,5065	3,67186	-,486	,627
	After Notification	16	15,7818	3,48286		

In Table 5, the effect of notifications of not paying out dividends for Fenerbahçe on the stock was examined by paired t-test. Between 2009 and 2019, Fenerbahçe declared that it would not payout dividends 16 times. In the analysis, 5 days before and 5 days after the non-dividend notification stock prices were compared. As a result of the analysis, it is understood that after the notification of not to payout dividends, Fenerbahçe's stock prices have increased by 1.74%. In other words, despite Fenerbahçe's notifications of not to payout dividends, stock prices did not decrease.

Table 6: Effect of Not Paying Dividend Notifications on Stocks (Galatasaray)

		N	Mean	Std. Deviation	T	Sig. (2-tailed)
Stock price	Before Notification	12	2,5955	1,24547	,344	,731
	After Notification	12	2,5200	1,15374		

In Table 6, the effect of not paying out dividend notifications on stocks for Galatasaray is analyzed by paired t-test. Between 2009 and 2019, Galatasaray notified that it would not payout dividends 12 times. In the analysis, 5 days before and 5 days after the non-dividend notification stock prices were compared. As a result of the analysis, it is understood that Galatasaray's stock prices lost 3% after the notification of not to pay out dividends.

Table 7: Effect of Not Paying Dividend Notifications on Stocks (Trabzonspor)

		N	Mean	Std. Deviation	T	Sig. (2-tailed)
Stock price	Before Notification	14	3,0963	2,22710	,372	,711
	After Notification	14	2,9629	2,01670		

In Table 7, the effect of not paying out dividend notifications on stocks for Trabzonspor was examined by paired t-test. Trabzonspor notified 14 times that it would not payout dividends between 2009-2019. In the analysis, 5 days before and 5 days after the non-dividend notification stock prices were compared. As a result of the analysis, it is understood that Trabzonspor lost 4.5% in its stock prices after the notification not to pay out dividends.

Table 8: Comparison of Dividend Payouts

	Notification of Not Paying Out Dividend	Changes in Stock Prices	Ranking
Beşiktaş	0	0	-
Fenerbahçe	8	+%1,27	2
Galatasaray	5	+%3,47	1
Trabzonspor	10	_%1,91	3

Table 9: Comparison of Not Paying Out Divident

	Notification of Divident Payout	Changes in Stock Prices	Ranking
Beşiktaş	15	-%0,57	2
Fenerbahçe	16	+%1,74	1
Galatasaray	12	-%3,00	3
Trabzonspor	14	-%4,50	4

5. CONCLUSION

The results showed that, dividend payout notifications have an impact on stock prices. According to the results obtained from the analysis, dividend payout notifications have a statistically significant and positive effect on stock prices. In the sample, while the biggest positive effect of dividend payout announcements was observed in Galatasaray stocks (3.47%), Fenerbahçe stocks ranked second with an increase (1.27%). On the other hand, Trabzonspor shares declined by 1.91% after the dividend payout was announced. Beşiktaş did not pay dividends during the period under review.

On the other hand, announcements for not paying out dividends have a statistically significant and negative effect on stock prices. In the analyzed period, after the announcement of not paying out dividends, only Fenerbahçe stocks did not decrease (1.74% increase), whereas Trabzonspor stocks were 4.5%; 3% in Galatasaray stocks; Besiktas stocks, on the other hand, decreased by 0.57%.

Research results are important in terms of revealing the effect of public disclosure announcements on financial performance. Accordingly, club managers can play a role in increasing financial performance by making announcements fully, completely and on time within the framework of effective corporate management.

In future studies, the differences identified in the performance of club stocks and the determinants that make up these differences will be researched to contribute to the literature.

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A COMPARATIVE NONPARAMETRIC ANALYSIS ON CRYPTO CURRENCY EXCHANGE RATE RETURNS

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ABSTRACT

Purpose- Cryptocurrencies market have grown considerably since 2008 in terms of number and frequency of transactions, despite their advantages and disadvantages. Therefore cryptocurrency market is addressed frequently by financial and government institutions globally. Cryptocurrencies, which provide advantages in terms of time and costs such as instant transactions and low transfer fees, are seen as an alternative financial asset for investors. Therefore, cryptocurrency holders purposing of investing in its exchange rates are exposed to market risk. The purpose of this study is to compare the effectiveness of cryptocurrency exchange rate returns with respect to each other.

Methodology- The relative efficiencies of exchange rate returns are compared with the second order stochastic dominance criterion. As a nonparametric approach Stochastic dominance is used in analyzing the risk of financial return series that do not exhibit a normal distribution.

Findings- When the exchange rate returns of five different cryptocurrencies are compared with the second order stochastic dominance criterion, it is determined that there are effective currencies among the cryptocurrency returns in the said period. On the other hand, it is seen that there are currencies that do not have stochastic dominance among the cryptocurrency returns.

Conclusion- The results results provide ideas for investors and researchers who want to include cryptocurrencies in their portfolios.

Keywords: Cryptocurrency, exchange rate risk, stochastic dominance, VaR, value at risk

JEL Codes: E44, G01, G32

KRİPTOPARA DÖVİZ KURU GETİRİLERİ ÜZERİNE KARŞILAŞTIRMALI NONPARAMETRİK BİR ANALİZ

ÖZET

Amaç- Kriptopara birimleri 2008'den bu yana, avantaj ve dezavantajlarına rağmen sayı ve işlem sıklığı açısından oldukça büyüme göstermektedirler. Büyüyen kriptopara piyasası küresel olarak finans ve devlet kurumları tarafından da sıklıkla ele alınmaktadır. Anlık işlem yapabilme ve düşük transfer ücretleri gibi zaman ve maliyetler açısından avantajlar sağlayan kriptoparalar yatırımcılar açısından da alternatif bir finansal varlık olarak görülmektedirler. Dolayısıyla kriptopara kurlarındaki yatırım amacıyla kriptopara tutanları piyasa riskine maruz bırakmaktadır. Bu çalışmanın amacı kriptopara döviz kuru getirilerinin birbirlerine göre etkinliklerinin karşılaştırılmasıdır.

Yöntem- Döviz kuru getirilerinin birbirlerine göre etkinlikleri ikinci dereceden stokastik baskınlık kriteri ile karşılaştırılmıştır. Stokastik baskınlık özellikle normal dağılım sergilemeyen finansal getiri serilerinin riskinin analizinde başvurulan herhangi bir dağılım varsayımına dayanmayan nonparametrik bir yaklaşımdır.

Bulgular- İşlem hacmi en yüksek 5 farklı kriptopara biriminin döviz kuru getirileri karşılaştırıldığında söz konusu dönemde kriptopara getirileri arasında ikinci dereceden stokastik baskın olarak elde edilen para birimleri tespit edilirken, diğer kriptopara getirilerine karşı etkin olmayan para birimleri olduğu da görülmektedir.

Sonuç- Karşılaştırma sonuçları, kriptoparaları portföylerine dahil etmek isteyen yatırımcılara ve araştırmacılara ışık tutmaktadır.

Keywords: Kriptopara, döviz kuru riski, stokastik baskınlık, VaR, riske maruz değer

JEL Codes: E44, G01, G32

1. GİRİŞ

Son yıllarda oldukça büyüyen kriptopara piyasası küresel olarak finans ve devlet kurumları tarafından da sıklıkla ele alınmaktadır. Binlerce çeşit kriptopara birimi içerisinde kapitalizasyonunun büyüklüğü nedeniyle en fazla bilineni Bitcoin'dir. 2020 yılı itibarıyla en yüksek piyasa değerine sahip kripto para Bitcoin (BTC)'i sırasıyla Ether (ETH), Ripple (XRP), Tether (USDT) ve Bitcoin Cash (BCH) takip etmektedir

(CoinMarket, 2020). Kriptopara birimleri 2008'den bu yana, avantaj ve dezavantajlarına rağmen sayı ve işlem sıklığı açısından oldukça büyüme göstermektedirler. Anlık işlem yapabilme ve düşük transfer ücretleri gibi zaman ve maliyetler açısından avantajlar sağlayan kriptoparalar ölçeklendirme, siber güvenlik ve volatilité gibi dezavantajları da taşımaktadırlar. Yatırımcılar açısından ise normallik varsayımını ihlal eden kriptopara fiyatlarındaki değişimler, alternatif bir finansal varlık olarak görülmelerini sağlamıştır. Kriptopara birimlerinin, fiyat hareketliliklerindeki oynaklık nedeniyle geleneksel para birimlerine göre daha değişken ve dolayısıyla daha riskli oldukları bilinmektedir (Osterrieder ve Lorenz, 2017; Phillip, Chan ve Peiris, 2018; Gkillas ve Katsiampa, 2018).

Risk yönetimi ve portföy analizi açısından kriptoparaların piyasada hangi yeteneklere sahip olduğunun ortaya çıkarılması yatırımcılar için önem taşımaktadır. Genel olarak Bitcoin, ortak pek çok özellikleri olduğundan iktisatçılar tarafından, altın ile karşılaştırılmaktadır. Hem Bitcoin hem de altın, değerlerinin çoğunlukla çıkarmanın az ve maliyetli olmasından almaktadır (Dyhrberg, 2016). İkisinin de uyuşu yok, her iki varlık da bir hükümet tarafından kontrol edilmiyor ancak birkaç bağımsız operatör ve şirket tarafından sürdürüldüğünden arz, yönetim ve kontrol süreçleri farklılık taşımaktadır. Glaser vd. (2014), Bitcoin borsasının ticaret verileri, Bitcoin Blockchain'den işlem verileri, Bitcoin Wikipedia makalesi için ziyaretçi istatistikleri ve önemli Bitcoin olaylarının tarihleri gibi bilgiler ışığında, Bitcoin'i ilk kez satın alan borsa kullanıcılarının, mal veya hizmetlerin ödemesi için kullanmak yerine bu Bitcoinleri spekülasyon amacıyla takas cüzdanlarında tuttuklarını belirtmişlerdir. Çalışmalarındaki bu sonucu ayrıca, Bitcoin fiyatlarının kriptopara birimiyle ilgili haberlerden etkilenmesi, kullanıcı taleplerinin borsada işlem gören Bitcoin hacmi üzerinde etkili olması ancak Bitcoin sistemi içindeki hacim üzerinde etkisi olmaması durumuyla desteklemektedirler. Kuzu ve Çelik (2020) Bitcoin ile diğer geleneksel yatırım araçları arasında uzun vadede eş bütünleşme ilişkisi görülmemesine ve mikro açıdan taşıdığı risklere rağmen Bitcoin'in portföy çeşitlendirme aracı olarak düşünülebileceğine değinmektedirler. Kriptopara üzerine yapılan analizler, piyasada ne tür bir role sahip olduklarını ortaya çıkarmak açısından önemlidir.

Bu makale, bir yatırım aracı olarak kullanılması durumunda, kriptopara birimlerinin fiyat değişimleri ile oluşan getirilerinde maruz kalınacak riskin ölçülmesine odaklanmaktadır. Finans alanında geleneksel olarak bilinen R-kare, Sharpe oranı ve beta gibi risk ölçüleri kullanılmaktadır. Bir diğer risk ölçüsü ise temeli 1960'lara dayanan Stokastik Baskınlık kriteridir. Kriptopara döviz kuru getirileri, yüksek volatilité ve birbirleri arasında korelasyon sergilemektedirler. Ayrıca normal dağılım özelliğini de sağlamamaktadırlar. Stokastik baskınlık özellikle normal dağılım sergilemeyen finansal getiri serilerinin riskinin analizinde başvurulan herhangi bir dağılım varsayımına dayanmayan nonparametrik bir yaklaşımdır. Bu çalışmada, kriptopara döviz kuru getirilerinin birbirlerine göre etkinlikleri ikinci dereceden stokastik baskınlık kriteri ile karşılaştırılmıştır.

2. LİTERATÜR

Etkin olmayan finansal piyasalarda, yatırımcıların getiriler üzerine analiz ve tahminler yaparak pozisyon alması mümkün olabilmektedir. Ancak kriptopara kurlarındaki dalgalanmalar işlem yapmak veya borsada kullanmak amacıyla kriptopara tutanları piyasa riskine maruz bırakmaktadır (Atıcı, 2020). Yapılan çalışmalarda kriptopara fiyatlarında artan trend ve getirilerinde oluşan yüksek volatilité risk unsuru olarak gösterilmektedir (Stavroyiannis, 2018; Güleç, Çevik ve Bahadır, 2018; Şahin ve Özkan, 2018). Başta Bitcoin olmak üzere farklı kriptoparaların volatilitelerinin modellenmesine ilişkin anlamlı sonuçlar içeren pek çok çalışma bulunmaktadır (Glaser vd., 2014; Dyhrberg, 2016; Katsiampa, 2017; Güleç, 2019; Katsiampa, Corbet ve Lucey, 2019; Ertuğrul, 2019; Silahlı vd., 2019; Bouri, Lucey ve Roubaud, 2020; Jiménez, Mora-Valencia ve Perote, 2020; Kayral, 2020; Platanakis ve Urquhart, 2020). Asimetrik volatilité modellerini uyguladığı çalışmada Akkuş ve Çelik (2020) Bitcoin getiri volatilitesinde uzun hafızanın varlığı tespit etmiş ve Bitcoin piyasasındaki pozitif haber şoklarının negatif haber şoklarına kıyasla volatilitéyi daha fazla arttırdığı sonucuna varmıştır. Dolayısıyla Bitcoin fiyatlarındaki oynaklık kamuya açıklanan bilgilerden de etkilenmektedir (Bartos, 2015). Teorik olarak asimetrik bilgi ortamının hakim olduğu ve fiyat hareketlerinin spekülatif nedenlerden etkilendiği bir kriptopara piyasasında, teknik analiz yöntemleri kullanılarak fiyatlar önceden tahmin edilebilir (Uyar, Kelten ve Morali, 2020).

Karaağaç ve Altınırnak (2018) en yüksek piyasa değerine ve bunun yanında yüksek işlem hacmine sahip 10 kriptopara birimlerinin, Konuşkan vd. (2019) ise Bitcoin ile Ether ve Ripple kriptopara birimlerinin fiyat hareketlerini nedensellik ilişkisiyle inceleyerek kısa dönemde etkileşim içinde olduklarını ortaya koymuşlardır. Kanat ve Öget (2018) analizleri sonucunda, İngiltere (FTSE), Amerika Birleşik Devletleri (S&P 500) ve Kanada (STX) Borsasının, Bitcoin fiyatının dalgalanması hakkında kısa vadede fikir verebileceği dolayısıyla yatırımcıların Bitcoin'e yatırım yaparak risklerini çeşitlendirme yoluna gidebileceği kanaatindedirler. Bunun yanında Kılıç ve Çütçü (2018) BIST-100 endeksi ile Bitcoin fiyatları arasında orta ve uzun vadede bir eşbütünleşme etkisinin bulunmadığını tespit etmişlerdir. Benzer şekilde Azimov ve Alkan (2019) ekonometrik analizleri sonucunda Çin ve Rusya'nın ulusal para birimlerin dolar karşısındaki kuru, bu ülkelerin ulusal rezervleri ve piyasa endeksleri ile Bitcoin'in dolar karşısındaki performansını araştırmış ve fiyat serilerinin uzun vadede eşbütünleşik ilişkili oldukları sonucuna varmışlardır. Tüm bu çalışmaların sonuçları unutulmamalıdır ki kapsadığı dönemi bağlamaktadır. Gül (2020), çalışmada kriptoparaların portföy çeşitlendirmesindeki performanslarını değerlendirmiştir. Hisse senetleri, emtialar, döviz kurları ve yatırım fonlarından meydana gelen portföylere ayrıca kriptoparaların eklenmesiyle, genel olarak daha yüksek getiri ve daha düşük risk seviyelerine ulaşıldığını görmüştür. Dolayısıyla, kriptoparaların portföy çeşitlendirmesinde kullanılabilirliği sonucuna varmıştır. Yağmur ve Mangır (2020), yine Bitcoin fiyatlarındaki hareketlilik nedeniyle, parasal niteliğinden kısa vadeli spekülatif bir finansal yatırım aracı olma özelliğine dikkati çekmişlerdir. Koutmos (2019), farklı bir yatırım aracı olarak ortaya çıkan Bitcoin'in, ekonomik değişkenlere göre görünüşte ilgi çekici bağımsız davranıştaki fiyatlarına rağmen, geleneksel finansal varlıklarıyla aynı tür piyasa risklerine maruz kalabileceği konusunda uyarılmaktadır.

Geleneksel portföylere, kriptoparaların dahil edilmesiyle sağlanan faydalar üzerine çalışmalar; kriptoparaların portföy riskinin düşürülmesinde etkili olduklarını ve aynı zamanda portföy çeşitlendirmede de alternatif olduklarına değinmektedirler: Dyhrberg, 2016; Ibragimov ve Prokhorow, 2016; Andrianto ve Diputra, 2017; Chuen, Guo ve Wang, 2017; Mba, Pinda ve Koumba, 2018; Borri, 2019; Brauneis ve Mestel, 2019; Liu, 2019; Bouri, Lucey ve Roubaud, 2020; Platanakis ve Urquhart, 2020.

Finansal yatırımlarda ilgili tüm taraflar, kriptopara birimlerinin fiyat hareketlerindeki oynaklıktan kar kaybına uğrayarak etkilenebilmektedir (Likitratcharoen vd., 2018). Bu nedenlerle kriptopara birimlerinin fiyatlarındaki oynaklık borsada kullanıcıların ilgisinde olmaktadır. Kriptopara

getirilerinin ikinci dereceden stokastik baskınlık kriteri ile etkinlik analizi üzerine çalışmalar oldukça azdır. İkinci dereceden stokastik baskınlığı kriptopara içeren portföy yatırımlarında kullanan çalışmalar; Anyfantaki, Arvanitis ve Topaloglou, 2018; Topaloglou ve Tsomidis, 2018 ve Belhadj ve Ben Hamad, 2019.

3. VERİ VE YÖNTEM

Analizde ikinci dereceden stokastik baskınlık kriteri ile kriptopara getirilerinin birbirlerine göre etkinlikleri ikiye bölünmüş karşılaştırmalarla incelenmiştir. 01.03.2019 ile 31.10.2020 tarihleri arasında, En yüksek piyasa değerine sahip ilk 10 kriptopara biriminin ABD doları cinsinden değerler, Bitcoin (btc), Ethereum (eth), Tether (usdt), XRP (xrp), Bitcoin Cash (bch), Chainlink (link), Binance Coin (bnb), Litecoin (ltc), (Polkadot), USD Coin (usdc), Cordano (ada). <https://coinmarketcap.com/> (02.11.2020)

Table 1: Kriptopara Getirilerine İlişkin Tanımsal İstatistikler

	btc	eth	usdt	xrp	bch	link	bnb	ltc	usdc	ada
Minimum	-0.45559	-0.54702	-0.03922	-0.39314	-0.56125	-0.61754	-0.55178	-0.44659	-0.02956	-0.50331
Maksimum	0.16585	0.17388	0.04024	0.22875	0.34377	0.48416	0.19346	0.22821	0.03178	0.18354
Medyan	0.00160	0.00104	0,00000	-0.00043	-0.00032	0.00172	0.00116	-0.00077	0,00000	0,00239
Ortalama	0.00206	0.00168	-0.00001	-0.00045	0.00112	0.00534	0.00166	0.00025	-0.00002	0.00126
Standart Sapma	0.03878	0.04741	0.00592	0.03946	0.05473	0.06759	0.04819	0.04778	0.00541	0.05267
VaR	0.10351	0.14259	0.01309	0.11527	0.15828	0.16339	0.12842	0.13689	0.01258	0.12923
CVaR	0.17353	0.21722	0.02113	0.16643	0.25167	0.25055	0.21689	0.20488	0.01929	0.20692

Stokastik baskınlık bir rastlantı değişkeninin dağılımından bağımsız olma özelliği taşıyan ve aslında dağılımı oluşturan değerlerin tamamını dikkate alan bir ölçüttür (Hanoch ve Levy, 1969). İstatistik olarak Stokastik Baskınlık, tercih edilen bir beklentinin birikimli dağılım değerinin hiçbir zaman ikinci tercih olanın birikimli dağılımını aşmaması durumudur ve bu tanım kısaca FSD tanımı olarak verilmektedir (Hadar ve Russell, 1969). Bir x raslantı değişkeninin tüm gerçel değerleri ($x \in R$) için $f(x)$ olasılık fonksiyonunu ve

$$F(x) = \int_{-\infty}^x f(t) dt$$

olarak verilen kümülatif dağılımı dikkate alalım. f ve g gibi herhangi iki olasılık dağılımları tüm $x \in R$ değerleri için $G(x) \geq F(x)$ koşulunu sağlıyorsa "**f g'ye birinci derece stokastik baskındır**" denir ve $f \succ_1 g$ ile gösterilir. Bu tanıma göre, f 'in beklenen faydası g 'nin beklenen faydasından küçük değilse f g'ye birinci derece stokastik baskındır. Eğer tüm $x \in R$ değerleri için

$$\int_{-\infty}^x G(t) dt \geq \int_{-\infty}^x F(t) dt$$

koşulu sağlanıyorsa "**f g'ye ikinci derece stokastik baskındır**" denir ve $f \succ_2 g$ ile gösterilir. Bir raslantı değişkeni olan x 'in bir eşik değer olarak η hedefi için ikinci dereceden stokastik baskınlık ilişkisi tüm $\eta \in R$ değerleri için $E([\eta - f]_+) \leq E([\eta - g]_+)$ olarak tanımlanır. Bu tanıma göre, f dağılımı g dağılımına göre daha tahmin edilebilir veya daha az risk içerir şeklinde yorumlanır.

4. BULGULAR

İkinci dereceden stokastik baskınlık karşılaştırmaları bir önceki bölümde tanımda verilen formülle elde edilmiş ve Tablo 2'de sunulmuştur.

Table 2: İkili Karşılaştırmalarla Etkinlik Sonuçları

rank		btc	eth	usdt	xrp	bch	link	bnb	ltc	usdc	ada
4	btc	-	Etkin				Etkin	Etkin			Etkin
2	eth		-				Etkin				
9	usdt	Etkin	Etkin	-	Etkin	Etkin	Etkin	Etkin	Etkin	Etkin	Etkin
7	xrp	Etkin	Etkin		-	Etkin	Etkin	Etkin	Etkin		Etkin
6	bch	Etkin	Etkin			-	Etkin	Etkin	Etkin		Etkin
1	link						-				
3	bnb		Etkin				Etkin	-			Etkin
5	ltc	Etkin	Etkin				Etkin	Etkin	-		Etkin
8	usdc	Etkin	Etkin		Etkin	Etkin	Etkin	Etkin	Etkin	-	Etkin
2	ada		Etkin				Etkin				Etkin
	Toplam	5	8	0	2	3	9	6	4	1	8

Tablo 2'den, sütunlarda ismi yazan bir kripto paranın satırlarda yer alan kripto paraya göre etkin olup olmadığı bilgisi verilmektedir. Örneğin, 10 kripto para içerisinde biri olarak link diğer 9 para birimine etkindir, diğer bir ifade ile ikinci dereceden stokastik baskındır. Bir kripto para getiri serisinin kendisine baskın olduğu ya da olamadığı gibi bir durum söz konusu olamayacağından bu hücreler ('-' işareti ile) boş bırakılmıştır. Usdt kripto para biriminin ise hiç etkinlik alamayan bir kripto para olduğu görülmektedir. Hücrelerdeki etkinlik daha açık bir ifade ile şu şekilde yorumlanabilir; örneğin eth ve btc kripto paralarının getirileri düşükten yükseğe doğru olacak şekilde kayıptan zanca

doğru sıralanmış olsun. Herhangi bir eşik getiri düzeyine göre; bu eşik düzeyinden daha düşük tüm mümkün getirilerin ortalaması eth kripto para birimi için daha düşüktür. Bu nedenle eth kripto para birimi btc kripto para birimine göre ikinci dereceden stokastik baskınlık kriteri açısından etkindir. Dolayısıyla Tablo 2’de elde edilen sonuçlara bir bütün olarak bakıldığında da varılacak sonuçlar aşağıdaki alt başlıkta verilmektedir.

5. SONUÇ

Yüksek risk ölçümleri potansiyel kayıpların karşılanması için yüksek risk sermayesi gerektirmektedir ve fiyatları ilgi çekecek düzeyde artış gösteren kriptopara birimleri için yasal düzenlemeler eksiktir. Yatırımlarının genellikle riskli olduğu ve finansal olarak güvenli olmadığı ilgili çalışmalarda da değinilen kriptopara birimleri arasında tercih yaparken yatırımcılar dikkatli olmalıdırlar. Bu nedenle çalışmada elde edilen nicel sonuçlar yüksek finansal riske sahip olan ancak herhangi bir kontrole tabi olmayan pozisyonlardan korumak için oldukça önemlidir.

Çalışmada kullanılan 10 kripto para getirilerinin ikinci dereceden stokastik baskınlık kriteri ile birbirlerine göre etkinlik karşılaştırmalarından aşağıdaki sonuçlar elde edilebilmektedir:

- ✓ link diğer tüm para birimlerine göre etkin bir para birimidir.
- ✓ link’ten sonra en etkin para birimleri ada ve eth’dir.
- ✓ Diğer para birimlerinin hiç birine karşı etkinliği olmayan usdt para birimidir.
- ✓ Kripto para birimleri yatırım aracı olarak portföye dahil etmek düşünüldüğünde, tabloda elde edilen etkinlik sırasına göre etkin parabirimlerine öncelik verilebilir.

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PROFITABILITY DETERMINANTS OF NEPALESE COMMERCIAL BANKS

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ABSTRACT

Purpose- The purpose of this study is to examine the the key determinants of profitability of Nepalese commercial banks.

Methodology- This study employs descriptive statistics to describe the profitability of Nepalese banks and its determinants. Further, the degree of correlation among different indicators of profitability and its determinants has been assessed by calculating correlation coefficient. Finally, this study has adopted a panel data regression model (Fixed Effect Model and Random Effect Model) to investigate the determinants and their impact on profitability of Nepalese commercial banks.

Findings- The analysis reveals that the bank profitability measured by ROA of Nepalese commercial banks is significantly affected by concentration ratio, banking sector development, GDP growth, inflation and exchange rate significantly in opposite direction rather it is not significantly affected by the internal factors like bank size, capital base, deposit, loan, off-balance sheet activities and number of branches. Another indicator of bank profitability; NIM is significantly affected only by capital adequacy, absolute number of branches and inflation rate.

Conclusion- This study concluded that the profitability of Nepalese commercial banks measured by return on assets is significantly influenced by the external factors. Among external factors, industry specific factors have high degree of impact on return on assets whereas macroeconomic variables have quite a weak degree but significant impact on profitability of Nepalese commercial banks as measured by return on assets. Further, the profitability measured by net interest margin (NIM) is significantly influenced only by capital adequacy, absolute number of branches and annual inflation rate.

Keywords: Nepalese commercial banks, bank profitability, profitability determinants, internal and external determinants, ROA and NIM

JEL Codes: C33, E44, G21

1. INTRODUCTION

Bank profitability is a key factor shaping financial development and economic growth (Osugwu, 2014). The profitability of the banking sector of any country is important because the financial system of a country is largely based on banking system (Ali et al., 2011). Economies that have a profitable banking sector are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou et al., 2008). The profitable banks positively participate in the Gross Domestic Product (GDP) of a country. Therefore, it is essential to study the indicators that have any impact on the profitability of banks as the ever-changing social, legal and macroeconomic environment may cause these factors to change (Owoputi et al., 2014). Low profitability weakens the ability and willingness of banks to finance the wider economy (Garcia & Trindade, 2019). Banks cannot function without being profitable, that not only helps them to cover the expenses and losses but also rewards the investors and depositors. Therefore, it is important to study the factors, which have an impact on the profitability of banks (Riaz & Mehar, 2013).

2. LITERATURE REVIEW

There exists large number of studies that are conducted to analyze the determinants of banking profitability. Most of the studies classified the determinants of banking profitability as internal factors and external factors. Literature showed that various studies have used different indicators as measures and proxies of banks profitability. Studies like Jara-Bertin et al., (2014), Chowdhury & Rasid (2016), Al-Homaidi et al. (2018) etc. used ROA, ROE, or both as bank profitability measures. In addition to ROA and ROE, Net Interest Margin (NIM) has also widely used as an indicator of bank profitability (Owoputi, 2014; Al-Homaidi et al., 2018; Islam & Shohel Rana, 2019). ROA and ROE reflect how well bank management uses the bank's real investment resources, the NIM focuses on the profit earned on interest activities. Literature revealed that earning indicators Capital Strength and Liquidity are statistically significant variables whereas management efficiency, asset structure, asset quality and economic proxies are insignificant variables to describe bank profitability measured by NIM (Islam & Shohel Rana, 2019).

Study of Eljelly (2013) and Madishetti & Rwechungura (2013) showed that only the internal factors have the substantial impact on the profitability of the banks. Study of Acaravci & Çalim (2013), Chowdhury & Rasid (2016), Bougateg (2017), Sultan et al. (2020) used natural logarithm of total assets as a measure for bank size. Alper & Anbar, (2011) and Masood & Ashraf, (2012) reported a positive effect of banks size

on banks' profitability. Whereas, Gul, Sehrish, Irshad, Faiza, Zaman, (2011) and Singh & Sharma (2016) found a negative effect on banks' profitability. Similarly, the previous studies showed that the banks with a high capital ratio are considered to be insured against bankruptcy, to have access to cheap funds, to be more flexible in pursuing business opportunities and to have the ability to absorb any unexpected losses. Thus, higher profitability can be expected for these banks Athanasoglou et al., (2008), Flamini et al., (2009), Sufian, (2011), Ben Selma Mokni & Rachdi, (2014), Olalere et al., (2017). But few studies like Saona, (2016) argued that well-capitalized banks are considered safer because they take less risk, and therefore produce lower returns and hence there exist negative relationship between profitability and capital adequacy.

Studies like Heffernan & Fu, (2011), Sufian & Kamarudin, (2012), Menicucci & Paolucci, (2016) etc. showed that loans contribute to banks' profitability. On the other hand, studies like Kosmidou et al., (2006) and Heffernan & Fu, (2011) claimed that the increase in loans could escalate the costs of funds and hence lead to a negative correlation between profitability and loans. Further the studies conducted by Chirwa, (2003), Saona, (2016), Menicucci & Paolucci, (2016) etc. showed the evidence that deposits improve banks' profitability. But the studies like Gul et al., (2011), Akbas & Karaduman, (2012), Tariq et al., (2014) etc. claimed that the lack of loan demand or poor management of the bank's liquidity could lead to a negative effect because these deposits would be costlier for banks in terms of the required branch networking and remuneration. Further, banks engage in off-balance sheet activities hoping to earn additional income to compensate for the decline of its earnings from traditional activities. Conversely, banks that are heavily involved in nontraditional activities are subject to higher risks which may lead to lower profitability (Al-Harbi, (2019). Studies like Valverde & Fernández, (2007), Nguyen, (2011), Sufian, (2011), Petria et al., (2015) etc. found positive impact of off-balance sheet activities on bank profitability but the studies of Chen and Liao (2011), Rahman et al., (2015) etc. found negative relationship between them. By following the study of Al-Harbi, (2019), this study has used other operating income to total assets as a proxy of Off-balance sheet activities. In addition, Al-Homaidi et al., (2018) argued that the number of branches is the most significant bank-specific determinants that influence the banks' profitability.

