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ISSN 2459-0762





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Social and Behavioral Sciences

PressAcademia Procedia publishes conference proceedings. **PressAcademia Procedia** is a scientific, academic, refereed and open-access journal. The publication languages are English and Turkish. **PressAcademia Procedia in Social and Behavioral Sciences** invites all conferences in the areas of business, economics, management, marketing, health management, logistics and trade, international business, business and labor law, finance, accounting, auditing, and other related social sciences. **PressAcademia Procedia** issues a DOI number for each manuscript published, an ISBN and a special volume number for each conference proceedings.

ISBN: 978-605-06192-8-7

12th Istanbul Finance Congress (IFC-2023)

IFC-2023 is an international congress hosted by Istanbul Technical University, Istanbul, Turkiye. IFC-2023 had participants from 15 different countries, namely; Turkiye, Jordan, Switzerland, USA, Germany, Italy, Czech Republic, Kosova, Morocco, Nigeria, Hungary, Spain, Bosnia, Turkish Republic of Cyprus, Romania. Hence, IFC-2023 is qualified an "International Congress" by the Higher Education Council of Turkiye.

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ISTANBUL FINANCE CONGRESS (IFC) | December 21, 2023 | Istanbul

CONGRESS PROGRAM

12th Istanbul Finance Congress (IFC-2023) hosted by Istanbul Technical University has participants from 15 different countries, namely; Turkiye, Jordan, Switzerland, USA, Germany, Italy, Czech Republic, Kosova, Morocco, Nigeria, Hungary, Spain, Bosnia, Turkish Republic of Cyprus, Romania. Hence, IFC-2023 is qualified an "International Congress" by the Higher Education Council of Turkiye.

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Zoom for Opening Session

<https://zoom.us/j/96299575237>

OPENING SPEECHES | SESSION 1 | ROOM 1 | December 21, 2023, Thursday

10.00-10.10	Prof. Oktay Tas, Istanbul Technical University, Welcome Speech, Congress Co-President
10.10-10.20	Prof. Suat Teker, Isik University, Welcome Speech, Congress Co-President
10.20-10.40	Keynote Speaker I - Prof. Thorsten Hens, Zurich University, Switzerland. Is Sustainable Investing Good for the Environment?
10.40-11.00	Keynote Speaker II - Prof. Frank Andreas Schittenhelm, Nürtingen-Geislingen University, Germany. Teaching Finance – Trends and Challenges
11.00-11.20	Keynote Speaker III - Prof. Tom Gillpatrick, Portland State University, USA. Global Business Planning in a Polycrisis World

PRESENTATION SESSIONS

ZOOM LINK	https://zoom.us/j/96299575237	https://zoom.us/j/96691613008
11.30 - 15.00	ROOM 1 SESSION 2.1 Chair: Prof. Oktay Tas, Istanbul Technical University	ROOM 2 SESSION 2.2 Chair: Assoc. Prof. Cumhuri Ekinci, Istanbul Technical University
11.30 - 11.45	Growth nexus of industrial sector development and sustainable growth in Africa Okwor Emmanuel Ejimnkonye, Evangel University, Nigeria Remigius Chinwoke Ejinkonye, Evangel University, Nigeria	Determinants of bank credit in Jordan and Palestine: a comparative study Ruba Dirani, University of Jordan Mohammad Khataibeh, University of Jordan Ghassan Omet, University of Jordan
11.45 - 12.00	Underpricing of IPOs (Initial Public Offering) in Borsa Istanbul: the effect of Covid-19 pandemic period Alper Ataker, Istanbul Technical University, Turkiye Oktay Tas, Istanbul Technical University, Turkiye	Momentum and contrarian trading by investor segments Baki Cem Sahin, Central Bank of Turkiye
12.00 - 12.15	Mapping the intellectual structure and evolution of information technology and auditing: a bibliometric review Esteban Perez Calderon, University of Extremadura, Spain Samer Azeez Alrahamneh, University of Extremadura, Spain	Innovation and financial performance: an European evidence Carmelo Ingrisano, University of Cassino and Southern Lazio, Italy Anna Maria Calce, University of Cassino and Southern Lazio, Italy Elisa Cafolla, University of Cassino and Southern Lazio, Italy Michele Lentini, University of Cassino and Southern Lazio, Italy



12.15 - 12.30	Management sciences and finance: what epistemological and methodological perspectives?	Tapping into long term value: a comprehensive overview of BIST30 index companies' future potential
	Benjana, H., Mohamed Premier University, Morocco	Zekeriya Bildik, Istanbul Technical University, Turkiye
	Mesnaoui, O., Mohamed Premier University, Morocco	Kaya Tokmakcioglu, Istanbul Technical University, Turkiye
12.30 - 12.45	Turkiye as a regional hub	Factors affecting country fintech: an European analysis
	Suat Teker, Isik University, Turkiye	Loris Di Nallo, University of Cassino and Southern Lazio, Italy
	Dilek Teker, Isik University, Turkiye	Anna Paola Micheli, University of Cassino and Southern Lazio, Italy
12.45 - 13.00	The digitalization-growth nexus: some empirical evidence from four regions with a Muslim majority	The competitiveness disparity between core and peripheral EU countries: an empirical analysis with panel ARDL approach
	Mehmed Ganic, International University of Sarajevo, Bosnia	Tayfun Tuncay Tosun, Istanbul Aydin University, Turkiye
13.00 - 13.15	Relations between the Central-European trade routes and revenues of EU members	Exploring carbon taxes as catalysts for financing nuclear power projects in Turkiye
	Gabor Miklos, Corvinus University of Budapest, Hungary	Ahmet Gokhan Sahin, Baskent University, Turkiye
		Guray Kucukcocaoglu, Baskent University, Turkiye
13.15 - 13.30	ESG sustainable technologies literature review using cluster-based methods	The importance of innovation in the circular economy
	Mohammad Zakaria Alqudah, Valencia University, Spain	Lucas Blazek, University of Finance and Administration, Czech Republic
	Laura Sierra-Garcia, Public University of Olavide, Sevilla, Spain	
13.30 - 13.45	Empirical investigation into the integration of cloud-based artificial intelligence in auditing	Innovative transformation in finance: global and Turkish perspectives on crowdfunding
	Yazan Abdelmajid Abu Huson, Valencia University, Spain	Askim Nurdan Tumbek Tekeoglu, Istanbul Commerce University, Turkiye
	Laura Sierra-Garcia, Public University of Olavide, Sevilla, Spain	Recep Ali Kucukcolak, Istanbul Commerce University, Turkiye
13.45 - 14.00	Detecting frauds in financial statements: a comprehensive literature review between 2019 and 2023	The effects of policy rate announcements on the exchange rates
	Saadet Gaffaroglu, Yildiz Technical University, Turkiye	Suat Teker, Isik University, Turkiye
	Selcuk Alp, Yildiz Technical University, Turkiye	Dilek Teker, Isik University, Turkiye
14.00 - 14.15	Advancing financial reporting in the Western Balkans: a bibliometric analysis of AI and IFRS integration for sustainable accounting	A review of the shares of the central bank from its creation up to the second world war
	Luan Vardar, University of Ukshin Hoti Prizren, Kosova	Gizel Busem Sayil, Independent Researcher, Turkiye
14.15 - 14.30	Reinforcement learning in individual pension system: the case of Turkiye	Financial sustainability of higher education system
	Yunis Dede, Gebze Technical University, Turkiye	Ali Eskinat, Netkent University, Turkish Republic of Cyprus
	Sadettin Haluk Citci, Gebze Technical University, Turkiye	Suat Teker, Isik University, Turkiye
14.30 - 14.45	Monetary momentum and risk management in stock market	The close connection between liquidity and profitability: analysis of the retail market
	Erdem Kilic, Turkish-German University, Turkiye	Lucian Gabriel Maxim, Transilvania University of Brasov, Romania
	Sitki Sonmez, Istanbul Commerce University, Turkiye	
14.45 - 15.00	Handling missing values in mixed panel financial data: a comparison of different techniques	Do regional tax incentives in Turkiye increase household incomes?
	Cumhur Ekinci, Istanbul Technical University, Turkiye	Raziye Selim, Istanbul Technical University, Turkiye
	Mustafa Abdullah Hakkoz, Istanbul Technical University, Turkiye	Suat Kucukciftci, Istanbul Technical University, Turkiye
	Unsal Kiran, Istanbul Technical University, Turkiye	
	Sirma Seker, Istanbul Technical University, Turkiye	

15.00 - 16.45	ROOM 1 SESSION 3.1	ROOM 2 SESSION 3.2
	Chair: Prof. Deniz Parlak, Dogus University	Chair: Dr. Umit Tura, Bolu Abant Izzet Baysal University
15.00 - 15.15	Cryptocurrency interest in geographical regions with high unemployment rates - <i>İşsizlik oranı yüksek olan coğrafi bölgelerin kripto para ilgilenimi</i> Elif Bezirgan, Balikesir University, Turkiye	The relationship of fintech investments with economic factors, technological factors and financial development: the example of Turkiye and China - <i>Fintek yatırımlarının ekonomik faktörler, teknolojik faktörler ve finansal gelişim ile ilişkisi: Türkiye ve Çin örneği</i> Erdi Zengin, Istanbul Technical University, Turkiye
15.15 - 15.30	Sharia compliance and stock portfolio return: a field study - <i>Şeriat uyumu ve hisse senedi portföy getirisi: bir saha çalışması</i> Deniz Parlak, Dogus University, Turkiye	Towards better IT governance: a comprehensive IT internal control model for information technology firms - <i>Daha iyi BT yönetimine doğru: bilgi teknolojisi firmaları için kapsamlı bir BT iç kontrol modeli</i> Zeyd Gulesin, Turkish Technology, Turkiye
15.30 - 15.45	Tools for hiding currency risk: application of data analysis - <i>Kur riskinden korunma araçları: veri analizi uygulaması</i> Aysegül Aydoğan, Isik University, Turkiye Ercan Calis, Marmara University, Turkiye	Examining the relationship between bitcoin and altcoins - <i>Bitcoin ve altcoinler arasındaki ilişkinin incelenmesi</i> Esra Aksoylu, Maltepe University, Turkiye
15.45 - 16.00	Causality relationship between bank indices: an application on selected countries - <i>Banka endeksleri arası nedensellik ilişkisi: seçilmiş ülkeler üzerinde bir uygulama</i> Levent Sezal, Kahramanmaraş Sutcu Imam University, Turkiye Ahmet Serbetci, Kahramanmaraş Sutcu Imam University, Turkiye	Analysis of the relationship between ESG scores and financial performance of the companies in the BIST sustainability index - <i>BIST sürdürülebilirlik endeksindeki şirketlerin sürdürülebilirlik notları ile finansal performansları arasındaki ilişkinin analizi</i> Mete Bumin, Banking Regulation and Supervision Agency, Turkiye Aysegül Ertugrul, Istanbul Gelisim University, Turkiye
16.00 - 16.15	The relationship between money supply and inflation: analysis with panelvar approach - <i>Para arzı ve enflasyon ilişkisi: panelvar yaklaşımı ile analizi</i> Esengül Özdemir Altınisik, Duzce University, Turkiye Basak Tanınmış Yucememis, Marmara University, Turkiye	Exchange rate hedged deposit accounts as a macroprudential monetary policy instrument - <i>Makro ihtiyati para politikası aracı olarak kur korumalı mevduat hesabı uygulaması</i> Halil Tunali, Istanbul University, Turkiye Duygu Kalkay, Bandirma University, Turkiye
16.15 - 16.30	The impact of governance scores, leverage, and Tobin's q on credit risk: an analytical study - <i>Yönetişim skorları, kaldıraç ve Tobin's q'nun kredi riski üzerindeki etkisi: bir analiz çalışması</i> Elif Guneren Genc, Istanbul Commerce University, Turkiye Ertunc Ererdi, Istanbul Commerce University, Turkiye	Financial literacy practices of public institutions: the case of Turkiye - <i>Kamu kurumlarının finansal okuryazarlık uygulamaları: Türkiye örneği</i> Umit Tura, Bolu Abant Izzet Baysal University, Turkiye
16.30 - 16.45	Factors impacting the price of the gold: an empirical study of EGARCH model Serkan Cankaya, Istanbul Commerce University, Turkiye Murat Konuklar, Istanbul Commerce University, Turkiye	Gender difference in financial inclusion: a comparative analysis Dilek Teker, Isik University, Turkiye Sena Donmez, Isik University, Turkiye



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224	Sezgin Gunes	Isbank
225	Sırma Seker	ITU
226	Sıtkı Sonmezer	Istanbul Ticaret University
227	Simge Gezmez	Isbank
228	Suat Kucukciftci	ITU
229	Suat Teker	Isik University
230	Suheyla Nur Ciftci	Isbank
231	Sultan Cetinbas Karul	Isbank
232	Sumru Ayatar	Isbank
233	Talat Anıl Arslanpay	Isbank
234	Taner Yucedag	Isbank
235	Tayfun Tuncay Tosun	İstanbul Aydın University
236	Thorsten Hens	Zurich University, Switzerland
237	Tom Gillpatrick	Portland State University
238	Umit Tura	Abant İzzet Baysal U
239	Unal Cakmak	Isbank
240	Unsal Kiran	ITU
241	Ural Berk Karaoglanoglu	Isbank
242	Vennur Akyıldız	Isbank
243	Vezire Didem Bulduk	Isbank
244	Volkan Colak	Isbank
245	Volkan Coşkun	Isbank
246	YAMANI, O	Université Mohamed Premier, Morocco
247	Yasemin Tarakcı	Isbank
248	Yazan Abdelmajid Abu Huson	Univ of Valencia, Spain
249	Yenisel Ozgur Taskinoz	Isbank
250	Yesim Sariibrahim	Isbank
251	Yılmaz Kok	Isbank
252	Yunis Dede	Gebze Technical Unşversity
253	Zekeriya Bildik	Istanbul Technical University
254	Zeyd Gülesin	Turkish Technology
255	Zeynep Demirtas	Isbank
256	Zeynep Gizem Guvenc	Isbank
257	Zeynep Simsek Yorulmazel	Isbank

CONTENT

Title and Author/s	Page
1. Tapping into long term value: a comprehensive overview of BIST 30 Index companies' future potential	
<i>Bildik, Z., Tokmakcioglu, K.</i>	1-5
DOI: 10.17261/Pressacademia.2023.1843	
PAP- V.18-2023(1)-p.1-5	
2. Cryptocurrency interest in geographical regions with high unemployment rates	
<i>Bezirgan, E.</i>	6-11
DOI: 10.17261/Pressacademia.2023.1844	
PAP- V.18-2023(2)-p.6-11	
3. Underpricing of IPOs (Initial Public Offering) in Borsa Istanbul: The effect Of Covid-19 pandemic period	
<i>Ataker, A., Oktay, T.</i>	12-19
DOI: 10.17261/Pressacademia.2023.1845	
PAP- V.18-2023(3)-p.12-19	
4. Relations between the Central-European trade routes and revenues of EU members	
<i>Miklós, G.</i>	20-30
DOI: 10.17261/Pressacademia.2023.1846	
PAP- V.18-2023(4)-p.20-30	
5. Exploring carbon taxes as catalysts for financing nuclear power projects in Turkey	
<i>Sahin, A.G., Kucukkocaoglu, G.</i>	31-37
DOI: 10.17261/Pressacademia.2023.1847	
PAP- V.18-2023(5)-p.31-37	
6. Tools for hiding currency risk: application of data analysis	
<i>Aydogdu, A., Calis, E.</i>	38-46
DOI: 10.17261/Pressacademia.2023.1848	
PAP- V.18-2023(6)-p.38-46	
7. Detecting frauds in financial statements: a comprehensive literature review between 2019 and 2023 (June)	
<i>Gaffaroglu S., Alp S.</i>	47-51
DOI: 10.17261/Pressacademia.2023.1849	
PAP- V.18-2023(7)-p.47-51	
8. Causality relationship between bank indices: an application on selected countries	
<i>Sezal, L., Serbetci, A.</i>	52-56
DOI: 10.17261/Pressacademia.2023.1850	
PAP- V.18-2023(8)-p.52-56	

CONTENT

Title and Author/s	Page
9. Analysis of the relationship between sustainability scores and financial performance of the companies in the BIST sustainability index <i>Bumin, M., Ertugrul, A.</i> DOI: 10.17261/Pressacademia.2023.1851 PAP- V.18-2023(9)-p.57-62	57-62
10. Currency protected deposit account implement as a macroprudential monetary policy instrument <i>Tunali, H., Kalkay, D.</i> DOI: 10.17261/Pressacademia.2023.1852 PAP- V.18-2023(10)-p.63-68	63-68
11. Innovation and financial performance: an European evidence <i>Intrigano, C., Calce, A.M., Cafolla, E., Lentini, M.</i> DOI: 10.17261/Pressacademia.2023.1853 PAP- V.18-2023(11)-p.69-70	69-70
12. Financial Sustainability of Higher Education System <i>Eskinat, A., Teker, S.</i> DOI: 10.17261/Pressacademia.2023.1854 PAP- V.18-2023(12)-p.71-72	71-72
13. The relationship between money supply and inflation: analysis with panelvar approach <i>Altinisik, E.O., Yucememis, B.T.</i> DOI: 10.17261/Pressacademia.2023.1855 PAP- V.18-2023(13)-p.73-75	73-75
14. Determinants of bank credit in Jordan and Palestine: a comparative study <i>Dirani, R., Khataibeh, M., Omet, G.</i> DOI: 10.17261/Pressacademia.2023.1856 PAP- V.18-2023(14)-p.76-77	76-77
15. The effects of policy rate announcements on the exchange rates <i>Teker, S., Teker, D., Gumustepe, .</i> DOI: 10.17261/Pressacademia.2023.1857 PAP- V.18-2023(15)-p.78-79	78-79
16. The close connection between liquidity and profitability: analysis of the retail market <i>Maxim, L.G.</i> DOI: 10.17261/Pressacademia.2023.1858 PAP- V.18-2023(16)-p.80-81	80-81
17. Factors affecting country fintech: an european analysis <i>Di Nallo, L., Micheli, A.P., Giangrande, N.</i> DOI: 10.17261/Pressacademia.2023.1859 PAP- V.18-2023(17)-p.82-83	82-83