Study conducted by Demirgüç-Kunt & Huizinga (2000) supported structure-conduct performance theory, which indicates that high concentration is positively related to profitability. On the other hand, the efficient-market or efficient-structure hypothesis contradicts structure conduct-performance theory; specifically, the efficient-structure hypothesis suggests that firms with superior efficiency will obtain a large market share, and as consequence, the market will become more concentrated. Therefore, higher concentration does not necessarily imply market power, and consequently, the relationship between concentration and profitability does not have to be positive. This logic has been empirically verified by Ameer & Mhiri (2013) which found a significant but negative relationship between concentration and profitability. Further, Demirgüç-Kunt & Huizinga (1999) found a negative relation between profitability and banking sector development, especially in developing countries. On the other hand, large banking sectors bring more opportunities and reduce costs leading to higher profitability and margins. Ghosh (2016) reported a positive relationship between profitability (ROA) and industry size.

Large number of study used GDP as a macroeconomic factor and a common measure that is used to measure the aggregate economic activity within an economy (Masood & Ashraf, 2012; Ongore & Kusa, 2013; Pasiouras & Kosmidou, 2007; Petria et al., 2015; Saona, 2016; Singh & Sharma, 2016; Rani & Zergaw, 2017). In this study, annual growth rate of real GDP has been used rather than using absolute value of real GDP. Further, Inflation rate has been widely used by prior studies of banks' profitability (Alper & Anbar, 2011; Masood & Ashraf, 2012; Jara-Bertin et al., 2014; Chowdhury & Rasid, 2016). Further, Chowdhury & Rasid, (2016) and Menicucci & Paolucci (2016) suggested that foreign exchange rate is an important factor for banks' profitability.

3. DATA AND METHODOLOGY

To know the promising factors that affect the profitability of Nepalese banks, this study has used casual-comparative and descriptive type of research design to analyze the relationship between bank profitability and its determinants and to describe the actual happening in Nepalese commercial banks regarding the subject. Further, the study is based on quantitative information of 20 commercial banks for the period of 11 years (2010-2020) which is abstracted from different sources on the basis of their availability. To investigate the major determinants of bank's profitability of Nepalese commercial banks, quantitative data from secondary sources has been abstracted. For the purpose, data with yearly frequency has been used in this study. Banking and Financial Statistics issued by NRB and the financial statements of banks from their websites are major sources of data. Further, data issued by Ministry of Finance and reports of World Bank also used as a source of data for this study.

Major factors that can affect the bank profitability of Nepalese commercial have been selected on judgmental basis. For the study purpose, return on assets (ROA) and net interest margin (NIM) have been used as the indicators of bank profitability. Further, the factors that might affect the bank profitability have been categorized as internal and external factors. Study used bank size (LNAS), Capital adequacy (CAD), Loans (LOAN), Deposits (DEP), Off-balance sheet activities (OBS) and number of branches (BRN) as internal factors of bank profitability. Similarly, bank specific variables; n-Bank Concentration Ratio (CONC) and Banking sector development (BSD) and macro-economic variables; Annual real GDP (GDP), Annual inflation rate (INF) and Exchange rate (EXR) have been used as the external determinants of bank profitability.

As the tool of data analysis, this study has used descriptive statistics to describe the profitability of Nepalese banks and its determinants. Further, the degree of correlation among different indicators of profitability and its determinants has been assessed by calculating correlation coefficient. Finally, this study has adopted a panel data regression model (Fixed Effect Model and Random Effect Model) to investigate the determinants and their impact on profitability of Nepalese commercial banks. To decide the suitable model between Fixed Effect Model and Random Effect Model, different test has been performed. In this study, fixed effects are tested by the F test, while random effects are examined by the Lagrange multiplier (LM) test (Breusch & Pagan, 1980). Further, Husman specification test has been conducted to select appropriate model between random effect and fixed effect.

For the purpose of empirical analysis of determinants of profitability of Nepalese commercial banks, the following model is specified:

$$\pi_{it} = \alpha + \beta_1 IF_{it} + \beta_2 EF_{it} + U_{it}$$

Here, π_{it} denotes the profitability level of bank i at time t , IF and EF are internal factors and external factors respectively and U_{it} is the error term.

4. FINDINGS

Pearson correlation coefficients between the variables advocate that the bank profitability measured by ROA has significant positive correlation with capital adequacy ratio, off balance sheet activities and GDP growth rate where as it has significant negative correlation with inflation rate. Further, ROA has no significant correlation with size, loan, deposit, number of branches, concentration ratio, banking sector development and exchange rate. Another indicator of profitability NIM is significantly correlated only with bank size, loan, deposit and branch number in same direction. Therefore, correlation analysis concluded that bank profitability measured by ROA can significantly be influenced by capital base, off-balance sheet activities, growth rate of real GDP and inflation rate whereas the profitability measured by NIM can be significantly affected by size of the bank, loan, deposit and absolute number of branches.

In this study, stationarity of each variable have been checked by using panel unit root test. Result of unit root test revealed that ROA, ROE, CAD, OBSA, CONC and GDP growth do not have unit root (hence are stationary) in level and hence are I(0) variables whereas rest of the variables; SIZE, DEPOSIT, LOAN, BRN, BSD and INF have unit root and hence are non-stationary in level but are stationary in first difference and hence are I(1) variables.

4.1. Regression Analysis

For the analysis purpose, this study seeks for suitable panel regression model among pooled OLS, Fixed Effect Model and Random Effect Model. Applying appropriate model avoid biased and spurious result (Staikouras & Wood, 2011). Fixed effects have been tested by the F test, while random effects are examined by (Breusch & Pagan's (1980) Lagrange Multiplier (LM) test. The former compares a fixed effect model and OLS to see how much the fixed effect model can improve the goodness-of-fit, whereas the latter contrast a random effect model with OLS. Further, Hausman specification test (Hausman, 1978) has been applied to compare the random effect model to its fixed counterpart (Hun, 2011). Under Hausman test, if the null hypothesis that the individual effects are uncorrelated with the other regressors is not rejected, a random effect model is favored over its fixed counterpart.

Testing a Fixed Effect (F-test) shows that there is a significant fixed effect or significant increase in goodness-of-fit in the fixed effect model; therefore, the fixed effect model is better than the pooled OLS. Similarly, Testing Random effect model (LM-test) also suggests that there is a significant random effect in the panel data, and that the random effect model is able to deal with heterogeneity better than does the pooled OLS. Finally, Hausman specification test to compare between fixed and random effect models shows that Fixed Effect Model is appropriate when ROA is taken as an indicator of profitability whereas Random Effect Model as an appropriate model for analysis when NIM is used as an indicator of bank profitability. The result of Hausman test has been presented in table 1. Table 1 presents the result of Hausman test. Panel-A shows the result of Hausman test for model in which ROA is used as a dependent variable and Panel-B shows the result of Hausman-test for model in which NIM is used as a dependent variable.

Table 1: Hausman Test

Panel-A: ROA as profitability		Panel-B: NIM as profitability	
Chi square	199.08	Chi square	3.26
Prob> Chi square =	0.0000	Prob> Chi square =	0.9868
<i>FEM is appropriate</i>		<i>REM is appropriate</i>	

In Panel-A, value of chi-square is significant at 5% level of significance and hence suggest that Fixed Effect Model is appropriate. In contrast to this, Panel-B revealed that the value of chi-square is insignificant at 5% level of significance and hence suggest the Random Effect Model as an appropriate model for analysis. Therefore, this study has applied fixed effect model to analyze the determinants of bank profitability if it is measured by ROA and random effect model to analyze the determinants when the profitability is measured by NIM. Table 2 presents the summary result of model estimation. In table, Panel-A is the result of fixed effect model estimation when profitability is measured by ROA and Panel-B is the result of random effect model estimation when profitability is measured by NIM.

Table 2: Model Estimation Results Summary

Panel-A: ROA					Panel-B: NIM			
	Coef.	Std. Err.	t-value	p-value	Coef.	Std. Err.	t-value	p-value
Constant	0.3721	0.0717	5.19	0.0000	0.0515	0.0517	1.00	0.3190
Size	0.0122	0.0121	1.01	0.3140	-0.0096	0.0087	-1.10	0.2730
CAD	-0.0150	0.0226	-0.66	0.5070	0.0410	0.0148	2.76	0.0060
Deposit	-0.0067	0.0107	-0.62	0.5330	-0.0069	0.0076	-0.90	0.3660
Loan	0.0115	0.0071	1.62	0.1060	0.0046	0.0051	0.89	0.3710
OBSA	0.2581	0.1977	1.31	0.1930	0.0771	0.1341	0.57	0.5650
BRN	0.0000	0.0000	0.22	0.8250	0.0001	0.0001	2.10	0.0360
CONC	-0.8308	0.1617	-5.14	0.0000	-0.0425	0.1166	-0.36	0.7160
BSD	-0.2125	0.0563	-3.78	0.0000	-0.0188	0.0408	-0.46	0.6460
GDP	-0.0032	0.0008	-3.83	0.0000	0.0001	0.0006	0.04	0.9690
INF	-0.0008	0.0003	-2.30	0.0230	0.0009	0.0002	3.44	0.0010
EXR	-0.0008	0.0002	-4.89	0.0000	-0.0001	0.0001	-0.82	0.4130
F-statistics = 6.53, Prob > F = 0.0000					Wald chi-square = 59.40, Prob > chi-square = 0.0000			
R-squared = 0.5370					R-squared = 0.2665			
LR Test					= 86.89, Prob >= chibar-square = 0.000			

As per the result presented in Panel A of table 2, F-statistic is significant (p-value is less than 0.05) and hence the fixed effect model is significant for estimating ROA of a bank. Further, the independent variables applied in this study can describe 53.70 percent variation in ROA of the bank which is advocated by the value of R-square. According to the result of Panel-A, ROA of Nepalese commercial bank is not significantly affected by the internal factors like bank size, capital base, deposit, loan, off-balance sheet activities and number of branches. Therefore the result of

this study contract with the study of Eljelly (2013) and Madishetti & Rwechungura (2013) which concluded that only the internal factors have the substantial impact on the profitability of the banks. Further, the result of this study contradict with the result of Pradhan & Shrestha (2018) who showed that all the bank specific factors are found to be significant factors affecting the bank performance. Result showed that ROA of a bank is positively influenced by size of the bank, loan, off-balance sheet activities and absolute number of branches but their impact seems insignificant. Further, ROA is negatively influenced by capital base and deposit but their impact also is insignificant. The result of this study could not verify the evidence of the economies of scale theory, negative impact of credit portfolio volume and weak asset quality, and positive impact of greater bank activity diversification with bank profitability measured by ROA found by the study of Gwachha (2019) in Nepalese banking. Though the significant factor of banking profitability seems alike, the direction of impact of external factors like market share (here represented by concentration ratio) and GDP also contradict with the study of Pradhan (2018) in Nepalese context.

Panel-B of table 2 is the estimation result of random effect model in which NIM has been used as an indicator of bank profitability. Statistically significant Wald chi-square (i.e. p-value is less than 0.05) indicates that the model is significant and best fit. Further, the variables that affect bank profitability applied in this model can describe only 26.65 percent variability in NIM. Further, the statistically significant Chibar-square value of likelihood ratio (LR) test confirmed the significance of random effect. Estimation result revealed that the NIM is significantly affected only by capital adequacy, absolute number of branches and inflation rate as their p-values are lower than 0.05. Though their impact seems statistically significant, degree of impact is very nominal as signified by their coefficient values. Though the NIM is positively influenced by loan, off-balance sheet activities, and GDP growth rate and negatively influenced by bank size, deposit, concentration ratio, banking sector development and exchange rate, their impact on NIM are insignificant in Nepalese commercial banks.

5. CONCLUSION

Study of analyzing the determinants of commercial bank profitability in Nepal shows that only external factors shape the size of bank profitability as measured by return on assets. Among external factors, industry specific i.e. concentration and banking sector development have high degree of impact on return on assets whereas macroeconomic variables i.e. GDP growth, inflation rate and exchange rate have quite a weak degree but significant impact on profitability of Nepalese commercial banks as measured by return on assets. Further, the profitability of Nepalese commercial banks measured by net interest margin (NIM) is shaped only by few variables included in this study. Capital adequacy, absolute number of branches and annual inflation rate significantly determine the level of net interest margin of Nepalese commercial banks.

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PUBLIC FINANCE IN JORDAN: A LESSON FROM COVID-19

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ABSTRACT

Purpose - COVID-19 is a human and economic tragedy. It has become obvious that the virus pressed hard public finances all over the world. However, countries with relatively limited fiscal space face will experience more pressure. Within this context, this paper has two objectives. First, to outline the status of public finance in Jordan, and in particular, the weight that foreign grants carry in public revenues. Second, to examine the impact of foreign grants on the tax effort in Jordan. In other words, the objective is to examine whether or not public finance in Jordan suffers from the “aid curse”.

Methodology - The period 1984 – 2019 forms the data for the statistical analysis. In addition, and to examine the impact of foreign aid on tax effort, the paper uses time series analysis techniques including stationarity tests, optimal lag length criteria, co-integration, long-run relationship, and variance decomposition analysis.

Findings - Based on the empirical results, Jordan does suffer from the curse of aid. Grants do have a negative and significant impact of tax revenues (tax effort).

Conclusion - Relevant stakeholders in Jordan should use COVID-19 as a “trigger” point for change in the country’s fiscal mobilization process. This is the only way to reduce the growing public debt, and reduce the country’s reliance on foreign grants.

Keywords: Jordan, fiscal space, grants, cures of aid, co-integration.

JEL Codes: H30; H60; H62

1. INTRODUCTION

COVID-19 has forced governments to introduce various fiscal measures. Within this context, however, countries with limited fiscal space will experience two problems. First, their budget deficits will increase as their public spending increases and local revenues fall. Second, the increasing budget deficits will increase public debt levels.

COVID-19 is a tragedy. However, the evolving experience of COVID-19 should be a “trigger” that creates future windfalls. For example, all previous Jordanian governments (since availability of data in 1965) have had four common themes. They all had relatively low tax effort, consistent budget deficits, consistent reliance on foreign grants, and high public debt. During the period 2010-2019, for example, the mean annual tax revenue to Gross Domestic Product (GDP) was around the 15 percent mark, budget deficit to GDP ratio was equal to -7.5 percent, mean annual grants to GDP ratio was equal to 2.9 percent, and public debt to GDP ratio was equal to 84.7 percent. Based on just these four public finance observations, one can argue that COVID-19 provides Jordan with an opportunity for change. Indeed, public finance in Jordan might suffer from the Dutch Disease. All previous, and present, governments have received huge amounts of grants. Over time, this windfall has probably contributed to the low tax effort.

This paper has two objectives. First, to describe the status of public finance in general, and the tax effort in particular. Second, to examine the impact of foreign grants on Jordan’s tax effort. Section 2 provides a brief review of the relevant literature. Section 3 outlines the data and methodology. In section4, we present the main results and discuss them. Finally, section 5 concludes the paper.

2. AID AND TAX REVENUE: LITERATURE REVIEW

The absence of a theoretical model notwithstanding, the literature points out that grants can encourage the recipient economies to improve their tax and collection systems, and hence, increase their tax effort. However, grants can also make governments less prepared to increase their tax efforts (McGillivray and Morrissey, 2001 and Carter, 2013). The empirical literature that examines the grants-tax effort nexus is in disagreement. Some papers report a positive impact of grants on tax revenues. Others, however, report either a negative impact or no relationship at all.

Some of the papers that report a positive impact of grants on tax revenues are Heller (1975), Remmer (2004), Clist and Morrissey (2011), and Carter (2013). For example, Clist and Morrissey (2011) examine the tax effort in 82 developing countries (1970–2005), and based on their results, the impact of grants on tax revenue is positive and tends to “increase tax revenue over the medium term”. Amusa et al. (2020) use the autoregressive distributed lag model approach (ARDL) to examine the impact of foreign aid on the tax effort in Nigeria. Their results reflect a positive impact.

Those with a negative impact include Gupta (2007), Moss et al. (2008), Benedek et al. (2012), and Boukbech et al. (2018). For example, Boukbech et al (2018) examine the impact of grants on the tax effort for a panel 29 lower middle-income countries (2001-2014). Again, their results indicate that net official development aid negatively impacts the tax effort.

In addition to the impact of grants on tax effort, the research literature looks at other determinants of tax revenues. For example, the fact that the agriculture sector is difficult to tax (high informal sector), one expects a negative relationship between the share of agriculture in GDP and total tax effort (Morrissey et al. (2015). In addition, in economies with large manufacturing companies, tax revenues are usually higher than in other economies with no such sector (Fenochietto and Pessino, 2013). Real economic growth is also an important factor. Growth should positively affect tax revenues. Many researchers use other variables as well, including, for example, government stability and law and order (Gupta, 2007). Rodríguez (2018) used a dataset that includes 138 countries (1976–2015) to estimate static and dynamic models. The results indicate that the share of the agriculture sector in countries’ GDP, financial intermediation, natural rents, education, and the quality of government and democracy impact tax revenues.

Finally, it is interesting to note that in a recently published paper, Oz-Yalaman (2019) examine the impact of financial inclusion on the tax effort in 137 countries across the globe. Using panel data analysis and the Global Findex database (2011-2017), the results show that there is a positive relationship between financial inclusion and tax revenues.

3. THE DATA AND METHODOLOGY

To examine the impact of foreign grants on the tax effort in Jordan, we specify the below model:

$$TE_t = \lambda + \beta GRANTS_t + \psi GDP_t + \varepsilon_t \quad (1)$$

where, TE, GRANTS, and GDP are the natural logarithm of tax revenues, received grants, and real GDP respectively. The expected signs of the parameters are $\lambda > 0$, $\beta > 0$, $\psi > 0$. The error term (ε) is assumed to be independently and identically distributed. Finally, the subscript (t) denotes time (1984-2019).

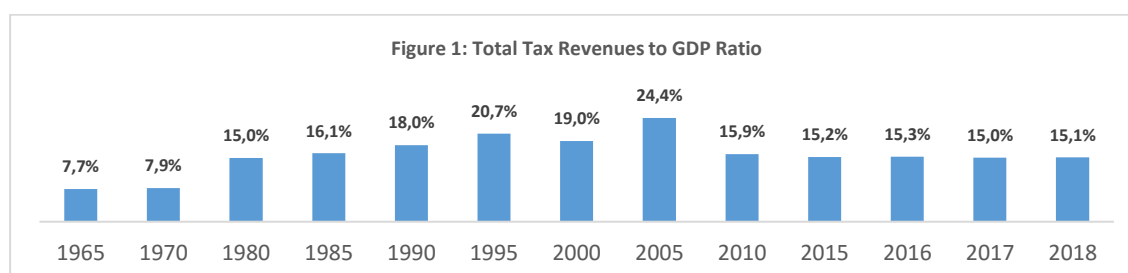
To estimate expression 1, we examine the data in terms of their stationarity. We then examine the optimal lag structure and estimate the co-integrating relationship among the variables using the Johansen-Masulius procedure. In other words, the co-integrating rank (r) is tested using the maximum eigenvalue and the trace test. Based on the co-integration results, a vector error-correction (VEC) model is estimated to examine the long-run and short-run causality dynamics.

$$\Delta TE_t = \alpha + \lambda e_{t-1} + \sum_{i=1}^n b_i \Delta GRANTS_{t-i} + \sum_{i=1}^m c_i \Delta GDP_{t-i} + \varepsilon_t \quad (2)$$

In this expression (2), a long-run convergence does occur between the variables if the error correction term (λ) is negative and statistically significant. Finally, we estimate variance decomposition analysis to examine the power of grants and GDP in explaining the variability of tax effort over time.

4. FINDINGS AND DISCUSSION

Before we present and discuss the results, it is useful to raise some observations about public finance in Jordan. First, the tax effort remains relatively low. During the period 1965 – 2019, tax to GDP ratio has increased from 7.7 percent to 15.1 percent only.



Second, since the year 1965, no government has ever experience a surplus in its budget. Indeed, during the period 1976 -1980, the mean annual budget deficit to GDP ratio was more than 22 percent (Table 1). Third, grants have always been a major part of the government's local revenues (tax and non-tax). Again, during the period 1968 – 1970, the mean annual ratio of grants to total public revenues was equal to 115.2%. However, since then, grants to public revenues have been falling.

Table 1: Public Finance and Grants

Period	Budget Deficit to GDP	Grants to Local Revenues	Period	Budget Deficit to GDP	Grants to Local Revenues
1965 - 1967	-8.2%	54.8%	1991 - 1995	-5.2%	16.9%
1968 -1970	-21.8%	115.2%	1996 - 2000	-6.1%	13.5%
1971 -1975	-17.1%	101.5%	2001 - 2005	-7.3%	23.3%
1976 -1980	-22.2%	86.5%	2006 - 2010	-6.5%	12.6%
1981 - 1985	-16.9%	57.3%	2011 - 2015	-8.5%	15.7%
1986 - 1990	-15.0%	32.6%	2016 - 2019	-5.6%	13.0%

In Table 2, we present the results of the unit root test (Dickey-Fuller). These results reveal that all variables are non-stationary at their level forms and stationary at their first differences forms. Indeed, this result is consistent in all three estimations: with no constant and trend, with a constant and no trend, and with both a constant and trend.

Table 2: Augmented Dickey-Fuller Unit Root Test

Variable	Level			First-Difference		
	None	Constant	Constant & Trend	None	Constant	Constant & Trend
TAX	5.981	-0.485	-2.369	-3.421*	-5.225*	-5.139*
GRANTS	1.328	0.187	-2.540	-7.377*	-7.583*	-7.849*
GDP	5.661	0.718	-2.045	-3.586*	-5.149*	-5.275*

*Significant at the 99 percent confidence level.

The stationarity findings imply that all variables are integrated in the same order (first differences). Indeed, this conclusion is supported by the Phillips-Peron test. In addition, this conclusion indicates that we can apply the Johansen co-integration test to test or detect the long-term co-integrating relationship among our group of variables. With an optimal lag length equal to 2, in Tables 3 and 4, we report the results of the Johansen co-integration test.

Table 3: Johansen Multivariate Co-Integration Test

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	5 percent CV	P-Value
None *	0.527	34.988	29.798	0.012
At most 1	0.226	9.544	15.495	0.317
At most 2	0.025	0.845	3.841	0.358

Trace statistic indicates two co-integrating equations at the 5 percent level.

Table 4: Johansen Multivariate Co-Integration Test

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	5 percent CV	P-Value
None *	0.527	25.443	21.132	0.0116
At most 1	0.226	8.699	14.264	0.3120
At most 2	0.025	0.845	3.8415	0.3579

Max-eigenvalue test indicates two co-integrating equations at the 5 percent level.

Again, based on the reported results of both the trace and maximum eigenvalue statistics, we conclude that there is at least two co-integrating relationships at the 5 percent significance level. Such results reveal the presence of a long-run relationship among our group of variables. In addition, this result implies that we can estimate a Vector Error Correction Model (VEC).

The regression results under the VEC model with two lags confirm the existence of a long-run equilibrium relationship among our variables. Indeed, this is confirmed by the negative and significant value of the coefficient (λ) of the error correction term (λe_{t-1}).

Long Run Relationship : $TAX_{t-1} = 49.241 - 2.381* Grants + 4.976* GDP$

Finally, it is also useful to note that the results of the variance decomposition analysis reveal that the variability in real economic growth is largely lagged by its own variance. The results of this analysis are reported in Table 5 below. However, what is more important to note is the observation that grants reflect the stronger power in explaining the variability in tax revenue over time.

Table 5 : Variance Decomposition Analysis

Period	TAX EFFORT	GRANTS	GDP
1	100.0000	0.000000	0.000000
2	80.69828	15.93966	3.362069
3	68.04761	27.50266	4.449725
4	65.82101	29.47771	4.701278
5	65.04645	30.04461	4.908937
6	64.23717	30.69906	5.063773
7	63.67549	31.16794	5.156568
8	63.32255	31.45563	5.221825
9	63.04943	31.67696	5.273605
10	62.82696	31.85885	5.314188

5. CONCLUSIONS

COVID-19 will widen budget deficits, especially in countries with limited fiscal space. Within this context, one can argue that the public finance implication of the corona should be used by countries as a “trigger” point for change. The fact that the Jordanian economy has low tax revenues and dependent on foreign grants, this paper examined the nexus between tax revenues and grants during the period 1980 – 2019. Clearly, the results indicate that foreign aid negatively and significantly decreases tax revenues. Jordan suffer from the “curse of aid” or “Dutch Disease”. Relevant stakeholders in Jordan to change the tax law in Jordan, make its fair, progressive, diversified, and simple. This is the only way to reduce the growing public debt, and reduce the country’s reliance on foreign grants.

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TESTING FOR HERDING BEHAVIOR IN STOCK MARKET: BIST 30 INDEX EXAMPLE

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ABSTRACT

Purpose- In the study, using weekly data of 19 companies that are constantly traded in the BIST 30 index, in the period 06.05.2012-27.09.2020, Christie and Huang's (1995) and Chang et al. (2000) approach was aimed to test herd behavior.

Methodology- In the study test of herd behavior, Christie and Huang (1995) and Chang et al. (2000) approaches were used. First, as dependent variable cross-sectional absolute deviations for the price series are calculated. Independent variables are assigned as dummy variables for the lower/upper extreme values of 1% and 5% of the market return. Afterwards, estimations were made with Least Squares and Quantile Regression methods.

Findings- As a result of the estimation made with Least Squares and Quantile Regression methods, While the coefficient of β_1 for the 1% return slice is statistically significant and the positive, coefficient β_2 as statistically significant and negative, for the 5% return slice, both times the coefficient are statistically significant and positive. The coefficients should be statistically significant and negative in order to pay to show the presence of herd behavior. As a result of the findings, it can be mentioned that 19 firms that are constantly traded in the BIST 30 index have herd behavior for a 1% return slice in the 2012-2020 period.

Conclusion- As a result of the analyzes made to determine herd behavior in the period of 06.05.2012-27.09.2020 by using weekly data of 19 companies that are continuously traded in the BIST 30 index, the existence of herd behavior in the relevant period observed. Accordingly, it can be said that investors investing in the BIST 30 index trust the information of other investors when their stock prices tend to fall and invest with this information.

Keywords: Behavioral finance, herd behavior, equity market, quantile regression, least squares

JEL Codes: G41, C22, D53

PAY PİYASALARINDA SÜRÜ DAVRANIŞININ TEST EDİLMESİ: BİST 30 ENDEKSİ ÖRNEĞİ

ÖZET

Amaç- Çalışmada BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın haftalık verileri kullanarak 06.05.2012-27.09.2020 döneminde Christie ve Huang'ın (1995) ve Chang vd. (2000) yaklaşımı ile sürü davranışının test edilmesi amaçlanmıştır.

Metodoloji- Çalışmada sürü davranışını tespit edebilmek Christie ve Huang'ın (1995) ve Chang vd. (2000) yaklaşımları kullanılmıştır. İlk olarak bağımlı değişken olan fiyat serilerine ilişkin yatay kesit mutlak sapmaları hesaplanmıştır. Bağımsız değişkenler, piyasa getirisinin %1 ve %5' lik getiri dilimlerinin alt/üst uç değerleri için kukla değişken olarak atanmıştır. Ardından En Küçük Kareler ve Kantil Regresyon yöntemleri ile tahminleme yapılmıştır.

Bulgular- En Küçük Kareler ve Kantil Regresyon yöntemleri ile yapılan tahminleme sonucunda, %1 getiri dilimi için β_1 katsayısı istatistiksel olarak anlamlı ve pozitif β_2 katsayısı ise istatistiksel olarak anlamlı ve negatif olarak tespit edilirken, %5 getiri dilimi için her iki kat sayıda istatistiksel olarak anlamlı ve pozitif olarak tespit edilmiştir. Sürü davranışının varlığından söz edebilmek için katsayıların istatistiksel olarak anlamlı ve negatif olması gerekmektedir. Bulgular sonucunda BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın 2012-2020 döneminde %1'lik getiri dilimi için sürü davranışının varlığından söz edilebilmektedir.

Sonuç- BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın haftalık verileri kullanarak 06.05.2012-27.09.2020 döneminde sürü davranışının tespit edilebilmesi için yapılan analizler sonucunda, ilgili dönemde %1'lik getiri dilimi için tamamen gözlemlenmemesine rağmen getirinin piyasanın üst uç değerlerinde bulunduğu dönemde sürü davranışının varlığından söz edilebilmektedir. Bu doğrultuda BİST 30 endeksinde yatırım yapan yatırımcıların pay senedi fiyatları düşme eğiliminde olduğu zaman diğer yatırımcıların bilgilerine güvendikleri ve bu bilgiler ile yatırım yaptıkları söylenebilir.

Anahtar Kelimeler: Davranışsal finans, sürü davranışı, pay piyasası, kantil regresyon, en küçük kareler

JEL Kodları: G41, C22, D53

1. GİRİŞ

Davranışsal finans literatüründe sürü davranışı kavramı yatırımcılar arasındaki etkileşimden kaynaklanan alım satımlar arasındaki ilişkiyi tanımlamak için kullanılmaktadır. Bu davranış, finansal gruplar ve başarılı yatırımcıların faaliyetlerini taklit etmeye çalışan daha az başarılı yatırımcılar için kendi bilgilerini kullanmak yüksek maliyete neden olacağından dolayı rasyonel olarak kabul edilmektedir (Chiang ve Zheng, 2010:1911). Bir yatırımcının başkalarını taklit edebilmesi için, başkalarının eylemlerinden haberdar olması ve onlardan etkilenmesi gerekmektedir. Başkalarının yatırım yaptığı bilgisi yatırımcının yatırım yapmama kararını değiştirerek yatırım yapmaya karar vermesine neden oluyor ise yatırımcı sürü davranışı sergilemiş olmaktadır. Bir yatırımcının başkalarını gözlemledikten sonra planladığı kararını tersine çevirmesi üç nedenle açıklanabilmektedir. (i) Diğer yatırımcılar yatırımlarının geri dönüşü hakkında bir şeyler biliyor olabilir ve eylemleri bu bilgiyi ortaya çıkarmaktadır. (ii) Başkaları adına yatırım yapan fon yöneticileri için sağlanan teşvikler taklit etmenin ödüllendirileceği şekilde olabilir. (iii) Bireyler içsel bir uyum tercihinə sahip olabilmektedir (Bikhchandani ve Sharma, 2001:280).