CONTENT

Title and Author/s	Page
18. Digitalization-growth nexus: some empirical evidence from four regions with a Muslim majority <i>Ganić, M.</i> DOI: 10.17261/Pressacademia.2023.1860 PAP- V.18-2023(18)-p.84-85	84-85
19. The competitiveness disparity between core and peripheral EU countries: an empirical analysis with panel ARDL approach <i>Tosun, T.T.</i> DOI: 10.17261/Pressacademia.2023.1861 PAP- V.18-2023(19)-p.86-87	86-87
20. Esg Sustainable Technologies Literature Review Using Cluster-Based Methods <i>Alqudah, M.Z., Garcia, L.S., Benau, M.A.G.</i> DOI: 10.17261/Pressacademia.2023.1862 PAP- V.18-2023(20)-p.88-89	88-89
21. Gender difference in financial behavior: a comparative analysis <i>Teker, D., Donmez, S.</i> DOI: 10.17261/Pressacademia.2023.1863 PAP- V.18-2023(21)-p.90-91	90-91
22. Examining the relationship between bitcoin and altcoins <i>Aksoylu, E.</i> DOI: 10.17261/Pressacademia.2023.1864 PAP- V.18-2023(22)-p.92-94	92-94
23. Advancing financial reporting in the Western Balkans: a bibliometric analysis of AI and IFRS integration for sustainable accounting <i>Vardari, L.</i> DOI: 10.17261/Pressacademia.2023.1865 PAP- V.18-2023(23)-p.95-96	95-96
24. Turkiye as a regional hub <i>Teker, S., Teker, D., Orman, I.</i> DOI: 10.17261/Pressacademia.2023.1866 PAP- V.18-2023(24)-p.97-98	97-98
25. Towards better IT governance: a comprehensive it internal control model for information technology firms <i>Gulesin, Z.</i> DOI: 10.17261/Pressacademia.2023.1867 PAP- V.18-2023(25)-p.99-100	99-100

CONTENT

Title and Author/s	Page
26. A review of the shares of the Central Bank from its creation up to the Second World War <i>Sayil, G.B.</i> DOI: 10.17261/Pressacademia.2023.1868 PAP- V.18-2023(26)-p.101-102	101-102
27. Handling missing values in mixed panel financial data: a comparison of different techniques <i>Ekinci, C., Hakkoz, M.A., Kiran, U., Seker, S.</i> DOI: 10.17261/Pressacademia.2023.1869 PAP- V.18-2023(27)-p.103-104	103-104
28. Trading behavior by foreign and domestic investors <i>Sahin, B.C.</i> DOI: 10.17261/Pressacademia.2023.1870 PAP- V.18-2023(28)-p.105-106	105-106
29. Mapping the intellectual structure and evolution of information technology and auditing: a bibliometric review <i>Calderon, E. P., Alrahamneh S. A.</i> DOI: 10.17261/Pressacademia.2023.1871 PAP- V.18-2023(29)-p.107-108	107-108
30. Research methodology in finance <i>Benjana, H., Mesnaoui, O., Yamani, O.</i> DOI: 10.17261/Pressacademia.2023.1872 PAP- V.18-2023(30)-p.109-110	109-110
31. Reinforcement learning in individual pension system: the case of Turkey <i>Dede, Y., Citci, S. H., Yanikkaya, H.</i> DOI: 10.17261/Pressacademia.2023.1873 PAP- V.18-2023(31)-p.111-112	111-112
32. Empirical investigation into the integration of cloud-based artificial intelligence in auditing <i>Huson, Y.A.A., Garcia, L.S., Benau, M.A.G., Aljawarneh, N.M.</i> DOI: 10.17261/Pressacademia.2023.1874 PAP- V.18-2023(32)-p.113-114	113-114
33. Shari-Ah convergence and stock portfolio returns: a field study <i>Parlak, D.</i> DOI: 10.17261/Pressacademia.2023.1875 PAP- V.18-2023(33)-p.115-116	115-116
34. Financial literacy practices of public institutions: the case of Turkiye <i>Tura, U.</i> DOI: 10.17261/Pressacademia.2023.1876 PAP- V.18-2023(34)-p.117-118	117-118



CONTENT

Title and Author/s	Page
35. Monetary momentum and risk management in stock market <i>Kilic, E., Sonmezer, S.</i> DOI: 10.17261/Pressacademia.2023.1877 PAP- V.18-2023(35)-p.119-120	119-120
36. Factors impacting the price of the gold: an empirical study of EGARCH model <i>Cankaya, S., Konuklar, M.</i> DOI: 10.17261/Pressacademia.2023.1878 PAP- V.18-2023(36)-p.121-129	121-129
37. Innovative transformation in finance: global and Turkish perspectives on crowdfunding <i>Tekeoglu, A.N.T., Kucukcolak, R.A., Kucukcolak, N.I.</i> DOI: 10.17261/Pressacademia.2023.1879 PAP- V.18-2023(37)-p.130-140	130-140
38. Is sustainable investing good for the environment? <i>Thorsten, H., Benli, V.F.</i> DOI: 10.17261/Pressacademia.2023.1880 PAP- V.18-2023(38)-p.141-142	141-142



TAPPING INTO LONG TERM VALUE: A COMPREHENSIVE OVERVIEW OF BIST 30 INDEX COMPANIES' FUTURE POTENTIAL

DOI: 10.17261/Pressacademia.2023.1843

PAP- V.18-2023(1)-p.1-5

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To cite this document

Bildik, Z., Tokmakcioglu, K., (2023). Tapping into long term value: a comprehensive overview of BIST 30 index companies' future potential. PressAcademia Procedia (PAP), V.18, 1-5.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1843>

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ABSTRACT

Purpose - This article aims to establish a correlation between the valuation potential of companies listed on the Borsa Istanbul 30 index and their enduring competitive advantage, focusing on microeconomic Key Performance Indicators (KPIs) and corporate governance dimensions.

Methodology - The study conducted an extensive analysis of the financial statements of BIST 30 companies spanning three years. Employing a unique approach utilizing Triangular Spherical Fuzzy Sets, it assessed the significance of these KPIs and corporate dimensions, chosen for their capacity to handle imprecise data. Three experts were consulted over three years to assign importance scores to each indicator, which were then used to calculate cumulative scores for individual stocks.

Findings - The application of the Triangular Spherical Fuzzy Sets method provided a comprehensive understanding of these indicators, enabling a nuanced evaluation of the cumulative score for each stock. Notably, a clear distinction emerged between service and manufacturing companies, suggesting a potential glass ceiling effect that favors production-oriented enterprises. The observed patterns in certain stocks aligned with the framework developed in this study.

Conclusion - This study illustrates the use of fuzzy logic in evaluating stock valuation potential, revealing insights into their sustained growth prospects. Aligned with Warren Buffett's value investing principles, it advances modeling approaches within the Turkish public stock exchange. Offering a unique perspective on BIST 30 stocks' long-term valuation potential, it provides valuable insights for investors, stakeholders, and analysts in the dynamic finance landscape. Emphasizing the understanding of companies' enduring competitive strength in an evolving market is pivotal.

Keywords: Value investing, triangular spherical fuzzy sets, long term competitive advantage, corporate governance.

JEL Codes: D46; C58; C81

1. INTRODUCTION

Forecasting stock returns and long-term growth has remained a persistent focus within finance (Bernstein, 2016). Advances in information dissemination have accelerated data flow, elevating market transparency and efficiency (Ariely, 2016). An influential paradigm shift, led by Benjamin Graham, emphasizes the selection of undervalued stocks based on intrinsic worth, advocating comprehensive analysis of financial statements and market position. Graham's value investing strategy prioritizes tangible factors—earnings, assets, and liabilities—over market sentiments, aiming to identify stocks undervalued in the market. Investors following this philosophy scrutinize a company's financial health, earnings potential, and asset value, seeking opportunities for long-term growth (Zhang, 2022). Warren Buffett, a disciple of Graham, further refined value investing, stressing the significance of qualitative aspects like competitive advantages and management quality alongside quantitative metrics (Rajaratnam et al., 2014).

In the vast array of investment options within stock markets, discerning the specifications that yield long-term value remains a quest. Is there a miracle formula amidst this complexity? Our research aims to address this by scrutinizing the long-term valuation prospects of companies within the Borsa Istanbul 30 index. Delving into the intricacies of company valuation, our study introduces a novel perspective by integrating key financial KPIs—such as gross profit margin, cash flow ratios, working capital metrics, market value to book value—alongside critical corporate governance dimensions. Through the application of an innovative methodology, the Triangular Spherical Fuzzy Sets, we amalgamate robust KPI values with expert evaluations to derive a composite score. This score serves as a yardstick to assess companies' long-term competitive advantage, enabling the ranking of BIST 30 index companies based on their valuation potential.

Employing this unique methodology, our study provides a strategic framework combining microeconomic indicators to gauge the long-term valuation potential of stocks. This framework offers insights into expected stock price trajectories under typical market conditions, elucidating the principles of Warren Buffett's value investing strategy within the Turkish public stock exchange context.

2. LITERATURE REVIEW

In the fiercely competitive market landscape, establishing a long-term competitive advantage stands as the cornerstone of success. The means to achieve this advantage are multi-faceted, and the degree of a company's long-term competitive strength varies accordingly. Some research suggests that nurturing long-term competitive power is intricately linked to Corporate Social Responsibility (CSR). These studies explore ESG metrics, seeking meaningful correlations between ESG scores and key financial performance indicators such as ROA, ROE, and stock returns (Wang et al., 2015; Saeidi et al., 2015; Blasi et al., 2018). The underlying premise is that corporate management guided by solid principles, values, and societal considerations can outperform even ostensibly more rational management styles. This perspective underpins the contemporary approach to sustainability adopted by organizations, emphasizing not only profitability but also environmental and societal sensitivity. Alshehhi et al. (2018) analyzed 132 papers from top journals, revealing that 78% of them indicate a positive relationship between corporate governance metrics and financial performance.

On the other hand, some research focuses on microeconomic KPIs as a predictor and result of long-term competitive power and thereby valuation potential of stocks. Ibrahim and Meghouar (2019) examines value creation relationship between some microeconomic KPIs like turnover, operating cost, working capital and explores positive relationship between valuation and these KPIs in larger companies. Hristov et al. (2022) defines five sustainable key performance indicators for long term success of the company as environmental, economic, social, cultural and organizational dimensions and managed interviews with 110 managers to determine sustainable key performance drivers.

3. THE DATA AND METHODOLOGY

The Fuzzy Theory, introduced Zadeh introduced the Fuzzy Theory to tackle the challenges posed by an increasingly uncertain world inundated with information (Zadeh, 1965). The development of Spherical Fuzzy sets by Kahraman and Gundogdu (2018) presented a more comprehensive approach by integrating membership, non-membership, and hesitancy degrees, ranging from zero to one. However, in finance, expert opinions are often presented in intervals denoting key expectations and ranges, commonly displayed as medians, maximums, and minimums. To align this interval representation with spherical fuzzy sets, we created triangular spherical fuzzy sets. Here, expert evaluations correspond to the midpoint, while the minimum and maximum points signify the lower and upper limits for membership, non-membership, and hesitancy values.

$SFS = \{u, ([\mu_{SFS}(x), \nu_{SFS}(x), \pi_{SFS}(x)]) \mid u \in U\}$ where $\mu_{SFS} : FS \rightarrow [0,1]$, $\nu_{SFS} : FS \rightarrow [0,1]$, $\pi_{SFS} : FS \rightarrow [0,1]$

$$0 \leq (\mu_{SFS}^2(x) + \nu_{SFS}^2(x) + \pi_{SFS}^2(x)) \leq 1 \quad \forall x \in FS \quad (1)$$

$\mu_{SFS}(x)$, $\nu_{SFS}(x)$ and $\pi_{SFS}(x)$ represent degrees of membership, non-membership and hesitancy of x to FS , respectively. Triangular Spherical Fuzzy Sets (SFS) A_{TFS} spherical fuzzy set of the universe of discourse U is given by

$$A_{TFS} = \{u, ([\mu(u), \mu_m(u), \mu_h(u)], [\nu(u), \nu_m(u), \nu_h(u)], [(\pi(u), \pi_m(u), \pi_h(u))]) \mid u \in U\} \quad (2)$$

where $\mu_{A_{TFS}} : U \rightarrow [0,1]$, $\nu_{A_{TFS}} : U \rightarrow [0,1]$, $\pi_{A_{TFS}} : U \rightarrow [0,1]$

μ : membership degree, ν : non-membership degree, π : hesitancy degree

Triangular Spherical Weighted Arithmetic Mean (TRSWAM) has been created to be applied for expert evaluations. TRSWAM is defined as

$$w = (w_1, w_2, w_3, \dots, w_n) ; w_i \in [0,1] ; \sum_{i=1}^n w_i = 1,$$

$$TRSWAM_w(TRSFS_1, \dots, TRSFS_n) = w_1 TRSFS_1 + w_2 TRSFS_2 + \dots + w_n TRSFS_n$$

$$= \left\{ \left[\left(1 - \prod_{i=1}^n (1 - \mu_{TRSFS_i}^2)^{w_i} \right)^{1/2}, \prod_{i=1}^n \nu_{TRSFS_i}^{w_i}, \left[\prod_{i=1}^n (1 - \mu_{TRSFS_i}^2)^{w_i} - \prod_{i=1}^n (1 - \mu_{TRSFS_i}^2 - \pi_{TRSFS_i}^2)^{w_i} \right]^{1/2} \right\} \quad (3)$$

Step 1: Expert Selection: It is selected a panel of three experts to assess the relative importance of five Key Performance Indicators (KPIs) and five dimension of company concerning long-term competitive advantages year by year. Three experts have been chosen based on fuzzy logic background, trade experience, and being well informed about economic trends spanning from 2000-2022.

Step 2: Selection of Key Performance Indicators for BIST 30 Valuation Potential: Evaluating a company's value holds significant importance for investors, stakeholders, and potential buyers as it shapes their assessment criteria. Strengthening a company's valuation is intricately tied to establishing a sustainable competitive advantage, fostering improved profitability, and bolstering financial robustness. To delve deeper into this aspect, a set of six Key Performance Indicators (KPIs) has been identified as reliable metrics for assessing long-term competitive advantage: gross profit margin, cash flow from investments / net sales, cash flow from operations / total liabilities, net working capital / net sales, total liability / shareholder equity, market value / book value. These chosen KPIs, emphasizing profitability, investment effectiveness, financial stability, play a crucial role in evaluating a company's potential for sustainable competitive advantage and, as a result, its appeal to investors and stakeholders.

Step 3: Selection of dimensions for BIST 30 stocks Valuation Potential: The valuation prospects of stocks are deeply intertwined with a comprehensive understanding of a company's management, financial strategies, market position, and growth trajectory. Evaluating these pivotal factors empowers investors and stakeholders to make informed decisions about the company's potential for sustained success and

its attractiveness as an investment. Corporate governance metrics play a pivotal role in determining long-term competitive advantage and, consequently, the valuation potential of companies. Expert evaluations, involving meticulous analyses of the company's corporate governance and growth metrics, required nearly 250 hours per expert. Evaluation criteria of each dimension is given at Table 1.

Table 1: Dimension Evaluation Criteria

Shareholder perspective	Transparency and Public Relations	Stakeholders' Perspective	Board of Directors	Business and Growth Strategy
Shareholder Rights and Equitable Treatment	Communication Strategies and Stakeholder Engagement	Stakeholder Engagement and Collaboration	Board Composition and Diversity	Strategic Planning and Execution
Dividend Policies and Shareholder Returns	Disclosure Policies and Reporting Practices	Corporate Social Responsibility (CSR) Initiatives	Leadership Structure and Independence	Long-Term Vision and Goals Alignment
Transparency in Financial Reporting to Shareholders	Investor Relations and Shareholder Communications	Ethical Practices and Stakeholder Rights	Governance Oversight and Risk Management	Market Expansion and Diversification Strategies
Governance Structure and Board Accountability	Ethics and Integrity in Public Communications	Supply Chain and Vendor Relationships	Committees and Their Responsibilities	Innovation and Research & Development Focus
Voting Rights and Proxy Access	Crisis Management and Reputation Building	Employee Relations and Workplace Culture	Director Qualifications and Expertise	Acquisitions and Partnerships for Growth
Shareholder Activism and Engagement	Community Engagement and Social Responsibility	Environmental Sustainability and Impact	Board Evaluation and Performance Assessment	Performance Measurement and KPIs
Conflict Resolution and Dispute Handling with Shareholders	Media Relations and Public Perception Management	Community Development and Contributions	Decision-Making Processes and Transparency	Risk Management in Growth Initiatives

Step 4: Expert Weighting & Aggregation & Defuzzification Process: To ensure a comprehensive and fair evaluation, different levels of expertise among experts were accounted for by assigning specific weights to their assessments. These assessments were combined using aggregation and defuzzification methods, generating precise values for the six KPIs and five dimensions from 2020 to 2022. Assigning relative weights to experts based on their individual proficiency, finance experience, and stock market knowledge represented as $w(i)$, where i ranges from 1 to 3, was a deliberate process. These weights are given as 40 %, 30 % and 30 % (Kahraman et al. 2020), were calibrated to ensure $\sum w_i = w_1 + w_2 + w_3 = 1$. In the process of weighting and aggregation TRSWAM operator has been employed. In defuzzification process; It is then revisited aggregated expert evaluations of these eleven indicators (six KPIs + five dimensions) where:

For $n=1$ to 11 and For $j=2020$ to 2022

$$D(I_{n,j})^* = ((a\mu_{ji} + a\mu_{jm} + a\mu_{jn}) - (av_{ji} + av_{jm} + av_{jn}) - (av_{ji} + av_{jm} + av_{jn})/2)/3 \quad (4)$$

Where $D(I_{n,j})$ represent defuzzified indicator with number n belongs to year j . This procedure leads to a defuzzified expert evaluation for each indicator, playing a vital role in establishing the scores for long-term competitive power.

Step 5: Evaluation of Indicators: Recognizing the varying influence of different indicators on a company's long-term competitive advantage, three supplementary experts were engaged to assess these indicators based on their individual significance in determining a company's enduring competitive strength. Using a five-point linguistic scale—from 'not important' to 'very important'. These linguistic assessments were subsequently defuzzified using a triangular linguistic scale. The final crisp weight scores for the KPIs were then computed, portraying their respective importance levels.

Step 6: Calculation of Indicators: As of December 31, 2022, BIST 30 index companies listed. Four of these companies are financial institution, were excluded from the analysis due to the typical balance sheet structure of finance companies, which distorts the values of the first group of indicators. The first set of six indicators, referred to as KPIs for 2020-2022, were computed based on the financial statements (Url-1). On the other hand, a separate set of five indicators referred to as dimensions underwent evaluation by three experts. Employing a seven-point linguistic scale—from 'outstanding' to 'disaster', these experts conducted their assessments. These linguistic evaluations were then clarified using a triangular linguistic scale for five indicators.

Step 7: Normalization of Indicators and Relative Point Scoring: In the process of normalizing indicators, max-min normalization was applied to nine indicators, excluding the total liability / shareholder equity and market value / book value (Khanmohammadi et al. 2019). This is because this particular KPI lacks a specific optimal value, neither a maximum nor a minimum. For this indicator, the median value of the Borsa Istanbul 100 index companies over the past five years was adopted as the reference value for the normalization process for leverage ratio. On the other hand, industry averages has been employed for normalization of market value / book value (Url-2).

According to the selected approach of max-min normalization or optimum point normalization:

$$\text{For } n=1 \text{ to } 11, \text{ For } j=2020 \text{ to } 2022 \text{ in where; Normalized } (I_{n,j}) = (I_{n,j}) / (\text{Max } (I_{n,j})) \quad (5)$$

Following the normalization of all KPIs, the defuzzified expert evaluations of each KPI were multiplied by their corresponding normalized values, thus calculating the relative point for each KPI, as shown below (Gundogdu 2019):

$$\text{For } n=1 \text{ to } 11, \text{ For } j=2020 \text{ to } 2022 \text{ in where; Normalized } (I_{n,j}) * D(I_{n,j}) = \text{Relative Point of } (I_{n,j}) = \text{RP}(I_{n,j}) \quad (6)$$

In order to derive the ultimate relative point for each indicator, the median of $\text{RP}(I_{n,j})$ was chosen for the period from 2020 to 2022. This ultimate relative point stands as a fundamental gauge for evaluating the performance of each KPI and its influence on the overall scores for long-term competitive prowess.

Step 8: Final Scoring and Ranking: While determining the final scores for each BIST 30 company, a straightforward approach could involve summing up all the final relative points of the eleven distinct indicators. However, it is acknowledged that these indicators might hold varying degrees of importance when assessing a company's long-term competitive advantage. To account for this, Step 6 was implemented, with the assigned indicator weights. For each KPI, a final score was calculated as follows:

$$\text{Final Score of Stock} = \sum_{n=1}^{11} \text{RP}(I_{n,j}) * \text{Relative weight of } I_{n,j} \text{ where } \text{RP}(I_{n,j}) \text{ represents relative point of indicator with number } n.$$

A comprehensive list of 26 stocks were compiled based on the calculated final scores. Table 2 provides the final scores for all 26 stocks in ranked order, indicating their long-term competitive prowess and high valuation potential in the long run. Higher scores signify a greater valuation potential for the respective stocks.

Table 2: BIST 30 Valuation Potential and Ranking

Stock ticker	Stock	Final Score	#Ranking
KOZAA	KOZA ANADOLU METAL MADENCİLİK İŞLETMELERİ A.Ş.	43.19	1
TUPRS	TÜPRAŞ-TÜRKİYE PETROL RAFİNERİLERİ A.Ş.	42.84	2
SISE	TÜRKİYE ŞİŞE VE CAM FABRİKALARI A.Ş.	42.60	3
EREGL	EREĞLİ DEMİR VE ÇELİK FABRİKALARI T.A.Ş.	41.42	4
THYAO	TÜRK HAVA YOLLARI A.O.	39.97	5
ODAS	ODAŞ ELEKTRİK ÜRETİM SANAYİ TİCARET A.Ş.	39.81	6
ARCLK	ARÇELİK A.Ş.	39.64	7
KCHOL	KOÇ HOLDİNG A.Ş.	39.58	8
ASELS	ASELSAN ELEKTRONİK SANAYİ VE TİCARET A.Ş.	38.80	9
SAHOL	HACI ÖMER SABANCI HOLDİNG A.Ş.	38.19	10
ALARK	ALARKO HOLDİNG A.Ş.	37.80	11
TAVHL	TAV HAVALİMANLARI HOLDİNG A.Ş.	36.79	12
PGSUS	PEGASUS HAVA TAŞIMACILIĞI A.Ş.	36.28	13
ENKAI	ENKA İNŞAAT VE SANAYİ A.Ş.	35.39	14
BIMAS	BİM BİRLEŞİK MAĞAZALAR A.Ş.	34.72	15
FROTO	FORD OTOMOTİV SANAYİ A.Ş.	33.66	16
AKSEN	AKSA ENERJİ ÜRETİM A.Ş.	32.21	17
TOASO	TOFAŞ TÜRK OTOMOBİL FABRİKASI A.Ş.	28.75	18
KOZAL	KOZA ALTIN İŞLETMELERİ A.Ş.	28.43	19
SASA	SASA POLYESTER SANAYİ A.Ş.	26.64	20
TCELL	TURKCELL İLETİŞİM HİZMETLERİ A.Ş.	26.39	21
PETKM	PETKİM PETROKİMYA HOLDİNG A.Ş.	25.68	22
KRDMMD	KARDEMİR KARABÜK DEMİR ÇELİK SANAYİ VE TİCARET A.Ş.	25.34	23
EKGYO	EMLAK KONUT GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş.	22.10	24
GUBRF	GÜBRE FABRİKALARI T.A.Ş.	20.41	25
HEKTS	HEKTAŞ TİCARET T.A.Ş.	16.97	26

4. FINDINGS AND DISCUSSION

Experts have identified market to book value, business and growth strategy, gross profit margin, cash flow from operations / total liabilities and board of directors as the most crucial indicators in determining the long-term competitive advantage that drives substantial potential price increases in the stock market. The study shows that sector is not a direct indicator for BIST30 companies' performance. Ultimately, it directly reflects on indicators as higher gross profit margin, positive operating cash flow and declining liabilities as proxies.

Among the companies listed in the BIST 30 index, four entities from the Koc Group stand out, with three of them securing positions within the top eight in terms of highest points. This achievement appears to be a testament not only to their adherence to corporate governance principles but also to their sound financial management practices.

Among the top 10 ranked companies, all except Turkish Airlines belong to the production sector. This observation could indicate a distinct separation between production and service companies, potentially implying a glass ceiling effect favoring production-oriented enterprises over service-based ones. Hektaş, positioned as the lowest-ranked company in the research, seems to affirm the conventional market wisdom by appearing overvalued. Another notable stock, Kardemir, holds a lower score and exhibits a widespread dispersion of shares among various investors, to the extent that a 5% shareholder holds a board seat. This scenario suggests that the competitive struggle for board representation might contribute to the company's perceived overvaluation.

5. CONCLUSIONS

This paper undertakes a thorough examination of distinguishing factors influencing certain BIST 30 stocks and their enduring value, employing the innovative Triangular Spherical Fuzzy Sets methodology for the first time in literature. The study delved into the 2023 Borsa İstanbul 30 index companies, assessing specific microeconomic Key Performance Indicators (KPIs) and corporate governance dimensions, encompassing pivotal factors such as gross profit margin, cash flow metrics, market to book ratio, and various governance perspectives.

A panel of distinguished experts provided comprehensive evaluations of these indicators, leading to a nuanced understanding of their significance. Aggregating and defuzzifying these assessments generated precise values for each indicator, while the experts' linguistic evaluations offered balanced perspectives on their importance. This research showcases the application of fuzzy logic in appraising stock

valuation potential, shedding light on their prospects for sustained growth. It not only aligns with the principles of value investing, advocated by Warren Buffett, but also contributes to modeling approaches within the Turkish public stock exchange context.

In summary, this study presents a distinctive viewpoint on the long-term valuation potential of BIST 30 stocks, offering valuable insights for investors, stakeholders, and analysts in the dynamic finance landscape. It underscores the imperative of comprehending companies' enduring competitive strength in an ever-evolving market.

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CRYPTOCURRENCY INTEREST IN GEOGRAPHICAL REGIONS WITH HIGH UNEMPLOYMENT RATES

DOI: 10.17261/Pressacademia.2023.1844

PAP- V.18-2023(2)-p.6-11

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To cite this document

Bezirgan, E., (2023). Cryptocurrency interest in geographical regions with high unemployment rates. PressAcademia Procedia (PAP), V.18, 6-11.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1844>

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ABSTRACT

Purpose- In regions with high unemployment rates, individuals often face economic uncertainty and may seek alternatives to traditional financial systems. In such circumstances, some individuals may turn to alternative investments and financial instruments, with cryptocurrencies such as Bitcoin being among them. The value of these cryptocurrencies is often volatile due to their speculative nature, which can lead investors to take on more significant risks. While this situation can result in substantial gains, it can also lead to significant financial losses.

The primary use of cryptocurrencies is generally for investment purposes. Since cryptocurrencies are digital, they operate entirely in a virtual environment. The loss or theft of the digital password in the virtual space means the loss of the wallet. Security in cryptocurrencies is very weak. The lack of government guarantees and legal infrastructure globally poses certain threats to investors, making cryptocurrencies carry a higher risk compared to other investment instruments.

This study will investigate the regional relationship between cryptocurrency interest and unemployment rates. The aim is to determine whether individuals living in geographical areas with high unemployment rates show more interest in cryptocurrencies compared to those in other geographical regions.

Methodology- In line with the research objective, Google search engine data for the past 10 years has been analyzed using content analysis methodology. A query has been conducted to determine in which regions of Turkey cryptocurrency names are most frequently searched, and a comparison has been made on a provincial level across all 81 provinces. Additionally, considering the unemployment data provided by the Turkish Statistical Institute (TUIK), regions with high and low unemployment rates have been identified. Subsequently, an investigation has been carried out to determine whether there is any correlation between regional Google searches and unemployment rates in these areas.

Findings- When examining the findings from the perspective of unemployment, it has been observed that the regions where cryptocurrency names are most frequently searched align with areas having the highest unemployment rates, while the least searched areas correspond to regions with lower unemployment rates. Among the 10 provinces with the highest unemployment rates, 8 of them are included in the list of 10 provinces with the highest Bitcoin search frequency. Similarly, 8 out of 10 provinces with the lowest employment rates are also listed among the 10 provinces with the highest Bitcoin search frequency. Furthermore, among the 10 provinces with the lowest per capita gross domestic product (GDP), 7 of them are included in the list of 10 provinces with the highest Bitcoin search frequency.

Conclusion- As a result of the relationship analyses conducted in the research, it has been observed that in Turkey, regions with high unemployment rates, low employment rates, and low Gross Domestic Product (GDP) have a higher frequency of Bitcoin searches compared to other regions.

Keywords: Cryptocurrency, unemployment, bitcoin

JEL Codes: P44, E24, E44

1. INTRODUCTION

Cryptocurrencies, unlike traditional financial markets, constitute a relatively young asset class predominantly based on new technologies. Bitcoin, among many other digital assets in the cryptocurrency world, has become a symbol representing cryptocurrencies for numerous individuals. While other cryptocurrencies also play a significant role in the market, Bitcoin is often the first name that comes to mind when discussing cryptocurrencies. These currencies operate in a decentralized manner, in contrast to central electronic currencies and banking systems. The control of this decentralized structure is facilitated by Blockchain transaction databases (Çarkacıoğlu, 2016: 8). Consequently, there is uncertainty and volatility regarding the value and future success of cryptocurrencies. Cryptocurrencies are highly sensitive to news, regulatory developments, technological advancements, and market sentiments. Their prices are largely dependent on supply-demand balance, investor sensitivity, and speculation. This condition can lead to the cryptocurrency market being volatile and speculative. Speculation involves economic activities that include asset buying and selling based on expectations of future price movements (Tunç and Kaya, 2018: 1249). The cryptocurrency market, lacking sufficient transparency and clarity, is considered speculative because investors engage in such speculation aiming for future growth potential or short-term profits.

In this context, one viewpoint suggests that the gains of financial capital are fundamentally based on the ability to make and implement "very hasty" decisions under the influence of risk, speculation, and a short-term mindset (Yeldan, 2009: 27). At this point, individuals' propensity for risk-taking can often vary depending on personal characteristics, living conditions, and individual experiences. The unemployment situation, one of these factors, can be considered as a factor that affects individuals' risk-taking tendencies, bringing financial uncertainty, psychological stress, and concerns about the future. Some individuals may be more inclined to take risks when unemployed because they might want to explore various ways to cope with financial difficulties or create new opportunities. Others, on the other hand, may be more cautious due to the loss of financial security resulting from unemployment. Additionally, other factors such as a person's general character, level of experience, and other factors influencing risk-taking tendencies can also play a role. While some individuals may naturally be more risk-tolerant, others may be more conservative.

The aim of this research is to investigate the interest in Bitcoin among individuals residing in geographical regions with high unemployment rates in Turkey. In other words, the goal is to determine whether individuals living in geographical areas with high unemployment rates show a greater interest in cryptocurrencies compared to those in other regions. For this purpose, unemployment data classified by geographical regions, as disclosed by the Turkish Statistical Institute (TUIK), have been utilized. As mentioned above, the decentralized nature of Bitcoin limits the availability of concrete data on this subject. Indirectly accessible data provides insights into the topic. One such set of data is search engine data. In this study, the search frequencies of the term 'bitcoin' through the Google search engine and their geographical distribution have been examined. As a result of the investigation, a comparison has been made between the most searched cities and regions with high unemployment rates.

2. LITERATURE REVIEW

In the literature, there is a frequent occurrence of studies investigating the concepts of Bitcoin, unemployment, cryptocurrency issues, and the relationships among these topics. However, it has been observed that there are relatively limited studies focused on cryptocurrency investors. Some of these studies address the motivation sources of cryptocurrency investors. The results of these studies indicate that in countries with high unemployment rates and inflation, cryptocurrency investments have become a more attractive option (Demirler, 2022: 105). On the other hand, the increase in unemployment and impoverishment due to various reasons is emphasized to significantly impact the financial sector, and the cryptocurrency sector is also affected by this influence (Koç and Çelik, 2022: 53).

From another perspective, events like global disasters lead to many people becoming unemployed, putting significant pressure on the existing financial system (Ege and Şahin, 2015, pp. 369-391; Ege and Yaman, 2017, p. 180). Alongside these pressures, another important point highlighted is the decrease in trust that investors have in banks and financial institutions. In challenging times, investors tend to turn towards assets they perceive as safe havens, such as Bitcoin (Korkmazgöz et al., 2022: 93).

Moreover, in the literature, there are studies indicating that macroeconomic news has significant effects on financial markets and cryptocurrency markets (Birz and Lott, 2011: 1; Corbet et al., 2018: 1). The findings of these studies particularly draw attention to the impacts of unemployment and Gross Domestic Product (GDP) data on financial markets and cryptocurrency markets. Some studies examining cryptocurrency investors have also investigated individuals' risk tolerances (Uçkun and Dal, 2021: 155). The research results state that 62.2% of cryptocurrency investors are individuals with above-average and high risk tolerance. Consequently, many study findings suggest that personality traits and psychological conditions influence cryptocurrency purchase decisions (Gazali, 2018: 64; Kim et al., 2020). Therefore, behavioral finance studies indicate that investors can exhibit irrational behavior and be subject to systematic biases (Demirler, 2022: 101).

In McWharther's study (2018), the focus was on examining the factors behind the high price volatility of Bitcoin, with a particular emphasis on determining the role that media could play in these fluctuations. To achieve this goal, an analysis was conducted using the least squares method on 92 observations containing monthly data between July 2010 and March 2018. The study incorporated variables such as the Financial Stress Index, Consumer Confidence Index, unemployment rate, interest rate, Google Bitcoin search data, gold price, news indicators, and daily Bitcoin transaction volume. According to the analysis results, factors identified to have a significant impact on Bitcoin's price volatility included the number of people searching for the term "Bitcoin" on Google and the prevalence of negative news. Furthermore, it was observed that economic indicators were ineffective in determining price variability, and the conclusion was drawn that Bitcoin might not be a wise investment tool in the current situation due to its unpredictable price changes.

In Puri's study (2016), an analysis of Bitcoin prices during the period between January 2011 and March 2016 was conducted. The study utilized data such as searches for "Bitcoin" on Google, inflation rate, unemployment rate, industrial production, money supply, the trade-weighted U.S. dollar index (TWEXB), and U.S. Treasury bonds. The analysis, based on five years of monthly time series, revealed a positive and significant impact of the increase in Google searches for "Bitcoin" on Bitcoin prices. Additionally, it found that traditional macroeconomic indicators, excluding inflation, did not have a significant impact on the values of Bitcoin.

In this study, the aim is to determine whether individuals living in geographical regions with high unemployment rates show more interest in cryptocurrency compared to those in other regions. Additionally, some macroeconomic indicators will be used to make inferences about Bitcoin investments.