Piyasalarda sürü davranışın olması piyasalarda aşırı oynaklığa ve sistemik riske yol açabilmektedir (Bikhchandani ve Sharma, 2001:282) Bu nedenle piyasalarda sürü davranışının varlığının ve sürü davranışına sebep olan etkenlerin araştırılması önem arz etmektedir. Çalışmada BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın haftalık verileri kullanılarak 06.05.2012-27.09.2020 döneminde Christie ve Huang'ın (1995) ve Chang vd. (2000) yaklaşımı ile sürü davranışının test edilmesi amaçlanmıştır. Bu doğrultuda ilk olarak literatürde yer alan çalışmalara yer verilmiş olup ardından metodoloji ve sonuç bölümlerine yer verilmiştir.

2. LİTERATÜR TARAMASI

Sürü davranışının piyasalarda test edilmesine yönelik literatürde yapılan çalışmalardan bazılarını kronolojik sıralamaya göre yer verilmiştir.

Gleason vd. (2003), çalışmalarında üç Avrupa borsasında işlem gören 13 emtia vadeli işlem sözleşmesinde sürü davranışının varlığını Christie ve Huang (1995) yöntemi ile araştırmışlardır. Yapılan analiz sonucunda vadeli işlem piyasalarında sürü davranışının olmadığı tespit edilmiştir. Caparrelli vd. (2004), çalışmalarında 1988-2001 döneminde Christie ve Huang (1995), Chang vd. (2000) ve Hwang ve Salmon (2001) modelleri ile İtalyan menkul kıymetler piyasasında sürü davranışını test etmişlerdir. Yapılan analizler sonucunda olağanüstü piyasa koşullarında sürü davranışının olduğunu tespit etmişlerdir. Doğukanlı ve Ergün (2011), 2000-2010 döneminde, Doğukanlı ve Ergün (2015), 2000-2011 döneminde, Ergün ve Doğukanlı (2015), 2000-2012 döneminde Christie ve Huang (1995) ve Chang, Cheng ve Khorana'nın (2000) yatay kesit değişkenliğine dayalı yöntemlerini kullanarak Borsa İstanbul'da sürü davranışının varlığını araştırmışlardır. Doğukanlı ve Ergün (2015) çalışmalarında ilgili dönemde yatırımcıların bazı dönemlerde sürü davranışı gösterdiğini tespit ederken, Doğukanlı ve Ergün (2011) ve Doğukanlı ve Ergün (2015) ilgili dönemde sürü davranışının varlığı tespit edilememiştir. Prosad vd. (2012), çalışmalarında 2006-2011 döneminde Hindistan pay senedi piyasasında sürü davranışını incelemişlerdir. Christie ve Huang (1995) ve Chang vd. (2000) yönteminin kullanıldığı çalışma sonucunda sürü davranışı tespit edilememiştir. Kayalidere (2012), İMKB'de sürü davranışının varlığını 1997-2012 döneminde Christie ve Huang (1995) yöntemi ile araştırmıştır. Çalışmada analiz dönemi 1997-2004 ve 2005-2012 dönemi olarak ikiye ayrılmış olup çalışma sonucunda 1997-2004 döneminde sürü davranışının yoğun olarak hissedildiği, 2005-2012 döneminde ise sürü davranışının etkisinin azaldığı tespit edilmiştir. Ulsan vd. (2013), çalışmalarında 02.01.2008- 31.12.2012 döneminde, BİST-100 endeksinde işlem gören bankalar üzerinden sürü davranışı araştırmışlardır. İlk olarak endekse ilişkin volatilité yapısının araştırıldığı çalışmada Christie ve Huang (1995) ve Chang vd. (2000) yöntemleri ile sürü davranışı incelenmiş ancak ilgili dönemde sürü davranışının varlığına dair bulguya rastlanılamamıştır. Javaira ve Hassan (2015), çalışmalarında 2002-2007 döneminde KSE-100 endeksinde sürü davranışını Christie ve Huang (1995) ve Chang vd. (2000) yöntemleri ile test etmişlerdir. Yapılan analiz sonucunda ilgili dönemde sürü davranışı tespit edilememiştir ancak Mart 2005 likidite krizi döneminde Pakistan pay senedi piyasasında yatırımcılar arasında bilgi asimetrisinden kaynaklanan sürü davranışı gözlemlenmişlerdir. Galariotis vd. (2016), çalışmalarında 2000-2015 döneminde G5 piyasaları (CAC40, DAX, NIKKEI 225, FTSE 100, S&P500) üzerinde sürü davranışı ve pay senedi piyasası likiditesi arasındaki ilişkiyi araştırmışlardır. Christie ve Huang (1995) modeli kullandıkları çalışmanın sonucunda piyasanın likiditesinin yüksek olduğu zamanlarda sürü davranışı eğiliminin arttığını ancak Almanya için tersi durumun geçerli olduğunu tespit etmişlerdir. Vo ve Phan (2017), çalışmalarında 2005-2015 döneminde Vietnam borsasında sürü davranışının varlığını araştırmışlardır. Veriler, kriz öncesi, kriz dönemi ve kriz sonrası dönem olarak Christie ve Huang (1995) ve Chang vd. (2000) yöntemleri kullanılarak analiz edilmiştir. Çalışma sonucunda ilgili dönem boyunca Vietnam borsasında sürü davranışı tespit edilmiştir. Yousaf vd. (2018), çalışmalarında 2004-2014 döneminde Pakistan pay senedi piyasasında kriz ve ramazan etkisini dikkate alarak Christie ve Huang (1995) ve Chang vd. (2000) yöntemleri kullanılarak sürü davranışını araştırmışlardır. Çalışmanın sonucunda işlem hacmi düşük günlerde ve yıl olarak 2005,2006 ve 2007 yıllarında sürü davranışı tespit edilirken dönemin geri kalanında ve ramazan ayında sürü davranışı tespit edilememiştir. Atacan ve Altay (2019), çalışmalarında emtia futures piyasalarında 1998-2018 döneminde sürü davranışının varlığını araştırmışlardır. Çalışmada Christie ve Huang (1995), Chang, Cheng ve Khorana (2000) ve Hwang ve Salmon (2004)'ün yöntemleri kullanılmıştır. Yapılan analiz sonucunda piyasada artışların olduğu dönemlerde sürü davranışının daha belirgin olduğunu tespit etmişlerdir. Medetoğlu ve Saldanlı (2019), çalışmalarında Borsa İstanbul'da 2012-2018 tarihleri arasında sürü davranışının varlığını Hwang ve Salmon (2004) modeli ile analiz etmişlerdir. Yapılan uygulama sonucunda ilgili dönemde 35 ayda sürü davranışını tespit etmişlerdir. Çelik ve Deniz Koç (2019), çalışmalarında Borsa İstanbul hisse senedi piyasasında sürü davranışını, Christie ve Huang (1995) yöntemini kullanarak 2005-2018 yılları arasında kriz dönemini dikkate alarak oluşturdukları dört dönem üzerinde test etmişlerdir. Yapılan analiz sonucunda, kriz öncesi dönemde sürü davranışının olmadığı, kriz sonrası dönemlerde ise piyasanın likiditesinin yüksek olduğu zamanlarda sürü davranışının sergilendiği tespit edilmiştir. Ballis ve Drakos (2020), çalışmalarında kripto para piyasasında sürü davranışının varlığını 2015-2018 döneminde Christie ve Huang (1995) ve Chang vd. (2000) yöntemleri ile test etmişlerdir. Yaptıkları analiz sonucunda kripto para piyasalarında yatırımcıların diğer yatırımcıların kararlarını, kendi bilgilerini ekmeden taklit ettikleri sonucuna ulaşmışlardır. Yang vd. (2020), çalışmalarında Case-Shiller Endeksi üzerinde yaptıkları araştırma ile sürü davranışının emlak piyasası üzerine olan etkilerini 2000-2019 döneminde Christie ve Huang'ın (1995) yaklaşımı ile araştırmışlardır. Çalışma sonucunda sürü davranışının emlak piyasasında bireysel getirileri etkilemediği sonucuna ulaşmışlardır. Batmunkh vd. (2020),

çalışmalarında Moğol borsasında sürü davranışının varlığını Christie ve Huang'ın (1995) yaklaşımı ile 1999-2019 dönemi için test etmişlerdir. Yapılan analiz sonucunda boğa ve ayı piyasası dönemlerinde ve ayrıca yüksek ve düşük oynaklık sırasında ve tüm dönem boyunca sürü davranışı tespit edilmiştir.

3. VERİ SETİ VE METODOLOJİ

Çalışmada BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın haftalık verileri kullanılarak 06.05.2012-27.09.2020 döneminde Christie ve Huang'ın (1995) ve Chang vd. (2000) yaklaşımı ile sürü davranışının test edilmesi amaçlanmıştır. Araştırma dönemi Kardemir Karabük Demir Çelik Sanayi ve Ticaret A.Ş. firmasına ilişkin ulaşılabilen haftalık fiyat serisi tarihi olan 06.05.2012'den başlatılmıştır. Analize dahil edilen firmalar Tablo 1'de gösterilmektedir.

Tablo 1: Analize Dahil Edilen Firmalar

BİST Kodu	Firma Adı
AKBNK	Akbank T.A.Ş.
ARCLK	Arçelik A.Ş.
EKGYO	Emlak Konut Gayrimenkul Yatırım Ortaklığı A.Ş.
EREGL	Ereğli Demir ve Çelik Fabrikaları T.A.Ş.
GARAN	Türkiye Garanti Bankası A.Ş.
ISCTR	Türkiye İş Bankası A.Ş.
KRDMD	Kardemir Karabük Demir Çelik Sanayi ve Ticaret A.Ş.
KCHOL	Koç Holding A.Ş.
KOZAL	Koza Altın İşletmeleri A.Ş.
PETKM	Petkim Petro Kimya Holding A.Ş.
SAHOL	Hacı Ömer Sabancı Holding A.Ş.
SISE	Türkiye Şişe ve Cam Fabrikaları A.Ş.
HALKB	Türkiye Halk Bankası A.Ş.
TUPRS	Tüpraş-Türkiye Petrol Rafinerileri A.Ş.
THYAO	Türk Hava Yolları A.O.
TTKOM	Türk Telekomünikasyon A.Ş.
TCELL	Turkcell İletişim Hizmetleri
VAKBN	Türkiye Vakıflar Bankası A.O.
YKBNK	Yapı ve Kredi Bankası A.Ş.

Çalışmada sürü davranışını tespit edebilmek Chang vd. (2000) yaklaşımına göre ilk olarak yatay kesit mutlak sapmaları (cross – sectional absolute deviation) aşağıdaki denklem yardımıyla hesaplanmıştır (Chang vd. (2000), Ballis ve Drakos (2020), Atacan ve Altay (2019), Vo ve Phan (2017), Javaira ve Hassan (2015), Prosad vd. (2012), Ergün ve Doğukanlı (2015), Caparrelli vd. (2004)).

$$CSAD_t = \frac{1}{N} \sum_{i=1}^N |R_{i,t} - R_{m,t}| \quad (1)$$

Formülde $R_{i,t}$ i payının t zamandaki getirisi, $R_{m,t}$ ise payın dahil olduğu pazarın getirisini ifade etmektedir. Çalışmada haftalık veriler kullanılarak sürekli getiriler aşağıdaki formül yardımıyla hesaplanmıştır.

$$R_t = \ln \left(\frac{P_t}{P_{t-1}} \right) \quad (2)$$

CSAD_t değeri hesaplandıktan sonra, ilk olarak En Küçük Kareler (EKK) yöntemi kullanılarak ardından EKK yaklaşımına alternatif bir yöntem olan Kantil Regresyon (KR) yöntemi kullanılarak tahminleme yapılmıştır. Kantil regresyon yöntemi kararlı olmayan bir ortamda dağılımları ölçmek için avantaj sağlamakta ve bağımlı değişkenin tüm dağılımı üzerinde analiz yapılabilmesini sağlamaktadır (Vo ve Phan, 2017:6). Aşağıda 3 numaralı denklemde EKK, 4 numaralı denklemde KR modeli gösterilmektedir.

$$CSAD_t = \alpha_i + \beta_1 D_t^L + \beta_2 D_t^U + \varepsilon_t \quad (3)$$

$$Q_r(r|CSAD_t) = \alpha_{i,r} + \beta_{1,r} D_t^L + \beta_{2,r} D_t^U + \varepsilon_{r,t} \quad (4)$$

Modelde, t günündeki endeks getirisi tüm endeks getirilerinin %1 veya %5 getiri dilimlerinin üst uç değerlerinde bulunması durumunda D_t^U 1, aksi takdirde 0 değerini alan, t günündeki endeks getirisi tüm endeks getirilerinin %1 veya %5 getiri dilimlerinin alt uç değerlerinde bulunması durumunda D_t^L 1, aksi takdirde 0 değerini alan kukla değişkenler olarak atanmıştır. Rasyonel varlık fiyatlandırma modelleri β_1 ve β_2 katsayılarının pozitif olmasını öngörmektedir. Bu doğrultuda katsayıların tahminlerinin istatistiksel olarak anlamlı ve negatif çıkması sürü davranışının varlığını göstermektedir (Christie ve Huang, 1995:33). Analiz sonucunda elde edilen bulgular ilerleyen bölümde açıklanmaktadır.

4. BULGULAR

Çalışmada BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın haftalık verileri kullanılarak 06.05.2012-27.09.2020 döneminde sürü davranışının test edilebilmesi için değişkenler hesaplandıktan sonra ilk olarak EKK yöntemi kullanılarak tahminleme yapılmıştır. EKK yöntemine ilişkin analiz sonuçları Tablo 2'de yer almaktadır.

Tablo 2: EKK Regresyon Sonuçları

Değişkenler	%1'lik dilim		%5'lik dilim	
	Katsayı	Olasılık	Katsayı	Olasılık
α	0.027393	0.0000	0.025352	0.0000
β_1	0.005326	0.0133	0.008054	0.0010
β_2	-0.002932	0.0000	0.007438	0.0017
R-Kare	0.039809		0.061220	
Düzeltilmiş R-Kare	0.035394		0.055124	
F-istatistik	9.017436		10.04268	
Prob (F-istatistik)	0.000145		0.000060	

EKK regresyon sonuçlarına göre, %1'lik getiri dilimi için β_1 katsayısı %5 anlamlılık düzeyinde anlamlı ve pozitif, β_2 katsayısı ise %1 anlamlılık düzeyinde anlamlı ve negatif bir değer olarak bulunmuştur. %5'lik getiri dilimi için ise her iki katsayıda %1 anlamlılık düzeyinde anlamlı ve pozitif bir değer olarak bulunmuştur. β_2 katsayısının negatif ve anlamlı bir değer olması yatay kesit mutlak sapmaları (CSAD) ile piyasa getirisi arasındaki ilişkinin doğrusal olmadığını göstermektedir. EKK yöntemi ile tahminleme yapıldıktan sonra Kantil Regresyon (KR) yöntemi kullanılarak da tahminleme yapılmıştır sonuçlar Tablo 3'te gösterilmektedir.

Tablo 3: Kantil Regresyon Sonuçları

Değişkenler	α	β_1	β_2	R-Kare	Düzeltilmiş R-Kare	Prob(Quasi-LR ist.)
%1'lik dilim için						
Quantile($\tau=10\%$)	0.016842 (0.0000)	0.002902 (0.0328)	-0.002743 (0.0179)	0.016777	0.012256	0.039099
Quantile($\tau=25\%$)	0.020703 (0.0000)	0.004369 (0.0328)	-0.002768 (0.0179)	0.023003	0.018511	0.001847
Quantile($\tau=50\%$)	0.026366 (0.0000)	0.004750 (0.0032)	-0.002884 (0.0330)	0.018341	0.013827	0.006185
%5'lik dilim için						
Quantile($\tau=10\%$)	0.016057 (0.0000)	0.005073 (0.0023)	0.006184 (0.0181)	0.022400	0.016052	0.032325
Quantile($\tau=25\%$)	0.018606 (0.0000)	0.003738 (0.1254)	0.006738 (0.0107)	0.029168	0.022864	0.004420
Quantile($\tau=50\%$)	0.024009 (0.0000)	0.009916 (0.0366)	0.008948 (0.0293)	0.026963	0.020644	0.006166

Bağımlı değişkenin $\tau=0.10$, $\tau=0.25$ ve $\tau=0.50$ kantil değerleri için elde edilen kantil regresyon sonuçları incelendiğinde, %1'lik getiri dilimi için β_1 katsayısı anlamlı ve pozitif, β_2 katsayısı ise anlamlı ve negatif bir değer olarak bulunmuştur. %5'lik getiri dilimi için ise her iki katsayıda anlamlı ve pozitif bir değer olarak bulunmuştur. Kantil regresyon sonuçları EKK regresyon sonuçlarını destekler nitelikte gerçekleşmiştir. Analiz sonuçları ilgili dönemde BİST 30 endeksinde %1'lik getiri diliminde üst uç değerlerde sürü davranışının olduğuna dair kanıt sunmaktadır.

5. SONUÇ

Çalışmada BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın haftalık verileri kullanılarak 06.05.2012-27.09.2020 döneminde Christie ve Huang'ın (1995) ve Chang vd. (2000) yaklaşımı ile sürü davranışının test edilmesi amaçlanmıştır. En Küçük Kareler (EKK) ve Kantil Regresyon (KR) yöntemi kullanılarak tahminleme yapılmıştır. Her iki regresyon yöntemi sonucunda da %1'lik getiri dilimi için β_1 katsayısı anlamlı ve pozitif, β_2 katsayısı ise anlamlı ve negatif bir değer olarak bulunmuştur. %5'lik getiri dilimi için ise her iki katsayıda anlamlı ve pozitif bir değer olarak bulunmuştur. Sürü davranışını varlığından söz edebilmek için katsayıların tahminlerinin istatistiksel olarak anlamlı ve negatif çıkması gerekmektedir. %1'lik getiri diliminde β_2 katsayısı ise anlamlı ve negatif bir değer olarak bulunması sürü davranışına dair kanıtlar sunmaktadır. Bu doğrultuda, yatırımcıların pay senedi fiyatı düşme eğiliminde olduğunda kendi bilgilerini görmezden geldikleri, diğer yatırımcıların fikirlerine güvendikleri ve piyasadaki fikir birliğine dayanarak yatırım yaptıkları söylenebilmektedir.

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MILITARY SPENDING AND GROWTH: THE POST-COVID-19 NEW NORMAL IN JORDAN

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ABSTRACT

Purpose - COVID-19 has forced governments to implement fiscal policy measures that will widen budget deficits in many countries. Economies with limited public revenues or limited fiscal space, like Jordan, will probably suffer more, and probably for years to come. The expected deterioration in the status of public finance will force the government in Jordan to make difficult choices in the re-allocation of its budgetary resources. Within this context, the fact that Jordan has always been a relatively big spender on the military, the pandemic might lead to some decrease in this spending item. This is why the objective of this paper examines the impact of military spending on economic growth in Jordan.

Methodology – To examine the nexus between military spending and economic growth, this paper uses annual data that covers the period 1980 – 2019. The variables used in the analysis are real Gross Domestic Product (GDP), real military spending, and real bank credit to the private sector. As for the methodology, time series techniques are used and these include stationarity tests, co-integration and the long run relationship.

Findings – The impact of military spending on real economic growth is negative. The impact of bank credit to the private sector, on the other hand, is positive and significant. In addition, the results indicate that that bank credit to the private sector reflects increasing importance in explaining the variability in real economic growth over time.

Conclusion - The fact that military spending is relatively high, and its impact on growth is negative, policy makers might be tempted to shift financial resources from this sector to other such as health and education. However, such a decision would not be easy given the fact that Jordan is located in a politically and security unstable environment. After all, military spending the lack of security can be a major impediment to growth and development.

Keywords: Jordan, military spending, growth, bank credit, co-integration.

JEL Codes: H30, H60, H62

1. INTRODUCTION

Soon after its emergence, COVID-19 has become the issue of the day. The virus has hit the largest economies in the world. It has forced nations to adopt lockdown measures. The virus has disrupted the supply side and demand sides of economic activity. In addition, COVID-19 has led governments to adopt various, and arguably, unprecedented monetary policy and fiscal policy measures. The adopted measures will increase public spending levels and decrease public revenues. In other words, budget deficits will increase. Countries with limited fiscal space, their public debt will probably rise to the extent that their budgets will be under pressure for many years to come.

The socio-economic implications of COVID-19 to public finances, notwithstanding, no Jordanian government, since 1965, has managed to realize a surplus in its budget. For example, the period 2012-2019 witnessed an average budget deficit equal to 7.2 percent of GDP (Ministry of Finance / General Government Bulletins). Within this context, it is interesting to note two observations. First, before the onslaught of COVID-19, total public debt stood at 96.7 percent of GDP. Second, during the period 2012-2019, military spending in Jordan was equivalent to 15.6 percent of total public spending, and 4.6 percent of GDP.

The expected widening in Jordan's budget deficit and the rise in public debt will force the Jordanian government to make some difficult choices. The government may well re-examine its policy priorities and hence, re-allocate some of its spending items. The pandemic might lead to some decrease in military spending in Jordan.

This paper looks the economics of Jordan's military spending. First, few observations about military spending in Jordan, and in other countries, are outlined. Second, using the period 1980 – 2019, the main objective of this paper is to examine the nexus between economic growth and military spending in Jordan. In section two, we briefly review the literature. In section 3, we discuss the data and methodology. In section 4, we present and discuss the results. In section 5, we summarize and conclude the paper.

2. MILITARY SPENDING AND GROWTH: LITERATURE REVIEW

For a long time, military spending has been attracting a lot of research attention. On average, the literature argues that military spending affects economic growth through demand, supply, and security channels (Dunne et al., 2005).

The demand channel argument is the Keynesian multiplier. In economies with some spare capacity, an increase in military spending increases aggregate demand and hence, results in higher economic growth. Military spending, on the other hand, might crowd-out public as well as private investment. The extent of this impact (crowding-out) depends on, not only the prevailing spare capacity, but also on the source of financing the extra military spending. The financing source might be a decrease in other public spending, increase in taxes, increase in public debt, or even increase the money supply itself.

The supply channel of military spending rests on its spillover impact. For example, new technologies, developed by the military, can have spill over impacts on the rest of the economy at large. Finally, the security channel of military spending rests on protecting people, property, and factors of production in general. Security, after all, maintains security, enables markets to function properly, and promotes investment. Lack of security, on the other hand, destroys growth and development.

The absence of a theoretical agreement notwithstanding, too many empirical papers examine, among others, the impact of military spending on economic growth. This literature examines the relationship at country-level and cross-country level.

As far as military spending in the Middle East is concerned, Lebovic and Ishaq (1987) use 20 Middle Eastern countries (1973-1982) to examine the impact of military spending on growth. Based on their panel data analysis, they report a negative impact. Yildirim et al (2005) examine this issue as well. Their results, based on a panel of 13 Middle Eastern countries (1983 – 1999) and dynamic panel estimations show that the military promotes economic growth. Other papers examine the nexus between military spending and growth at the individual-country level. For example, DeRouen (2000) investigates this issue using relevant data from Israel only. While DeRouen reports a negative impact in the Israeli case, Sezgin (2000) and Yildirim and Sezgin (2002) report a positive impact in the case of Turkey. In addition, Abu-Bader and Abu-Qarn (2003) use Egypt, Israel and Syria in their analysis and report a negative impact of military spending on growth in all three countries.

More recent published papers include Aurelien and Jean-Claude (2018), Aurelien et al. (2019), and Mohanty et al. (2020). Aurelien and Jean-Claude (2018) use vector auto-regression (VAR) modeling (1985-2015) and their results, for the case of Chad, show that military expenditure negatively affects economic growth. Aurelien et al. (2019) apply their analysis to a group of 41 African countries (20 stable and 21 unstable). Based on the period 1990 – 2017, and the Generalized Method of Moments (GMM) analysis, they state that military spending negatively and affects economic growth in both sets of countries. Mohanty et al. (2020) investigate the relationship between economic growth and military expenditure in the Indian economy (1970 - 2016). Using the autoregressive distributed lag and Toda-Yamamoto Granger causality analysis, they results report a positive impact.

3. THE DATA AND METHODOLOGY

This paper examines the impact of military spending on real economic growth in Jordan during the period 1980-2019. To examine this issue, we specify model (1):

$$GDP_t = \lambda + \beta MILITARY_t + \psi CREDIT_t + \varepsilon_t \quad (1)$$

where, GDP is real GDP, MILITARY is real military spending, and CREDIT is real bank credit to the private sector. All three variables are in their logarithmic form. The expected signs of the estimated parameters are $\lambda > 0$, $\beta > 0$, $\psi > 0$. The error term (ε) is assumed to be independently and identically distributed. The subscript (t) denotes time (1980-2019).

To proceed in our analysis, we first test the data for their stationarity, and then determine the optimal lag structure. Following this, we examine the co-integrating relationship among the variables using the Johansen-Masulius procedures. This co-integration is tested using the maximum eigenvalue (λ_{max}) and the trace test (λ_{trace}).

$$\lambda_{max} = -T \log(1 - \lambda_{r+1}) \quad (2)$$

where the suitable null is $r = g$ co-integrating vectors with ($g = 0, 1, 2, 3, \dots$) against the alternative which is $r \leq g + 1$.

$$\lambda_{trace} = -T \sum_{i=r+1}^k \log(1 - \lambda_i) \quad (3)$$

where, the null is $r = g$ against the general specification $r \leq 1$.

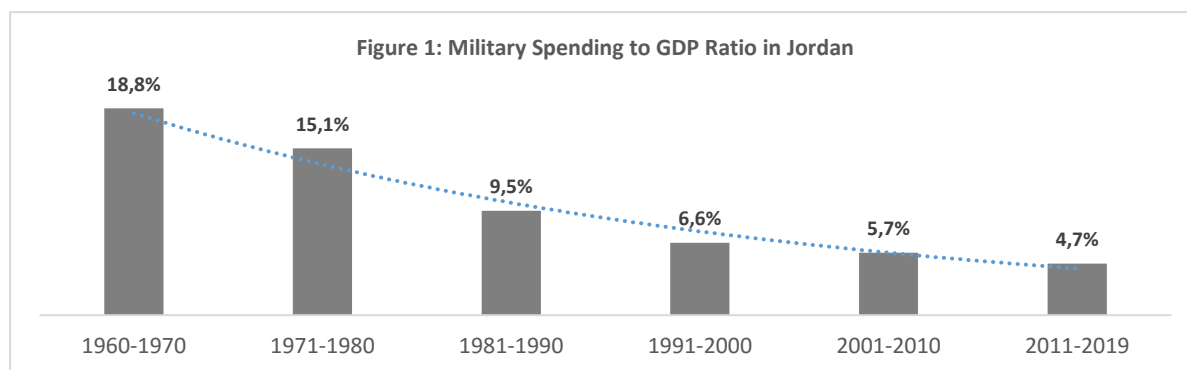
Finally, we estimate a vector error-correction (VEC) model to examine the long-run relationship between the variables, and variance decomposition to examine the importance of both military spending and bank credit in explaining the variability of economic growth over time.

$$\Delta \text{GROWTH}_t = \alpha + \lambda e_{t-1} + \sum_{i=1}^n b_i \Delta \text{GROWTH}_{t-i} + \sum_{i=1}^m c_i \Delta \text{MILITARY}_{t-i} + \sum_{i=1}^p e_i \Delta \text{CREDIT}_{t-i} + \varepsilon_t \tag{4}$$

4. MILITARY SPENDING IN JORDAN: SOME OBSERVATIONS AND EMPIRICAL RESULTS

Based in Sweden, the Stockholm International Peace Research Institute (SIPRI) is an independent institute that focuses its research effort on subjects like general security, conflict and peace, arms control, and armament and disarmament. In addition, SIPRI maintains “The SIPRI Military Expenditure Database”. This database contains time series data on the military spending of countries since 1949. From this database, two observations about Jordan’s military spending are worth raising.

a. Without going into the details of the political and military environment at that time (Arab-Israeli Conflict), Jordan spent huge amounts on the military during the period 1060-1980. Since 1980, however, and relative to Gross Domestic Product (GDP), this ratio has been consistently falling (Figure 1).

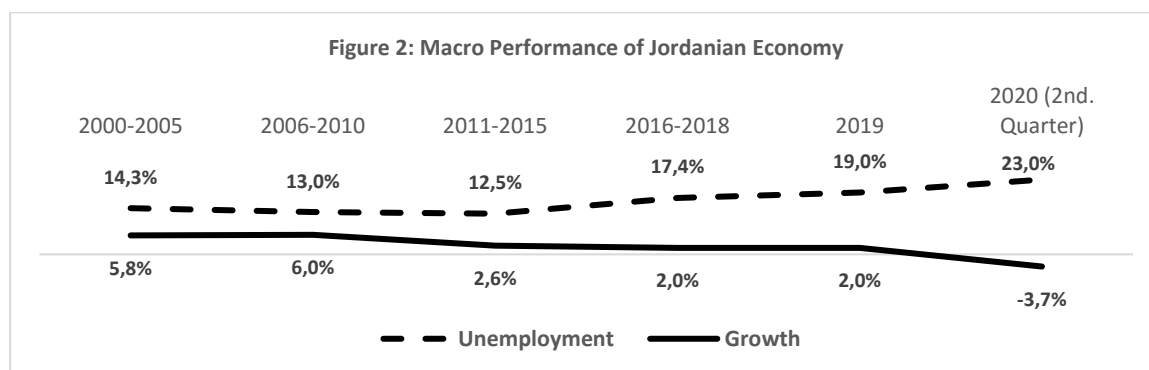


b. In 2019, and relative to GDP, Oman was the largest military spender in the world. Jordan remains one of the high spending Arab countries.

Table 1: Regional, International, and Local Spending on the Military

Military Spending to GDP Ratio (2019)					
Low Spenders		Medium Spenders		High Spenders	
Switzerland	0.7%	Iran	2.3%	Pakistan	4.0%
Japan	0.9%	Tunisia	2.6%	Lebanon	4.2%
Egypt	1.2%	Turkey	2.7%	Jordan	4.7%
Germany	1.3%	Morocco	3.1%	Israel	5.3%
Finland	1.5%	USA	3.4%	Kuwait	5.6%
UK	1.7%	Iraq	3.5%	Algeria	6.0%
France	1.9%	Bahrain	3.7%	Saudi Arabia	8.0%
China	1.9%	Russia	3.9%	Oman	8.8%

It is clear that Jordan is one of the top spenders in the world on its military. This fact, together with the weak status of public finance, if contextualized in their macroeconomic environment, one can argue the Jordanian government, one way or another, will soon face some difficult choices in the re-allocation process of resources and in reshuffling some policy priorities. Indeed, this is what one would expect, given the hitherto existing high unemployment rate, modest real economic growth, as well as the fact that during the period 2012-2019, the budget deficit was equivalent to 7.2 percent of GDP.



In Table 2, we present the unit root test (Dickey-Fuller) results. The results indicate that the three variables are not stationary in their level forms. However, they all become stationary at their first-difference levels.