3. THE DATA AND METHODOLOGY

This research employed a qualitative research method, and the data used in the study were examined through content analysis. In line with the research objective, Google Trends application data, specifically search engine data, were analyzed over the past five years. An inquiry was conducted to determine in which regions of Turkey the term 'bitcoin' was searched the most, and a comparison was made among the 81 provinces.


The use of the term 'bitcoin' instead of 'cryptocurrency' aims to signify that, for many individuals, the expression 'bitcoin' has become a symbol representing cryptocurrencies. While there are various digital assets in the world of cryptocurrencies, Bitcoin is just one of them.

Other cryptocurrencies also constitute a significant part of the market, but Bitcoin is generally the first name that comes to mind when discussing cryptocurrencies.

In the study, regions with high and low GDP, unemployment rates, and employment rates were identified based on TÜİK (Turkish Statistical Institute) unemployment data. The regional Google searches were then examined to determine whether there is any relationship between these economic indicators and the frequency of 'bitcoin' searches.

The table below includes the cities that have ranked in the Google searches for the term 'bitcoin' in the last five years.

Table 1: Search for the term 'Bitcoin' via Google Search Engine




Most Searched Cities	Least Searched Cities
1. Siirt	1. Trabzon
2. Bingöl	2. Erzurum
3. Batman	3. Samsun
4. Hakkari	4. Adana, Kayseri, Karaman
5. Tunceli	5. Kütahya, Ankara
6. Bitlis	6. Bartın, Sivas
7. Muş	7. Çanakkale
8. Mardin	8. Afyonkarahisar, Amasya
9. Şırnak	9. Sakarya, Zonguldak, Burdur, İzmir
10. Ağrı	10. Osmaniye

Source: Google Trends (2023)

When Table 1 is examined, it is observed that in the last five years, the provinces where the word 'bitcoin' is most searched in Turkey are Siirt, Bingöl, Batman, Hakkari, Tunceli, Bitlis, Muş, Mardin, Şırnak, and Ağrı. The provinces where the word 'bitcoin' is most searched are mostly geographically located in the Southeastern Anatolia region. The Southeastern Anatolia region is also the region with the highest unemployment rates. The provinces with the least searches are, in order, Trabzon, Erzurum, Samsun, Adana, Kayseri, Karaman, Kütahya, Ankara, and Bartın. In contrast to the provinces where the most searches are concentrated in a region, these provinces show a more homogeneous distribution across Turkey. The table number 2 below presents the unemployment data at the provincial level as disclosed by TÜİK.

Table 2: Unemployment Rates (2022)



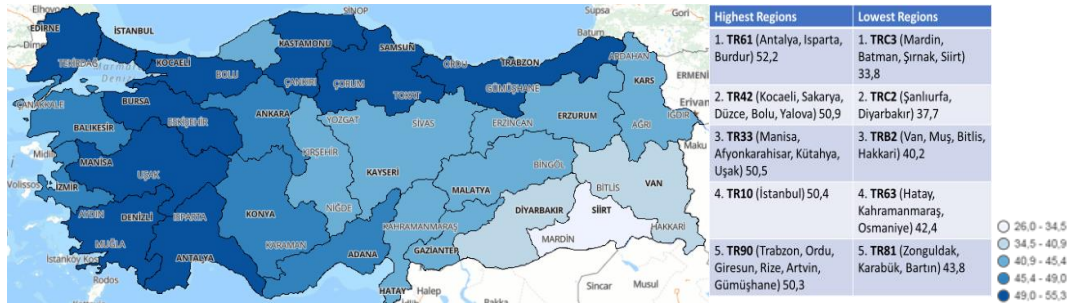
Highest Regions	Lowest Regions
1. TRB2 (Van, Muş, Bitlis, Hakkari) (19,2)	1. TR82 (Kastamonu, Çankırı, Sinop) 6,2
2. TRC3 (Mardin, Batman, Şırnak, Siirt) (18,5)	2. TR22 (Balıkesir, Çanakkale) 7,1
3. TR63 (Hatay, Kahramanmaraş, Osmaniye) (14,6)	3. TR33 (Manisa, Afyonkarahisar, Kütahya, Uşak) 7,1
4. TR31 (İzmir) (13,0)	4. TR52 (Konya, Karaman) 7,4
5. TRA2 (Ağrı, Kars, Iğdır, Ardahan) (12,7)	5. TR21 (Tekirdağ, Edirne, Kırklareli) 7,8

○ 5,1 - 8,6
 ● 8,6 - 11,8
 ● 11,8 - 16,0
 ● 16,0 - 23,6
 ● 23,6 - 33,5

Source: Turkish Statistical Institute (2023)

When Table 2 is examined, it is observed that the regions with the highest unemployment rates are TRB2, TRC3, TR63, TR31, and TRA2. The geographical regions with the lowest unemployment rates are listed as TR82, TR22, TR33, TR52, and TR21. The TRB2 region consists of the provinces of Van, Muş, Bitlis, and Hakkari, with an unemployment rate of 19.2%. The TRC3 region comprises Mardin, Batman, Şırnak, and Siirt provinces, and the region's unemployment rate is observed to be 18.5%. The regions with the least unemployment are indicated as TR82 and TR22.

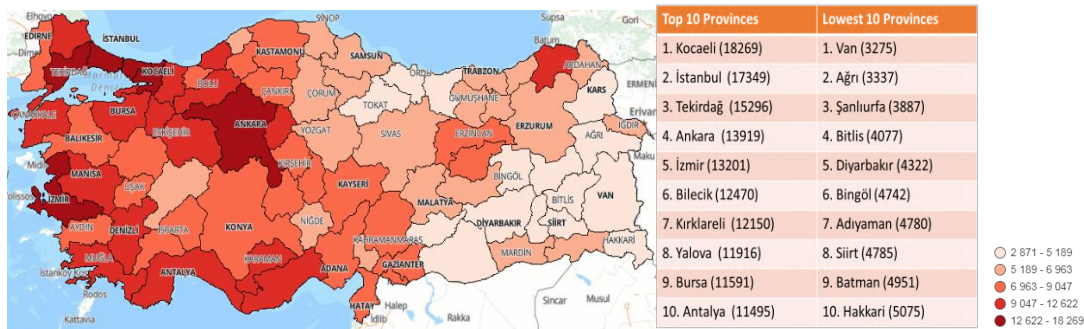
Table 3: Employment Rates (2022)



Source: Turkish Statistical Institute (2023)

The employment rates by regions are presented in Table 3. It is observed that the geographical regions with the highest employment rates are, respectively, TR61, TR42, TR33, TR10, and TR0. The regions with the lowest employment rates are TRC3, TRC2, TRB2, TR63, and TR81. The provinces forming the TRC3, TRC2, and TRB2 regions, where the employment rate is low, are generally the provinces in the Southeastern Anatolia region. Provinces such as Mardin, Batman, Şırnak, Siirt, Şanlıurfa, and Diyarbakır have employment rates below 40%.

Table 4: GDP per capita in 2022 (\$)



Source: Turkish Statistical Institute (2023)

The data for the Gross Domestic Product (GDP) in 2022 is presented in Table 4 above. According to this, the provinces with the highest GDP in Turkey are Kocaeli, İstanbul, Tekirdağ, Ankara, İzmir, Bilecik, Kırklareli, Yalova, Bursa, and Antalya. The provinces with the lowest GDP are Van, Ağrı, Şanlıurfa, Bitlis, Diyarbakır, Bingöl, Adıyaman, Siirt, Batman, and Hakkari.

Table 5: Comparison Chart

Google Search (Most)	Unemployment Rates (%) (Highest)	Employment Rates (%) (Lowest)	Per person GDP (Lowest)
Siirt	TRB2 (Van, Muş, Bitlis, Hakkari)	TRC3 (Mardin, Batman, Şırnak, Siirt)	Van
Bingöl			Ağrı
Batman	TRC3 (Mardin, Batman, Şırnak, Siirt)	TRC2 (Şanlıurfa, Diyarbakır)	Şanlıurfa
Hakkari			Bitlis
Tunceli	TR63 (Hatay, Kahramanmaraş, Osmaniye)	TRB2 (Van, Muş, Bitlis, Hakkari)	Diyarbakır
Bitlis			Bingöl
Muş	TR31 (İzmir)	TR63 (Hatay, Kahramanmaraş, Osmaniye)	Adıyaman
Mardin			Siirt
Şırnak	TRA2 (Ağrı, Kars, Iğdır, Ardahan)	TR81 (Zonguldak, Karabük, Bartın)	Batman
Van			Hakkari

In Table 5, the frequency of Bitcoin searches by provinces is provided along with regions where unemployment rates are highest, regions with the lowest employment rates, and provinces with the lowest per capita gross domestic product (GDP). The table is prepared for cross-comparison to identify similarities and differences among the four variables. The province with the highest frequency of Bitcoin searches, which is one of the main variables in our study, is Siirt. Siirt is located in the 2nd region where unemployment rates are the highest and also in the region with the lowest employment rates. Additionally, Siirt ranks as the 8th province with the lowest GDP rates. The second-highest

frequency of Bitcoin searches by provinces is in Bingöl. Bingöl is positioned as the 6th province with the lowest GDP rates. Batman, ranking third in Bitcoin searches, is located in the 2nd region with the highest unemployment rates and the 1st region with the lowest employment rates. However, Batman is the 9th province with the lowest GDP rates. Hakkari, ranking fourth in Bitcoin searches, is situated in the 1st region with the highest unemployment rates and the 3rd region with the lowest employment rates. It is also the 10th province with the lowest GDP rates. Bitlis, in the 6th position for Bitcoin searches, is located in the 1st region with the highest unemployment rates and the 3rd region with the lowest employment rates. Bitlis is the 4th province with the lowest GDP rates. Muş, with the highest frequency of Bitcoin searches, ranks 7th. Muş is situated in the 2nd region with the highest unemployment rates and the 3rd region with the lowest employment rates. Mardin and Şırnak, where Bitcoin searches are at the 10th position, are located in the 1st region with the lowest employment rates. Van, ranking 10th in Bitcoin searches, holds the position of Turkey's lowest province in terms of GDP rates. When the data in Table 4, which provides a comparative overview of provinces and regions in terms of the frequency of Bitcoin searches, unemployment rates, employment rates, and per capita gross domestic product (GDP), is evaluated geographically, it is observed that the majority of the provinces listed in the table are from the Eastern Anatolia and Southeastern Anatolia regions. Out of the 10 provinces listed based on the frequency of Bitcoin searches on the Google search engine, six are located in the Eastern Anatolia region, while the remaining four are in the Southeastern Anatolia region.

Eight out of the ten provinces listed in terms of Bitcoin search frequency are located in the first two regions with the highest unemployment rates. Additionally, eight out of the ten provinces listed in the first three regions with the lowest employment rates are included in the list based on Bitcoin search frequency. Furthermore, among the ten provinces with the lowest per capita gross domestic product (GDP), seven are included in the list of ten provinces based on Bitcoin search frequency.

5. CONCLUSION

In this study, the relationship between cryptocurrency interest (Bitcoin search frequency) by provinces and unemployment rates, employment rates, and per capita gross domestic product (GDP) ratios has been examined. Consequently, provinces and regions have been compared in terms of four variables.

According to the results obtained in the research, it can be stated that there is a resemblance among the provinces in the Eastern Anatolia and Southeastern Anatolia regions concerning Bitcoin search frequency, unemployment rates, employment rates, and per capita gross domestic product (GDP) ratios. Out of the 10 provinces listed based on Bitcoin search frequency on the Google search engine, six are located in the Eastern Anatolia region, while the remaining four are in the Southeastern Anatolia region.

Moreover, eight out of the ten provinces listed in terms of Bitcoin search frequency are located in the first two regions with the highest unemployment rates. Additionally, eight out of the ten provinces listed in the first three regions with the lowest employment rates are included in the list based on Bitcoin search frequency. Furthermore, among the ten provinces with the lowest per capita gross domestic product (GDP), seven are included in the list of ten provinces based on Bitcoin search frequency.

As a result of the relationship analyses conducted in the study, it is observed that the frequency of Bitcoin searches is higher in provinces and regions in Turkey where the unemployment rate is high, employment rates are low, and GDP is low compared to other provinces and regions.

In the context of the results obtained in the research, it is necessary to first evaluate the relationship between the provinces where Bitcoin search frequency is observed and the provinces with high unemployment rates. Findings from studies conducted by Gazali (2018) and Kim et al. (2020) have concluded that personality traits and psychological conditions influence cryptocurrency purchase decisions. Similarly, unemployment is a concept associated with factors such as financial uncertainty, psychological stress, and concerns about the future. Individuals facing situations like financial uncertainty, psychological stress, and future concerns may have a higher risk appetite. Some individuals may be more inclined to take risks when unemployed because they might want to explore various ways to cope with financial difficulties or create new opportunities. This inclination can lead them towards speculative alternatives. In the cryptocurrency markets, where Bitcoin is the market leader, volatile changes can provide investors with high profits in a short period. Such situations may attract individuals facing regular income issues to the cryptocurrency market. Similarly, in regions with low employment rates and provinces with low per capita gross domestic product (GDP), similar situations of irregular income may arise.

The increasing interest in cryptocurrencies should guide investors to be more conscious of potential financial fluctuations. In this context, organizing educational programs to increase economic awareness in society, providing opportunities for education in economics and investment for individuals to make more informed financial decisions, developing economic policies to reduce unemployment rates, and encouraging individuals to diversify their investments and adopt risk management strategies can be beneficial. Before investing in volatile assets like cryptocurrencies, individuals should be aware of the risks and appropriate measures should be taken.

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UNDERPRICING OF IPOS (INITIAL PUBLIC OFFERING) IN BORSA ISTANBUL: THE EFFECT OF COVID-19 PANDEMIC PERIOD

DOI: 10.17261/Pressacademia.2023.1845

PAP- V.18-2023(3)-p.12-19

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To cite this document

Ataker, A., Oktay, T., (2023). Underpricing of IPOs (Initial Public Offering) in Borsa Istanbul: The effect of Covid-19 Pandemic Period. PressAcademia Procedia (PAP), V.18, 12-19.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1845>

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ABSTRACT

Purpose- This research has both theoretical and practical implications. The study's findings will provide valuable insights into the impact of the COVID-19 pandemic on IPO mispricing in the Turkish IPO market. The study delves into the behavior of IPOs that were issued between 2010 and 2022, with a focus on how they were affected by the COVID-19 pandemic. The results may help investors and issuers understand the pandemic's effects on IPO pricing and inform their investment decisions. The study will also provide valuable insights to investors, regulators, and market participants, allowing them to make more informed decisions during market volatility and uncertainty periods.

Methodology- The study involves employing two methods: the traditional ordinary least squares (OLS) and the more appropriate quantile regression (QR). The OLS method focuses on assessing the average impact of independent variables on mispricing, disregarding the unexplored latent characteristics of the mispricing distribution, especially when it deviates from a normal distribution. In contrast, the QR method allows us to investigate the diverse effects of independent variables at different levels of mispricing due to the asymmetric distribution of returns. By employing the QR approach, it can be identified the specific impacts of each variable on IPOs within particular levels of mispricing. This robust method is capable of handling potential heterogeneity in the distribution, which was observed in the sample. The QR method also facilitates the examination of various segments of the mispricing distribution, including the tail regions, enabling a comparison of the effects of explanatory factors on IPOs that range from extremely overpriced to extremely underpriced. Due to the constraints of the project, the paper has been done with a limited number of shares.

Findings- The study investigates the impact of the COVID-19 pandemic on Initial Public Offering (IPO) mispricing in financial markets, examining changes in mispricing levels before, during, and after the pandemic. The results indicate a significant increase in IPO mispricing during the COVID-19 period, consistent with expectations due to factors such as heightened asymmetric information, reduced IPO volume, and decreased demand.

The analysis tests the hypothesis that Covid-19 has a significant impact on IPO results. The results show that the null hypothesis (H0) cannot be rejected, supporting the notion that the pandemic has a substantial effect on IPO mispricing. This is particularly evident in equations examining 1-year returns. Furthermore, the study explores the influence of various factors on IPO mispricing, including stock market indices and dummy variables representing different years. While some index values are found to be insignificant, the Borsa Istanbul-All Index and dummy variables for 2020, 2021, and 2022 are significant in specific equations. Notably, the persistence of the impact of COVID-19 beyond the relevant period suggests a lasting effect on IPO mispricing.

Examining sector-specific effects, the study finds that, based on first-day returns, all sector values, except for SEC 3 (Consumer Non-Cyclicals), are significant. However, for 1-year returns, only SEC 5 (Financials) and SEC 4 (Energy) exhibit significance, with the latter being slightly above the 10% limit. The increasing demand for energy companies in recent times is identified as a potential driver for higher levels of "IPO underpricing" in specific IPOs within these sectors.

Conclusion- The study provides robust evidence of increased IPO mispricing during the COVID-19 pandemic, highlighting the persistent impact of the crisis on financial markets, as well as sector-specific nuances influencing mispricing levels.

Keywords: IPOs (Initial Public Offerings), mispricing, pandemic, initial returns, long-term returns

JEL Codes: C21, C23, D81, E44, G14

1. INTRODUCTION

IPO (Initial Public Offering) mispricing has been a topic of interest in the finance and economics literature for several decades. Researchers have examined various factors that contribute to IPO mispricing, the consequences of mispricing, and potential explanations for the phenomenon. IPO mispricing refers to the deviation of the offer price from the actual market value of newly issued shares. It is typically measured as the difference between the offer price and the first-day closing price or the initial return of the stock.

Underpricing is a common form of IPO mispricing, where the offer price is set below the stock's market value. This results in a significant initial return for investors who are allocated shares in the IPO. Overpricing, on the other hand, occurs when the offer price is set above the stock's market value, leading to negative initial returns. Numerous factors contribute to IPO mispricing, including **information asymmetry**, where disparities between issuers and investors hinder accurate valuation; **market conditions**, with bullish markets increasing demand and underpricing; the **book-building process**, involving negotiations between issuers, underwriters, and institutional investors; **investor sentiment**, where positive feelings drive up demand and contribute to underpricing; and **reputation signaling**, where companies intentionally underprice to signal quality and attract investors. IPO mispricing has consequences for different market participants: **issuers** face missed capital-raising opportunities or lack of investor interest based on underpricing or overpricing, respectively; **investors** receiving IPO allocations benefit from underpricing, but subsequent investors may suffer negative returns from inflated initial prices; **underwriters'** reputation and pricing accuracy for future offerings are influenced by mispricing; and the **efficient market hypothesis** is challenged, indicating markets may not always fully reflect fundamental values.

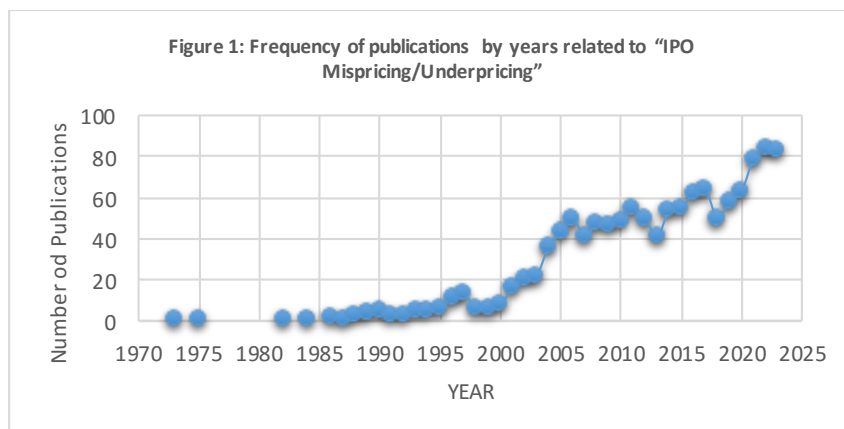
The COVID-19 outbreak a pandemic, started in March 2020, which led to a global economic downturn and heightened uncertainty in financial markets worldwide, including the IPO market. Researchers have examined the effects of the pandemic on IPO underpricing, exploring how market conditions, investor sentiment, and other factors have influenced the mispricing phenomenon. Understanding the impact of the pandemic on IPO underpricing can provide insights into changes in market dynamics, investor behavior, and the overall functioning of the IPO market during times of crisis. This research paper specifically examines the impact of the pandemic on IPO activity, with a focus on the increase in information uncertainty. To measure this effect, we use underpricing and post-IPO stock return volatility as proxies.

2. LITERATURE REVIEW

Researchers have put forth various theories to elucidate IPO mispricing, encompassing information-based explanations involving asymmetry, uncertainty, and informed traders; behavioral finance theories centered on investor sentiment, herding behavior, and overreaction to news; signaling models positing underpricing as a deliberate strategy for signaling quality and enticing investors; and institutional factors encompassing regulatory requirements, underwriter reputation, and the influence of investment banks in determining IPO prices.

2.1. Literature Review: IPO Underpricing

The phenomenon known as IPO underpricing is widely recognized as empirical evidence of high first-day returns for IPO firms. Since the Securities and Exchange Commission conducted a study in 1971, it has been evident that IPO stocks are initially priced lower than their subsequent sale price in the secondary market. This trend of IPO mispricing has persisted over time, as demonstrated by the frequency of studies analyzing the mispricing of IPOs in Figure 1. In 1973, Dennis Logue (Logue, 1973) published the first academic paper on the subject of IPO mispricing. Titled "On the Pricing of Unseasoned Equity Issues: 1965-1969," the study examined 250 IPOs released between 1965 and 1969. The search yielded a second article, namely Ibbotson's (Ibbotson, 1975) study named "Price Performance of Common Stock New Issues." In this study, the author analyzed a sample of 120 IPOs released between 1960 and 1969. After Ibbotson's work, numerous studies have confirmed the significant initial day returns for IPO stocks. These studies have put forth various explanations for underpricing, including information asymmetry among investors, the reputation of underwriters signaling by qualitative firms, and other factors.



Source: Scopus Data; Filter: "IPO" & "Mispricing" and "IPO" & "Underpricing", As of 13/06/2023

2.2. Literature Review: IPO Underpricing during COVID-19

Existing studies done by Baig in 2021 and 2022 and Zaremba in 2022, on equity, debt, and derivative markets demonstrate that the severity of the COVID-19 outbreak, coupled with government policy measures, resulted in higher levels of volatility and uncertainty. It is anticipated higher levels of underpricing and volatility for IPOs that were issued during the pandemic. This is because increased uncertainty is typically associated with higher levels of IPO underpricing, and it is natural to expect greater underpricing during times of economic distress. Government intervention and stimulus measures implemented in response to the pandemic could have influenced IPO underpricing. These measures aimed to stabilize financial markets and support economic recovery. The provision of liquidity and favorable market conditions resulting from government actions may have positively impacted IPO underpricing. The COVID-19 pandemic compelled governments to swiftly adapt and take action to protect both the health and the economy of their respective countries. However, there were notable variations in how different countries handled the crisis, resulting in divergent outcomes. Therefore, this paper focuses on analyzing the IPO changes in Turkey, to identify the underlying factors behind these changes. It is apparent that informational shocks and government responses related to the pandemic have had a significant impact on the IPO markets, and our research aims to shed light on these effects.

2.3. Literature Review: Underpricing in the Turkish IPO Market

The first study conducted on the IPO market in Türkiye emerged in the year 2000 (Kiyamaz, 2000). In his research, he took 163 firms listed and traded on the Istanbul Stock Exchange between 1990 and 1996. This research again focused on initial (first trade date) return and the results show that the Turkish IPOs are underpriced on the initial trading day by an average of 13.1%. In his research, he also made a sub-sector analysis for IPO underpricing. Then in 2006, M. Banu Durukan (Durukan, 2006) showed that the relationship between ownership structure and underpricing is weak and Mehmet Orhan (Orhan, M., 2006) investigated underpricing on the Istanbul Stock Exchange for 18 sectors for the period 1996–2005. His analysis showed that half of the sectors provided a negative first-day return.

Other research regarding Turkish IPO Market Underpricing is also mainly concentrated on “Initial Returns” and “Ownership” and commitment period. Finally, in 2023, there is research (Ilbasmiş, M., 2023) related to the effect of uncertainty on IPO underpricing, short-term performance after IPO, and hot-and-cold-IPO market cycles. Empirical results show that short-term market-adjusted abnormal returns of IPO firms during the pandemic are much larger than those before the pandemic.

Table 1: Mispricing Across Time and Markets

Country	Study	Year	Period	Mean(%)	Median(%)
US	Miller & Reilly	1987	1982 - 1983	9,87	2,78
Hong Kong	McGuinness	1992	1980 - 1990	17,60	
US	Michaely & Shaw	1994	1984 - 1988	7,27	
Australia	Lee et al.	1996	1976 - 1989	16,41	10,00
Germany	Ljungqvist	1997	1970 - 1993	9,20	
Japan	Hamaoi Packer, Ritter	2000	1989 - 1995	15,70	
Malaysia	Jelic, Saadouni & Briston	2001	1980 - 1995	99,25	79,04
Canada	Kooli & Suret	2001	1991 - 1998	20,57	5,00
Belgium	Engelen	2003	1996 - 1999	14,32	
China	Wang	2005	1994 - 1999	271,90	123,90
UK	Hill & Wilson	2006	1991 - 1998	11,41	
Malaysia	Ahad-Zaluki et al.	2007	1990 - 2000	95,20	76,50
China	Guo & Brooks	2008	1984 - 2005	378,40	119,37
Türkiye	Kucukkocaoglu	2008	1993 - 2005	7,01	7,67
France	Chahine and Filatotchev	2008	1997 - 2000	22,70	9,80
Taiwan	Lee & Kua	2010	1997 - 2007	28,42	17,98
China	Lee, Hsieh & Yen	2010	1993 - 2005	144,42	108,16
Brazil	Boulton, Smart & Zutter	2010	2000 - 2004	13,70	13,90
China	Gao	2010	2006 - 2008	157,00	
India	Hopp & Dreher	2013	1988 - 2005	96,74	
Singapore	Hopp & Dreher	2013	1988 - 2005	22,43	
South Korea	Lin et al.	2013	1991 - 2011	55,83	36,19
New Zealand	Lin et al.	2013	1991 - 2011	17,95	31,51
Indonesia	Husnan, Hanafi & Muhandar	2014	1995 - 2012	23,06	15,42
Greece	Autore et al.	2014	1998 - 2008	58,30	
Taiwan	Chang, Chen, Kao & Wu	2014	2006 - 2010	50,60	34,00
US	Chang et al.	2014	2006 - 2010	13,36	6,27
Australia	Bird & Ajmal	2016	1995 - 2013	25,51	8,62

3. DATA & METHODOLOGY

3.1. Data Collection

The study uses a quantitative research approach, and data will be gathered on IPOs launched in the Turkish market during the period from January 2010 to December 2022 from the Borsa Istanbul website, company prospectuses, and financial news reports. BIST-ALL, BIST-100, and BIST-Sector returns have also been included in the research for the determination of the actual return performances of IPOs for the relevant time period. Additionally, pandemic-related data such as stock returns, offer prices, and market conditions.

3.2. IPO Initial Return Calculation

The study will employ regression analysis to determine whether there is a significant relationship between the COVID-19 pandemic and IPO mispricing. The analysis will also control for other variables such as market conditions, company size, and industry sector. The first step is calculating the initial returns of IPOs as a measure of mispricing. Then compare the IPO offer price with the closing price on the first day, on the week-end, on the month-end, on the 3-month-end, on the 6-month-end, and year-end trading.

$$Initial\ Return_i = \frac{CP_i - AOP}{CP_i} \text{ where } CP_i \text{ is the closing price on the trading date and AOP is the Adjusted-Offer-Price.} \quad (1)$$

Adjusted-Offer-Price (AOP) is the retroactively corrected version of the initial public offering (IPO) price due to subsequent capital increases through paid-in and bonus share issuances, as well as dividend payments by the company. So,

$$AOP = OP \times PAF \text{ where OP is the Offer-Price and PAF is the Price-Adjustment-Factor.} \quad (2)$$

$$Adjusted\ Initial\ Return_i = Initial\ Return_i - MR_i \text{ where } MR_i \text{ is the Market Return for the related time period.} \quad (3)$$

For this study, for market returns, the "Adjusted Returns" calculation includes not only the BIST-100 but also the BIST-ALL, calculated by considering all stocks, and sector-specific BIST-Sector indices.

3.3. Variables Used in Equations

Y1: Return on first trade date	SEC1	Basic Materials	SEC7	Industrials
Y2: Return on first week	SEC2	Consumer Cyclical	SEC8	Real Estate
Y3: Return on first month	SEC3	Consumer Non-Cyclical	SEC9	Technology
Y4: Return on Month-3	SEC4	Energy	SEC10	Utilities
Y5: Return on Month-6	SEC5	Financials		
Y6: Return on first year	SEC6	Healthcare		

$DYEAR_t$: Dummy variable for the year of IPO ($t = 2010, 2011, \dots, 2022$)

$DSEC_i$: Dummy variable for the sector/industry of Equity

P_0 : Initial Return of the equity on a specific time period (First trade date, first week, first month, third month, sixth month, and first year)

P_{ALL} : Initial Return of the overall stock exchange on a specific time period (First trade date, first week, first month, third month, sixth month, and first year)

P_{100} : Initial Return of the BIST 100 (Borsa Istanbul 100 index) on a specific time period (First trade date, first week, first month, third month, sixth month, and first year)

P_{SEC} : Initial Return of the related Equity's Sector Index on a specific time period (First trade date, first week, first month, third month, sixth month, and first year)

3.4. Hypothesis and Equations

This research aims to analyze below hypothesis:

H01: In the long run (1-year) there is mispricing (underpricing) in Turkish IPO Market

H02: The COVID-19 pandemic has led to increased IPO mispricing in the Turkish market.

Based on these hypotheses, in the first section of the research, clarity will be provided regarding whether there is an error in the pricing of IPOs in the long term. While conducting this study, on the one hand, returns will be taken into account, and on the other hand, the effects of year and sector factors will be eliminated. In the second section, the impact of the COVID-19 period on this pricing will be examined based on the final values obtained.

Since the dummy variables $DYEAR$ and $DSEC$ are included in the equations, a constant term is not used in the equations to avoid the perfect multicollinearity problem.

Equations for IPO Mispricing and COVID Impact

Equation 1. Y1 First Trade Date

$$\Delta \ln P_0 = COVID + \beta_1 \Delta \ln P_{ALL} + \beta_2 \Delta \ln P_{100} + \beta_3 \Delta \ln P_{SEC} + \sum_{t=1} DYEAR_t + \sum_{i=1} DSEC_i + \varepsilon_j \quad (4)$$

H_0 : COVID has a significant impact on IPOs

H_0 : $\beta_1 = \beta_2 = \beta_3 = 0$

Equation 2. Y2 Week 1

$$\Delta \ln P_0' = \text{COVID} + \Delta \ln P_0 + \beta_1 \Delta \ln P_{ALL}' + \beta_2 \Delta \ln P_{100}' + \beta_3 \Delta \ln P_{SEC}' + \sum_{t=1} \text{DYEAR}_t + \sum_{i=1} \text{DSEC}_i + \varepsilon_j \quad (5)$$

H_0 : COVID has a significant impact on IPOs

H_0 : $\beta_1 = \beta_2 = \beta_3 = 0$ and H_0 : $\alpha_1 = 0$

Equation 3. Y3 Month 1

$$\Delta \ln P_0'' = \text{COVID} + \alpha_1 \Delta \ln P_0 + \alpha_2 \Delta \ln P_0' + \beta_1 \Delta \ln P_{ALL}'' + \beta_2 \Delta \ln P_{100}'' + \beta_3 \Delta \ln P_{SEC}'' + \sum_{t=1} \text{DYEAR}_t + \sum_{i=1} \text{DSEC}_i + \varepsilon_j \quad (6)$$

H_0 : COVID has a significant impact on IPOs

H_0 : $\beta_1 = \beta_2 = \beta_3 = 0$ and H_0 : $\alpha_1 = \alpha_2 = 0$

Equation 4. Y4 Month 3

$$\Delta \ln P_0''' = \text{COVID} + \alpha_1 \Delta \ln P_0 + \alpha_2 \Delta \ln P_0' + \alpha_3 \Delta \ln P_0'' + \beta_1 \Delta \ln P_{ALL}''' + \beta_2 \Delta \ln P_{100}''' + \beta_3 \Delta \ln P_{SEC}''' + \sum_{t=1} \text{DYEAR}_t + \sum_{i=1} \text{DSEC}_i + \varepsilon_j \quad (7)$$

H_0 : COVID has a significant impact on IPOs

H_0 : $\beta_1 = \beta_2 = \beta_3 = 0$ and H_0 : $\alpha_1 = \alpha_2 = \alpha_3 = 0$

Equation 5. Y5 Month 6

$$\Delta \ln P_0'''' = \text{COVID} + \alpha_1 \Delta \ln P_0 + \alpha_2 \Delta \ln P_0' + \alpha_3 \Delta \ln P_0'' + \alpha_4 \Delta \ln P_0''' + \beta_1 \Delta \ln P_{ALL}'''' + \beta_2 \Delta \ln P_{100}'''' + \beta_3 \Delta \ln P_{SEC}'''' + \sum_{t=1} \text{DYEAR}_t + \sum_{i=1} \text{DSEC}_i + \varepsilon_j \quad (8)$$

H_0 : COVID has a significant impact on IPOs

H_0 : $\beta_1 = \beta_2 = \beta_3 = 0$ and H_0 : $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$

Equation 6. Y6 Year 1

$$\Delta \ln P_0''''' = \text{COVID} + \alpha_1 \Delta \ln P_0 + \alpha_2 \Delta \ln P_0' + \alpha_3 \Delta \ln P_0'' + \alpha_4 \Delta \ln P_0''' + \alpha_5 \Delta \ln P_0'''' + \beta_1 \Delta \ln P_{ALL}''''' + \beta_2 \Delta \ln P_{100}''''' + \beta_3 \Delta \ln P_{SEC}''''' + \sum_{t=1} \text{DYEAR}_t + \sum_{i=1} \text{DSEC}_i + \varepsilon_j \quad (9)$$

H_0 : COVID has a significant impact on IPOs

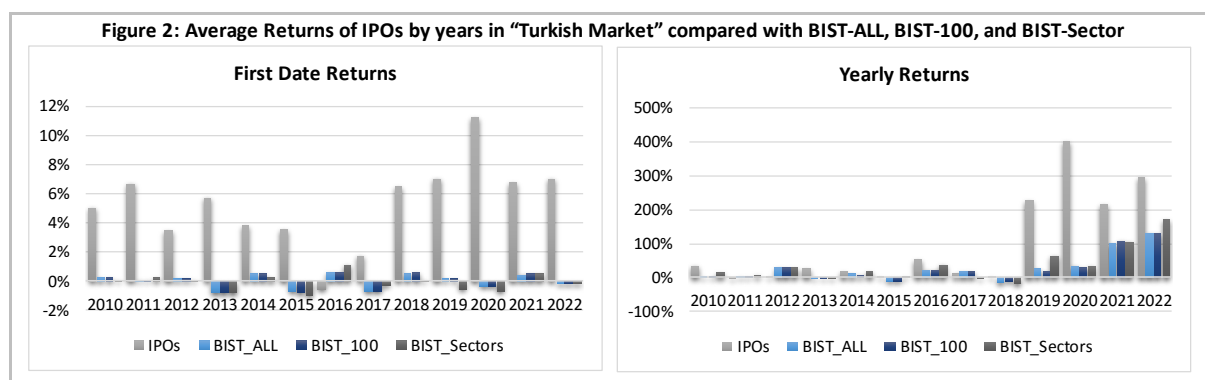
H_0 : $\beta_1 = \beta_2 = \beta_3 = 0$ and H_0 : $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$

4. EMPIRICAL RESULTS

The pandemic has led to increased uncertainty and volatility in financial markets, which could have resulted in mispricing. The study finds evidence of increased IPO mispricing during the Covid-19 pandemic. Additionally, the study may reveal differences in mispricing levels before and after the outbreak of the pandemic.