Table 2: Augmented Dickey-Fuller Unit Root Test

Variable	Level			First-Difference		
	None	Constant	Constant & Trend	None	Constant	Constant & Trend
GDP	3.343	0.261	-2.155	-3.769*	-5.378*	-5.337*
MILITARY	3.051	-0.591	-2.303	-5.225*	-6.199*	-6.114*
CREDIT	8.124	-1.921	-3.539***	-2.597**	-4.134*	-4.036*

*Significant at the 99 percent confidence level.

Following the stationarity tests, we determine the optimal lag length (2), and estimate the Johansen co-integration test to examine the long-term co-integrating relationship among the three variables. In Tables 3 and 4, the results of the Johansen co-integration test are reported.

Table 3: Johansen Multivariate Co-Integration Test

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	5 percent CV	P-Value
None*	0.430	31.812	29.797	0.029
At most 1	0.235	10.40019	15.494	0.251
At most 2	0.006	0.215468	3.8414	0.643

Trace statistic indicates two co-integrating equations at the 5 percent level.

Table 4: Johansen Multivariate Co-Integration Test

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	5 percent CV	P-Value
None*	0.4308	21.411	21.131	0.046
At most 1	0.2351	10.184	14.264	0.200
At most 2	0.0056	0.215	3.841	0.643

Max-eigenvalue test indicates two co-integrating equations at the 5 percent level.

The trace and maximum eigenvalue statistics indicate that at least two co-integrating relationships exist. This also implies that there is a long-run relationship between the variables. When we estimate a two-lag Vector Error Correction Model, the negative and significant coefficient of the error correction term confirms the long-run equilibrium relationship between the three variables. These findings indicate that military spending and bank credit to the private sector jointly promote real economic growth.

$$\text{Long-Run Relationship: } \ln \text{GDP}_{t-1} = 15.002 - 0.497^* \text{ MILITARY} + 0.821^* \text{ CREDIT}$$

Finally, when we run variance decomposition analysis, the results show that the variability in real economic growth is mostly lagged by its own variance. However, and over time, bank credit to the private sector increases in power in explaining the variability in real economic growth, and not military spending.

Table 5: Variance Decomposition Analysis

Period	GDP	MILITARY	CREDIT
1	100.0000	0.000000	0.000000
2	89.63981	5.274009	5.086183
3	85.50920	3.328646	11.16215
4	81.84993	2.161581	15.98849
5	78.97057	1.616355	19.41307
6	76.69518	1.459147	21.84567
7	74.90189	1.502960	23.59515
8	73.48006	1.633356	24.88658
9	72.34286	1.792674	25.86447
10	71.42360	1.952614	26.62379

5. CONCLUSIONS

COVID-19 has forced many governments across the globe to implement some unprecedented fiscal policy measures, especially in its spending side. The extra spending measures will no doubt put pressure on budget deficits. Indeed, economies with relatively weak public finance (low tax and non-tax revenues), like Jordan, will be particularly vulnerable. The resultant deterioration in the budget deficit will probably force the Jordanian government to make difficult choices in re-allocating its resources. In other words, the pandemic might lead to some decrease in military spending.

The fact that military spending is relatively high, and its impact on growth is negative, one can argue that the government should shift some resources from this sector (military) to other sectors such as health and education. However, such a decision would not be easy given the fact that Jordan is located in a politically and security unstable environment. After all, lack of security can be a major impediment to growth and development. Military spending maintains security per se.

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REVISITING DISCOUNTED CASH FLOWS MODEL AS A CAPITAL BUDGETING DECISION TOOL

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ABSTRACT

Purpose- In this study, the classical discounted cash flows (DCDF) model is revisited and the input factors of the model are analysed in details.

Methodology- A model analysis approach is used in this research. The fundamental assumptions and the input factors (cash flows, time period, risk, discount rate, etc.) of DCF model are questioned.

Findings- NPV and IRR are two methods using discounted cash flows and oftenly applied for capital budgeting decisions. The assumptions used in the DCF analysis are very strong and not fitting well in the reality of practical life. Economic life of the project may be much longer or shorter than projected in the analysis. The computation of discount rate bases on subjective interpretations (weights of capital components, cost of debt, opportunity cost of equity). Estimation of cash flows is the most critical input of the analysis but generally the least weighted factor (CF or FCF, inclusion of only relevant cash flows, depreciation and interest expenses, installments, credit sales and purchases, etc.). Risk adjustment can be made either on the discount rate or expected cash flows. Moreover, the analysis of international capital investments makes the issue more complicated. Also, the inclusion of real options adds an economic value to the analysis.

Conclusion- DCF is not straight forward a capital budgeting model anyone can easily use. The application of DCF requires expertise and a picky view on details. Nevertheless, the acceptance of capital investments utilizing DCF method can not be independent of overall company strategic goals.

Keywords: Discounted cash flows, discount rate, capital budgeting decisions, expected cash flows.

JEL Codes: G20, G30, G31

1. INTRODUCTION

Capital budgeting is a process that managers use to make decisions about whether long-term investments or capital expenditures are worth pursuing by their organizations. This process includes planning, analyzing, selecting, implementing, managing and auditing capital investments. Capital budgeting decisions involve long-term investments. They generally require large amount of initial investments and referred as capital investments. These investments are expected to generate significant cash flows for a number of future years, hold a critical part of the long term strategic planning and directly affect the sustainability of the firm.

A company strategy is the formulation and implementation of a company's key decisions. A well-designed company strategy should include a statement of the company's goals, criteria to decide which activities a company should do and should not do, a view on how the company should be organized internally, how it should deal with the external environment and contain an explanation for why the goals will be achieved by adhering to the strategy. Hence, capital budgeting decisions cover a large part of the company strategy.

In theory, capital projects should be analyzed in terms of shareholder wealth maximization. Based on this assumption, managers should undertake all investment projects with a positive net present value (NPV). By so doing, managers should enhance firm market value and consequently increase owners' wealth. In practice, managers may not necessarily accept a project just because it appears financially attractive. Achieving the financial objective of shareholder wealth maximization requires developing a business strategy. Successful capital investments affect the achievement of company's strategic objectives.

After defining the importance of capital budgeting decisions and tying to the company's strategic objectives, the following parts of the paper are organized as follows. The next section sets the assumptions and input factors of discounted cash flows (DCF) model. The following part revisits and questions each of the critical factor used in the application of DCF model. The final section concludes the findings.

2. DISCOUNTED CASH FLOWS (DCF) METHOD

The typical capital budgeting method (directly or indirectly) involves three steps; estimating cash flows generated by the project, finding an adequate discount rate for each cash flow, and estimating the initial cost of the investment (including opportunity costs). Discounted cash flows (DCF) method discounts all expected cash flows today and in the future at a given rate. Net Present Value (NPV) and Internal Rate of

Returns (IRR) are two applications of DCF model. IRR is a special case of NPV. IRR is the actual percentage return generated by a project. To determine whether the project's IRR is sufficient to justify its initial costs, the project's return needs a benchmark return (hurdle rate or cutoff rate) for comparison.

Net Present Value (NPV) model may be shown as below;

$$NPV = -I_0 + \sum (CF_N / [1 + k]^N)$$

Input factors of a NPV computations are economic life of the project (N), initial investment (I_0), expected future cash flows (CF), discount rate (k), project risk (business risk, project risk, σ_{project} , β_{project}), and real options if available.

The assumptions of the model may be stated such that capital markets are perfectly efficient, no frictions in financial markets, no transaction costs, no information asymmetry, all player are rational, no differences in taxes (among financial instruments and countries) and law of one price is hold in everywhere. These assumptions used in the DCF analysis are very strong and not fitting well in the reality of practical life.

3.1. Economic Life

A general assumption is that all initial investments are done, completed and ready to use for operations in a single day (today at $t=0$). Besides, it is assumed that the project's economics life is known and certain disregarding the changes in technology, competitors, trade-production restrictions, tax laws, tax rates, supply of raw materials, manufacturing parts, workers and managers. On the other hand, in the large capital investment projects the initial investment period may easily take a couple of years to put parts of operation together. The problems in licensing, construction, receiving parts, machinery, supplies, financing and labor may easily extend the initial investment period. Meanwhile the capital investment projects has been employed, the economic life of the project may be extended because of modifications in production facilities and innovations in products and production processes. On the other hand, it may be limited by changes in business environment, e.g. technology, taxes, competitors.

3.2. Initial Investment

The initial investment covers the acquisition of new assets, additional need for net working capital, acquisition of land and constructing a building. The costs of acquisition of new assets include invoice price, delivery, insurance for delivery, installation-testing-calibration, materials used for testing and training of workers. Additional need for net working capital (NWC) is defined as the difference in between current assets and current liabilities. With the employment of the new project, increases or decreases in account receivables/payables and inventories may be needed. If the capital investment requires replacing old assets with new ones, the differences in net cost in total acquisition cost of new and total disposal cost/revenue or old must be considered. If a land needs to be acquired, not only the purchasing price of land but the cost of grading (property appraisal, negotiate purchase contracts, lawyer fees, commissions, licensing and taxes, etc) and improving (engineering services, traffic arrangements, driveways, fences and etc) the property must also be considered. For constructing a building for the project, the costs for architectural and engineering fees, bids form contractors, evaluation of bids and construction, and taxes must ne included in the initial investment computations.

3.3. Expected Future Cash Flows

The estimation of future cash flows must consider the inclusion of all relevant cash inflows and outflows, namely; positive of negative externalities, opportunity costs/revenues, all initial investments, change in net fixed assets, change in net working capital, recovery of net working capital and liquidation of assets at terminal date, collection on revenues, payments for expenses, tax advantages in initial investments earned carried on future years. It must also exclude all irrelevant cash inflows and outflows, namely; sunk costs, interest expenses, noncash revenues and expenses. Moreover, the estimation of cash flows must consider the affect of inflation and adjust selling prices (aware of price elasticity of demand), time value of credit sales and credit purchases and installments, change in tax shield on depreciation expenses, change in COGS, interest expenses on debt, loss carry forward, reinvestment of excess cash, salvage value at the terminal date, tax advantages in initial investments earned carried on future years.

3.4. Discount Rate

The cost of capital has two common sources; debt and equity. Cost of capital is simply calculated by the weighted average cost of each capital components (WACC).

$$WACC = w_d k_d (1 - T) + w_e k_e$$

Where w is the weight of each capital component, k_d is the marginal cost of debt and k_e is the opportunity cost of equity capital.

WACC is forward looking rate of return considering financing mix. The estimation of weights is based on capital structure of the firm. A problem arises at this point questioning what values taken into account computing the weights of capital components. The book values or the market values of accounts on the balance sheet need to be considered. More, the existing capital structure or the targeted capital structure after the planned investment takes place and is recorded among the assets and liabilities on the balance sheet of the firm.

The cost of debt is the required rate of return that debt holders require on the firm's debt instruments. The average cost of outstanding debt or the cost of most recent debt or the cost of incoming debt should be used the cost of firm's debt. Moreover, the cost of debt is related to

short term debt or long term debt, or the debt is planned to obtain through bank loans, commercial paper issues or bond issues, or pure interest cost or gross cost of borrowing including transactions costs and commissions need to be considered.

The cost of equity is the required rate of return on the firms' stockholders. The equity funds may come from existing internal sources (k_e) or from issues of new common stocks for cash (k_e). In the estimation of opportunity cost of equity three approaches are commonly used, namely; Gordon Model, Capital Asset Pricing Model (CAPM) or cost of debt plus risk premium model.

The cost of equity by Gordon Model is stated as below;

$$k_s = (D_1 / P_0) + g \quad \text{or} \quad k_e = (D_1 / [P_0 - F]) + g$$

Where k is the cost of equity, D_1 is expected cash dividend per share at time 1, P_0 is the current publicly traded stock price, F is the floatation cost for new stock issues and g is the constant growth rate of cash dividends for infinity. Gordon model is based on the expected future cash dividend payments which can only be estimated by the estimation of constant g . However, companies may not have a perceivable dividend policy or pay no dividends at all, then it is highly disruptive to estimate a constant g even if it is not possible. P_0 represents the current stock price but it is not easy to define what price is the most related one, e.g. closing price of the last trading day, average price of last week/month/months/year/years, trading volume weighed price or mid-day price.

The cost of equity by Capital Asset Pricing Model (CAPM) is stated as below;

$$k_s = k_{RF} + (k_M - k_{RF}) + \beta_{\text{Project}}$$

k_{RF} is the risk free rate and approximated by Treasury Securities (1-year, 5-year, 10-year or 20-year maturity). It may be suggested to use the same maturity of Treasury Securities with the life of project. k_M is the expected market return and approximated by a market index (historical returns on the index or future expected returns $k_M - k_{RF}$ is the market risk premium representing the additional return is required to invest in a riskier investment. CAPM implies only market risk of project (β_{Project}) explains the risk-return relation. On the other hand, Baker & Powell (2005) argues that firm size and book-to-market ratio also affect the risk of a project. A firm's stock beta can be observed in the market if the firm is publicly traded but a project's beta can not. Then, the historical returns of a similar project may be used applying pure play method and approximating for a similar firm's beta. This firm must be publicly traded and in the same line business. Pure play firm may have a different debt structure and therefore a different level of risk. If the pure play firm includes any debt in its financing structure, the beta needs to be adjusted (unleveraged) to reflect the business risk only.

CAPM has weaknesses. CAPM assumes markets are efficient, betas are stable over time, betas can be estimated forward looking, a market portfolio exists and is represented by stock indices and its expected return is measurable. Moreover, beta measures only systematic risk and is valid for well diversified portfolios. The unsystematic risk measured by standard deviation (total risk or individual firm risk) is disregarded by CAPM.

The cost of equity by cost of debt plus risk premium is stated as below;

$$k_s = k_d + \text{Risk Premium}$$

The risk premium in this approach is a subjective value determined by analysts as a reasonable and acceptable risk premium on the current or marginal cost of debt of a particular firm. The risk premium in this approach is completely different from the market risk premium in CAPM. The market risk premium is valid for all risky assets in the market while the risk premium in this approach is specific to a firm.

3.5. Project Risk

Project risk needs to be included in the analysis by an adjustment either in the discount rate or in the cash flows estimation. If a risk adjustment on expected cash flows is desired, a scenario analysis on cash flows for each the future years may be applied. As go further, the probability distribution of the scenarios get wider showing greater riskiness of cash flows in the future. Alternatively, by applying simulations consider the sector and the project, certainty equivalent factors are computed. The certainty equivalent factors show the riskiness of each future cash flows by assigning a greater reduction rate on each cash flows as years go further. When adjusting the discount rate for risk (Risk Adjusted Discount Rate - RADR), a risk adjustment on WACC is usually made by adding/subtracting a subjective percentage (+/- 3% for example). The next step is the risk classifications of capital investments. The risk groups may be classified as the replacement projects (low risk group), expansion projects (average risk group) and R&D projects (high risk group). Alternatively, the expected return and risk of each individual project is calculated and then coefficient of variation ($CV_{\text{Project}} = \sigma / k$) of each project is computed to determine risk level of the project. Also, sensitivity and scenario analysis may be used to classify projects into risk groups. CAPM, on the other hand, can be used to get the risk adjusted discount rate directly by adjusting the beta for a particular project [$k = k_{RF} + (k_M - k_{RF}) \beta_{\text{Project}}$]. Another way for inclusion of risk in discount rate is to use risk free rate and add subjective a risk premium for the business risk (RP_{business}) and add a subjective risk premium for specific risk of the project (RP_{Project}) [$\text{RADR} = k_{RF} + RP_{\text{business}} + RP_{\text{Project}}$]

3.6. International Investments

International capital investments projects oftenly involve with dealing a number of currencies, inflation rates, interest rates on various currencies, exchange rate fluctuations, political risks, foreign exchange restrictions, foreign financing restrictions, hurdle rates for parent company and subsidiary, different tax systems and tax rates, different accounting standards (definition of revenues & expenses, treatment of leases, valuation of loans and financial securities, changes in values of certain assets and liabilities, etc.)

3.7. Real Options

Myers (1977) introduced real options for capital investments. Real options help managers gain a greater flexibility to abandon, delay or expand a project through the life time of the project. Hence, losses can be reduced and gains can be increased. Real options increase the quality and validity of the analysis since there exist uncertainties about future cash flows and timing of project initiation. Besides, irreversibility of capital investments makes real options more valuable. Types of real options may be listed as option to defer, time to build, option to abandon, option to alter operating scale, option to switch, option to upscale and multiple interacting real options (rainbow options).

4. CONCLUSIONS

NPV and IRR are two methods using discounted cash flows and often applied for capital budgeting decisions. The assumptions used in the DCF analysis are very strong and not fitting well in the reality of practical life. Economic life of the project may be much longer or shorter than projected in the analysis. Initial investment can not happen in a single day. It may cover a long period of time (a couple of years). Some costs incurred in the initial investment period may be overlooked and not included in the analysis. The computation of discount rate bases on subjective interpretations (weights of capital components, cost of debt, opportunity cost of equity). Estimation of cash flows is the most critical input of the analysis but generally the least weighted factor (CF or FCF, inclusion of only relevant cash flows, depreciation and interest expenses, installments, credit sales and purchases, etc.) Risk adjustment can be made either on the discount rate or expected cash flows. Moreover, the analysis of international capital investments makes the issue more complicated. Also, the inclusion of real options adds an economic value to the analysis. Hence, DCF is not straight forward a capital budgeting model anyone can easily use. The application of DCF requires expertise and a picky view on details. Nevertheless, the acceptance of capital investments utilizing DCF method can not be independent of overall company strategic goals.

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THE INTERACTION BETWEEN CORPORATE GOVERNANCE AND FINANCIAL PERFORMANCE: AN IMPLEMENTATION FOR THE UK BANKS

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ABSTRACT

Purpose- The purpose of this study is to examine the relationship between the performance of commercial banks with corporate governance elements. Thus, the listed commercial banks in the London Stock Exchange (LSE) of the UK will be considered in this study. Hence, using availability data of the Financial Times Stock Exchange 100 (FTSE 100) companies including banks that operate in LSE, the period (2010-2019).

Methodology- The study employs a sample of 10 biggest banks trading on (LSE) ranked by market capitalization as of December 31st. 2019. The study will use panel data method and the results will be analysed by descriptive statistics, correlation, and regression. Seven major corporate governance variables will be analysed within the framework of corporate governance theory namely: Board Size, Board Independent, Foreign owners, bank ownership structure, Audit Committee, Female Board, Financial Leverage, and board size and their impact on the financial performance of the commercial bank in the UK which will be measured using Return on Assets Ratio (ROA), Return on Equity (ROE), and The TOBIN's Q.

Finding- The analysis of previous studies reveals that internal corporate governance mechanism (Board of Director's) has significant impact on the performance of banks such as Tamer Shahwan (2014).

Conclusion- This study will investigate the relationship between CG (Board Characteristics, Audit committee, Owners structure, and banks size and financial leverage) and banks performance which will measured by (ROA, ROE, and TOBIN; Q).

Keywords: Corporate governance, board of directors' characteristics, audit committee characteristics, ownership structure, bank performance.

JEL Codes: M40, M41

1. INTRODUCTION

Corporate governance has become one of the most topical issues in the modern business world today and has appeared to assist both management and shareholders of various finance and non-finance enterprises. According to Choudhury & Alam (2013), corporate governance is the relationship between corporate management, executives, the providers of equity, and people and institutions who save and invest their money to get a return. Corporate governance ensures that the board of directors is responsible for the pursuit of corporate an aim and that the enterprises conform to the rules and regulations. Reddy et al (2013) claimed that good corporate governance system allows companies to have easier access to resources, lower costs of capital, enhance stakeholder reputation and improve organisational performance. Cadbury (1992) stated that corporate governance concerned with the duties and responsibilities of an enterprise's board of directors to successfully guide it. Moreover, the report is concerned with the relationship between shareholders and other stakeholder groups. Furthermore, the report defines corporate governance, as 'the system by which companies are directed and controlled. Therefore, this widely accepted definition identifies management accountability to shareholders. <https://www.frc.org.uk/>.

2. LITERATURE REVIEW

In the literature, the concept of corporate governance defined as 'corporate governance is the system by which companies are directed and controlled'. This is widely accepted definition by Sir Arthur Cadbury's (Cadbury 1992) and clearly identifies the management accountability to shareholders. <https://www.frc.org.uk/>.

Furthermore, OECD in 2001 has published a broader definition of corporate governance "Corporate governance refers to the private and public institutions, including laws, regulations and accepted business practices, which together govern the relationship, in a market economy, between corporate managers and entrepreneurs (corporate insiders) on one hand, and those who invest resources in corporations, on the other, this definition indicates that corporate governance means establishing a set of rules and actions that facilitate the shareholders decision making process. <http://www.oecd.org/>.

Makki and Lodhi(2013) agreed that the aim of corporate governors is to gain competitive benefit in a free market knowledge economy. This competitive edge is possible if Corporate governance enhances value through exploiting all available resources. Good Corporate governance practices ensure better decision making, operational efficiency, and reduction in wastes. It further balances the interests of all stake holders including executives and non-executive. Shareholders can believe that companies with good Corporate governance practices make sure that free cash flow should be returned to shareholders as dividend rather than being expropriated by the insiders.

What is More, Asma'a Al-Amarnah(2014) referred that Corporate governance is needed because of the existence of agency problems caused by the separation of ownership of resources and managing those resources. Good Corporate Governance practice is one mechanism used to minimize the conflict of interest between agents (management) and principals (shareholders). Since the bank sector is the most important sector in any economy, it is critical for economic growth and development; hence, there is a need for its strict regulation all over the world.

On the other hand, many researchers believes that companies with weak corporate governance may confront sustainability problems in highly competitive markets and as well as increase the level of agency problem between executive and shareholders. Additionally, according to Makki & Lodhi(2013) poorly governed firms have lower operating performance while good governed firms demonstrate higher financial performance and market firms with good corporate governance practices not only grant more cash dividend but also more rights to its shareholders.

2.1.Theoretical Perspective of Corporate Governance

There are underlying theories pertaining to corporate governance relation between the owner and manager to reduce the conflict of interest between two parties such as:

Agency theory- Identifies the agency relationship between the shareholder or (principal) and the manager or (agent). Managers are appointed by shareholders to manage and run the business to achieve company's goal which is shareholders' wealth maximisation. However, agency theory pinpoints the problems of goal incongruence between managers and shareholders whereby the managers may act in their personal interests by pursuing prerequisites and power. Pande & Ansari (2014).

Stewardship theory- While Agency theory assumes that principals and agents have divergent interests and that agents are essentially self-serving and self-centred, Stewardship theory takes a diametrically opposite perspective it suggests that the agents (directors and managers) are essentially trustworthy and good stewards of the resources entrusted to them, which makes monitoring redundant. Bathula, H. (2008).

Stakeholder Theory- The theory of stakeholder suggests management to take care of the development of all stakeholder relationships, and not concentration only on shareholders' interests. Therefore, the new performance of companies is to focus on society as a whole which be different from the objective of companies to maximise shareholder's wealth. Bouheni, & Levy (2016).

2.2. Differences in Corporate Governance for Banks

Oskar Kowalewski (2008) believes that the board of director's role is to drive firms in safe way, define the strategic plan, and review the company's performance and risk management. There are many debates about the role boards of director's play, as they are essential to the success of the company. The role of chairman is also very important because it connects the board with management.

According to Andy Mullineux (2006) the banking system and financial market have been changed and developed in order to spurs economic growth. Moreover, the corporate governance plays major roles in banking system as good bank regulation and control become part of corporate governance system. In addition, good corporate governance structure of banks needs a good risk related prudential regulation, pay more attention to conflicts of interest (agency problem) and competition issue, particularly given the clear information that advantage of banks over their retail customers.

2.3. Corporate Governance and Bank Performance

The firm's performance is directly affected by the performance of the board of directors (BOD). Thus, the (BOD) can be more effective if they understand the procedure of work which has the linkage between the (BOD) outputs and firm performance. Murphy & McIntyre (2008). Directors assistance determine the strategic direction of a business and are accountable for ensuring the organisation has a good Mehrotra, S,2016, and Embi, & Ismail, 2016). scheme of internal control. (Javed, & Malik, 2013, Boussaada, & Karmani,2015,

3.METHODOLOGY

Defines research methodology as the adoption of a scientific approach to collect data in order to respond to a research query and meet a research objective.

3.1. Bank Performance Measurement

Banks performance in the corporate governance literature is based on the financial indicators and banks value. There are many measures of banks performance, therefore, this research will use three set of financial measures of banks performance as accounting-based and market-based measures. Most commonly used accounting-based measures are return on assets (ROA), return on equity (ROE) and The TOBIN's Q.

Return on Assets (ROA) measure performance which is widely used in the literature and highly representative as an accounting-based measure. It shows the efficiency of assets employed. ROA shows the earnings that banks have generated from their investments in capital assets. Since managers are responsible for the operation of the business and utilization of the bank's assets, ROA is a measure that allows users to assess how well a bank's corporate governance system is working in securing and motivating efficiency of the banks management. ROA is calculated as net income divided by total assets.

Return on Equity (ROE), is another important measure of banks performance used in corporate governance studies. The primary aim of the banks is to make profit. Return on equity is the most acceptable ratio in order to measure profit. It is defined as the net income divided by common equity. Mirchandani & Gupta (2018) state that ROE is another accounting-based performance measure widely used in corporate governance research. It is a measure that shows the profit generated from the money invested by the shareholders. ROE is calculated by dividing net income by common equity

Naushad & Malik (2015) state the performance measure, that we use in the study by considering the financial aspect. The TOBIN's Q is denoted as the proxy for it. TOBIN's Q propounded by James C. Tobin (1969) explains the relationship of current cost of replacement assets to the market value of the firm's assets including share & stocks. Tobin's Q is a market-based measure of profitability widely used in corporate governance studies as a proxy for firm performance. It is defined as the ratio of the market value of assets to the replacement value of assets which shows the financial strength of a company. Bhagat & Jefferis (2002).

3.2. Hypotheses

Corporate governance of banks is principally complex, as these financial institutions are unique and differ basically from non-financial institutions. Indeed, corporate governance of banks plays an important role due to the distinctiveness of these institutions. Banks being the right arm of the economy, its corporate governance is a challenging subject.

Board Size and Banks Performance

Salim et al. (2016) agree that board size can have either a positive or negative effect on corporation performance. On one hand, a large board makes coordination and communication difficult, allowing the CEO to gain control over the board, triggering the agency issue and reducing company performance. On the other hand, resource-dependent theory suggests that a larger board allows for more specialists from different fields and therefore facilitates high-quality decision making. Further, more board members can provide additional networking to allow acquisition of key external resources.

H0: There is a positive or a negative relationship between Board size and bank performance in the UK.

H1: There is no a positive or a negative relationship between Board size and bank performance in the UK.

Board Independence and Banks Performance

According to Hoti & Dermaku (2018) a greater number of independent board members have an impact on improving the board's objectivity and its ability to present some views on various issues.

H0: There is a positive or a negative relationship between Board independent and bank performance in the UK.

H2: There is no a positive or a negative relationship between Board independent and bank performance in the UK.

Foreign Ownership and Banks Performance

Asma'a Al-Amarneh (2014) cites that international ownership is another factor that can lead to differences in organizational objectives, practices, and governance mechanisms. If foreign investors hold a large portion of shares of a corporation, a signal will be sent to all other participant in the market that foreign investors have a high confidence in these companies. Accordingly, the value of the company will increase.

H0: There is a positive or a negative relationship between Board Foreign Ownership and bank performance in the UK.

H3: There is no a positive or a negative relationship between Board Foreign Ownership and bank performance in the UK.

Ownership Structure and Banks Performance

Basuony Mohamed et al (2014) provided evidence that changes in performance are significantly associated with change in insider ownership. Moreover, he is also consistent with the view that insider ownership can be an effective tool in reducing agency cost. This factor measures as dummy variable that equals to zero if more than 50% of the bank is owned by individuals. One if more than 50% of the bank is owned by government agency.

H0: There is a positive or negative relationship between ownership concentration and banks performance.

H4: There is no a positive or negative relationship between ownership concentration and banks performance.

Audit Committee and Banks Performance

Lutzy, (2003) found that companies in the volatile industries experiencing instances of financial statement fraud had fewer audit committees, less independent audit committees, or fewer audit committee meetings. Its measure by the proportion of independent directors on the audit committee.

H0: There is a positive or a negative relationship between the independence of the audit committee members and banks performance.

H5: There is no a positive or a negative relationship between the independence of the audit committee members and banks performance.

Female Board Members and Banks Performance

Zelechowski and Bilimoria (2004) found that having a female CEO or female director on the board of directors will result in better financial performance.

H0: There is a positive or negative relationship between female board members and banks performance.

H6: There is no a positive or negative relationship between female board members and banks performance.

Financial Leverage and Banks Performance

H0: There is a positive or negative relationship between Financial Leverage and banks performance.

H7: There is no a positive or negative relationship between Financial Leverage and banks performance.

Bank Size and Bank Performance

H0: There is a positive or negative relationship between bank size and banks performance.

H9: There is no a positive or negative relationship between bank size and banks performance.

The Model Specification

the model is generally designed as follows:

$$Y_{it} = \alpha_{it} + \beta_{kit} X_{kit} + u_{it}$$

Where the first subscript, i refers to the entity being observed, and the second subscript, t, refers to the date at which it is observed.

The Regression Models are Constructed

$$ROA = \beta_0 + \beta_1 BOAS + \beta_2 PIND + \beta_3 FB + \beta_4 BOS + \beta_5 AC + \beta_6 GNDER + \beta_7 LEVG + \beta_8 BAKS + u$$

$$ROE = \beta_0 + \beta_1 BOAS + \beta_2 PIND + \beta_3 FB + \beta_4 BOS + \beta_5 AC + \beta_6 GNDER + \beta_7 LEVG + \beta_8 BAKS + u$$

$$\text{Tobin's } q = \beta_0 + \beta_1 BOAS + \beta_2 PIND + \beta_3 FB + \beta_4 BOS + \beta_5 AC + \beta_6 GNDER + \beta_7 LEVG + \beta_8 BAKS + u$$

Data Collection

Since the main aim of this thesis is to conduct an investigation of the corporate governance practices of banks listed in London Stock Exchange (LSE) and their effect on banks performance used data from FTSE 100, and CG index companies in LSE. London Stock Exchange data are published daily. London Stock Exchange CG index contains aspects of corporate governance practices related to the board of directors, board compensation, the audit committee, shareholder rights, and disclosure and transparency. Moreover, secondary data of corporate governance of banks annual reports for accounting information, will be used for the analysis purpose period from 2010 to 2019.

Sample Selection

The Samples that we will use are biggest banks trading on the London Stock Exchange (UK) ranked by market capitalization as of December 31st, 2019. Sample used is an unbalanced panel dataset of commercial banks operating in the UK over the period 2010-2019. While financial data on banks is mainly obtained from the web page of the Banks chosen. Moreover, the information about board size and outside directors is hand-collected from the annual reports of individual banks.

CONCLUSION

The purpose of this study to examine the relationship between corporate governance mechanism and the UK banks performance, if LSE. The Samples that will use are biggest banks trading on the London Stock Exchange (UK) ranked by market capitalization as of December 31st, 2019, and their effect on banks performance we used data, of FTSE 100. The UK has one of mostly strong CG structure. In this research we will use ROA, ROE, Tobin Q as measure to the banks performance as many studies used them as mentioned early. Corporate

governance will measure by use board size, board independent, ownership, foreign board, female board, audit committee, inflation, bank size, and leverage.

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EVALUATION THE PERFORMANCE OF STOCK FUNDS USING MULTI-CRITERIA DECISION MAKING METHODS

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ABSTRACT

Purpose- The aim of this study is to apply MCDM methods in addition to the traditional methods which are commonly utilized in evaluating the efficiency of stock funds. In this direction, starting from the fact that the normal distribution of stock returns, which is one of the assumptions of Modern Portfolio Theory, is mostly violated in practice, higher order moments are included in the objective functions of MCDM methods in addition to the first and second moments.

Methodology- In this study, in addition to the traditional performance measurement methods such as Sharpe Ratio, Information Ratio, Treynor Ratio and Jensen's Alpha; Adjusted Sharpe Ratio and TOPSIS, MOORA from MCDM methods are utilized by including high-order moments in addition to the first and second moments in the objective functions. In the next step, the ranking process was carried out with respect to traditional and recommended performance evaluation methods. Then, the rankings were evaluated using Spearman Rank Correlation Test.

Findings- As a result of the analyses using the stock funds obtained from the TEFAS Turkey Electronic Fund Trading Platform for the period of 2018, 2019 and the first 9 months of 2020, ranking process is carried out using each methods' and these rankings are compared using the Spearman Rank Correlation Test. According to the results of the Jarque-Bera test, it is seen that the majority of the stock funds included in the sample do not show normal distribution. This situation strengthens our hypothesis and emphasizes the necessity of including higher moments in the analysis. According to Spearman's Rank Correlation Test results, strong relationships are found among the rankings obtained from traditional performance measurement methods. Moreover, it has been observed that the strength of the relationship between non-traditional methods and traditional methods is very weak. In other words, while the stock funds proposed by a traditional method were supported by other traditional methods, by making suggestions in a different direction TOPSIS and MOORA offered an alternative perspective considering the high-order moments.

Conclusion- In this study, it is shown that the higher order moments and alternative ranking methods can be used in evaluating the performance of stock funds. In the view of both performance measurement and the portfolio selection window, these methods are considered to be useful in the analysis of stock funds. Accordingly, this study is intended to provide a perspective for equity fund managers, fund investors, and researchers to evaluate the effectiveness of stock funds.

Keywords: TOPSIS, MOORA, high-order moments, stock funds, performance measurement methods.

JEL Codes: G10, G11, G19

HİSSE SENEDİ YATIRIM FONLARININ PERFORMANSININ ÇOK KRİTERLİ KARAR VERME YÖNTEMLERİ İLE DEĞERLENDİRİLMESİ

ÖZET

Amaç- Bu çalışmanın amacı, hisse senedi fonlarının etkinliğini değerlendirmede kullanılan geleneksel yöntemlerin yanısıra, ÇKKV yöntemlerinin uygulanmasıdır. Bu doğrultuda, Modern Portföy Kuramı'nın varsayımlarından biri olan hisse senedi getirilerinin normal dağılımının pratikte çoğunlukla ihlal edildiği gerçeğinden hareketle, ÇKKV yöntemlerinin amaç fonksiyonlarına birinci ve ikinci momentlere ek olarak yüksek dereceden momentler dahil edilmiştir.

Metodoloji- Bu çalışmada geleneksel performans ölçüm yöntemlerinden Sharpe Oranı, Bilgi Oranı, Treynor Oranı ve Jensen'in Alpha'sına ek olarak ayarlanmış Sharpe oranı ve ÇKKV yöntemlerinden TOPSIS, MOORA kullanılmış, ÇKKV yöntemlerinin amaç fonksiyonlarına birinci ve ikinci momentlere ek olarak yüksek dereceden momentler dahil ederek değerlendirilmiştir. Sonraki aşamada, her bir yöntemle göre sıralama yapılmış ve analizler neticesinde elde edilen sıralamalar, Spearman sıra korelasyon testi kullanılarak karşılaştırılmıştır.

Bulgular- TEFAS Fon Bilgilendirme Platformu'ndan elde edilen hisse senedi fonlarının 2018, 2019 yılları ve 2020 yılının ilk 9 ayına ait verilerle gerçekleştirilen analizler neticesinde her bir yöntemle göre sıralama yapılmış ve analizler ile elde edilen sıralamalar Spearman sıra korelasyon testi kullanılarak karşılaştırılmıştır. Jarque-Bera testinin sonuçlarına göre, örnekleme dahil edilen hisse senedi fonlarının büyük bir çoğunluğunun normal dağılım göstermediği görülmektedir. Bu durum, hipotezimizi kuvvetlendirmekte ve analizlere yüksek momentlerin dahil edilmesinin gerekliliğine vurgu yapmaktadır. Analizler sonucunda, geleneksel performans ölçüm yöntemlerinden elde edilen sıralamalar arasında kuvvetli ilişkiler tespit edilmiştir. Geleneksel olmayan metodlar ile geleneksel yöntemler arasında ise ilişkinin gücünün zayıf olduğu görülmüştür. Bir diğer deyişle, geleneksel bir metriğin önerdiği fonları diğer geleneksel metrikler desteklerken, TOPSIS ve MOORA gibi geleneksel olmayan yöntemler ise yüksek dereceden momentleri göz önünde bulundurarak alternatif bir bakış açısı sunmuştur.

Sonuç- Bu çalışmada, hisse senedi fonlarının performansının değerlendirilmesinde yüksek dereceden momentlerin ve alternatif sıralama yöntemlerinin kullanılabilmesi ortaya konulmuştur. Hem performans ölçüm hem de portföy seçim penceresinden bakıldığında bu yöntemlerin hisse senedi fonlarının analizinde dikkate alınmasının yararlı olacağı düşünülmektedir. Bu doğrultuda, çalışmanın, hisse senedi fon yöneticileri, fon yatırımcıları ve araştırmacılar için hisse senedi fonlarının etkinliğinin değerlendirilmesi noktasında bir bakış açısı sağlaması amaçlanmıştır.

Anahtar Kelimeler: TOPSIS, MOORA, yüksek dereceden momentler, hisse senedi fonları, performans ölçüm yöntemleri.

JEL Kodları: G10, G11, G19

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SWAP TRANSACTIONS AND PROFITABILITY RELATIONSHIP: AN EMPIRICAL RESEARCH ON THE TURKISH BANKING SECTOR

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ABSTRACT

Purpose- The increase in volatility in exchange rates in the last 5 years has increased the level of exchange risk for the Turkish banking sector, whose liabilities are mainly composed of foreign currency funds. To manage the currency risk, the tendency towards derivative financial instruments has increased and swap transactions have a share of 85% in the total derivatives' portfolio as of the end of 2019, according to BRSA data. Studies in the literature on the subject of the Turkish banking sector focus on the effect of derivative financial instruments on banks' risk level. In studies on the effect of derivative transactions on profitability, it is seen that the derivative transaction's portfolio is evaluated as a whole. In this context, taking into account that swap transactions are carried out to make a profit in addition to being a risk management tool, the purpose of the study is to determine the causality between profitability and swap transactions recorded by banks within the scope of "Derivative Transactions for Trading Purposes".

Methodology- In the research, the data of the first 8 private banks according to balance sheet size were analyzed. State-owned banks were excluded from the study due to their capital structures, working principles, competition conditions, and their functions being relatively different from private banks. The variables to be analyzed in the study are net profit and swap transaction volume data that banks account for under "Derivative Transactions for Trading Purposes" by IFRS 9. The data were obtained from financial statements and audit reports disclosed to the public by banks. These data are for 20 quarters covering the years 2015-2019. In this context, short and long-term causality analysis was performed between swap volume and net profit. It has been determined whether the causality relationship between the variables is one-way or two-way. Panel unit root tests, Johansen cointegration test, Wald test, and Granger causality test were performed respectively to achieve the purpose of the study.

Findings- Cointegration between swap volume and net profit of banks included in the analysis has been determined. For this reason, short and long-term causality analysis was performed by applying the Vector Error Correction Model (VECM). As a result of the causality test, it was concluded that there is long-term bidirectional causality among the variables and one-sided causality in the short-term. Short-term causality is from swap volume to net profit.

Conclusion- As a result of the analysis of the quarterly swap volume and net profit data of the eight banks operating in the Turkish banking sector in terms of balance sheet size for the period 2015-2019, it is understood that both variables affect each other in the long-term. In the short run, the causality is one-sided and it is concluded that the swap volume affects the net profit. It is believed that a study on the effect of currency swaps, which has a significant share in the swap portfolio, on profitability will be useful in the studies to be carried out in the following period.

Keywords: Derivatives, swap transactions, profitability, turkish banking sector, causality analysis.

JEL Codes: G30, G21

SWAP İŞLEMLER VE KÂRLILIK İLİŞKİSİ: TÜRK BANKACILIK SEKTÖRÜ ÜZERİNE AMPİRİK BİR ARAŞTIRMA

ÖZET

Amaç- Son 5 yıllık dönemde döviz kurundaki volatilitenin artması, kaynak yapısının önemli bir bölümü döviz cinsi fonlardan oluşan Türk bankacılık sektörü açısından kur riskinin düzeyini artırmıştır. Kur riskinin yönetimi amacıyla türev finansal araçlara yönelim artmış ve swap işlemler BDDK verilerine göre toplam türev portföyü içerisinde 2019 yılsonu itibarıyla %85 paya sahip olmuştur. Literatürde konuya ilişkin Türk bankacılık sektörünü konu alan araştırmalar, türev finansal araçların bankaların risk düzeyine olan etkisi üzerinde yoğunlaşmaktadır.

Türev işlemlerin, kârlılık üzerindeki etkisine yönelik araştırmalarda ise türev işlemler portföyünün bir bütün olarak değerlendirildiği görülmektedir. Bu çerçevede swap işlemlerin risk yönetimi aracı olmasının yanında kâr elde etme amacıyla da gerçekleştirildiği dikkate alınarak, bankaların “Alım-Satım Amaçlı Türev İşlemler” kapsamında kayıt altına aldıkları swap işlemler ile dönem net kârı arasında bir nedenselliğin tespiti, çalışmanın amacını oluşturmaktadır.

Yöntem- Araştırmanın kapsamında, Türk bankacılık sektöründe faaliyet gösteren ve bilanço büyüklüğü bakımından ilk 8 özel sermayeli mevduat bankası yer almakta olup, sermaye yapıları, çalışma esasları, rekabet şartları ve fonksiyonlarının göreceli olarak özel sermayeli bankalardan ayrışması nedeniyle kamu sermayeli mevduat bankaları, araştırma kapsamına alınmamıştır. Araştırmada analiz edilecek değişkenler, ilgili bankaların TFRS 9 hükümlerine göre “Alım-Satım Amaçlı Türev İşlemler” kapsamında muhasebeleştirdikleri swap işlemler hacmi ile dönem net kârı verileridir. Veriler, ilgili bankalar tarafından kamuya açıklanan finansal tablolar ve bağımsız denetim raporlarından elde edilmiş olup, söz konusu veriler 2015-2019 yıllarını kapsayan 20 çeyrek dönem verileridir. Bu çerçevede swap hacmi ile dönem net kârı arasında kısa ve uzun dönemli nedensellik analizi gerçekleştirilmiş, değişkenler arasındaki nedensellik ilişkisinin tek veya çift yönlü olup olmadığı tespit edilmeye çalışılmıştır. Analiz kapsamındaki değişkenlere, panel birim kök testi, Johansen eşbütünleşme testi, uzun dönemli nedensellik testi ve kısa dönemli nedensellik analizini ifade eden Wald testi ile Granger causality testleri uygulanmıştır.

Bulgular- Analiz kapsamında yer alan bankaların swap hacmi ile dönem net kârı arasında eşbütünleşme tespit edilmiştir. Bu sebeple Vektör Hata Düzeltme Modeline (VECM) başvurulmuş kısa ve uzun dönemli nedensellik analizi gerçekleştirilmiştir. Nedensellik testi sonucunda, değişkenler arasında uzun dönemli çift yönlü nedenselliğin bulunduğu, kısa dönemde ise tek yönlü nedenselliğin bulunduğu sonucuna varılmıştır. Kısa dönemli nedensellik, swap hacminden dönem net kârı yönündedir.

Sonuç- Türk bankacılık sektöründe faaliyet gösteren ve bilanço büyüklüğü bakımından ilk sırada yer alan sekiz bankanın 2015-2019 dönemine ait çeyrek dönem swap hacmi ile dönem net kârı verilerinin analizi sonucunda, uzun dönemde her iki değişkenin birbirini etkilediği anlaşılmıştır. Kısa dönemde ise nedensellik tek yönlü olup, swap hacminin dönem net kârı üzerinde etkili olduğu sonucuna varılmıştır. İzleyen dönemde yapılacak çalışmalarda, swap portföyü içerisinde önemli bir yere sahip olan döviz swaplarının kârlılık üzerindeki etkisine yönelik bir araştırmanın faydalı olacağı düşünülmektedir.

Anahtar Kelimeler: Türev finansal araçlar, swap işlemler, kârlılık, Türk bankacılık sektörü, aanel nedensellik analizi.

JEL Kodları: C19

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THE NEXUS BETWEEN OIL PRICES AND AIRLINES STOCK RETURNS IN BORSA ISTANBUL DURING THE COVID-19 PANDEMIC

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ABSTRACT

Purpose- The impact of crude oil on the industries is different based on the dependency of the related business line. Thus, airlines are usually sensitive to the changes in crude oil price changes since it composes a considerable proportion of the operational costs. This study distinguishes itself from the majority of the literature that it focuses on analyzing the crude oil price airlines stock prices and transportation index in Borsa İstanbul and discuss the impact of the change in crude oil prices on them both in the long-run and specifically in the covid-19 pandemic.

Methodology- In our study, the return spillover effect is determined by the mean equation set as vector autoregressive model (VAR model) while the volatility spillover effect between crude oil price and the stock price of airlines companies is determined via the variance equation set as the VECH-TARCH model to catch the asymmetric news impact as well.

Findings- According to the model results the volatility spillover effect between crude oil price and airlines' stock price is more significant compared to the return spillover effect. In the short term the volatility spillover effect between crude oil price and Turkish Airlines stock price is more significant compared to Pegasus Airlines (PGSUS) and transportation index. Secondly, in the long run the volatility spillover effect between crude oil prices and all three assets are strongly significant. Third, there is no asymmetric news impact between crude oil prices and Pegasus Airlines stocks and transportation index. However, asymmetry exists for Turkish Airlines stocks. Good news from crude oil markets to Turkish Airlines increase the volatility as well.

Conclusion- According to the model results the volatility spillover effect between crude oil price and airlines' stock price is more significant compared to the return spillover effect. transportation index and oil prices. Only in the Covid-19 period there is an influence between Turkish Airlines and transportation index returns with Dubai and WTI oil prices.

Keywords: Spillover, airlines, VAR-VECH-TARCH, crude oil, Turkish Airlines, Pegasus, contagion effect

JEL Codes: C58, G14, L93, E44

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THE NEW TREND IN DIGITAL ASSET MANAGEMENT: ROBO-ADVISORS

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ABSTRACT

Purpose- The robo-advisors used by investors looking for financial advice are web-based platforms that utilize algorithms to automatically create and manage portfolios. They recommend portfolios according to the personal preferences of the investors, which are determined by online surveys. Digital financial advice is a new trend in Turkey, and this study provides an overview of the changing landscape of digital asset management and financial advice. It aims to examine the market situation of robo-advisors in Turkey.

Methodology- A SWOT analysis is being conducted to determine the strengths, weaknesses, opportunities and threats of these new digital financial advisors.

Findings- The analysis shows that robo-advisors are among the most noticeable developments in digital asset and wealth management. Low fee structure, and low minimum investment requirement are some of the strengths and standardization, quick and easy introduction for young people due to their propensity for technology are some of the opportunities that robo-advisors have, and these positive aspects show why some of the industry experts believe that it is obvious robo-advisors cause difficulties for those who are traditional and refuse to change over time.

Conclusion- Robo-advisors, were recently introduced in Turkey and their number is still limited. The number of these consultants deployed worldwide is very high and is also growing in Turkey, and the true potential, strengths and weaknesses of these advisors in Turkey will be better understood if they are deployed on a large scale.

Keywords: Digitalization, asset management, robo-advisors, traditional advisors, automated investments

JEL Codes: G11, G20, O16

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NONLINEAR IMPACT OF CREDITS ON CURRENT ACCOUNT BALANCE: THE CASE OF TURKEY

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ABSTRACT

Purpose- The association between credit growth and current account balance become much stronger recently. A typical example of the interaction between credit expansion and current account deficit is the experience of Turkey in the 2010-2011 period after the QE policies of the advanced central banks. The demand channel may be the main reason behind the connection between the credits and the current account deficit in economies like Turkey. Undoubtedly changes in credit growth affect the current account, but inherently the impact of the positive changes in credits would not be similar to that of the negative changes. This paper aims to investigate the asymmetric relationship between the current account balance and credits in Turkey quarterly data from 1992 to 2019.

Methodology- The study employs the novel non-linear Autoregressive Distributed Lags model. In the analyses different model specifications along with different credit definitions are considered.

Findings- The analysis reveals that the positive innovations in credit growth affect current account deficit in a different way than the negative innovations in the long run. Further, it may be stated that the deteriorating impact of the increase in credit growth on current account balance is more than the improving impact of the decrease in credit growth on current account balance.

Conclusion- Based upon the findings it may be concluded that when assessing the external balance and designing appropriate monetary and macroprudential policies, asymmetric effects of credit developments on current account balance should be considered to avoid possible deteriorating impact of the credit expansion on the current account balance.

Keywords: Credits, Current account, cointegration, nonlinear ARDL, asymmetry

JEL Codes: C22; E44; F32

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SYSTEMIC RISK OF TUNISIAN FINANCIAL SYSTEM: MEASURING AND PREDICTING FUTURE UNEMPLOYMENT RATE

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ABSTRACT

Purpose- The purpose of this study is to measure the systemic risk of the Tunisian financial system around the revolution period by the use of covar method and to test its ability to predict the future unemployment rate in the economy.

Methodology- Our empirical study aims to measure the systemic risk of the Tunisian banking system over the period going from 2008 to 2015. Our study period is marked by the 2011 Tunisian revolution and goes from June 2008 to December 2015. Our research sample consists of the eleven Tunisian listed banks on the Tunisian stock exchange. We calculate monthly bank returns that are calculated as the arithmetic mean of the daily data of the month. We use daily closing pricing data of the eleven listed banks and the stock market index TUNINDEX from 2 January 2008 to 31 December 2015. The variable to explain: Tunindex: the benchmark index of the Tunis Stock Exchange. It is composed of the country's fifty largest capitalizations. It allows an assessment of the market trend. The explanatory variables are the returns of the eleven banks listed on the Tunisian stock exchange. For the measurement of Covar, we approach the bank risk by its historical volatility based on the GARCH (1.1) model developed by Belerselv (1986). We then sum quarterly bank Covars to obtain the Covar of the whole banking system and integrate it into a model, to test empirically the relationship between the calculated "CoVaR and the future unemployment rate in Tunisia during the post-revolution period (2011 – 2014). We apply the OLS least squares and corrected least squares method. To check for the robustness of obtained results, we then adopt the "VAR" called the Autoregressive Vector (Sims, 1980), which highlights interdependencies between several time series.

Findings- Results show that ATTIJARI BANK is the largest contributor to the TUNINDEX systemic risk before revolution, while BT is the least influent one. Private banks rankings are reversed during post revolution period, against public banks which maintained their ranks. Globally, many private banks that floundered at the bottom of the rankings before revolution rank very high during the following period. Moreover, the top 5 of Tunisian systemic banks after revolution is composed of two public banks and three private ones. Public banks are risky because of the bad governance they suffer due to state intervention. Regards to the most systemic private banks (BT, BIAT et ATB), they seem to be the biggest on the financial place and with the highest performances and outstanding's loans to the economy. Finally, the regressions' results show that the future unemployment rate depends only on the preceding one and not on the systemic risk index (COVAR).

Conclusion- Finally, our research aims to add a broader perspective to establish and ensure compliance with good governance principles within public banks, particularly in terms of independence. Moreover, it encourages for the strengthening of the large private bank prudential supervision, the latters being considered as the most efficient and the most active on markets. Also, our research should be completed by a study of bank's systemic risk determinants in order to better control et prevent any slippages

Keywords: Systemic risk, Tunisian banking sector, covar, unemployment rate

JEL Codes: G01, G21, J6

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COMPARISON OF MACHINE LEARNING ALGORITHMS OVER CLASSIFICATION PROBLEMS: SALES FORECASTING

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ABSTRACT

Purpose- Machine learning is frequently used in the field of sales forecasting. Businesses can make predictions by analyzing some of their past data before launching a new product. Thus, by producing an optimal number of products, they aim to minimize both the cost of raw materials and labor, as well as the damage that can be incurred by costs such as storage and logistics. By identifying the target audience of the product, they have the opportunity to develop sales strategies in this way.

Methodology- For this purpose, classification problems from machine learning problems were discussed in the study. Previously presented product data with the same characteristics as the product intended to be sold was collected, "product sold" and "product not sold" binary classification study was carried out. In the study, which used k Nearest Neighbor, Naive Bayes and Linear Support Vector Machines from supervised learning algorithms, the data set was divided into a training set and a test set.

Findings- As a result of the study, the k Nearest Neighbor algorithm provided the highest accuracy with accuracy of 0.71.

Conclusion- In sales prediction studies, the nearest neighbor algorithm from machine learning algorithms results in relatively better results.

Keywords: Machine learning, k nearest neighbor, naive bayes, linear support vector machines, sales forecasting

JEL Codes: C19

MAKİNE ÖĞRENMESİ ALGORİTMALARININ SINIFLAMA PROBLEMLERİ ÜZERİNDEN KARŞILAŞTIRILMASI: SATIŞ TAHMİNİ

ÖZET

Amaç- Makine öğrenmesi, satış tahmini alanında sıkça kullanılmaktadır. İşletmeler, yeni bir ürünü piyasaya sunmadan önce geçmiş verilerinden birtakım analizler yaparak geleceğe yönelik kestirimler yapabilmektedir. Böylelikle, optimal sayıda ürün üreterek hem hammadde ve işgücü maliyetini hem de depolama, lojistik gibi maliyetlerin ortaya çıkarabileceği zararı en aza indirmeyi amaçlarlar. Ürünün hedef kitlelerini belirleyerek bu doğrultuda satış stratejileri geliştirme imkânı bulurlar.

Yöntem- Bu amaçla, çalışmamızda, makine öğrenmesi problemlerinden sınıflandırma problemleri ele alınmıştır. Satılması hedeflenen ürün ile aynı özelliklere sahip, daha önce piyasaya sunulmuş ürün verileri toplanmış, "ürün satıldı" ve "ürün satılmadı" şeklinde ikili sınıflandırma çalışması yapılmıştır. Denetimli öğrenme algoritmalarından k En Yakın Komşu, Naive Bayes ve Doğrusal Destek Vektör Makineleri kullanılan çalışmada, veri seti öğrenme seti ve test seti olarak bölünmüştür.

Bulgular - Çalışma sonucu olarak, 0,71 doğruluk ile k En Yakın Komşu algoritması en yüksek doğruluğu sağlamıştır.

Sonuç- Satış tahmini çalışmalarında makine öğrenmesi algoritmalarından k en yakın komşu algoritması görece daha iyi sonuçlar vermektedir.

Anahtar Kelimeler: Makine öğrenmesi, k en yakın komşu, naive bayes, doğrusal destek vektör makineleri, satış tahmini

JEL Kodları: C19

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EFFECT OF GENERAL MANAGER CHANGES ON FINANCIAL PERFORMANCE: A STUDY ON BIST 30 COMPANIES

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ABSTRACT

Purpose- The decisions of the top managers of a company significantly affect the financial performance of that company. For companies, the general manager is actually the most valuable intellectual resource for that company. General managers' influence on strategies and organizational outcomes is critical. In this respect, the study is important and focuses on whether changes in the general manager have an impact on financial performance. There are many criteria for the selection of a new general manager. In this election, almost like a "horse race", companies can finish this job by choosing from among the inside candidates or buy the experience from outside. Candidates selected from the inside can act faster and on the spot because they know the company. External candidates, on the other hand, can make more agile and correct decisions because they have a pool of resumes and different experiences. This study aims to analyze the financial performance of companies included in the BIST30 index. When the literature is searched, the decisions of the company's top management and the status of the company, which are the main factors of this study, significantly affect the financial performance of the companies. The study is carried out to measure the financial performance impact based on the periods with a change of general manager. The focus and purpose of the study are to analyze the financial performance of the general manager change while analyzing whether the status of the company as a public/private company has an effect on financial performance. In this respect, the study is different from other studies.

Methodology- The design of the research covers companies with a change of general manager. The main body of the research consists of public companies included in the Borsa Istanbul (BIST) 30 index. First of all, within the scope of the literature examined on the effect of general manager changes on financial performance, variables such as ROA, ROE, Tobin's Q are used as dependent variables and Leverage Ratio, Share Closing Price, General Manager Change, General Manager's Origin, General Manager's Experience and Number of Employees determined as. Data on firm performance indicators were obtained from the PDP (Public Disclosure Platform) electronic database, Thomson Reuters Eikon Data Terminal and independent audit reports of the companies. In order to measure the impacts better, data for the pre and post-change periods were also collected. In order to create a balanced panel set, 24 companies out of 30 companies included in the Borsa Istanbul (BIST) 30 index were included in the research. The reason why 6 companies are excluded from the scope of the analysis is that there are no general manager changes as of the quarter periods of 2011-2019, which were included in the scope of work in the relevant companies. The effects of the origins, experience, and status of the newly appointed general manager on the financial performance of the company as a public/private sector company were analyzed with panel data regression analysis. Descriptive statistics were created, panel unit root tests, Hausman test, and panel regression analysis were performed respectively in order to achieve the purpose of the study.

Findings- This study conducted on Borsa Istanbul (BIST) 30 Companies was not consistent in terms of regression results. First of all, within the scope of the analysis, it has been concluded that there is no significant relationship between the general manager changes and the financial performance of the company. While examining this effect, the selection of the general manager, which is frequently mentioned in the literature, by the internal or the external appointment was included in the analysis, and as a result, it was determined that the newly appointed general manager was selected through internal appointment and external appointment did not have an effect on financial performance. As a result of the study, a similar result was reached with the study conducted by Fanegan (2010) in the literature. According to the findings obtained from the analysis, it was concluded that the effect of being a Public/Private Sector company within the scope of general manager changes on financial performance was not found to be statistically significant. This result stands out as a point that diverges from the literature.

Conclusion- The effect of the changes in the general manager on the financial performance of the companies was found to be statistically insignificant for the 24 companies included in the BIST30 companies and the period 2011Q1-2019Q4. It should be noted that these findings were obtained for a relatively narrow sample in a developing economy and would not make sense on their own. In future studies,

sectors/companies with more general manager changes can be taken into account, and a sector in which the effect of gender change is also taken into account can be examined. In this way, more meaningful results on the subject can be achieved.

Keywords: General manager changes, financial performance, agency theory, bist30 companies, public-private separation.

JEL Codes: M40

GENEL MÜDÜR DEĞİŞİMLERİNİN FİNANSAL PERFORMANSA ETKİSİ: BIST 30 ŞİRKETLERİ ÜZERİNE BİR ÇALIŞMA

ÖZET

Amaç- Bir şirketin üst yöneticilerinin kararları o şirketin finansal performansını önemli derecede etkilemektedir. Şirketler için genel müdür, aslında o şirket için en değerli entelektüel kaynaktır. Genel müdürlerin stratejiler ve organizasyonel sonuçlar üzerindeki etkisi kritiktir. Çalışma, bu bakımdan önem kazanmakta olup genel müdür değişikliklerinin finansal performansa etkisi olup olmadığına odaklanmaktadır. Yeni genel müdür seçimi için birçok kriter vardır. Şirketler bu seçimde nerdeyse bir "at yarışı" gibi içeriden adaylar arasından seçimle bu işi bitirebilir ya da dışarıdan deneyimi satın alabilir. İçeriden seçilen adaylar, şirketi tanıdıkları için aksiyon almada daha hızlı ve yerinde hareket edebilirler. Dışarıdan adaylar ise özgeçmiş havuzuna sahip oldukları ve farklı deneyimlere sahip oldukları için daha atik ve doğru kararlar alabilirler. Bu çalışma, BIST30 endeksinde yer alan şirketlerin finansal performansını analiz etmeye yöneliktir. Literatür araştırması yapıldığında bu çalışmanın ana faktörleri olan şirket üst yönetiminin kararları ve şirketin statüsü şirketlerin finansal performansını önemli ölçüde etkilemektedir. Çalışma, genel müdür değişikliği olan dönemler baz alınarak finansal performans etkisini ölçmeye yönelik olarak yapılmaktadır. Çalışmadaki odak noktası ve amaç, genel müdür değişikliğinin finansal performansını analiz ederken, şirketin kamu/özel şirket statüsünde olması durumunun da finansal performansa etkisinin olup olmadığını analiz etmektedir. Yapılan çalışma bu yönüyle diğer çalışmalardan ayrılmaktadır.

Yöntem- Araştırmanın tasarımı, genel müdür değişikliği olan şirketleri kapsamaktadır. Araştırmanın ana kütlelerini Borsa İstanbul (BIST) 30 endeksinde yer alan halka açık şirketler oluşturmaktadır. Öncelikle genel müdür değişikliklerinin finansal performans üzerindeki etkisi üzerine incelenen literatür kapsamında bağımlı değişken olarak ROA, ROE, Tobin's Q gibi değişkenlerin kullanıldığı, bağımsız değişken olarak da Kaldıraç Oranı, Hisse Kapanış Fiyatı, Genel Müdür Değişimi, Genel Müdürün Kökeni, Genel Müdürün Deneyimi ve Çalışan Sayısı olarak belirlenmiştir. Firma performans göstergelerine ilişkin veriler KAP (Kamuyu Aydınlatma Platformu) elektronik veri tabanından, Thomson Reuters Eikon Veri Terminalinden ve şirketlerin bağımsız denetim raporlarından elde edilmiştir. Etkilerin daha iyi ölçümlenebilmesi için, değişim öncesi ve sonrası dönemlere ait veriler de toplanmıştır. Dengeli panel set oluşturulması amacıyla Borsa İstanbul (BIST) 30 endeksinde yer alan 30 şirket üzerinden 24 şirket araştırmaya dâhil edilmiştir. 6 şirketin analiz kapsamı dışında bırakılma nedeni ise ilgili şirketlerde çalışma kapsamına alınan 2011-2019 yılları çeyreklik dönemleri itibarıyla genel müdür değişikliği bulunmuyor olmasıdır. Yeni atanan genel müdürün kökeninin, deneyiminin ve şirketin kamu/özel sektör şirketi olma durumunun finansal performansı üzerindeki etkileri panel veri regresyon analiziyle incelenmiştir. Çalışmanın amaca ulaşabilmesi için sırasıyla tanımlayıcı istatistikler oluşturulmuş, panel birim kök testleri, Hausman testi ve panel regresyon analizleri yapılmıştır.