The results include:

- Statistical results present a detailed analysis of returns, BIST-ALL adjusted returns, BIST-100 adjusted returns, and BIST-Sector adjusted returns for three different periods: Full Period (n=204), Pre-Covid (n=127), and During-After Covid (n=77). In summary, there are significant differences in Means and Standard Deviations in "Adjusted Market Returns" which means IPO companies have higher returns compared to the market or in other words, IPOs in general were underpriced during offerings.
- COVID impact tested for each equation and the results show that we cannot reject the H_0 , which means COVID-19 pandemics have a significant impact on IPO results.
- "Y3" (Month-End Returns) has a positive coefficient (0.782) with a strong significant probability (0.001) in Equation 4 and "Y1" (First-Date Returns) has a positive coefficient (3.036) with a significant probability (0.032) in Equation 6.
- While all index values are insignificant for Equation 1, we see that only the Borsa Istanbul-All Index is significant in our equation in Equation 6, that is when we consider 1-year returns. Due to the broadened definition of "IPO underpricing" in this study (considering not only initial day returns but also returns for various periods, including up to one year), the previously observed high values of "IPO underpricing" in earlier studies are lower.



- In addition to this, it can be seen that the dummy variables D2020, D2021, and D2022 are also significant in all equations. These results had already emerged while conducting the COVID-19 analysis. However, it is understood from these results that the impact of COVID continues not only in the relevant period but also in 2022.
- Considering the first-day returns of IPOs, all sector values except SEC 3 (Consumer Non-Cyclicals) are significant (SEC 3 has a non-significant p-value (0.142)), while based on 1-year returns, it is possible to say that the effect of only SEC5 (Financials) and SEC4 (Energy), which is slightly above the 10% limit, continues. Particularly in recent times, there has been an increasing demand for energy companies, which may lead to higher levels of "IPO underpricing" in specific IPOs, especially those conducted in these sectors.

4. CONCLUSIONS

Understanding the effects of COVID-19 on IPO mispricing in the Turkish market is crucial for developing effective strategies to mitigate pricing anomalies during future crises. This research proposal outlines the objectives, research methodology, results, and implications of the study.

Market Returns Analysis: There are significant differences in means and standard deviations in "Adjusted Market Returns" across various periods, indicating that IPO companies had higher returns compared to the market. This implies a trend of underpricing during offerings.

COVID-19 Impact Analysis: The study tests the impact of COVID-19 on IPO results for each equation. The results suggest a significant impact, with coefficients and probabilities varying across equations. Notably, the impact includes increased asymmetric information, reduced IPO volume, and decreased demand, leading to higher rates of IPO underpricing during the COVID-19 period compared to before and after the pandemic.

Equation-Specific Results: Each equation reveals specific insights into the factors influencing IPO underpricing. For instance, Equation 3 shows a substantial positive relationship between $\Delta \ln P_{ALL}$ and the dependent variable, while Equation 4 indicates that $\Delta \ln P_{SEC}$ is not statistically significant. The results vary across equations, emphasizing the importance of considering different variables.

D2020, D2021, D2022 Impact: The dummy variables D2020, D2021, and D2022 are found to be significant in all equations, indicating that the impact of COVID-19 continues not only in the relevant pandemic period but also extends into 2022.

Sector-Specific Analysis: The study explores sector-specific impacts on IPO returns. While the first-day returns of IPOs across sectors are mostly significant, 1-year returns show continued effects primarily in the Financials and Energy sectors.

Month-End and First-Date Returns: Specific variables, such as "Y3" (Month-End Returns) in Equation 4 and "Y1" (First-Date Returns) in Equation 6, demonstrate significant positive coefficients, indicating their influence on the dependent variables.

Limitations and Implications: The study notes that the broadened definition of "IPO underpricing," considering returns for various periods, has led to lower values compared to earlier studies. This underscores the importance of refining measurement metrics.

Continued Impact of COVID-19: The results highlight that the impact of COVID-19 continues, as evidenced by the significant coefficients associated with the "COVID" variable in various equations.

In conclusion, the study provides valuable insights into the dynamics of Turkish IPOs during and after the COVID-19 pandemic. The findings contribute to the understanding of market behavior, IPO underpricing trends, and the persistent impact of external shocks on financial markets.

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RELATIONS BETWEEN THE CENTRAL-EUROPEAN TRADE ROUTES AND REVENUES OF EU MEMBERS

DOI: 10.17261/Pressacademia.2023.1846

PAP- V.18-2023(4)-p.20-30

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Miklós, G. (2023). Relations between the Central-European trade routes and revenues of EU members. PressAcademia Procedia (PAP), V. 18, 20-30.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1846>**Copyright:** Published by PressAcademia and limited licensed re-use rights only.**ABSTRACT**

Purpose - The purpose of this study is to analyse the trade and economic relations of European Union member states which are important gate of EU trade with third countries. This research highlights the shifting of the trade routes and economic geographic process. What kind of impacts are there in EU countries that a significant part of EU-China trade has been moving from vessels to freight trains or to combined, overland-maritime transportation. It has partly taken out the former China – Rotterdam/Hamburg maritime way.

This paper is analysing the role of Port of Piraeus in this process as the pretty new but very important port for the Chinese COSCO maritime transportation company and on other hand how does the new structure change the revenues for the members in this situation.

Methodology - The study employs the so-called collection cost. It is an important revenue for the member states. It comes from the Traditional own resources, it is 20 percent of the tariffs. It remains in the budget of EU member states and only 80 percent goes to the Brussels budget. The old members especially Netherlands, Belgium and Germany want to protect their own current position and share in the integration trade with third/external partners. It means that these countries can handle the tariff administration and get the mentioned 20 percent amount.

Findings - The analysis reveals that the new EU members with high potential in international trade would like to recut the “trade-cake” to receive higher benefits from it due to the mentioned collection cost or the value-added-tax related to logistics and manufacturing industries.

Conclusion - Based upon the analysis, it may be concluded that every member state can increase the profit from the collection cost and value-added-tax and on other hand they can decrease the direct GNI-based contribution to EU’s budget due to a better position in international trade.

Keywords: Collection cost, one belt one road, tariffs, Port of Rotterdam, Port of Piraeus, Port of Hamburg**JEL Codes:** F15, H54, N74**1. INTRODUCTION**

This research highlights the shifting of the trade routes and economic geographic process. What kind of impacts are there in EU countries that a significant part of EU-China trade has been moving from vessels to freight trains or to combined, overland-maritime transportation. It has partly taken out the former China – Rotterdam/Hamburg maritime way.

This paper is analysing the role of Port of Piraeus in this process as the pretty new but very important port for the Chinese COSCO maritime transportation company and on other hand how does the new structure change the revenues for the members in this situation.

Paul Krugman (1991) American economist opened a debate about the importance of geography which was not relevant in the previous decades. In his opinion the economic geographical approaches could modulate the answers of economics to some questions and challenges. In the 1990s the production location points and structures determined by them or the relations between centres and peripheries are significant for the economics but in the last years due to the new research the trade routes and logistic points and capabilities are also dominant for the global trade and transportation. It is particularly true to the economic and trade blocks and customs unions. The faster and more flexible customs clearance also appeared due to customs union.

As a new phenomenon this research wants to monitor the changing of economic interests which comes from tariffs and duties. The trade does not work only among national states but trade blocks too including customs union. Otherwise, the transported quantities and the administration have been centralized more and more, it means on the level of integration that the profit of trade goes to those countries where goods and services entered the trade blocks. There are plenty of diplomatic debates and competition for these activities and revenues.

Regarding the previous technology and level of development, the trade theories weren’t engaged to the giant vessels with delivery of more thousands TEU¹ containers simultaneously which could have meant huge tariff revenue for the importer gate state of a trade block. But nowadays the geographical location of paying the tariffs really matters due to the technological development, much bigger capacities, much

faster and stable vessels etc. It is a relevant situation and expectable problem in European Union so far because the financial contribution and expenditure of EU members can be defined by it in long term. We cannot expect that the World Trade Organization or other international institution would cancel all trade barriers and obstaclesⁱⁱ, we have to calculate these tariff benefits in the future too.

One of main principles of this research does not calculate on disappearing of tariffs and duties. First of all, I analyse the economic and trade activities and results of those European ports – Rotterdam, Antwerpen and Hamburg – which have got domestic and/or overland connections called hinterlands. There are some special and relevant factors in the survey such as natural conditions of ports, chronological and spatial developments, logistic capacity of transportation of containers and other commodities. I must emphasise the three most important ports in EU: the mentioned Dutch Rotterdamⁱⁱⁱ, the Belgian Antwerp and the German Hamburg have got great capacity to trade with their hinterlands and third partner out of EU. But in the last decade the Greek Port of Piraeus could close up to the European elite, it has got impressive economic results considering the trade activities. Though Hamburg could get back its classic hinterland after the EU enlargement in 2004^{iv}, the development of Piraeus has been so strong and powerful since 2013 that it can reshape the list of importance of ports here in Europe in the future especially in the issue of containerization. The new Chinese – European transportation project, the One Belt One Road (OBOR) can also participate in the competition among ports to strengthen the position of Port of Piraeus. OBOR (called as Belt and Road Initiative or New Silk Road too) as a huge overland-railway and maritime transportation routes system between the continents is beyond Greece and gives the role of a new gate for the EU trade to Greece.

Antwerp is out of the queue regarding the geographical expansion. This port can be developed the most difficulty because the location in the estuary of Schelde river which is a physical obstacle for the Belgian port. The further possibility of the expansion is given only for Rotterdam in natural ways. Despite the trade collaboration with Zeebrugge the second most important EU port has got limited developing regarding the hinterland connection. It is narrower than for Rotterdam or the mentioned Hamburg.

Finally, I'm making a calculation about benefits and handicaps of the position as "EU gate" regarding the collection cost which is the 20 percent of single EU tariff revenue, and it remains in that country where the importer wants to pay the duty. The conclusion is available in the last chapter of this paper.

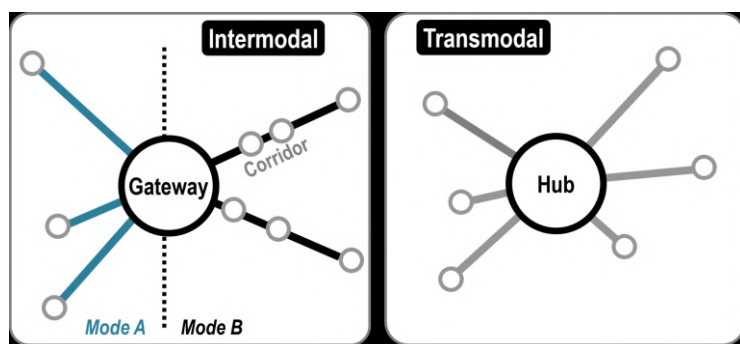
Sum up the research, the rarely mentioned trade routes as the part of the geographical economic approach will take on a bigger role in the future among the big trade blocks. Considering the different giant economic blocks, we expect that the new trade ways can contain the reorganization of regional and global trade interests plus the economic debates and competition within the blocks.

Finally here we must mentioned that the study differentiates the types of ports: gateway and transshipment.

Gateway type ports have got hinterland so the imported (and exported) goods and commodities are transported to (from) overland logistical stations or centres by freight trains, trucks or inland navigation (Erdős, 2021, pp. 110). In the case of transshipment the imported commodities and goods move from bigger ports (hub) to smaller ports by feeder ships. It also means that the transshipment ports are served by only ships and not by other traffic modes.

The gateway ports are usually more competitive because the long-term investment and development will be more profitable due to various hinterland relations. The transshipment ports can depend on economic recovery and slowdown periods and plus shifting of demand of vessel companies.

Figure 1: Port Structure of Gateway/Transshipment



Resource: Rodrigue, 2020, pp. 68.

2. METHODOLOGY

The study is engaged to calculation of tariff revenues especially the so-called collection cost as the 20 percent of the tariff remains in the national budget. Only 80 percent goes to single EU budget until 2020. Since then, this value increased to 25 percent.

It uses the data from Eurostat between 2000 and 2019. The member states could get 10-25-20 percent of tariffs^v could retain to cover the so-called administrative expenditures. It should be noted that European Commission aimed to decrease the 20 percent value to 10 percent again like in the past, but the members refused this part of the Commission's reform proposals. Nowadays we know that the leader exporter-importer EU states were able to lift up the 20 percent to 25 percent between 2021-2027 budget period which is totally opposite way of Commission's willing (European Commission, 2018, 16.p.)

Table 1: Collection Cost (percent) 1970-2023

Period	Percent of collection cost (%)
1970-2001	10
2002-2015	25
2016-2020	20
2021-	25

Resource: Eurostat, https://ec.europa.eu/budget/graphs/revenue_expenditure.html

As we can see the different key of collection cost term by term, it is also worth calculating a proportional income for the member countries. The recent 20 percent key seems to be the best choice for it.

I have made a standalone calculation too. In one hand there is a ratio shows and explains the nominal number (as the retained value or as the official name: collection cost) compared to the GNI-based contribution to the budget of EU customs union. On other hand, and of course it is related to the first one, the member state can finance its own contribution to the budget partly or fully. Now needless to say the GNI-based contribution is a kind of balancing amount, it can change year by year, but it cannot transcend a max. limit of a 7-year budget period.

Table 2: GNI-based Max. Limit of EU Budget (percent)

Period	GNI-based max limit (percent)
2000-2006	1,24*
2007-2013	1,045
2014-2020	1,29
2021-2027	1,4

* until 2002 European Commission used the GNP-based calculation

Resource: Halmi (2018, pp.10.) and European Commission (2022)

The formula of our calculation is quotient between the nominal collection cost and GNI-based contribution.

Figure 2: Formula of TOR-Increasing Quotient (TIQ)

$$\frac{\text{Collection cost}}{\text{GNI-based contributions}} = \text{TOR-Increasing Quotient}$$

Resource: own calculation

The bigger value of collection cost as the bigger value of retained amount is the numerator. Economically it is an increasing activity of tariffs, logistics, transportation, manufacturing industry too. As surplus appears in the contribution to added-value amount but it means that it decreases the denominator at the same time. It is more friendly to customs clearance country because if the numerator increases the whole quotient is bigger.

The GNI-based contribution in the denominator (as a balancing factor) must be larger than the value of the retained amount has decreased. If the GNI-based contribution goes up, the quotient must go down.

The two impacts strengthen or weaken the value of quotient in the meantime. As we have a higher value of numerator as the added value-based contribution is higher too which decreases the necessary of GNI-based contribution of members. So, a higher numerator means a lower denominator if we know the fixed maximum limit of member state contributions for a 7-year period in EU.

3. TRADE ROUTES

Let's see the transportation routes. Beijing has determined six important trade routes to secure the supply and logistic chain (OECD, 2018):

1. *China – Mongolia – Russia Economic Corridor*: the partners decided about development of this infrastructure way and project in 2014 Dushanbe, Tajikistan (Tiezzi, 2014). This route uses the infrastructure of Trans-Siberia railway as well, so the trade partners have already had an operating way. Before the Russian - Ukrainian war Moscow was the third biggest trade partner of EU, but the trade intensity had changed, the Far-East region was closer to Russia as trading and logistic partner (Wolffgang, Brovka & Belozero, 2013). I have to add some important information it is not the fastest way between the main Chinese production centres and its main consumer, EU. It is 11.100 km long even though the Trans-Siberian railway is used, and it takes 18-20 by freight train. Of course, it is much faster than the 23.000 km long maritime route between Shanghai and Rotterdam which takes 45-60 days by container vessels (Gussarova, Aminjonov & Khon, 2017).
2. *New Eurasia Land Bridge Economic Corridor*^{vi}: it is simply the fast railway connection between China and Europe via smaller Central-Asian countries which enjoys the advantages of nonstop, nontariff routes given by trade and economic blocks. There are some leaving, transit or important warehouse-logistic stations like Chongqing (Chóngqing) or Yiwu (Yiwū) which is one of the Shanghai's

terminals. There has been direct freight train between Yiwu and Madrid 9.977 km long route. But the most common direct cargo train relation is the China – Germany (Duisburg) delivered at least 20.000 TEU containers per a year between 2012-2014. Since than fully loaded freight trains move in both directions, and it usually takes 10 days (Smith, 2022).

The first container train arrived in Rotterdam in 2015. The vessels could take it 60 days (between Chongqing/Shanghai and Rotterdam). It decreased to 14 days by cargo train in 2015 (Lechmacher, 2015).

Or let's see another example. The distance between the Chinese Zhejiang region and London-Barking was only 18 days for a directional freight train, it could go halves the former average time of transportation (Lau, Ling, Rathbone, Wijeratne, Yau & Wong, 2017). Following this strategy freight trains arrive in Latvia, France, Germany or Czech Republic from China too. This study provides the location of crossing border station, it is situated in Małaszewicze, Poland. It also means that Poland is the country in the customs union where the imported goods enter the territory of European Union. The benefits of this „belt“:

- a. This corridor can build on existing and well-maintained infrastructure like the relatively developed Kazakh sections.
- b. Freight trains are faster than giant vessels.
- c. Additionally, the overland route is 40 percent shorter, the container can move 65-70 percent faster than in the maritime way.

There is only one big handicap of the railway transportation to be much more expensive than the transportation by ships therefore the bulk goods will be delivered via the maritime ways in the future too (Engelberth – Sági, 2017).

The a) point also stated this corridor is well located in terms of infrastructure as it includes there more or less independent economic entities: China, the Eurasian Customs Union and the European Union. This fact significantly simplifies the issue of transportation because the deliver companies have to focus only two customs borders.