Bulgular- Borsa İstanbul (BIST) 30 Şirketleri üzerine yapılan bu çalışma regresyon sonuçları itibarıyla tutarlı çıkmamıştır. Öncelikle, analiz kapsamında genel müdür değişiklikleri ile şirketin finansal performansı arasında anlamlı bir ilişki olmadığı sonucuna ulaşılmıştır. Bu etki incelenirken literatürde sıkça yer alan genel müdürün içeriden atanma veya dışarıdan atanma yoluyla seçilmesi analize dâhil edilmiş ve sonuç olarak yeni atanan genel müdürün içeriden atanma ve dışarıdan atanma yoluyla seçilmiş olmasının finansal performans üzerinde bir etkisi olmadığı saptanmıştır. Çalışmanın sonucunda literatürde yer alan Fanegan (2010) tarafından yapılan çalışma ile benzer bir sonuca ulaşılmıştır. Analiz sonucunda elde edilen bulgulara göre genel müdür değişiklikleri kapsamında Kamu/Özel Sektör şirketi olma durumunun finansal performansa etkisinin istatistiksel olarak anlamlı çıkmadığı sonucuna varılmıştır. Ulaşılan bu sonuç, literatürle ayrışan bir nokta olarak öne çıkmaktadır.

Sonuç- Genel müdür değişikliklerinin firmaların finansal performansı üzerinde etkisi BIST30 şirketleri içerisinde yer alan 24 şirket ve 2011Q1-2019Q4 dönemleri için istatistiksel olarak anlamsız çıkmıştır. Bu bulguların, gelişmekte olan bir ekonomide ve görece dar bir örneklem için elde edilmiş olması ve tek başına anlam ifade etmeyeceğini de belirtmek gerekir. İleride yapılacak olan çalışmalarda genel müdür değişiminin daha fazla olduğu sektörler/firmalar dikkate alınabilir, cinsiyet değişiminin etkisinin de göz önüne alındığı bir sektör incelenebilir. Bu şekilde konuyla ilgili daha anlamlı sonuçlara ulaşılabilir.

Anahtar Kelimeler: Genel müdür değişiklikleri, finansal performans, vekâlet teorisi, bist30 şirketleri, kamu-özel ayrımı.

JEL Kodları: M40

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ECONOMIC EVALUATION OF TRANSPORTATION PROJECTS BASED ON DIFFERENT FINANCING METHODS: AT THE FRAMEWORK OF FINANCIAL COMPUTABLE GENERAL EQUILIBRIUM MODEL

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ABSTRACT

Purpose- The purpose of this study is to develop a first fully functional Turkish Financial Computable General Equilibrium (FCGE) model that analyzes the economic impacts of infrastructure investment projects under different financing options. We examine three alternative financing methods, i.e., public financing with tax revenues and government bonds, public financing with region specific tax policy and private financing.

Methodology- The study employs Financial Computable General Equilibrium (FCGE) model. The FCGE model integrates the real economy with the financial one, and traces the flows of financial and real resources among economic agents at the same time. Computable General Equilibrium (CGE) models typically are comparative static equilibrium models of interregional trade and location based in microeconomics, using utility and production functions with substitution between inputs. The transport system enters the spatial economy through the costs of transport services. Transport sub models are applied to feed CGE models with cost changes in the transport sector as a result of policy measures. Our model is composed of a multi-regional financial CGE model and a transport network model. Turkish Multi Regional Computable General Equilibrium model constitutes of 11 regions. The model includes ten producers, one regional household, one national (or central) government and the rest of the world.

Findings- The model is designed to analyze the economic effects of fiscal policies such as the transportation investment expenditures and alternative financing approaches on economic growth and welfare. It is possible to estimate growth and distributional effects of each project based on the financing method once the information on the investment expenditures, the construction location and the changes in the accessibility generated by the project are injected into the FCGE model. As a first attempt, we build a Financial Social Accounting Matrix (SAM) for Turkey that FCGE models need, containing the details of financial institutions and transaction of agents' assets and liabilities. The model specifies the behaviours of ten different sectors, one household, a central government, and the rest of the world. The model is designed to analyze the impacts of highway development with different financing strategies. We examine three alternative financing methods: it can (a) public financing with tax revenues and government bonds, (b) public financing with region specific tax policy or (c) private financing.

Conclusion- The main contribution of this research is to develop a first fully functional FCGE model to analyze the economic impacts of the infrastructure investment projects and their financing options on growth and welfare in Turkish economy. We develop a first fully functional Turkish Financial Computable General Equilibrium (FCGE) model that analyzes the economic impacts of infrastructure investment projects under different financing options. There are a number of ways to finance highway infrastructure investment: fuel taxes, user fees, trust funds etc. This Financial CGE model is expected to assess the consistency of highway investment programs under different financing options, so the government can make a decision on an approval for the project based according to their benefits and costs on national level.

Keywords: Social accounting matrix, fiscal policy, project analysis, computable general equilibrium models, transportation investments.

JEL Codes: E16, E62, C68

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IMPROVE PRODUCTIVITY IN A BEARING INDUSTRY USING VALUE STREAM COSTING

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ABSTRACT

Purpose- This research aims to apply the technique of Value Stream Costing (VSC) in an industrial manufacturing company. Lean manufacturing technique is used to minimize the waste and maximize the flow. Value stream mapping (VSM) can identify continued opportunities to enhance value, eliminate waste, and improving flow. Four steps is followed in order to fulfil the value stream mapping: identifying the product, creating a current state value stream map, creating a future state value stream map, and creating an action plan. After developing the current and future state value maps, VSC is used to evaluate the improvements that are gained by implementing VSM technique. Parameters such as productive and non-productive capacity, takt time, production lead time (PLT), and process cycle efficiency (PCE) will be used to evaluate the current and future state value stream maps and to conduct the VSC analysis. Graphs will be used to show the improvements and demonstrate some of the ideas.

Methodology- The study employs Lean manufacturing (LM) methodology to improve the overall organizations' performance. In specific, Value stream mapping (VSM) analysis is used in this research. VSC is one tool that can be used for implementing the lean manufacturing technique. Value Stream Costing (VSC) is a new technique that can be used to evaluate the efficiency of lean implementation and to calculate the percentage of cost reduction. Observing the process is also used to collect data before and after the improvement implementations.

Findings- The analysis reveals that Value stream mapping (VSM) is helpful to implement improvement and it is used to look at the improvement from financial perspective. Implementing the value stream costing resulted in improving the capacity from 8% to 23%. It also helped the company to reduce the total cost for the product from \$8,706.78 to \$7,623.5.

Conclusion- Based on the analysis and the findings, it may be concluded that VSC is a technique that should replace the traditional costing technique. VSC analysis is emphasising on added a value to products and services by removing costs related to non-value added activities. This technique is in support with lean techniques goals of reducing waste and improving productivity. The gains from implementing lean can be translated into dollar amount using VSC to support future improvement activities.

Keywords: Value stream costing, productivity, case study, cost analysis, bearing manufacturing

JEL Codes: M20, L60, C83

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SOFTWARE DEVELOPERS' PERCEPTION OF PROJECT SUCCESS

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ABSTRACT

Purpose- The purpose of this quantitative study is to investigate and define project success according to software project participants in the Turkish Information Technology sector. In this study, the effect of different project management methodologies and education levels were also considered.

Methodology- The study employs a quantitative hypothesis-testing method. The survey instrument of Procaccino, Verner, Shelfer and Gefen (2005) was used in this analysis. In collecting the responses, a 5-point Likert-type scale was used to specify the degree of agreement with each written statement (Procaccino, Verner, Shelfer, & Gefen, 2005).

Findings- A total of 211 responses were collected. The demographic analysis shows that 31% (66) of the participants were female and 69% (145) were male. The average age of the survey participants was 33.9 years. The average number of years working in the IT sector was 9.7. Additionally, the analysis showed that 2 responses were missing, and 1 response only included the Kanban method. Interestingly 66 responses (31%) were only Scrum, which is one of the Agile methods. Moreover, 11 responses (5%) were only Waterfall, and 41 responses (19%) included both Waterfall and Scrum. 48.3% (102) of the participants used mixed methods, and 40.8 % (86) used at least one Agile method.

Conclusion- During the analysis of survey results, factor analysis, The Kruskal-Wallis test, correlation analysis, regression analysis were used. Factor analysis was applied and nine factors were found and explained 63.526% of the measurement. These factors were: personal growth, customer requirements, rewards, interpersonal relations, team factors, management, project output, and personal factors. Difference analysis was applied to the demographic variables. As a result, it was found that gender, age group, job position, and education level did not cause a difference in the definition of project success. Work experience created a significant difference in the project output factors and project management methodology created a significant difference in the team factors. As a result of the correlation analysis, in the first correlation, the project output factors and professional growth factors were highly correlated with each other (0.600). The other correlations were as follows: the second correlation is identified between interpersonal relations factors and professional growth factors (0.544), the third correlation was identified between reward and professional growth factors (0.541), the fourth correlation was identified between customers and professional growth factors (0.489), the fifth correlation was identified between team factors and professional growth factors (0.481), and the sixth correlation was identified between personal factors and professional growth factors (0.349). The least correlated variables were the personal and professional growth factors (0.349). According to the regression analysis, the significance was very high ($p = 0.008$). This meant that the model was statistically significant and a regression equation exists providing a definition for the project success.

Keywords: Agile, waterfall, project management methodology, project success

JEL Codes: C12, C83, M15

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TESTING FOR HERDING BEHAVIOR IN STOCK MARKET: BIST 30 INDEX EXAMPLE

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ABSTRACT

Purpose- In the study, using weekly data of 19 companies that are constantly traded in the BIST 30 index, in the period 06.05.2012-27.09.2020, Christie and Huang's (1995) and Chang et al. (2000) approach was aimed to test herd behavior.

Methodology- In the study test of herd behavior, Christie and Huang (1995) and Chang et al. (2000) approaches were used. First, as dependent variable cross-sectional absolute deviations for the price series are calculated. Independent variables are assigned as dummy variables for the lower/upper extreme values of 1% and 5% of the market return. Afterwards, estimations were made with Least Squares and Quantile Regression methods.

Findings- As a result of the estimation made with Least Squares and Quantile Regression methods, While the coefficient of β_1 for the 1% return slice is statistically significant and the positive, coefficient β_2 as statistically significant and negative, for the 5% return slice, both times the coefficient are statistically significant and positive. The coefficients should be statistically significant and negative in order to pay to show the presence of herd behavior. As a result of the findings, it can be mentioned that 19 firms that are constantly traded in the BIST 30 index have herd behavior for a 1% return slice in the 2012-2020 period.

Conclusion- As a result of the analyzes made to determine herd behavior in the period of 06.05.2012-27.09.2020 by using weekly data of 19 companies that are continuously traded in the BIST 30 index, the existence of herd behavior in the relevant period observed. Accordingly, it can be said that investors investing in the BIST 30 index trust the information of other investors when their stock prices tend to fall and invest with this information.

Keywords: Behavioral Finance, Herd Behavior, Equity Market, Quantile Regression, Least Squares

JEL Codes: G41,C22,D53

PAY PİYASALARINDA SÜRÜ DAVRANIŞININ TEST EDİLMESİ: BİST 30 ENDEKSİ ÖRNEĞİ

ÖZET

Amaç- Çalışmada BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın haftalık verileri kullanılarak 06.05.2012-27.09.2020 döneminde Christie ve Huang'ın (1995) ve Chang vd. (2000) yaklaşımı ile sürü davranışının test edilmesi amaçlanmıştır.

Metodoloji- Çalışmada sürü davranışını tespit edebilmek Christie ve Huang'ın (1995) ve Chang vd. (2000) yaklaşımları kullanılmıştır. İlk olarak bağımlı değişken olan fiyat serilerine ilişkin yatay kesit mutlak sapmaları hesaplanmıştır. Bağımsız değişkenler, piyasa getirisinin %1 ve %5' lik getiri dilimlerinin alt/üst uç değerleri için kukla değişken olarak atanmıştır. Ardından En Küçük Kareler ve Kantil Regresyon yöntemleri ile tahminleme yapılmıştır.

Bulgular- En Küçük Kareler ve Kantil Regresyon yöntemleri ile yapılan tahminleme sonucunda, %1 getiri dilimi için β_1 katsayısı istatistiksel olarak anlamlı ve pozitif β_2 katsayısı ise istatistiksel olarak anlamlı ve negatif olarak tespit edilirken, %5 getiri dilimi için her iki kat sayıda istatistiksel olarak anlamlı ve pozitif olarak tespit edilmiştir. Sürü davranışının varlığından söz edebilmek için katsayıların istatistiksel olarak anlamlı ve negatif olması gerekmektedir. Bulgular sonucunda BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın 2012-2020 döneminde %1'lik getiri dilimi için sürü davranışının varlığından söz edilebilmektedir.

Sonuç- BİST 30 endeksinde devamlı olarak işlem gören 19 firmanın haftalık verileri kullanılarak 06.05.2012-27.09.2020 döneminde sürü davranışının tespit edilebilmesi için yapılan analizler sonucunda, ilgili dönemde %1'lik getiri dilimi için tamamen gözlemlenmemesine rağmen getirinin piyasanın üst uç değerlerinde bulunduğu dönemde sürü davranışının varlığından söz edilebilmektedir. Bu doğrultuda BİST 30 endeksinde yatırım yapan yatırımcıların pay senedi fiyatları düşme eğiliminde olduğu zaman diğer yatırımcıların bilgilerine güvendikleri ve bu bilgiler ile yatırım yaptıkları söylenebilir.

Anahtar Kelimeler: Davranışsal Finans, Sürü Davranışı, Pay Piyasası, Kantil Regresyon, En Küçük Kareler

JEL Kodları: G41,C22,D53

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AN EMPIRICAL RESEARCH ON THE LEVEL AND DETERMINANTS OF FINANCIAL INCLUSION: THE CASE OF TURKEY

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ABSTRACT

Purpose- The purpose of this study is to evaluate the current situation of financial inclusion and its determinants in Turkey.

Methodology- The study employed the descriptive analysis method and Probit regression and the data was obtained through questionnaires from 480 respondents.

Findings- The analysis reveals that in Turkey, 89.8% of the individuals have a formal account, and the remaining 10.2% of individuals are unbanked. Although the unbanked population is small in Turkey, financially excluded individuals were mostly excluded voluntarily. Using an account to save money and borrowing from family or friends are more common. In Turkey, 69.8% of respondents benefited from insurance services.

Conclusion- Based on the analysis findings, it is concluded that individuals' income & education levels are significantly associated with account ownership and formal savings. The income variable affected formal borrowing as well. The individual's age only affected to account ownership, while gender did not significantly affect financial inclusion indicators.

Keywords: Financial inclusion, financial access, financial exclusion.

JEL Codes: O16, D14, G21

FINANSAL İÇERME DÜZEYİ VE BELİRLEYİCİLERİ ÜZERİNE AMPİRİK BİR ARAŞTIRMA: TÜRKİYE ÖRNEĞİ

ÖZET

Amaç- Bu çalışmanın amacı, Türkiye'deki finansal içerme mevcut durumunu ve belirleyicilerini değerlendirmektir.

Metodoloji- Araştırmada veriler, 480 kişiye uygulanan online anket ile elde edilmiştir. Tanımlayıcı istatistikler ve probit regresyonu kullanılarak analiz edilmiştir.

Bulgular- Analiz bulguları, Türkiye'de bireylerin % 89,8'inin resmi bir hesaba sahip olduğunu ve geri kalan % 10,2'sinin ise banka dışı kalan kitle olduğunu ortaya koymaktadır. Finansal kapsam dışında kalan bireyler çoğunlukla gönüllü olarak dışlanmışlardır. Ülkede bir finansal kurum hesabını kullanarak para biriktirme ve aile, akraba veya arkadaşlardan borç alma yöntemi diğer yöntemlere göre daha yaygındır. Ayrıca, ankete katılanların % 69,8'i sigorta hizmetlerinden de yararlanmışlardır.

Sonuç- Analiz bulgularına dayalı olarak, Türkiye'de bireylerin gelir ve eğitim düzeyi ile hesap sahipliği ve resmi tasarrufları arasında önemli bir ilişki olduğu sonucuna varılmıştır. Ayrıca, gelir değişkeni resmi kredi kullanımını da anlamlı bir şekilde etkilemiştir. Bireylerin yaşı sadece hesap sahipliğini anlamlı bir şekilde etkilerken, cinsiyet finansal içerme göstergelerini anlamlı olarak etkilememiştir.

Anahtar Kelimeler: Finansal içerme, finansal erişim, finansal dışlanma.

JEL Kodları: O16, D14, G21

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ALGORITHM EXAMPLES IN FINANCIAL MARKETS: ASSETS INCOME ANALYZING, BENCHMARK AND BACKTESTING WITH PYTHON PROGRAMMING

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ABSTRACT

Purpose- The need for fast and reliable trading has increased to reduce human and non-human risks in financial markets and to change the pricing in the markets. Algorithms are prepared and used as a result of technological opportunities to manage these risks and to facilitate the management of revenue policies. Strategies can be created based on historical information on asset prices and these strategies can be implemented through algorithms. This study aims to analyze the performance of the applications of the created strategies with algorithms.

Methodology- Based on the prices that occurred in the market within a certain period, instead of "keep in portfolio", the results of the buy-sell transactions made in accordance with the condition-condition principle such as golden cross of algorithmic trade transactions were compared. The program, in which 50-day and 200-day moving averages are used in algorithmic transactions, was written in Python (vs. 2.7).

Findings- By using the same, similar or different algorithms for different asset types, different rates of positive and negative returns can be obtained. The results obtained provide evidence that algorithmic transactions can perform better against the acquisition and retention of the asset in the portfolio.

Conclusion- In the study comparing algorithmic transactions with the "keep in portfolio" investment strategy, varying results were obtained for different assets. Although the findings show that the same strategy cannot bring positive returns for every financial instrument, it is recommended to develop strategies specific to different asset groups for future studies.

Keywords: Algorithmic trade, benchmark and backtest, assets income analyzing, data science

JEL Codes: D53, F47, G11,

FINANSAL PİYASALARDA ALGORİTMA UYGULAMALARI: PYTHON PROGRAMLAMA İLE GETİRİ ANALİZİ, KIYASLAMA VE KARŞILAŞTIRMA

ÖZET

Amaç- Finansal piyasalarda beşeri ve beşeri olmayan risklerin azaltılması ve piyasalardaki fiyatlamaların değişimlerine yönelik hızlı ve güvenilir bir şekilde alım-satım yapma ihtiyacı artmıştır. Söz konusu risklerin yönetilmesi ve getiri politikalarının yönetiminin kolaylaştırılması için teknolojik imkanlar neticesinde algoritmalar hazırlanmakta ve kullanılmaktadır. Varlık fiyatlarındaki geçmiş bilgiye göre stratejiler oluşturulabilmekte ve bu stratejiler algoritmalar vasıtasıyla uygulanabilmektedir. Bu çalışmanın amacı, oluşturulan stratejilerin algoritmalar vasıtasıyla yapılan uygulamalarının performanslarını analiz etmektir.

Yöntem- Belirli bir dönem içerisinde piyasada oluşan fiyatlamalar baz alınarak "portföyde tut" yerine algoritmik trade işlemlerinin golden cross vb. Koşul-şart ilkesi doğrultusunda yapılan al-sat işlemleri sonuçları mukayese edilmiştir. Algoritmik işlemlerde 50 günlük ve 200 günlük hareketli ortalamaların kullanıldığı program, Python dilinde (vs. 2.7) yazılmıştır.

Bulgular- Farklı varlık türlerinde aynı, benzer veya farklı algoritmalar kullanılarak farklı oranlarda pozitif veya negative getiriler elde edilebilmektedir. Elde edilen sonuçlar, algoritmik işlemlerin varlığın portföye alınıp tutulmasına karşı daha yüksek performans gösterebileceğine dair kanıtlar sunmaktadır.

Sonuç- Algoritmik işlemlerin "portföyde tut" yatırım stratejisi ile karşılaştırıldığı çalışmada, farklı varlıklar için değişen sonuçlar elde edilmiştir. Bulgular, her finansal enstrüman için aynı stratejinin pozitif getiriye ulaştırılamayacağını göstermekle beraber bundan sonraki çalışmalar için farklı varlık gruplarına özgü stratejiler geliştirilmesi önerilmektedir.

Anahtar Kelimeler: Algoritmik trade, geçmişe dönük testler, getiri analizi, veri bilimi
JEL Kodları: D53, F47, G11,

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EFFECT OF ESG DATA ON THE FINANCIAL PERFORMANCE OF COMPANIES: A STUDY ON THE AIRLINE SECTOR

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ABSTRACT

Purpose- In recent years, financial markets around the world have faced environmental, social and governance (ESG) factors as one of the tools of investment decision-making. Therefore, ESG scores stand out as an area of increasing interest for researchers in the financial world. In the study, firstly, studies in the literature related to ESG data were examined in order to prepare the theoretical background. In the reviewed literature, there is no study conducted in the airline sector regarding the effect of ESG data on financial performance. For this reason, the airline sector was chosen to differentiate from the studies reviewed in the literature. In this study, it is aimed to test the effect of the ESG scores calculated for companies in the airline industry on the financial performance of companies.

Methodology- Which variables were used in studies conducted to test the relationship between ESG data and financial performance in the literature. In the studies reviewed, ESG General Score and ESG individual scores such as environmental (E), social (S) and governance (G) are used as independent variables, while return on assets (ROA), return on equity (ROE) and Tobin's It has been determined that rates such as Q are used. After the variables were determined, the data set to be used in the study was prepared. All airline companies in the world were determined as the universe, and 26 airline companies whose ESG data and financial data were accessed between 2010-2017, when a balanced panel data set was the longest and largest, were included in the study. The data of the companies subject to research were obtained from Thomson Reuters Eikon Data Terminal and made ready for analysis. Panel regression model was used as the analysis method in the study.

Findings- The stationarity of the series was examined by performing panel unit root tests, which is one of the assumptions to be provided in panel data models. The series are stabilized by taking the difference in non-stationary series. Then, in the study, which panel of 6 different models created to measure the effect of the ESG overall score and the environmental (E), social (S) and governance (G) scores used individually on return on equity (ROE), return on assets (ROA) and Tobin's Q ratios. Hausman Test was conducted to determine that it will be tested using the model. In line with the results of the Hausman Test, while random effects model was used in five models, fixed effects model was used in one model. To test the effect of ESG scores on financial performance, a statistically significant effect in models using Environmental (E), social (S) and governance (G) scores and financial performance indicators such as return on assets (ROA), return on equity (ROE) and Tobin's Q variables While no relationship could be determined, in the model established with the ESG Overall Score, it was concluded that there was only a statistically significant effect on Return on Assets (ROA).

Conclusion- It has been determined that the ESG scores do not have a statistically significant effect on the financial performance of companies in the airline industry, only that there is a statistically significant relationship between the ESG overall score and return on assets (ROA). These results reached in the study Minutolo et al. (2019), Velte (2017), and Almeyda and Darmansya (2019). In summary, the results show that the ESG scores calculated for companies in the airline industry do not affect the financial performance of companies, while airline sector investors do not take their ESG scores into consideration.

Keywords: ESG Data, environmental, social, governance, financial performance, airline sector, panel data analysis.

JEL Codes: M40

ESG VERİLERİNİN FİRMALARIN FİNANSAL PERFORMANSINA ETKİSİ: HAVAYOLU SEKTÖRÜ ÜZERİNE BİR ÇALIŞMA

ÖZET

Amaç- Son yıllarda, dünyanın dört bir yanındaki finansal piyasalar, yatırım karar alma sürecinin araçlarından biri olarak çevresel, sosyal ve yönetim (ESG: environmental, social and governance) faktörleri ile karşı karşıya kalmıştır. Bu nedenle ESG skorları finans dünyasındaki araştırmacıların artarak ilgi duyduğu bir alan olarak öne çıkmaktadır. Çalışmada öncelikle teorik alt yapısının hazırlanması için ESG verileri ile ilgili literatürde yapılan çalışmalar incelenmiştir. İncelenen literatürde ESG verilerinin finansal performansa etkisi ile ilgili havayolu sektöründe yapılan bir çalışmaya rastlanılmamıştır. Bu nedenle literatürde incelenen çalışmalardan ayırmak için havayolu sektörü seçilmiştir. Bu çalışmada, havayolu sektöründe yer alan firmalar için hesaplanan ESG skorlarının firmaların finansal performansları üzerindeki etkisini test etmek amaçlanmıştır.

Yöntem- Literatürde ESG verileri ile finansal performans arasındaki ilişkiyi test etmek için yapılan çalışmalarda hangi değişkenlerin kullanıldığı tespit edilmiştir. İncelenen çalışmalarda genel olarak bağımsız değişken olarak ESG Genel Skoru ile ESG bireysel skorları olan çevresel (E), sosyal (S) ve yönetim (G) gibi skorların kullanıldığı, finansal performans ölçmek için ise aktif karlılığı (ROA) özkaynak karlılığı (ROE) ve Tobin's Q gibi oranların kullanıldığı tespit edilmiştir. Değişkenler belirlendikten sonra çalışmada kullanılacak veri setinin hazırlanmaya başlanmıştır. Dünyadaki tüm havayolu firmaları evren olarak belirlenmiş ve dengeli bir panel veri setinin en uzun ve en geniş olduğu 2010-2017 yılları arasında ESG verilerine ve finansal verilerine ulaşılan 26 havayolu firması araştırmaya dâhil edilmiştir. Araştırmaya konu firmaların verileri Thomson Reuters Eikon Veri Terminalinden temin edilmiş ve analize hazır hale getirilmiştir. Çalışmada analiz yöntemi olarak panel regresyon modeli kullanılmıştır.

Bulgular- Panel veri modellerinde sağlanması gereken varsayımlardan olan panel birim kök testleri yapılarak serilerin durağanlığı incelenmiştir. Durağan olmayan serilerde fark alınarak seriler durağanlaştırılmıştır. Daha sonra çalışmada ESG genel skoru ve bireysel olarak kullanılan çevresel (E), sosyal (S) ve yönetim (G) skorlarının özkaynak karlılığı (ROE), aktif karlılığı (ROA) ve Tobin's Q oranları üzerindeki etkisini ölçmek için oluşturulan 6 farklı modelin hangi panel model kullanılarak test edileceğinin belirlenmesi için Hausman Testi yapılmıştır. Yapılan Hausman Testi sonuçları doğrultusunda beş modelde tesadüfi etkiler modeli kullanılırken bir modelde ise sabit etkiler modeli kullanılmıştır. ESG skorlarının finansal performans üzerindeki etkisini test etmek için Çevresel (E), sosyal (S) ve yönetim (G) skorları ile finansal performans göstergeleri olan aktif karlılığı (ROA), özkaynak karlılığı (ROE) ve Tobin's Q değişkenlerinin kullanıldığı modellerde istatistiksel olarak anlamlı etki bir ilişki tespit edilemezken, ESG Genel Skoru ile kurulan modelde ise sadece Aktif Karlılığı (ROA) üzerinde istatistiksel olarak anlamlı bir etkinin olduğu sonucuna ulaşılmıştır.

Sonuç- ESG skorlarının havayolu sektöründeki firmaların finansal performansı üzerinde istatistiksel olarak anlamlı bir etkisinin olmadığı sadece ESG genel skoru ile aktif karlılığı (ROA) arasında istatistiksel olarak anlamlı bir ilişkinin olduğu tespit edilmiştir. Çalışmada ulaşılan bu sonuçlar Minutolo vd. (2019), Velte (2017) ve Almeyda ve Darmansya (2019) tarafından yapılan çalışmalarda ulaşılan sonuçlarla benzerlik göstermektedir. Özetle ulaşılan sonuçlar, havayolu sektöründeki firmalar için hesaplanan ESG skorlarının firmaların finansal performansını etkilemediğini, havayolu sektörü yatırımcılarının ise ESG skorlarını çok dikkate almadığını göstermektedir.

Anahtar Kelimeler: ESG verileri, çevresel, sosyal, yönetim, finansal performans, havayolu sektörü, panel veri analizi.

JEL Kodları: M40

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LITERATURE ON THE VALUE ADDED INTELLECTUAL CAPITAL

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ABSTRACT

Purpose- The purpose of this study is to classify academically important studies related to the Pulic's (1998; 2004) "value added intellectual capital (VAIC)" which is one of the model that attracts the interest of academics studying intellectual capital; and hence, to especially contribute to the Turkish literature and help future researchers.

Methodology- In our literature review study, studies available with the topic of "VAIC" or "value added intellectual capital" in the Web of Science database over the period of 2015 and 2020 and that which are categorised as "Business", "Economics" and "Business Finance" are analysed.

Findings- This literature review reveals that more than 65% of the studies were found to be published in 2018 and after, so it has been a subject of great interest in the academic world in recent years. As a result of our literature study, it was concluded that the effect of intellectual capital on financial performance is the most investigated topic. To measure this effect it has been seen that; generally the panel data regression method is used. In all 37 studies included in the analysis, VAIC or any subcomponent was found to be statistically significant and positively associated with ROA. However, only 5 studies found that VAIC or any subcomponent was statistically significant and negatively associated with ROA. In these studies addressing accounting and finance literature; while VAIC (Pulic, 1998; 2004) is modifying; innovation expenditures, advertising expenditures and social welfare expenditures are taken into account.

Conclusion- Based on the analysis findings, it can be concluded that intellectual capital investments have become increasingly important for companies in recent years, regardless of the sector. According to the results obtained, it has been determined that VAIC and its subcomponents increase financial performance in most of the studies, regardless of country or sector. In addition, studies conducted in recent years shows that investments made in innovation capital such as "R&D expenditures" or in relational capital such as "advertising and marketing expenditures" are also intellectual capital investments and they can provide competitive advantage to companies.

Keywords: Intellectual capital, value added intellectual capital, financial performance, innovation capital, relational capital

JEL Codes: O 34, E 22, L 25

ENTELEKTÜEL KATMA DEĞER KATSAYISI ÜZERİNE ULUSLARARASI YAYINLAR

ÖZET

Amaç- Bu çalışmanın amacı entelektüel sermaye üzerine çalışan akademisyenlerin son yıllarda en çok ilgilendikleri modellerden biri olan Pulic'in (1998; 2004) "entelektüel katma değer katsayısı (VAIC)" ile ilgili önemli akademik çalışmaları sınıflandırarak özellikle Türkçe literatüre katkı sağlamak ve gelecekteki araştırmacıların fikir sahibi olmasına katkıda bulunmaktır.

Yöntem- Literatür taramamızda, Web of Science veri tabanında bulunan, 2015-2020 yılları arasında yayınlanmış, konusunda "VAIC" ya da "value added intellectual capital" geçen ve araştırma alanı "Business", "Economics" ve "Business Finance" olarak belirtilmiş makalelere ilişkin genel özellikler, modeller ve değişkenler irdelenmiş ve sınıflanmıştır.

Bulgular- Bu literatür taraması çalışmasında analiz konusu çalışmaların %65'den fazlasının 2018 ve sonrasında yayımlandığı tespit edildiğinden, son yıllarda akademik dünyada oldukça ilgi gören bir konu olduğunu ortaya koymaktadır. Literatür çalışmamız sonucunda, entelektüel sermayenin daha çok finansal performans üzerindeki etkisinin araştırıldığı ve bu etkiyi ölçmede ise genellikle panel veri regresyon yöntemi kullanıldığı sonucuna ulaşılmıştır. Analize dahil edilen 37 çalışmanın tamamında VAIC ya da herhangi bir bileşenin ROA ile istatistiki olarak anlamlı ve pozitif ilişkili olduğu tespit edilmiştir. Ancak, yalnızca 5 çalışmada VAIC ya da herhangi bir bileşenin ROA ile istatistiki olarak anlamlı ve negatif ilişkili olduğu tespit edilmiştir. Muhasebe ve finans literatürünü ele alan bu çalışmalarda; VAIC (Pulic, 1998; 2004) modifiye edilirken inovasyon harcamalarının, reklam harcamalarının ve sosyal refah harcamalarının dikkate alındığı tespit edilmiştir.

Sonuç- Analiz bulgularına dayanarak son yıllarda entelektüel sermaye yatırımlarının şirketler için, sektör ayırt etmeksizin, giderek artan bir önem kazandığı sonucuna varılabilir. Elde edilen sonuçlara göre, VAIC ve bileşenlerinin ülke ya da sektör ayırt etmeksizin çalışmaların büyük çoğunluğunda finansal performansı artırdığı tespit edilmiştir. Ayrıca son yıllarda yapılan çalışmalar; “AR&GE harcamaları” gibi inovasyon sermayesine yapılan ya da “reklam ve pazarlama harcamaları” gibi ilişkisel sermayeye yapılan yatırımların da entelektüel sermaye yatırımı olduğunu ve firmalara rekabet avantajı sağlayabildiklerini ortaya koymaktadır.

Keywords: Entelektüel sermaye, entelektüel katma değer katsayısı, finansal performans, inovasyon sermayesi, ilişkisel sermaye

JEL Codes: O 34, E 22, L 25

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MACHINE LEARNING AND ECONOMICS: BIBLIOMETRIC ANALYSIS

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ABSTRACT

Purpose- The purpose of the study, is to examine the development of international studies on machine learning in the field of economics and econometrics using Bibliometric Analysis and to visualize by Social Network Analysis between 2010 and 2019 in the Web of Science database.

Methodology- Bibliometric Analysis is used to gather information about a discipline and to measure scientific productivity and progress. Social network analysis shows the relationship structure by visualizing the findings obtained as a result of bibliometric analysis.

Findings- As a result of the bibliometric analysis, findings were obtained on the basis of variables such as the changes in the studies on the basis of years, the most published authors and the most cited studies, the distribution of these studies by countries and institutions, the course of the study topic, and the progress in the relational formation in the keywords. In addition, with the Social Network Analysis, the authors that network with each other and clusters and relationships between countries and keywords were mapped.

Conclusion- When the findings were examined, it was determined that the most studies on these topics were conducted in the United States of America in each year and the most cited study was Varian (2014). At the same time, when the studies are evaluated in the last decade, it has been observed that the tendency towards the subjects of Machine learning, which attracts attention in Economics and Econometrics, has increased rapidly. It has been observed that the studies are associated with the keywords "causality" and "causal effect" as well as "Financial Econometrics", "Behavioral Economics", "Experimental Economics". The findings obtained shed light on the development of Machine Learning in the fields of Economics and Econometrics.

Keywords: Machine learning, economics, econometrics, bibliometric analysis, social network analysis

JEL Codes: C45, A1, C1

MAKİNE ÖĞRENMESİ VE EKONOMİ: BİBLİYOMETRİK ANALİZ

ÖZET

Amaç- Bu çalışmada 2010 – 2019 yılları arasındaki son on yıllık süreçte Web of Science veri tabanında ekonomi ve ekonometri alanında makine öğrenmesi üzerine yapılan uluslararası nitelikteki çalışmaların ilgili literatürdeki gelişimi Bibliyometrik Analiz ile incelenmiştir. Ardından elde edilen bulgular Sosyal Ağ Analizi uygulanarak görselleştirilmiştir.

Metodoloji- Bibliyometrik Analiz, bir disiplin hakkında bilgi toplamak; bilimsel verimliliğin ve gelişimin ölçülmesi amacıyla kullanılmaktadır. Sosyal ağ analizi ise bibliyometrik analiz sonucunda elde edilen bulguları görselleştirerek, aralarındaki ilişki yapısını göstermektedir.

Bulgular- Bibliyometrik Analiz sonucunda, yıllar bazında çalışmalarda meydana gelen değişimler, ilgili konu hakkında en çok yayın yapan yazar ve en fazla atıf alan çalışmalar, bu çalışmaların ülkeler ve kurumlara göre dağılımı, çalışma konusunun seyri ve anahtar kelimelerdeki ilişkisel oluşumdaki ilerlemeler gibi değişkenler temelinde bulgular elde edilmiştir. Ayrıca Sosyal Ağ Analizi ile birbirleriyle ağ yapısı oluşturan yazarlar, ülkeler ve anahtar kelimeler arasındaki kümelenmeler ve ilişkiler haritalandırılmıştır.

Sonuç- Bulgular incelendiğinde, bu konular üzerine her yıl en fazla çalışmanın Amerika Birleşik Devletlerinde yapıldığı, en çok atıf alan çalışmanın Varian (2014) olduğu belirlenmiştir. Aynı zamanda, son on yıldaki çalışmalar değerlendirildiğinde, Ekonomi ve Ekonometri’de günümüzde dikkat çeken Makine öğrenmesi konularına yönelimin hızla artmış olduğu, çalışmaların “nedensellik” ve “nedensel etki” anahtar kelimelerinin yanısıra “Finansal Ekonometri”, “Davranışsal Ekonomi”, “DeneySEL Ekonomi” ile de ilişkilendirildiği ve finans ile bağlantılı anahtar kelimelerin sıklıkla kullanıldığı gözlemlenmiştir. Sonuçta elde edilen bulgular Makine Öğrenmesi’nin Ekonomi ve Ekonometri alanlarındaki gelişimine ışık tutar niteliktedir.

Anahtar Kelimeler: Makine öğrenmesi, ekonomi, ekonometri, bibliyometrik analiz, sosyal ağ analizi

JEL Kodları: C45, A1, C1

1. GİRİŞ

Zaman içinde internet teknolojilerinde meydana gelen gelişmeler önce bilimsel, ardından toplumsal hayatta ilerleme oluşturmaktadır. Makine öğrenmesi, temelde verinin sınıflandırılması ile bilgi elde edilmesini sağlayan algoritma temelli bir yaklaşımdır (Gürsakar, 2018).

Biyoloji, genetik, astronomi gibi farklı disiplinlerde sıklıkla kullanılan Makine öğrenmesinin Ekonomi ve Ekonometri disiplini içinde yerini alması oldukça yenidir (Çağlayan Akay, 2018 ve 2020). Makine öğrenmesi ve onun multidisipliner alanlarla bağlantısına olan ilginin akademik alanda da artmış olması bu konunun Ekonomi disipliniyle bağlantısının sorgulanmasına ve bu kapsamda Ekonometri alanında makine öğrenmesinin araştırılmasına yol gösterici olmuştur. Bu çalışmada, farklı bilim dallarında yaygın olarak kullanılmakta olan makine öğrenmesinin ekonomi ve ekonometri alanındaki yeri görülmek istenmiş ve makine öğrenmesi üzerine yayınlanan akademik çalışmaların son on yıllık gelişiminin bibliyometrik analiz ile incelenmesi amaçlanmıştır. Literatür incelendiğinde büyük veri ve makine öğrenmesi konularının bibliyometrik analizinin yapıldığı az sayıda çalışma olduğu görülmektedir. Bu çalışmalardan bazıları büyük veri ile ilgili çalışmaları ele alırken (Mishra (2013), Xian ve Madhavan (2014), Kocarik (2018), Liao vd. (2018), Ardito (2019), Liu vd. (2019), Rialti vd. (2019), Yilmazel (2019)) bazıları büyük veri ve makine öğrenmesi bir arada (Belmonte vd. (2020)) kullanmıştır. Bazıları başta sağlık olmak üzere çeşitli alanlarda makine öğrenmesi kullanımı (Makawana ve Jhaveri (2017), Stout vd. (2018), Bhattacharya (2019), dos Santos vd. (2019), Salod ve Singh (2020), Wang vd. (2020)), bazıları da yapay zeka (Alonso vd. (2018)) veya derin öğrenme (Li vd. (2020)) üzerine odaklanmıştır. Bu çalışmanın literatürdeki diğer çalışmalardan farkı, makine öğrenmesinin ekonomi ve ekonometri gibi spesifik bir alanda kullanımını incelemesidir. Bu amaçla öncelikle, uluslararası literatürde yapılmış olan çalışmaların derlenmesi ile araştırmanın veri seti elde edilmiştir. Bibliyometrik veriye, Sosyal Ağ Analizi uygulanarak çalışma bulguları değerlendirilmiştir.

2. VERİ ve METODOLOJİ

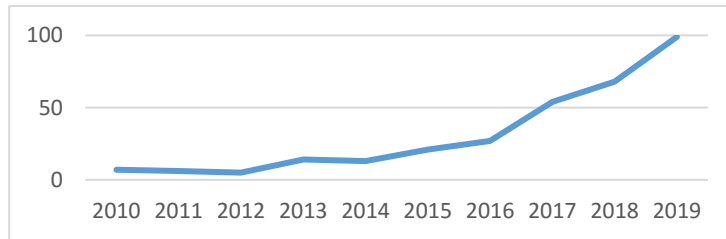
Bibliyometri, kitap (biblio) ve ölçüm bilimi (metric) sözcüklerinin birleşiminden oluşan bir kelimedir (Basaglia, 2014). Bilimsel yayın sayısı ve atıflardaki artış, projelere verilen destek miktarındaki artış, yapılan araştırma geliştirme faaliyetlerinin hızla ilerlemesi gibi niceliksel ve niteliksel argümanlar bir ülkedeki bilimsel ilerlemeyi göstermektedir. Bu nedenle belirli bir çalışma konusu hakkında yapılan istatistiksel tabanlı Bibliyometrik Analizler, çıktıların niceliklerinden yola çıkarak niteliklerine ulaşılacak pek çok etmeni inceleyerek bilimsel ilerleme hakkında bilgi verici nitelikte olmaktadır. Bu sayede bibliyometrik değerlendirmeler bir konudaki en verimli çalışmaları ve araştırmacıları belirlerken hem de bunlar arasındaki etkileşimlerin boyutlarını gösterdiği için bilim dünyasına ve ülkelere bilimsel çalışmaların geleceği hakkında yön veren araştırmalardır (Pritchard, 1967; Al, 2008). Bibliyometrik Analiz ile yapılan çalışmaların sayısı, en çok atıf alan çalışmalar ve yazarlar, kullanılan anahtar kelimelerin gelişimi, konu hakkında en çok çalışma yapılan ülke veya destekleyen kurum ve kuruluş gibi bilgiler toplanabilmektedir. Bu anlamda kitap, dergi, makale ve bildiri sayısının belirlenerek ülke, zaman ve alan boyutunda sınıflandırılması durumunda betimleyici; alanyazının parçaları arasında kurulan ilişkileri ortaya çıkaran referanslar, atıf alan yazarlar gibi konularda yapıldığında değerlendireci bibliyometri olduğu ifade edilebilir (Nicholas and Ritchie, 1978). Bibliyometrik analizle elde edilen verilerin, bibliyometrik bilimsel haritalandırma yöntemi ile görselleştirilerek sunulması sonuçların değerlendirilmesi açısından avantaj sağlamaktadır. Bu noktada verilere Sosyal Ağ Analizi uygulamak amacı ile kullanılan bir çok farklı yazılım bulunmakla birlikte bu araştırma kapsamında VOSViewer programı kullanılmıştır.

Ağ, “sistemi oluşturan parçaların karşılıklı etkileşimi ile beliren karmaşık sistemleri göstermenin paradigmatik bir yolu” olarak ifade edilmektedir (Toroczka, 2005). Sosyal Ağ Analizi, Ağ bilimi içerisinde yer almakta olup insanlar veya aktörler aralarındaki iş ortaklığı ve arkadaşlık gibi sosyal bağlardan oluşan ilişki yapılarını ortaya koymaktadır. Böylece Sosyal Ağ Analizi, incelenen birimlerin birbirleriyle ilişkisini görsel sunumlarla ortaya çıkarmaya yardımcı olmaktadır. Bunun sonucunda ise bir konu hakkında çalışma yapmak isteyen araştırmacılara bir yol gösterebilmektedir. Bu çalışmada 2010 – 2019 yılları arasında Ekonomi ve Makine öğrenmesi ile Ekonometri ve Makine öğrenmesi konularında yapılan ve ISI tarafından sağlanan Web of Sciences (WoS) veri tabanı kullanılarak uluslararası dizinde taranan 311 çalışma derlenmiş ve Bibliyometrik Analiz ile incelenmiştir. Her üç kelimenin ortak olarak kullanıldığı 12 çalışma bulunmakta olup tekrar eden çalışmalar veri setinden çıkartılmıştır. Bu çalışmaların 178 tanesi makale, 117 tanesi bildiri, 11 tanesi kitap bölümü şeklindedir.

3. BULGULAR

Çalışmada anahtar kelimelerin kullanımı, yıllar bazında yapılan yayın sayıları, en çok yayın yapılan ülke ve atıf sayıları, yazarların yayın ve atıf sayısı, en çok yayın yapan ve atıf alan kurumlar ve ülkeleri ile bu konuda en çok yayın yapan dergiler incelenmiş ve elde edilen bulgular tartışılmıştır.

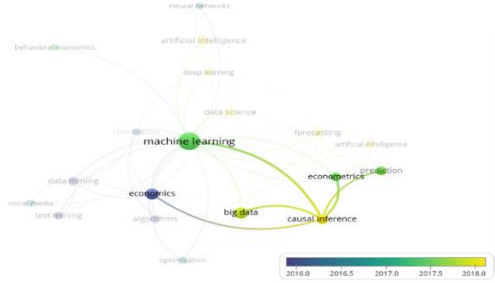
Şekil 1: Yıllar Bazında Yapılan Yayın Sayıları Grafiği



Şekil 1’de görülebileceği gibi Makine Öğrenmesinin Ekonomi ve Ekonometri alanında kullanımı 2015 (21) yılından itibaren artış göstermektedir. Son on yıl içerisinde yapılan 311 çalışmanın yaklaşık %14’ü bu yıla kadar yapılmışken, kalan kısım bu yıldan sonraki çalışmaları oluşturmaktadır. Özellikle son yıllarda katlanarak artan yayın sayısı 2019 yılında 99’a ulaşmıştır.

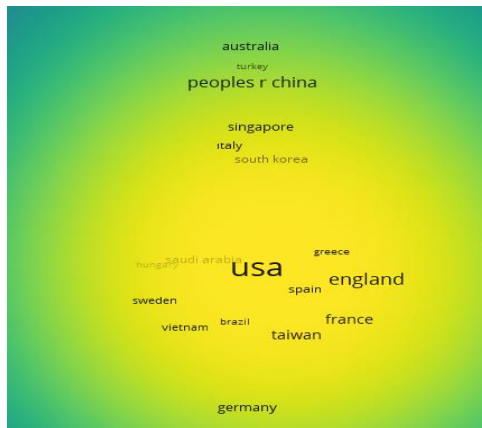
Tablo 1: Yıllara Göre Anahtar Kelimelerin Kullanımı

Yıllar	En Çok Kullanılan Anahtar Kelimeler	Sıklık (Sırasıyla)	Makine Öğrenmesiyle Kümelene
2010	Metin Madencilği, Proses Endüstrisi	2,2	-
2011	Ekonomi, Makine Öğrenmesi, Algoritma	3,3,2	Ekonometri, Markov Koşulu, Nedensellik
2012	Makine Öğrenmesi	2	Finansal Tahmin, Optimizasyon, Kredi Risk Analizi, Veri Madencilği
2013	Ekonomi, Makine Öğrenmesi, Algoritma	2,2,2	Sosyal Öğrenme, Deneysel Ekonomi, Zaman Serisi Analizi
2014	Ekonomi, Makine Öğrenmesi	2,2	Stok Fiyat Tahmini, Algoritmik Ticaret,
2015	Makine Öğrenmesi, Veri Madencilği	6,3	Politik Ekonomi, Finansal Regülasyon, Büyük Veri, Program Değerlendirmesi
2016	Makine Öğrenmesi, Büyük Veri, Ekonomi, Duyarlılık Analizi	12,4,2,2	Büyük Veri, Biyoinformatik, Epistemoloji,
2017	Makine Öğrenmesi, Yapay Zeka, Tahmin, Büyük Veri, Vektör Makineleri Destekleme, Oyun Teorisi, Davranışsal Ekonomi,	20,4,3,3,2,2,2,2	Büyük Veri, Oyun Teorisi, Davranışsal Ekonomi, Yapay Zeka, Tahmin, Ekonometri, Ekonomi,
2018	Makine Öğrenmesi, Yapay Zeka, Ekonometri, Ekonomi, Büyük Veri, Veri Bilimi, Optimizasyon, Veri Madencilği, Yapay Sinir Ağları, Derin Öğrenme	31,6,5,4,4,4,3, 3,2,2,2	Sosyal Medya, Stok Market Tahmini, Duygu Analizi
2019	Makine Öğrenmesi, Yapay Zeka, Büyük Veri, Derin Öğrenme, Ekonometri, Algoritma, Sınıflandırma, Veri Bilimi, Yapay Sinir Ağları, Davranışsal Ekonomi, Veri Madencilği, Sosyal Medya	44,9,9,9,7,4,3,3,2,2,2,2,2	Ekonomi, Ekonometri, Derin Öğrenme, Yapay Zeka, Tahmin, Nedensellik, Algoritma, Büyük Veri



Şekil 2: Nedensellik ilişkisi

öğrenmesi hiç kullanılmamışken, 2014 yılına kadar kullanımı ortaya çıkmış ve bu yıldan sonra da hızla artmıştır. Son iki yılda sosyal medya, duygu analizi, nedensellik, Ekonomi ve Ekonometri ile birlikte kullanımı dikkat çekmektedir. Bu durum, uzun yıllar nedenselliğin makine öğrenmesi içerisinde yer bulamaması nedeniyle konuya uzak duran Ekonomistlerin, son yıllarda tüketicilerin satın alma davranışlarının incelenmesinde makine öğrenmesi tekniklerinden yararlanmakta olduklarının bir göstergesi olarak gösterilebilir. Şekil 2'de özellikle 2018 yılından itibaren nedensellik, büyük veri ve makine öğrenmesi ile Ekonomi ve Ekonometri ilişkisinin kurulmuş olduğu görülmektedir. Aynı zamanda kümelene yapıları itibariyle veri madencilği, metin madencilği, sosyal medya araştırmaları ve sınıflandırma, ekonomi alanında makine öğrenmesi ve algoritma temelinde araştırılmaktadır. Benzer şekilde Ekonometri'de yapay zeka ve tahminleme çalışmaları ile de ilgilenilmekte olduğu sonucuna ulaşılmaktadır.



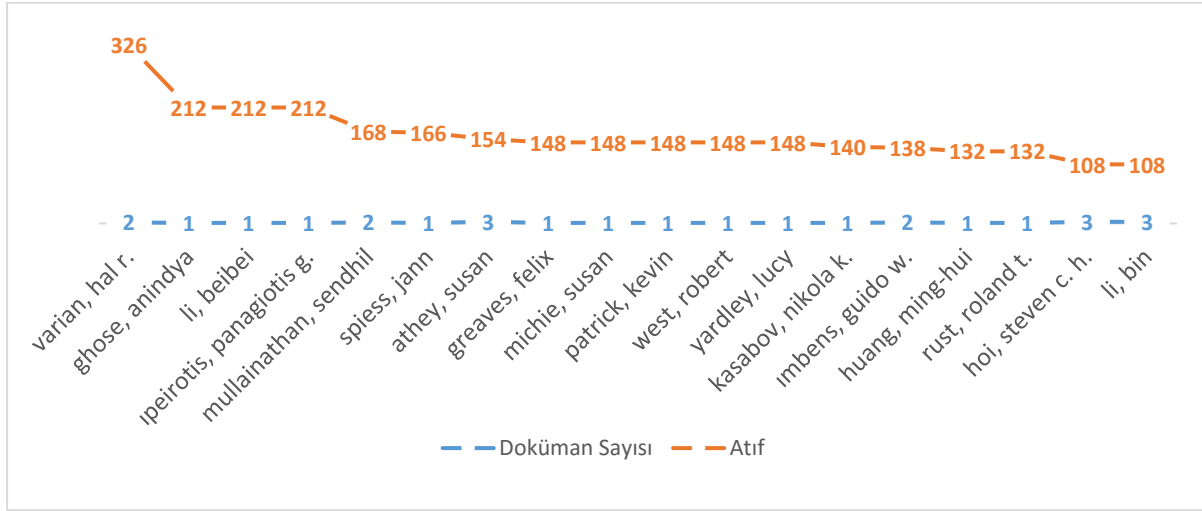
Şekil 3: Yapılan Çalışmaların Ülke Yoğunluğu

Tablo 2: En Çok Yayın Yapan Ülkeler ve Atıf Sayıları

Sıra	Ülke	Yayın Sayısı	Atıf Sayısı
1	ABD	137	2031
2	İngiltere	35	511
3	Çin Halk Cumhuriyeti	30	296
4	Almanya	21	109
5	İtalya	15	76
:	:	:	:
25	Türkiye	4	3

Bilim dallarına sağladığı katkı bakımından ülkelerin durumu incelendiğinde (Tablo 2) bu konuda yayın yapılan 53 ülke arasından, en fazla yayın yapan ve çalışmaları en fazla atıf alan ülkenin ABD olduğu ve ikinci sırada yer alan İngiltere'nin yaklaşık 4 katı çalışmaya sahip olduğu görülmektedir. Ülkelerin atıf ilişkileri bakımından yoğunluk grafiği (Şekil 3) incelendiğinde yayın sayısı daha fazla olan İngiltere'nin ABD ile birlikte bir küme oluşturduğu; Almanya'nın kurulan ağ bağlantıları neticesinde bu kümeye görece yakın olduğu; İtalya ve Avustralya'nın Çin Halk Cumhuriyeti ile birlikte bir küme oluşturduğu; ülkeler arasında 25. sırada olan

Türkiye'nin ise bu küme içerisinde olduğu görülmektedir. Singapur ve Yeni Zelanda'nın az sayıda çalışmaya sahip olmalarına karşın atıf sayılarının yüksek olması dikkat çekmektedir.



Şekil 4: Yazarların Atıf Yoğunluklarına Göre Yayın Sayısı Grafiği



Şekil 5: Yazarların Atıf İlişkilerine Göre Ağ Analizi Sonucu

Yazarların 2010 – 2019 yılları arasında yapmış olduğu çalışma sayıları ve atıflarını gösteren Şekil 4'teki grafik incelendiğinde S. Athey, S. C. H. Hoi ve B. Li'nin üç çalışmaları olduğu ve çalışmalarına yüksek sayıda atıf yapıldığı görülmektedir. Tek çalışması olup yüksek atıf alan diğer yazarlar A. Ghose, P. G. Ipeirotis ve B. Li'dir. H.R. Varian ise 2 çalışmasına aldığı 326 atıf ile en çok atıf alan yazar olarak görülmektedir. Bu bağlamda H.R. Varian'ın ilgili bir bilim alanına daha fazla katkı sağladığı söylenebilir. Şekil 5'te atıf ilişkisine göre yazarlar arasında 5 temel küme oluştuğu belirtilebilir. Kümelenmeler, H.R. Varian, S. Mullainathan, S. Athey, G. W. Imbens, A. Belloni ve A. Peysakhovich etrafında oluşmuştur.

Tablo 3: En Çok Yayın Yapan ve Atıf Alan

Sıra	Kurum Adı	Doküman Sayısı	Atıf Sayısı	Ülke	Kurum/Kuruluşlar ve Ülkeleri				
					Sıra	Kurum Adı	Doküman Sayısı	Atıf Sayısı	Ülke
1	Carnegie Mellon Üniv.	9	39	ABD	6	Chicago Üniv.	4	121	ABD
2	Harvard Üniv.	8	206	ABD	6	Southampton Üniv.	4	254	ABD
2	Stanford Üniv.	8	201	ABD	6	Yale Üniv.	4	79	ABD
2	Oxford Üniv.	8	185	ABD	:	:	:	:	:
3	MIT	7	71	ABD	8	Ulusal Taiwan Üniv.	2	157	Tayvan
4	Google	6	388	ABD	8	Ulusal Ekonomik Araştırmalar Bürosu	2	138	ABD
5	Georgia Teknoloji Enst.	5	41	ABD	9	Halk Sağlığı Birimi	1	148	İngiltere
5	Facebook	5	15	ABD	9	İmparatorluk Koleji	1	148	İngiltere
5	San Diego Üniv.	5	169	ABD	9	Auckland Teknoloji Üniv.	1	140	Yeni Zelanda
6	Nanyang Teknoloji Üniv.	4	109	Singapur	9	Maryland Üniv.	1	132	ABD

6	NYU	4	222	ABD	:	:	:	:	:
6	UCL	4	225	İngiltere	8	İzmir Katip Çelebi Üniv.	2	3	Türkiye
6	Berkeley Üniv.	4	306	ABD	9	Van Yüzüncü Yıl Üniv.	1	0	Türkiye

Son on yıl içerisinde çalışma yapan 458 kurum veya üniversite olduğu görülmektedir. Tablo 3 incelendiğinde doküman sayısı olarak en çok çalışma yapan üniversitenin Carnegie Mellon Üniversitesi olduğu ancak doküman sayısına göre atıf sayısının az olduğu tespit edilmektedir. Carnegie Mellon Üniversitesi'ni Harvard, Standford ve Oxford Üniversiteleri izlemektedir. Google şirketi tarafından yapılan 6 çalışma 388 atıf ile en çok atıf alan kurum olmaktadır. Google'ı atıf sayısının çokluğu ile Berkeley Üniversitesi ve Southampton Üniversitesi izlemektedir. Yayın sayısı ve atıf sayısı bakımından ülkeler incelendiğinde yine ABD'nin ilk sırada yer aldığı görülmektedir. Listede iki Türk Üniversitesinin de olduğu görülmektedir. Ön sırayı alan kurumların ABD'de olması dikkat çekmektedir.

Tablo 4: 2010 – 2015 ve 2016 – 2019 Dönemlerinde En Çok Yayın Yapan Dergi Sıralaması

Dergi	2010 – 2015 Arası Atıf Sayısı		Dergi	2016 – 2019 Arası Atıf Sayısı	
	Doküman Sayısı			Doküman Sayısı	
Acm Transactions on Intelligent Systems and Technology	3	37	Value in Health	4	9
Neural Networks	2	143	Expert Systems with Applications	3	44
Journal of Dairy Science	2	28	Electronic Commerce Research and Applications	3	16
Journal of Economic Perspectives	1	301	Journal of Economic Perspectives	2	299
Marketing Science	1	212	Journal of Medical Internet Research	2	151
Technological and Economic Development of Economy	1	73	Chemcatcher	2	53
Neuron	1	67	Quantitative Finance	2	6
Journal of The American Statistical Association	1	62	Heliyon	2	5
Acm Computing Surveys	1	56	Canadian Journal of Economics- Revue Canadienne D Economique	2	4
Expert Systems with Applications	1	51	Journal of Service Research	1	135
Computer Science and Information Systems	1	25	Technological and Economic Development of Economy	1	56

Çalışmaların yayınlandığı kaynaklar 5'er yıllık iki döneme ayrılarak karşılaştırılmış ve sonuçlar Tablo 4'te verilmiştir. Buna göre, her iki dönemde de ortak olarak yayın çıkartan derginin Journal of Economic Perspectives olduğu gözlemlenmektedir. Bu dergide yayımlanan çalışma sayısı görece az olsa da yayınlara yapılan atıf sayısı yüksektir. Bu da yayınların kalitesinin bir ölçüsü olarak görülebilmektedir. Aynı zamanda, bu derginin ilgili konuda gelişen çalışmaları yayınladığı söylenebilir.

5. SONUÇ

Astronomi, biyoloji ve genetik alanında yaygın olarak kullanılan büyük verinin günümüzde başta finans ve bankacılık sektörü olmak üzere, sağlık sektörü, pazarlama, yapay zeka ve tahmin konusunda çalışmaların ilerlemesi ile birçok farklı alanda belirleyici bir rol oynamaya başladığı görülmektedir (Çağlayan Akay, 2018). Son yıllara kadar bu alanda yapılan çalışmalarda nedensellik ilkesinin algoritmalarda yer bulamaması nedeniyle ekonomistler makine öğrenmesi ve büyük veri kavramlarına uzak durmuşlardır. Ancak son yıllarda Ekonomi konulu dergilerin de makine öğrenmesi çalışmalarına yer verdiği söylenebilir. Çalışmada 2010 – 2019 yılları arasında Ekonomi ve Makine öğrenmesi ile Ekonometri ve Makine öğrenmesi konularında yapılan 311 çalışma incelenmiştir. Bibliyometrik Analiz sonucunda, yıllar bazında çalışmalarda meydana gelen değişimler, ilgili konu hakkında en çok yayın yapan yazar veya en fazla atıf alan çalışmalar, bu çalışmaların ülkeler ve kurumlara göre dağılımı, çalışmalarda en sık kullanılan dil, çalışma konusunun seyri ve anahtar kelimelerdeki ilişkisel oluşumdaki ilerlemeler gibi değişkenler temelinde bulgular elde edilmiştir. Ayrıca Sosyal Ağ Analizi ile birbirleriyle ağ yapısı oluşturan (karşılıklı etkileşim içinde olan) yazarlar, ülkeler ve anahtar kelimeler arasındaki kümelenmeler ve ilişkiler haritalandırılmıştır. Son dönemlerde çalışma sayısının artmasıyla birlikte özellikle 2018 yılından itibaren nedensellik, büyük veri ve makine öğrenmesi ile Ekonomi ve Ekonometri ilişkisinin kurulduğu bulgusuna ulaşılmıştır. Veri madenciliği, metin madenciliği, sosyal medya araştırmaları ve sınıflandırma konuları, Ekonomi alanında makine öğrenmesi ile ilişkili bulunmuştur. Benzer şekilde, Ekonometri alanında makine öğrenmesi çalışmalarının yapay zeka ve tahminleme çalışmaları ile ilişkili olduğu sonucuna ulaşılmıştır. Bulgular incelendiğinde, bu konular üzerine her yıl en fazla çalışmanın Amerika Birleşik Devletleri'nde (ABD) yapıldığı, en çok atıf alan çalışmanın Varian (2014) olduğu belirlenmiştir. Aynı zamanda, son on yıldaki çalışmalar değerlendirildiğinde, Ekonomi ve Ekonometri'de günümüzde dikkat çeken Makine öğrenmesi konularına yönelimin hızla artmış olduğu, çalışmaların "nedensellik" ve "nedensellik" anahtar kelimelerinin yanısıra "Finansal Ekonometri", "Davranışsal Ekonomi", "DeneySEL Ekonomi" ile de ilişkilendirildiği ve

finans ile bağlantılı anahtar kelimelerin sıklıkla kullanıldığı gözlemlenmiştir. Sonuçta elde edilen bulgular Makine Öğrenmesi'nin Ekonomi ve Ekonometri alanlarındaki gelişimine ışık tutar niteliktedir.