China and the Eurasian Customs Union had a partnership agreement in May 2018. There are some relevant and practical parts of this agreement (beyond the classic nice diplomatic goals and political announcements): the states tend to minimize the physical obstacles against the transportation. Though the Chinese and European railway system use the classic 1435 mm track, the Eurasian Customs Union has the wide 1520 mm gauge track, the transloading between the different system is relative fast^{vii} due to this international contract (Hodgkinson, 2016).

3. *China – Central Asia – West Asia Economic Corridor*^{viii} (Derudder, Liu & Kunaka, 2018): Xinjiang Uygur Autonomous Region is the host area of this corridor. It takes the final station, Teheran, the capital of Iran via the relative stable „istan“ countries. This corridor is used to Iranian megacity and it has decreased the 44-45 days route to 14 days between Shanghai and Teheran. This way has got more legs or alternative routes.
 - a. It is the IV. TEN-T way, transporting from Bosphorus region (Istanbul) via Bulgaria, Romania, Transylvania/Banat, Hungary, Austria to Germany (Duisburg). It can have a leg to Moscow from Romania.
 - b. Or creating a new route from Port of Piraeus/Athens via Skopje and Beograd to Budapest where it can meet the previous one. It is the most relevant, a probable winner because the section between Beograd – Ópazova – India – Újvidék is totally reconstructed and Újvidék – Szabadka is being developed and it is also true the section of Hungary (Eszterhai, 2016).
 - c. Though the third alternative goes via more instable regions (via Syria, Iraq, Ukraine) it is begun to plan and there are sometimes test cargo trains try to transport. A new corridor as an idea was announced on 22nd February 2021 between Black Sea and Baltics^{ix} which has the most important final station are the Polish Gdansk and the Ukrainian Odessa. Before the war there were some test runs but since 2022 February it has been over (Railfreight, 2021).

There are many researchers and experts (ie.: Ferenc Erdősi dr., Viktor Eszterhai dr., Peter Frankopan, Man Hung Thomas Chan, Márton Péti dr., François de Soyres, Siobhan Murray, Nadia Rocha and others) say the sum of these routes are the New Silk Road. It follows the ancient and medieval path of Silk Road. Of course, there are many parts of the former Silk Road which is reconstructed or simplified due to modern technology. That's reason why the Kamchiq-tunnel was so important for Uzbekistan in 2016. The tunnel is 19,2 km long which is the record in Central-Asia. It is the part of Angren – Pop railway, the cost was 1,9 billion USD and was financed mostly by Export-Import Bank of China and the Worldbank too (Worldbank, 2021a). The heaviest sections were built by China Railway Tunnel Group.

There were some extremely relevant Chinese foreign political initiations for creating the New Silk Road project. The so-called 16+1 Cooperation or named as Cooperation between China and Central and Eastern European Countries (China-CEEC) was established, and summits are organised annually. It helps the Chinese presence in the Central-European, Balkan or Baltic regions. The members: Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovakia, Slovenia and finally China (Richet, 2018).

Figure 3: Main Routes of OBOR between EU - China



Resource: Péti, 2017, pp. 16.

[New \(New\) Eurasia Land Bridge Economic Corridor \[\(N\)ELBEC\]](#)

[China-Central Asia-West Asia Economic Corridor \[CCAWAEC\]](#)

[New Maritime Silk Road](#)

4. *China – Pakistan Economic Corridor* is situated on a prominent place within the New Silk Road. Its first and foremost pillar is Gwadar of 140.000 inhabitants as the maritime gate of the country and it has direct connection with North-West Chinese regions. The freight trains can avoid India and Strait of Malacca which is favoured area of modern piracy. Nowadays China must pass next to Malay Peninsula and sail to Sumatra Islands (avoid Singapore) and finally catch the Indian ocean and Bengal Bay.

There are dual proposes of Pakistan route:

- a. Kenya and its capital, Nairobi are available easily and safely which is important as sources of raw materials for China.
 - b. The second leg of maritime route turns at Gulf of Aden to North, and the ships sail between Djibouti and Yemen then can go to the Red Sea and further to Suez Canal. Finally crossing Port Said they get out to Mediterranean Sea and dock to NAPA ports (North Adriatic Ports Association cities) or they can continue their journey to Port of Piraeus, Greece which is the biggest and most important transshipment port now in the whole Mediterranean region.
5. *Bangladesh – China – India – Myanmar Economic Corridor*: the smaller countries and India have got similar interest in OBOR project namely they also want to avoid the South China Sea as insecurity water because it is the heart of Far-East piracy.
 6. *China – Indochina Peninsula Economic Corridor*: the smaller states and economies in this region should be the economic hinterland of China and Hong Kong.

Our study called the sum of these six routes together as One Belt One Road project after lots of explanations, additions, amendments.

This paper doesn't want to give a full analysing of OBOR and doesn't mention all sub strategies because it focuses on Europe firstly and analyses the trade routes to Europe. Therefore, it is engaged to 1, 2 and 3. way and monitors the final/arriving points and their economic benefits and losses. According to our viewpoint the OBOR has been developed mostly in the Europe – China relation since 2013 (World Bank Group, 2019). Before 2012 the overland transcontinental transportation was absolutely not relevant, the ratio was only under 1 percent between Europe and Far East. After 2012 this value is much higher in 2017, 408.00 TEU (Pepe, 2019) was delivered in any overland legs of OBOR. We must see and follow the growth:

- transported TEU increased by 13.600 percent.
- overland transportation was 4-7 percent of the whole transportation between the European and Far East regions.
- overland part of OBOR is a 22-45 billion USD industry now (Pepe, 2019).

It is clear for us that more than 60 countries have had different interest in the OBOR project including the leader power of EU, Germany too. It is true for building of infrastructure not just the profit of operation.

4. COLLECTION COST

Special income for member states

The focus point of this research is the changing of collection cost. The Council Decision (EU, Euratom) 2020/2053 of 14 December 2020 on system of own resources of the European Union and repealing Decision 2014/335/EU, Euratom plus earlier, the No. 609/2014/EU's decision^x provided for the 20 percent collection cost. Before 28th February 2001 it was 10 percent, between 1st March 2001 and 28th February 2014 it was 25 percent. This value (percent key) grew to 25 percent again after 14th December 2020 and it remains until the end of 2021-2027 budget period. This financial resource as a special contribution to budget of national states goes to those members which have got great export-import activities. It concentrates on North-West region of EU, from La Havre to Hamburg but the distribution is not balanced.

The enlargement in 2004 reshaped the geopolitical and trade relations of the European customs union due to the new Central-European members in the economic block. The few physical obstacles and national borders are favourable for the international trade. That's why the new alternative routes were discovered in the Far East – Europe; practically China – Germany trade relations. Finally the China – Russia/Kazakhstan – Belarus – EU/Poland trade way was born in the past and the imported products and commodities are cleared by Poland and not by Netherlands, Belgium or Germany longer. It is no question that the 20 percent collection cost moves to the Polish budget and it enriches Warsaw and not Amsterdam or Berlin.

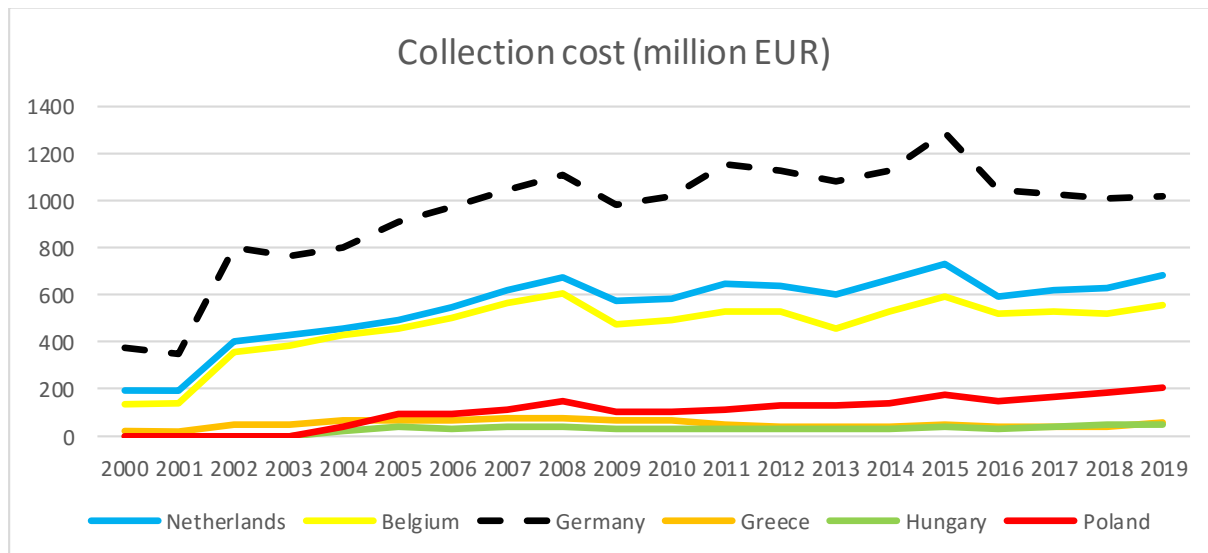
The financial data comes from the European Commission's official website, from page of the own resources (EU spending and revenue 2014-2020). I chose the following countries for analysing of 2000-2019 period:

- Netherlands: Rotterdam plays the most important role which is the greatest European port. Secondly Amsterdam is also a relevant post (not as much as Rotterdam so far). Both ports are characterised as *gateway* and *transshipment* port.
- Belgium: Antwerp is the second biggest port in EU. Antwerp is a typical *gateway* port for the goods and commodities from North America and Africa.
- Germany: Hamburg and Bremen are the two main ports of Germany. In the meantime Hamburg is the third most important port of EU. Hamburg as a giant *gateway* port has got very intensive trade activities with Central-European countries too.
- Italy: Gioia Tauro as an alternative port of Malta has got strong *transshipment* position but considering the tariff revenues it is not as relevant as the mentioned three top ports. I can mention the North Italian Trieste too which is a big oil refinery port. Our paper focuses on the container transportation so it doesn't include the analysing of Trieste.
- Greece: Port of Piraeus is the fourth biggest container port in EU in 2019. Despite it doesn't have classical hinterland supply routes that's why Piraeus is a great *transshipment* port now.
- Hungary: Hungary is strongly related to Greece and the potential changing of status of Piraeus. On other hand it depends on the new and fast freight train route between Beograd and Budapest via Újvidék, Szabadka and Kiskunhalas. It determines the tariff revenues too in the future.
- Poland: It became such as overland gateway of EU due to Małaszewicze transloading railway station. Małaszewicze is located on the very Eastern border of the European customs union, it functions as the Eastern gate of EU or we can name as the crossing border point of 1. corridor of OBOR.
- Slovakia: It seems to be an alternative Eastern gate for EU for a long time. Ágcsernyő-Tiszacsérnyő could have been a second Małaszewicze because it is located on the border station of Slovakia and Ukraine. Additionally, it works as dual transloading railway station for the normal European track system (1435mm) and for the Easter-European (so-called Soviet) 1520 mm gauge railway. The 1520 mm gauge tracks are used between Ungvár and Kassa. There was a chance to create a direct railway connection between Kassa and Wien until 30th May 2022. The Austrian Federal Railway, the ÖBB (Österreichische Bundesbahnen) gave up the plan for building a new wide gauge railway to Austria and wants to sell the interest in the project company, Breitspur Planungsgesellschaft mbH (Railfreight, 2022). Though there won't be robust trade expansion in this way, we used the numbers between 2000-2019.
- Slovenia: it has got only one port, Koper. It is a special rival of Port of Trieste especially in the terms of container transportation. It is significant for this paper and Hungary too as an escaping or alternative route.
- Austria: it is one of the important sharing station for freight trains with efficient and well-operation tariff-system and clearing.

Other conditions

The collection cost as TOR (Traditional own resources) was a 10 percent tax-key levied on tariff until 28th February 2001. This key was 25 percent between 1st March 2001 and 28th February 2014 and after 1st March 2014 the mentioned value was 20 percent (EU spending and revenue 2014-2020).

Figure 4: Collection Cost (Million EUR) 2000-2019

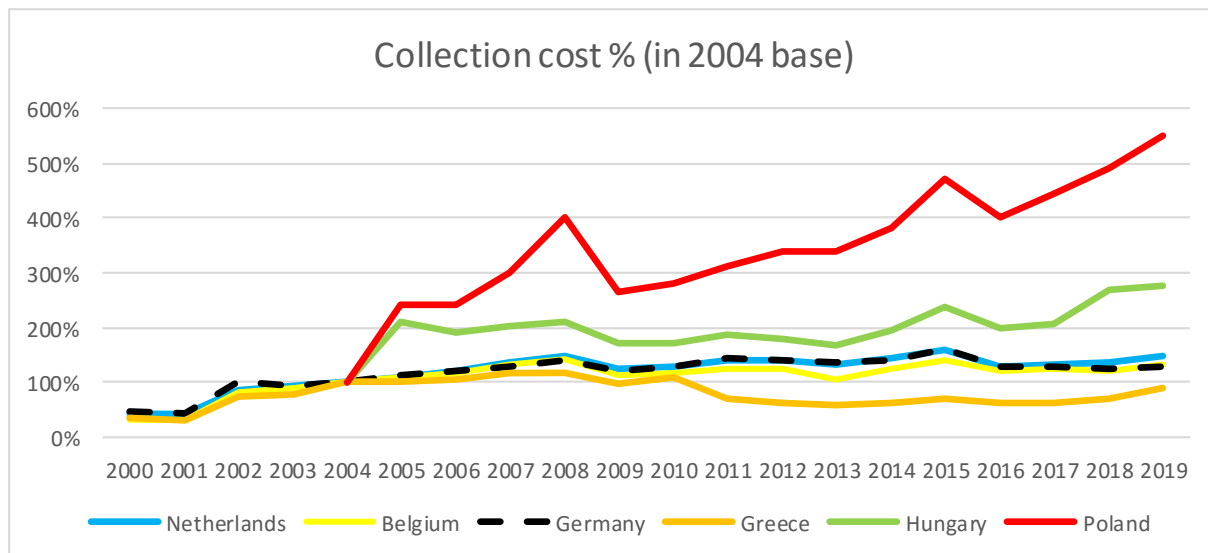


Following the sixth figure it is not a big surprise that Germany, Netherlands and Belgium could get the biggest amount as administration cost from the TOR revenue.

The Italian and Austrian revenue were continuously less and less between 2011-2019 while the largest growth occurred in Poland relatively and Hungary, Slovenia and Slovakia have got also favourable income values.

If we get the enlargement term in 2004 as base term only Austria and Greece were those two member states which couldn't increase their own ratio in this trade revenue issue, the other countries could do it. Of course, needless to say the base value of Central-European countries was very low in 2004, but not zero.

Figure 5: Collection cost (million EUR) 2000-2019 data based in 2004



If we analyse and calculate these incomes with solid 20 percent between 2000-2019 it can show interesting result theoretically. This way of calculation can modulate the results better regarding the capability of absorbing and presents a stronger Central-European position in this financial competition.

5. TARIFF REVENUE ANALYSIS

Our paper analyses the tariff revenue between 2000-2019 period. As we mentioned it was 10 percent based on tariffs before 2001.

Between 2002-2015 this ratio as the key of collection cost grew up to 25 percent and after 2016 it has moderated to 20 percent^{xi}. The study uses two different ways:

1. we use the real percent key and
2. we use a special, theoretical 20 percent key. The 20 percent key covers and is used on the earlier periods too.

On other hand we have a fixed and chain base index numbers calculation too where the starting year is 2004.

The data come from Eurostat „Total own resources database^{xii}.

In 2019 the record profits from collection cost were generated by ports in Germany (1023 million EUR), Netherlands (682,3 million EUR) and Belgium (558,8 million EUR) due to the biggest and busiest gates of the EU trade: the German Hamburg, the Dutch „port-couple”: Rotterdam – Amsterdam and the Belgian Antwerp.

This is followed by ports in Italy (460,8 million EUR) and France (443,5 million EUR). Ports in Spain (397,8 million EUR) and France are not part of this analyses. The reason for this is that port of Piraeus and the trading routes of OBOR are not crossing French and Spanish territories (at least not directly).

Poland has got significantly larger size of territory and economic-political position in Central-Europe. Additionally due to its location Poland is the gate of the 1. Corridor of OBOR to enter European Union, so it is such an overland gate for the external trade of European integration. Warsaw’s revenue was 206,7 million EUR which is about 30 percent of the Dutch collection cost and approximately 20 percent of German value.

Hungary’s profit from collection cost is 50 million EUR (one quarter of Polish amount). It is equal to Greek value (59,8 million EUR) and a bit less than the Czech revenue (71,7 million EUR). We have to mention that the third route of One Belt One Road project from Piraeus has not been started to build in the decade of 2010s yet.

Otherwise, if we get the fixed base index numbers our ranking is totally different. Between 2004-2019 the average EU increasing of collection cost revenue was 130 percent – the 10-25-20 percent key proportioning is not given in this indicator.

The gain of Central-European member states has been drastically bigger. Poland is the first country in this competition it reached 550 percent growth in this period. Slovenia is the second with 480 percent growth due to Port of Koper which is a relatively small port in EU but very efficient. The Slovakian increasing value is 330 percent while the Hungarian is 276 percent. These results show a pretty prosperous position in EU trade with third partners especially we know that neither Hungary nor Slovakia has got maritime port like Slovenia or Poland. We have to emphasise that the ports are the most important gates of EU for external trade and the 20 percent collection cost can be realized much easier if a member state has a maritime port. Especially it is located on the OBOR route directly.

If we monitor the fixed base index values of old member states these countries couldn’t increase their own benefits from this administrative cost as much as the new member states. The German fixed base index number compared to 2004 was 128 percent (under the average of European Union value). It is really interesting to analyse the German position because Hamburg seemed to be the greatest winner of enlargement in 2004. Port of Hamburg had served the Austria-Hungary Monarchy mostly before the First World War, but after the collapse of Monarchy especially during the Cold War Port of Hamburg lost its commercial-economic hinterland like the region of river Elbe, or the Czech, Hungarian or Polish industrial supply.