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THE NON-LINEAR RELATIONSHIP BETWEEN VOLATILITY AND SOVEREIGN CREDIT RISK: EVIDENCE FROM EMERGING COUNTRIES

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ABSTRACT

Purpose- This study investigates the nexus between the volatility index of VIX, and sovereign credit risk of CDS spread, in emerging markets, namely China, Russia, Brazil, Turkey, and Mexico. The emerging markets are in the center of investors' interest due to high return opportunities. The research aims to find out the relationship between the VIX index and the CDS spread of the abovementioned countries in the nonlinear level.

Methodology- The relationship between volatility and sovereign credit risk has been studied many times via linear models. However, financial series exhibit asymmetric dynamics, as volatility clustering, excess kurtosis, and others. Thus we use nonlinear autoregressive distributed lags (NARDL) analysis to capture nonlinear relations between the volatility and the sovereign credit risks of these countries by using daily data from 04.01.2010 to 29.11.2019. The linear ARDL model, that assumes symmetric dynamics of the variables, is not able to model the potential nonlinearity between CDS spreads and volatility movements. That is why we employ a nonlinear approach at this paper.

Findings- We apply the Wald test to check the cointegration between CDS and VIX, and find that all time series cointegrated and asymmetric dynamics. The bounds test of the NARDL model confirms the cointegration between VIX and CDS spreads of the countries under study. The analysis of estimated NARDL parameters shows that negative shocks of the volatility index have a long-lasting impact on CDS spreads. Chinese CDS spread are more sensitive to VIX index changes in the short run. The effect of a decrease in volatility on Russian CDS spread is higher than the effect of an increase. Turkish and Brazilian CDS spreads are more reactive to increase in the VIX, whereas Mexican CDS is less sensitive. Analyse outputs show there are asymmetric relations evident both in short-run and long-run periods.

Conclusion- Findings show that the impact of the shocks is asymmetric, and the impact of negative shocks on CDS spreads are higher than positive shocks of the same magnitude. These findings allow investors to consider global indicators when taking a position on sovereign bonds of emerging markets. Thus watching the VIX index, they may buy or sell the government bonds of these countries and they must consider its asymmetric impact.

Keywords: Volatility; Credit Default Swap; Asymmetry; NARDL

JEL Codes: C22; F65; G15

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EQUITY RETURN ANOMALIES IN TURKISH MARKETS

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ABSTRACT

Purpose- The purpose of this study is to investigate the predictive power of various anomalies in the cross-section of equity returns in Borsa Istanbul.

Methodology- Covering a sample period between 1988 and 2018, this study implements univariate portfolio analyses. Specifically, each month, stocks are sorted into quintile portfolios based on one anomaly at a time. Next, the one-month-ahead equal- and value-weighted portfolio returns are calculated for each quintile to test whether the return spread between the extreme anomaly portfolios is economically and statistically significant.

Findings- The findings using the whole sample document that market beta, firm size, lagged return and lottery demand have a significant and negative relation with future stock returns. In contrast, book-to-market ratio, investment and profitability have a strong positive relation with expected equity returns.

Conclusion- All anomalies that are shown to predict U.S. equity returns are not documented in Turkey. Except for the investment anomaly, the directions of these anomalies are in line with the existing literature in the U.S.

Keywords: Equity returns, Borsa Istanbul, anomalies, emerging markets.

JEL Codes: G10, G11, G12

TÜRKİYE PİYASALARINDA PAY GETİRİSİ ANOMALİLERİ

ÖZET

Amaç- Bu çalışma, Borsa İstanbul'da işlem gören pay senetleri için, pay senedi anomalilerinin, pay senetlerinin gelecekteki getirileri üzerinde anlamlı bir etkisinin olup olmadığını incelemektedir.

Yöntem- 1988-2018 yılları arasındaki dönemi kapsayan bu çalışmada, tek değişkenli portföy analizi kullanılmıştır. Pay senetleri her ay, söz konusu değişkenlerin büyüklüğüne göre beş portföye ayrılmaktadır. Daha sonra, bu portföylerin hem eşit ağırlıklı, hem de piyasa değerine göre ağırlıklandırılmış bir sonraki ayki getirileri hesap edilip, uç portföyler arasındaki getiri farkının ekonomik ve istatistik olarak anlamlı olup olmadığı test edilmiştir.

Bulgular- Tüm örnekleme bakıldığında, piyasa betası, şirket büyüklüğü, bir payın geçmiş aydaki getirisi ve piyango özelliği ile beklenen pay senedi getirileri arasında negatif bir ilişki görülürken, öz sermayenin defter değerinin piyasa değerine oranı, şirketin toplam varlıklarındaki büyüme (yatırım) ve karlılık oranı ile beklenen pay getirileri arasında pozitif bir ilişkiye rastlanmıştır. Bu anomalilerin yönü yatırım değişkeni haricinde literatürdeki bulgularla uyum göstermektedir.

Sonuç- ABD'de mevcut olan anomalilerin tamamı Türkiye için çalışmamaktadır. Ayrıca, yatırım anomalisi dışında Borsa İstanbul'da çalışan bu anomalilerin yönleri, ABD'deki mevcut literatürle uyumludur.

Anahtar Kelimeler: Pay senedi getirileri, Borsa İstanbul, anomaliler, gelişen piyasalar.

JEL Kodları: G10, G11, G12

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THE IMPORTANCE OF TIMING OF INTERNATIONALIZATION FOR MULTINATIONAL ENTERPRISES

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ABSTRACT

Purpose- The purpose of this study is to emphasize the importance of timing of entrance to international markets for Multinational Enterprises.

Methodology- In this study, the importance of the timing of entrance to international markets is tried to be emphasized with a literature research.

Findings- The literature review reveals that there are many studies about the internationalization processes of businesses (Williams & Crook, 2021; Kabongo & Okpara, 2019; Meschi, Ricard, & Moore, 2017). Especially with the effect of today's intense competitive environment and globalization, it is seen that the importance of timing for internationalization for multinational companies is discussed in various dimensions.

Conclusion- The objective of this study is to focus on the timing of internationalization of Multinational Enterprises. Timing of entrance to international markets has an important role in terms of the strategies of the firm that are aiming to open up to different markets. Sometimes businesses may have the advantage of entering earlier to the market and getting the advantage of being first mover by putting their internationalization strategies into practice earlier, but they may also face the risks of some unknown factors related to be first mover. On the other side when businesses prefer to enter international markets with a delay, even if it is less costly than entering the market first, it may be possible that this time the timing of entrance will not result in an advantageous market entry strategy (Tuppura et al., 2008). The decision of timing of entrance to international markets is a critical decision for Multinational Enterprises. The possible outcomes of timing of entrance to foreign markets should be evaluated in detail.

Keywords: Internationalization, timing of internationalization, multinational enterprises (MNE's)

JEL Codes: D25, F01, F20

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GENERAL LIABILITIES OF THE MEMBERS OF THE BOARD OF DIRECTORS IN JOINT STOCK COMPANIES UNDER THE PROVISIONS OF TURKISH COMMERCIAL LAW

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ABSTRACT

Purpose- The purpose of this study is to include the general legal liabilities of the members of the board of directors in closed joint stock companies as regulated in the Turkish Commercial Code (TCC) Art. 553 within the scope of the study. The special liability circumstances in TCC regarding the members of the board of directors will be held out of the scope of this study. In joint stock companies, the board of directors is one of the legally mandatory bodies that must be present. The management and representation of the joint stock company is the primary duty of the board of directors. It sets forth that board members are obliged to fulfil their duties with "due care of a prudent manager". Failure to do so will result in legal liabilities for the members. General legal liabilities of the members of the board of directors are regulated in Art. 553 of TCC No. 6102. According to this provision, the legal liability of board members is based on the principle of fault. However, unlike the abolished Commercial Code, this regulation has adopted the principle of differentiated solidarity regarding the responsibility of the board members abandoning the principle of joint liability. This study covers basic acknowledgements about the principle of fault, differentiated solidarity, liability lawsuit in terms of legal liabilities of the members of the board of directors in joint stock companies. **Methodology-** In accordance with the principle of fault regarding the liabilities of the members of the board of directors, the fault must be proven for the members to be held legally responsible. The basis for the wrongdoing here may be the legal relationship between the board member and the joint stock company, or the unfair actions of the board members. Since the law maker has removed the presumption of negligence against the board of directors in liability lawsuits to be filed against the members of the board of directors with law No. 6335, the proof of the fault is determined according to the general provisions. The kind of fault that should be existent in the members is objective fault, not subjective fault. According to the principle of objective fault, a board member is obliged to adopt the consideration and care shown by a conscious, sensible and reasonable person in the same social environment. In the presence of these traits and circumstances, members do not bear liability since no kind of faulty act can be attributed. TCC No. 6102 Art. 557 has brought a significant change to the members of the board of directors. With this change, in terms of fault liability instead of joint liability, differentiated solidarity concept has been adopted. Differentiated solidarity means that if more than one party is obliged to indemnify the same damage, each is held liable to the extent that the damage can be charged to each party based on its wilful misconduct and on a case-by-case basis. In order to be able to speak of joint liability principle, to begin with, more than one person should be held responsible for the damage. When the incurred damage is caused by more than one person, there is joint liability among the actors. This solace is against the harmed. In other words, each member of the board of directors who contributes to the birth of the damage is liable to the injured person for all of the damage, regardless of the degree of their fault. The principle of joint liability is valid not in the internal relationship between the members of the board of directors, but in the external relationship in which they are liable to the harmed. This understanding protects the injured party. Therefore, the member who gave the damage is responsible for compensating the loss of the injured, even if the extent of their intervention is minor. Differentiated solidarity principle, on the other hand, states that where more than one person shall be responsible for the damage incurred, rather than being held responsible for the overall damage, each and every board member may be found liable pro rata to the degree of their fault and status of the situation. The differentiated solidarity principle allows the members of the board of directors who are jointly and severally liable to use their personal reasons for extenuation against the injured who suffers in the external relationship. It should be noted that, as in the principle of joint liability, in this principle as well, more than one board member must be involved in the occurrence of the damage. For, none of these principles can be applied in terms of liability for a damage caused by the fault of a single board member. For this reason, it is not possible to apply the differentiated solidarity principle to joint stock companies managed by a single member board of directors. In summary, in accordance with the differentiated solidarity principle, each negligent board member taking part in the incurred damage will be obliged to compensate for the amount of the damage that may be attributed to them, not for the total, but in proportion to the degree of their personal faults and requirements of the situation. The differentiated solidarity principle allows the members to claim personal explanation /discount situations which used to be impossible to state when joint liability principle was in order and could only be claimed against other board members in the internal circle but could not be claimed against the injured party who happens to belong to the external circle.

Findings- In accordance with TCC Art. 553, members of the board of directors shall be held legally liable for the damage they cause to the company, shareholders and company creditors in case they fail to fulfill their obligations arising from the law and articles of association at the extent of their fault. To file a liability lawsuit, the members must act in defiance of the articles of association and the regulations regarding and these acts must lead to a loss of the company. Art. 555 of TCC states that the company and the shareholders have the right to file a suit due to the losses of the joint stock company. Pursuant to the aforementioned provision, the provisions of Art. 553 set forth that members of the board of directors are obliged to pay the losses of the company resulting from their faults to the joint stock company. However, the shareholders are also granted with the right to file a lawsuit against the members of the board of directors in case the members of the board of directors may not be willing file a lawsuit against themselves, mainly because they have the authority to represent the company. In other words, in case of an incurred loss owing to the members of the board of directors, shareholders who suffer the loss has the right to sue independently like the company itself. If the joint stock company suffers a damage, the compensation is paid to the company as a result of the lawsuit that is filed. The compensation claims against the liable members of the board of directors must be made within two years from the date on which the claimant became aware of the loss and the person that is responsible of it, in any case, the right to claim expires in five years from the day of the occurrence of the act that caused the damage. Art. 556 of TCC specifies that it is possible for the creditors of the company to file a liability lawsuit against the members of the board of directors only if the company goes bankrupt. Nevertheless, even then, the priority right to sue is given to the bankruptcy administration. If the bankruptcy administration does not file a lawsuit, the company creditor may file one on the condition that the compensation will be paid to the company. The parties that hold passive capacity to sue in terms of liability cases are specified separately in Art. 553. Accordingly, founders, members of the board of directors, executives and liquidators are liable for the damages they cause to the company. However, taking into consideration the focus of the study, only the members of the board of directors are referred here.

Conclusion- Unlike the former Commercial Code, TCC numbered 6102 has brought novel changes to the regulations regarding the general liability conditions of members of board of directors in Art. 553. No member without a fault shall be held responsible based on Art. 553. As a result of the amendment made by the law No. 6335, thanks to removal of the principle of the presumption of negligence, the members of the board of directors are relieved of the burden of proving their innocence. In addition, introducing the principle of differentiated solidarity with the Art. 557 an understanding that holds each member of the board of directors responsible only in proportion to their faults in the external relations has been adopted. With this regulation, no member will be held liable for any kind of loss and corruption beyond their control.

Keywords: Joint stock company, board of directors, liability, fault, differentiated solidarity

JEL Kodları: K22

TÜRK TİCARET KANUNU HÜKÜMLERİNE GÖRE ANONİM ŞİRKETLERDE YÖNETİM KURULU ÜYELERİNİN GENEL HUKUKİ SORUMLULUĞU

ÖZET

Amaç- Bu çalışmanın amacı, halka kapalı anonim şirketlerde yönetim kurulu üyelerinin Türk Ticaret Kanunu (TTK) M. 553'de düzenlenen genel hukuki sorumluluğuna çalışmanın elverdiği ölçüde yer vermektir. Çalışmada yönetim kurulu üyeleri için TTK'da düzenlenen özel sorumluluk hallerine yer verilmeyecektir. Anonim şirketlerde yönetim kurulu kanunen bulunması gereken zorunlu organlardan biridir. Anonim şirketin yönetim ve temsili yönetim kurulunun asli görevidir. Yönetim kurulu üyeleri görevlerini ifa ederken "tedbirl bir yöneticinin özeniyile" hareket etmeleri gerekmektedir. Buna aksi davranış yönetim kurulu üyelerinin hukuki sorumluluğuna neden olacaktır. 6102 sayılı TTK m. 553'de yönetim kurulu üyelerinin genel hukuki sorumluluğu düzenlenmiştir. Anılan hüküm uyarınca, yönetim kurulu üyelerinin hukuki sorumluluğu kusur prensibine dayandırmıştır. Bununla birlikte mülga Ticaret Kanunundan farklı olarak bu düzenleme yönetim kurulu üyelerinin sorumluluğunda mutlak teselsül ilkesini terk etmiş yerine farklılaştırılmış teselsül ilkesini benimsemiştir. Bu çalışmada anonim şirketlerde yönetim kurulu üyelerinin hukuki sorumluluğunda kusur prensibi, farklılaştırılmış teselsül ilkesi ve sorumluluk davasına ilişkin temel bilgiler ele alınacaktır.

Yöntem- Yönetim kurulu üyelerinin sorumluluğunda kusur ilkesi gereğince yönetim kurulu üyelerinin hukuki sorumluluklarının doğabilmesi için kusurun ispat edilmesi gerekmektedir. Buradaki kusurun dayanağı yönetim kurulu üyesi ile anonim şirket arasındaki hukuki ilişki olabileceği gibi yönetim kurulu üyelerinin haksız eylemleri de olabilecektir. Kanun koyucu, 6335 sayılı Kanun ile yönetim kurulu üyelerine karşı açılacak sorumluluk davalarında yönetim kurulu aleyhine olan kusur karinesini kaldırdığından kusurun ispatı genel hükümlere göre belirlenmektedir. Yönetim kurulu üyelerinde aranan kusur sübjektif kusur değil objektif kusurdur. Objektif kusur ilkesine göre, bir yönetim kurulu üyesi aynı sosyal çevrede bulunan bilinçli, makul ve mantıklı bir kişinin göstermesi gereken dikkat ve özeni göstermekle yükümlüdür. Bir diğer ifadeyle, yönetim kurulu üyeleri hukuki sorumluluğuna sebep olacak eylem ve işlemlerinde aynı sosyal çevrede bulunan bilinçli, makul ve mantıklı bir kişinin göstermesi gereken dikkat ve özeni göstermiş ise tedbirl bir yönetici gibi davranmış olacaktır. Bu hallerin varlığında yönetim kurulu üyelerine kusurlu bir eylemin isnadı mümkün olmayacağından hukuki sorumlulukları da doğmayacaktır. 6102 sayılı TTK m. 557'deki düzenlemesi ile yönetim kurulu üyelerinin sorumluluğunda önemli bir değişikliğe gitmiştir. Bu değişiklik ile kusur sorumluluğunda mutlak teselsül ilkesi terk edilerek yerine farklılaştırılmış teselsül ilkesi benimsenmiştir. Farklılaştırılmış teselsül anlam olarak birden fazla tarafın tazmin etmek zorunda olduğu bir zararda tarafların her biri somut olayın özelliğine göre kendilerine yüklenebileceği ölçüde zarardan sorumlu tutulmasıdır. Mutlak teselsül ilkesinden söz edebilmek için her şeyden önce zararın meydana gelmesi durumunda bu zarardan birden fazla kişinin sorumlu tutulabilmesi gerekir. Birden fazla kişinin birlikte meydana getirdikleri zarardan dolayı aralarında tam bir teselsül vardır. Bu teselsül zarar görene karşı söz konusudur. Yani zararın doğumuna katkısı bulunan her bir yönetim kurulu üyesi kendi kusurlarının derecesinden bağımsız olarak zararın tamamından zarar görene karşı sorumludurlar. Mutlak teselsül ilkesi yönetim kurulu üyeleri arasındaki ilişki değil zarar görene karşı sorumlu oldukları dış ilişkide geçerlidir. Bu anlayış zarar gören alacaklının korunduğu bir

anlayıştır. Bunun sonucunda da zarar veren yönetim kurulu üyesi zararın oluşumuna katkısı çok büyük oranda olmasa bile zarar görene karşı zararın tamamını tazmin etmekle yükümlü olmaktadır. İşte farklılaştırılmış teselsül ilkesinde yönetim kurulu üyelerinin her biri zararın tamamından sorumlu olmak yerine zarardan, kusuruna ve durumun gereklerine göre kendisine yükletilebildiği ölçüde diğer üyelerle birlikte sorumlu olmaktadır. Farklılaştırılmış teselsül ilkesi, müteselsil borçlu olan yönetim kurulu üyelerinin şahsi indirim sebeplerini, dış ilişkide zarar gören alacaklıya karşı kullanabilmelerine izin vermektedir.

Belirtmek gerekir ki, mutlak teselsül ilkesinde olduğu gibi bu ilke de zararın meydana gelmesinde birden fazla yönetim kurulu üyesinin kusuru bulunmalıdır. Zira, hem mutlak teselsül ilkesi hem de farklılaştırılmış teselsül ilkesi tek bir yönetim kurulu üyesinin kusuru ile verdiği zarardan kaynaklanan sorumlulukta uygulanamaz. Bu nedenle tek kişilik yönetim kurulu ile yönetilen anonim şirketlerde farklılaştırılmış teselsül ilkesinin uygulanması mümkün değildir. Özetle, farklılaştırılmış teselsül ilkesi gereğince meydana gelen zararda kusurları bulunan her bir yönetim kurulu üyesi zararın tamamından değil kişisel kusurlarının derecesi oranında ve durumun gereklerine göre kendilerine yükletilebilecek zarar miktarını tazminat olarak ödemekle yükümlü olacaklardır. Farklılaştırılmış teselsül ilkesi gereğince mutlak teselsül ilkesi gereğince sadece iç ilişkide diğer yönetim kurulu üyelerine karşı ileri sürülebilen ancak dış ilişkide zarar gören alacaklıya karşı ileri süremedikleri şahsi indirim durumlarını dış ilişkide alacaklıya karşıda ileri sürebilmektedirler.

Bulgular- Yönetim Kurulu üyesi, TTK m. 553 uyarınca kanundan veya esas sözleşmeden doğan yükümlülüklerini kusurlarıyla ihlal ettikleri takdirde hem şirkete hem pay sahiplerine hem de şirket alacaklılarına karşı verdikleri zarardan kusurları oranında hukuken sorumlu tutulmuşlardır. Sorumluluk davasının açılabilmesi için şirket yönetim kurulu üyelerinin esas sözleşmeye ve kanuna kusurlu olarak aykırı davranmış ve bu davranışından dolayı da şirketin zarar görmüş olması gerekmektedir. TTK m. 555'e göre anonim şirketin zararı nedeniyle şirket ve ortaklar aktif dava ehliyetine sahiptirler. Anılan hüküm uyarınca, yönetim kurulu üyesi kusurları sebebiyle şirketin uğradığı zararı m. 553 hükümlerine göre anonim şirkete ödemekle yükümlüdür. Ancak, yönetim kurulu üyelerinin esasen şirketi temsil yetkisine sahip olmaları sebebiyle kendi aleyhlerine dava açmaması ihtimaline karşılık pay sahiplerine de yönetim kurulu üyelerine karşı dava açma hakkı verilmiştir. Bir başka deyişle, yönetim kurulu üyelerinin şirkete zarara uğratması halinde, şirket bu davayı açabileceği gibi zarara uğrayan pay sahipleri de bağımsız olarak bu davayı açabileceklerdir. Anonim şirketin zarara uğraması halinde açılan davada tazminat şirkete ödenir. Hukuki sorumluluğu bulunan yönetim kurulu üyelerine karşı tazminat isteme hakkı davacının zararı ve sorumluyu öğrendiği tarihten itibaren iki yıl ve her halde zararı doğuran fiilin meydana geldiği günden itibaren beş yıl geçmekle zaman aşımına uğrar. TTK m. 556 uyarınca şirket alacaklılarının yönetim kurulu üyelerine karşı sorumluluk davasını açabilmeleri anonim şirketin iflası halinde mümkündür. Bu halde dahi öncelikli dava açma hakkı iflas idaresindedir. Şirket alacaklısı sorumluluk davasını ancak iflas idaresinin davayı açmaması halinde tazminat şirkete verilmek üzere açabilecektir. Sorumluluk davasında pasif dava ehliyetine sahip olanlar m. 553'de sayma yöntemine göre belirlenmiştir. Buna göre, kurucuların, yönetim kurulu üyelerinin, yöneticilerin ve tasfiye memurlarının şirkete verdikleri zarardan sorumlulukları bulunmaktadır. Ancak çalışmanın konusu gereğince burada sadece yönetim kurulu üyesi işaret edilmiştir.

Sonuç- 6102 sayılı TTK yönetim kurulu üyelerinin genel hukuki sorumluluğunu m. 553'de mülga Ticaret Kanunundan farklı olarak özel olarak düzenlemiştir. Yönetim kurulu üyelerinin hukuki sorumluluğundan dayanağı kusur prensibidir. Yani, kusuru bulunmayan hiçbir yönetim kurulu üyesi m. 553'e dayanarak sorumlu tutulamayacaktır. 6335 Sayılı Kanun ile yapılan düzenleme sonucunda kusurun ispatında yönetim kurulu üyesine olan kusur karinesi ilkesinden vazgeçilerek yönetim kurulu üyesi, kusursuzluğunu ispat etme külfetinden kurtulmuşlardır. Ayrıca m. 557 ile farklılaştırılmış teselsül ilkesi kabul edilerek her yönetim kurulu üyesini dış ilişkide sadece kusurları oranında sorumlu tutan anlayış getirilmiştir. Bu düzenleme sonucunda hiçbir yönetim kurulu üyesi kontrolü dışında kalan zararlardan sorumlu tutulamayacaktır.

Anahtar Kelimeler: Anonim şirket, yönetim kurulu üyesi, hukuki sorumluluk, kusur, farklılaştırılmış teselsül ilkesi
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ECONOMIC EFFECTS OF THE PANDEMIC ON CONSUMER BEHAVIOR AND CARGO SECTOR

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ABSTRACT

Purpose- The pandemic caused by the coronavirus, known as COVID-19, which first appeared in Wuhan, China in December 2019, has affected the whole world in many areas such as health, economy, business life, social life and education. The coronavirus has moved the retail industry, which is currently undergoing a rapid transformation, to the virtual environment even more rapidly. E-commerce and cargo companies can be seen as the most important actors of this transformation process. Within the scope of this study, the increased interest in e-commerce due to changing consumer behavior during the pandemic period and the reflection of these behavior change resulting on the amount of cargo transported are examined.

Methodology- In this study, internet usage, e-commerce volume and its effects on the cargo sector are analyzed in comparison with the world.

Findings- With the pandemic process, the number of internet users reached 60% of the whole world population, while the 18-44 age group constitutes 80% of internet users. While the share of e-commerce for the total retail volume in developed countries was 7.90% in 2015, this rate increased to 12.30% in 2019. While this rate was 7.40% in 2015 for the world in general, it is estimated to be 16% in 2020 and 22% in 2023. World e-commerce sales revenues were 1.3 trillion USD in 2014 and 3.5 trillion USD in 2019, and 6.5 trillion USD to be estimated. While the domestic e-commerce sales volume was 83.3 billion TL in the first 6 months of 2019, it was 91.7 billion TL in the first 6 months of 2020. The number of domestic cargoes transported approximately 3 times compared to 2019, and cargo companies employed a significant number of additional personnel to meet the increasing need. It was observed that the most ordered products were hygiene and sports products during the pandemic period.

Conclusion- Heavy workload of cargo has led to the emergence of new insights apart from the new projects. Especially the pandemic process has shown companies that turning to e-commerce is vital for the continuity of their commercial activities and companies have tended to be the supplier of major e-commerce platforms as well as establishing their own e-commerce sites. Seeing this need in the sector, entrepreneurs (especially for the delivery of perishable grocery products) developed new models and developed delivery models even during the day (with time commitments such as 20 minutes - 30 minutes). It is understood that these situations can change all processes from style to shopping habits and can direct commercial mentalities / activities. The possible effects of the pandemic are expected to continue in 2021. With the pandemic, the experienced digital transformation has retreated a few more years and accelerated.

Keywords: Pandemic period, Covid-19, retail industry, e-commerce, cargo companies

JEL Codes: M20, M30

PANDEMİNİN TÜKETİCİ DAVRANIŞLARINA VE KARGO SEKTÖRÜNE EKONOMİK ETKİLERİ

ÖZET

Amaç- İlk olarak 2019 yılının Aralık ayında Çin'in Wuhan şehrinde ortaya çıkan ve COVID-19 olarak bilinen Koronavirüsün sebep olduğu salgın hastalık, kısa sürede bütün dünyayı sağlık, ekonomi, iş hayatı, sosyal hayat ve eğitim gibi pek çok alanda etkilemiştir. Koronavirüs, halehazırda hızlı bir dönüşüm yaşamakta olan perakende sektörünü, daha da hızlı bir şekilde sanal ortama kaydırmıştır. Bu dönüşüm sürecinin en önemli aktörleri olarak, e-ticaret ve kargo firmaları görülebilir. Bu çalışma kapsamında, pandemi döneminde değişen tüketici davranışları nedeniyle e-ticarete alan ilginin artması ve bu davranış değişimi sonuçlarının taşınan kargo miktarına yansımalarının incelenmesi amaçlanmıştır.

Yöntem- Bu çalışmada internet kullanımı, e-ticaret hacmi ve kargo sektörüne olan etkileri, Dünya ile karşılaştırmalı olarak analiz edilmiştir.

Bulgular- Pandemi süreciyle birlikte, internet kullanıcı sayısı tüm dünya nüfusuna göre %60 seviyesine ulaşırken, 18-44 yaş grubu internet kullanıcılarının %80'nini oluşturmaktadır. Gelişmiş ülkelerde 2015 yılında toplam perakende hacmi için e-ticaretin payı %7.90 iken, bu oran 2019 yılında %12.30'a çıkmıştır. Bu oran Dünya geneli için 2015 yılında %7.40 iken, 2020 yılında %16 ve 2023 yılında %22 olması tahmin edilmektedir. Dünya e-ticaret satış gelirleri 2014 yılında 1.3 trilyon USD ve 2019 yılında 3.5 trilyon USD olarak gerçekleşmiş ve 2023 yılı için 6.5 trilyon USD olarak tahmin edilmektedir. 2019 yılının ilk 6 aylık döneminde yurtiçi e-ticaret satış hacmi 83.3 milyar TL iken, 2020 yılının ilk 6 aylık döneminde 91.7 milyar TL olarak gerçekleşmiştir. Yurtiçi taşınan kargo sayısı, 2019 yılına göre yaklaşık 3 kat artış gösterirken, artan ihtiyacı karşılamak için kargo firmaları önemli sayıda ilave personel istihdam etmiştir. Pandemi döneminde en fazla sipariş verişlen ürünlerin, hijyen ve spor ürünleri olduğu görülmüştür.

Sonuç- Kargo yoğunluğu, yeni projeler haricinde yeni anlayışların doğmasına neden olmuştur. Özellikle pandemi süreci firmalara e-ticarete yönelmenin ticari faaliyetlerinin devamlılığı adına hayati öneme sahip olduğunu göstermiş ve firmalar kendi e-ticaret sitelerini kurma yanında belli başlı e-ticaret platformlarının tedarikçisi olma eğilimine girmişlerdir. Sektördeki bu ihtiyacı gören girişimciler (Özellikle kolay bozulabilir market ürünlerinin teslimi konusunda) yeni yeni modeller geliştirerek gün içinde hatta (20 dakika – 30 dakika gibi zaman taahhütleri ile) teslimat modelleri geliştirmişlerdir. Sonuç olarak, içinde bulunulan geçici / kalıcı durumların, toplumsal olayların yaşam tarzından alışveriş alışkanlıklarına kadar tüm süreçleri değiştirebildiği bu durumların ticari zihniyetlere/faaliyetlere yön verebildiği anlaşılmaktadır. Pandeminin olası etkilerinin 2021 yılında da süreceleceği tahmin edilmektedir. Yaşanan dijital dönüşüm, pandemi ile beraber birkaç yıl daha geriye çekilmiş ve hızlanmıştır.

Anahtar Kelimeler: Pandemi dönemi, Covid-19, perakende sektörü, e-ticaret, kargo firmaları

JEL Kodları: M20, M30

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