The Italian value is more moderate (112 percent) but the Belgian result is equal to EU’s average (131 percent). The greatest growth was the Dutch one (149 percent) between 2004-2019 but it has also lagged behind the Central-European records. This order doesn’t change if we calculate value the proportional to 20 percent.

What is the connection (if there is) between the increasing revenue of Poland, Hungary or Greece and the decreasing one of Netherlands (and the other values of older member states).

The study made an interview with Dr. Professor Joost Hintjens who stated that the Antwerp has got another position like Port of Rotterdam or Port of Hamburg. He emphasized that the most important trade partners of Antwerp are the African and American countries while the Port of Rotterdam and of Hamburg handle the export-import between Europe and Asia. That is the reason and response why the Port of Antwerp hasn’t lost the position because it is not the direct rival aim stop of EU-Asia trade competition. In other words Port of Antwerp doesn’t need to share its own commercial capacities with the rival Eastern and Southern European ports.

As the following, eighth figure presents to us the real Dutch value has been decreasing opposite the Polish, Hungarian or Greek benefits. Since the Greek value is rather stagnate the Polish and Hungarian results must be significantly higher. The whole EU trade “cake” can grow only in long term, in shorter period the changing of Dutch collection cost relatively is smaller than the Central-European countries results.

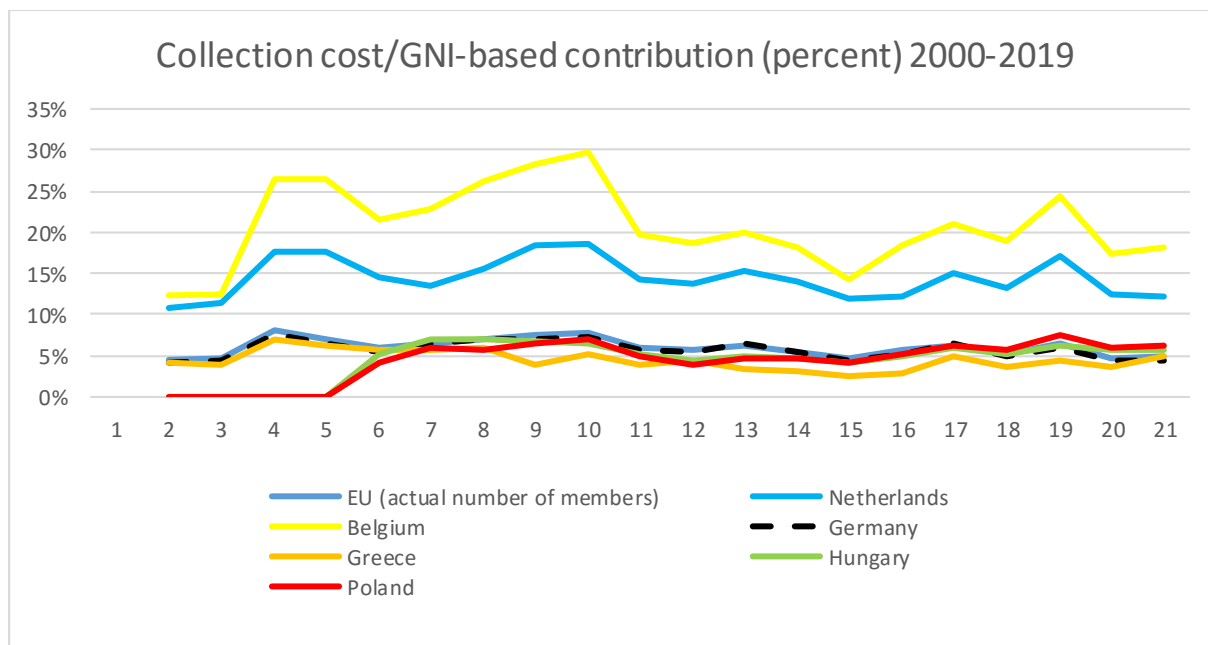
The new OBOR project since 2013 can explain this economic-financial situation. The First Corridor of OBOR appeared firstly through Poland between EU and Asia then a bit later the so-called Third Corridor was used from Port of Piraeus crossing the territory of Balkan countries, Hungary and Austria. The cake has been divided into more and more slices which means Port of Rotterdam could get less transportation relatively. It is particularly true if we know that the Rotterdam Port Authority developed the capacity of port due to the Maasvlakte 2 project and wanted to speed and concentrate the number of freight trains between the port and the hinterland.

There is a second calculation for the combination of the contribution of EU’s budget and the analysed collection cost. The biggest contribution of a member state is the GNI-based payment country by country. If it is compensated partly with remained 20 percent collection cost it will be better and more respectable for the net donor countries first and foremost.

Our indicator: the remained 20 percent collection cost is divided by GNI-based member state's contribution. As we talk about a quotient so the country can have a better position following two different ways:

1. The tariff revenue is increasing so the nominal remained collection cost must be higher than before. The bigger collection cost shows a more important and improving trade position with third partners (out of EU) and with the partners inside the integration too. It means the country's ports as in the gateway and/or transshipment position attained more trade relations or more intensive trade achievements.
2. The GNI-based contribution can be less it means the member state must pay less complementary financial contributions to reach its own upper financial maximum.

Figure 6: Collection Cost/GNI-based Contribution (percent) 2000-2019



Resource: Eurostat, https://ec.europa.eu/budget/graphs/revenue_expenditure.html, own calculation

Needless to say that this ratio is higher where the gateway position is stronger and more adequate. The GNI-based contribution is the biggest payment to the EU's budget but on other hand is a special balancing amount too. That's why an important interest of a member state is able to increase the share of other payments because it can decrease the GNI-based financial contribution.

Additionally we never forget a less visible but more important possibilities for the ports and countries. The Value Added Tax (VAT) is also the part of the member state's payment to Brussels's budget. The biggest part of manufacturing industry is concentrated in the biggest ports like in Port of Rotterdam, Antwerp or Hamburg (particularly in the first two ports). It means that a huge amount as VAT comes from these industrial sectors.

In summary the decreasing tariff revenue is bad for the net donor countries at least in two different ways:

- the country can get less revenue from VAT or payment of corporate tax
- the capacity of manufacturing industry is not used as much as before^{xiii}
- in the meantime the GNI-based contribution is going to increase

Otherwise those member states like Greece, Poland or Hungary located in the route of OBOR can expect an opposite effect from the project like the mentioned more developed countries.

- increasing tariff revenue means higher profit for the national budget
- the activity of logistics and manufacturing industry can grow up it means the VAT will be higher as well^{xv}.

In one hand Netherlands has had relatively decreasing revenue on other hand Port of Rotterdam has relatively higher dead capacity. Additionally Netherlands as well Germany must have paid a larger contribution to the European budget during the recession because of mortgage crises and they couldn't balance it with higher VAT-revenue or collection cost^{xv}.

All in all understanding the previous explanations we can expect a growing intensity trade competition among the ports and member states to get a bigger share of the different revenues.

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ⁱ Twenty-foot equivalent unit, a twenty-foot-long (6,1 meter) and generally 8-foot-wide (2,59 meter) container used in international trade

ⁱⁱ The longer and more ineffective WTO summits promise to us that time of the tariff reducing negotiations and contracts will be over and the large trade blocks don't have new interests to change in this frozen situation.

ⁱⁱⁱ Rotterdam and Antwerp were the most important ports of the global trade and economy in the first years of XX. century. Additionally, Antwerp had the biggest business proportion on the global level (Cholnoky, 1936)

^{iv} Hamburg was one of the most important port for the Austria-Hungary Monarchy due to the transportation on river Elbe. Though Wien wanted to build up lots of financial and physical barriers against it and to support Port of Trieste – at the same time Budapest wanted to lift up Port of Fiume to support the Hungarian international trade – Hamburg could remain the first gate of international trade of Austria-Hungary Monarchy (Erdősi, 2019, pp. 12-15).

^v It is the TOR, Traditional Own Resources

^{vi} It is the most important overland corridor for Europe, and it will have serious impact in the future to shape the European policies.

^{vii} The most important route is the New Eurasian Land Bridge Corridor for us. At the crossing border station between China and Kazakhstan a freight train must wait 42,4 – 59,7 hours in general. It means in the practice that a changing of train axis must be taken maximum 5-6 minutes (or less) to focus on the timetable Hodgkinson, 2016).

^{viii} This is the second corridor which can shift the importance of EU's trade routes and the economic benefits of members.

^{ix} <https://www.portgdansk.pl/en/events/port-of-gdansk-strikes-new-black-sea-to-the-baltic-trade-route-deal-with-ukraine/> (Accessed: 2023.10.19)

^x Council Regulation (EU, Euratom) No 609/2014 of 26 May 2014 on the methods and procedure for making available the traditional, VAT and GNI-based own resources and on the measures to meet cash requirements

^{xi} It went up to 25 percent after 2020, but this term is out of our survey.

^{xii} https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/2014-2020/spending-and-revenue_en

^{xiii} We must think of logistic and trade activity in the case of Port of Piraeus and the Polish cross-border station, Małaszewicze. First and foremost they handle the container trade so they are the rivals of Port of Rotterdam and Port of Antwerp in this position because their typical character is more transshipment than gateway. Other ports like the Italian Port of Trieste or the Spanish LNG terminals can be the rival of the Dutch and Belgian port in the manufacturing industry issue.

^{xiv} We can talk logistics in the case of Serbia too. New freight railway tracks are being built in Belgrade – marshalling yard in order to serve the increasing trade demand. There will be 120 tracks after the reconstruction and development. But we can mention the town of India (Indija) in the region Szerémség (Syrmia) which is one of the biggest logistic railway junction in Serbia – Voivodina. The European corridors X/A. and X/B. is divided here: the X/A. continues to Szávaszentdemeter – Zágráb (Sremska Mitrovica – Zagreb) while the X/B. turns to North toward Újvidék – Szabadka – Budapest (Novi Sad – Subotica – Budapest).

^{xv} During the economic crises the demand is expected to decrease and it means the tariff revenue is also lower than before the decline. But on the expenditure and contribution to EU's budget of states are fixed for 7 years so it needs an own national proportion to the budget of integration which cannot be recovered as much as in a recovery period.



EXPLORING CARBON TAXES AS CATALYSTS FOR FINANCING NUCLEAR POWER PROJECTS IN TURKEY

DOI: 10.17261/Pressacademia.2023.1847

PAP- V.18-2023(5)-p.31-37

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To cite this document

Sahin, A.G., Kucukkocaoglu, G., (2023). Exploring carbon taxes as catalysts for financing nuclear power projects in Turkey. PressAcademia Procedia (PAP), V.18, 31-37.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1847>

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ABSTRACT

Purpose- Climate change and the urgent need to transition to low-carbon energy systems have led nations worldwide to seek innovative financing mechanisms for sustainable energy sources. This article delves into the feasibility of leveraging carbon taxes as a potent financial instrument to promote nuclear power projects, with a particular focus on Small Modular Reactors (SMRs), in Turkey.

Methodology- This study outlines a methodology for designing a tailored carbon tax framework, addresses challenges, and highlights the strategic importance of this approach. Concurrently, an empirical case study has been conducted to introduce a carbon tax in Turkey to show the fundamentals of calculating carbon tax in Turkey.

Findings- By aligning carbon taxes with nuclear power initiatives, Turkey can reduce emissions, secure funding, enhance competitiveness, and contribute to global climate goals, paving the way for a sustainable energy future.

Conclusion- Implementing carbon pricing mechanisms could improve Turkey's investments in SMR power plants and reinforce its stance towards a more environmentally sustainable energy future.

Keywords: Green financing, nuclear power, sustainable investment, carbon taxes, financial

JEL Codes: Q30, Q40, H20

1. INTRODUCTION

In a world where it is increasingly urgent to transition to low-carbon energy systems, exploring innovative financing mechanisms to promote sustainable energy sources is vital. Although nuclear energy often provokes differing opinions, it offers significant opportunities for carbon-free energy production. The alarming rise in air pollution and its alarming role in exacerbating global warming underscore the urgent need for rapid and decisive global action. Forward-thinking countries, including the Netherlands, Sweden and Finland, have adopted the concept of a carbon tax as a way to control emissions and increase their commitment to energy initiatives to clean quantity.

However, it is increasingly evident that "pay as you pollute" alone is not enough to drive the deep, transformative change needed to usher in an era of widespread clean energy production. At this pivotal time when environmental sustainability requirements are higher than ever, innovative financing strategies must be explored to accelerate the transition to a low-carbon future.

The landscape of green finance is multifaceted, encompassing diverse interpretations. According to the United Nations Environment Program, green finance encompasses the augmentation of funds from both public and private sectors to bolster sustainable development projects (United Nations Environment Programme, 2023). Alternatively, Höhne (Höhne, Khosla, Fekete, & Gilbert, 2012) defines green finance as a broad concept encapsulating financial investments in sustainable development initiatives, environmental products, and policies fostering a sustainable economy. The Asia-Pacific Economic Cooperation (APEC) characterizes green finance as financial support aimed at propelling environmentally friendly growth (Asia-Pacific Economic Cooperation, 2011). Additionally, Zadek and Flynn (Zadek & Flynn, 2013) highlight that green finance entails covering operational costs, planning expenditures, land acquisition, and other financial aspects related to green projects. Soejachmoen (Soejachmoen, 2017) underscores the importance of sustainability in banking and investment decisions, wherein environmental screening and risk assessment guide choices to align with sustainability standards.

Conversely, a carbon tax is a levy imposed on carbon emissions stemming from the combustion of fossil fuels. The rates of carbon taxes are typically calibrated based on the carbon content of specific fossil fuels, with higher carbon content leading to higher tax rates. Carbon taxes serve as potent policy instruments in addressing global warming and mitigating climate change. Nonetheless, determining optimal tax rates necessitates meticulous consideration to achieve desired environmental outcomes while accounting for potential economic impacts.

The global landscape offers a mosaic of carbon tax implementations, with various countries adopting this approach for diverse reasons. Notable examples include Australia, Austria, Canada, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Japan, Mexico, Norway, Sweden, Switzerland, the United Kingdom, and Austria (Mengden, 2023). Some countries, like Turkey, have introduced similar taxes under different names, such as Motor Vehicle Tax or Private Consumption Tax.

Australia, for instance, introduced a comprehensive carbon tax in 2012, encompassing all greenhouse gas-emitting industries and major gas consumers, aiming for a 15% reduction in carbon emissions. Austria has recently integrated carbon taxes into broader reforms promoting renewable energy development and socio-ecological (CBC News, 2007) tax reforms (World Bank, 2014). Canada initiated its first carbon tax in Quebec in 2007, followed by a national carbon tax, which set a minimum price of \$20 per ton of CO₂ in 2019. Denmark has maintained a carbon tax since 1992, primarily levied on transport and non-district heating (Lenain, 2022). Estonia introduced a carbon tax in 2000, applying it to all CO₂ emissions from thermal energy producers, excluding biofuel emissions (Mengden, 2023).

This article delves into the feasibility of utilizing a carbon tax fund to finance nuclear power projects in Turkey, with a particular emphasis on Small Modular Reactor (SMR) projects. SMRs offer distinct advantages, such as lower initial costs, reduced construction periods, and decreased risk of project delays. In this study, we embark on a comprehensive exploration of the mechanisms involved in designing a carbon tax tool, establishing a carbon tax fund, deploying collected funds to support SMR projects, and adapting these frameworks to endorse nuclear energy initiatives in Turkey. The ensuing sections will address the nuances of green finance and carbon taxes, elucidating their global implementations, and subsequently, we will delve into the challenges and considerations associated with this innovative approach.

The study unfolds in four key sections. First, it elucidates the global landscape of green finance and carbon taxes, spotlighting diverse approaches adopted by countries to mitigate carbon emissions and drive clean energy transitions. This context sets the stage for the exploration of the intricacies of carbon tax design, target sectors, and fund allocation mechanisms specifically tailored to Turkey's unique circumstances. Second, the article outlines a meticulous methodology for crafting a robust carbon tax framework. It encompasses setting carbon tax rates calibrated to emission reduction targets, identifying priority sectors for taxation, and defining precise mechanisms for channeling carbon tax revenues into green energy projects, including nuclear power initiatives. Third, challenges and considerations associated with implementing this transformative strategy are addressed comprehensively. These encompass political will, public acceptance, regulatory complexities, international collaboration, economic viability, environmental impact, and security concerns. Navigating these challenges is essential for the successful implementation of carbon taxes and nuclear power projects in Turkey. Lastly, the article concludes by highlighting the significance of this innovative financing approach, positioning Turkey to secure funds for both emissions reduction and nuclear power expansion. It underscores how this strategic alignment can bolster Turkey's competitiveness on the global stage, foster economic growth, and contribute significantly to international climate goals.

In essence, this article serves as a call to action, inviting policymakers, researchers, and stakeholders to embark on a transformative journey towards a sustainable, resilient, and low-carbon energy future in Turkey. Through the fusion of carbon taxes, nuclear power projects, and strategic planning, Turkey stands poised to play a pivotal role in the global transition to a greener and more sustainable world. As our journey continues through this exploration of green finance, carbon taxes, and their global implications, we will also examine sectoral-based carbon emissions and regional-based carbon emissions, which will provide valuable insights into the broader context of the challenge at hand and the importance of innovative financing mechanisms to transition toward sustainable energy sources.

2. LITERATURE REVIEW

In this section of this article, we delve deeper into the realms of green finance and carbon taxes, elucidating their multifaceted nature and global implementations. Green finance, as previously defined, serves as a pivotal mechanism for channeling financial resources towards sustainable development projects and environmentally conscious initiatives. It represents a paradigm shift in financial decision-making, where sustainability criteria are integral in assessing investment viability.

Carbon taxes, on the other hand, have emerged as indispensable tools in addressing the pressing issue of carbon emissions. The case studies presented earlier, spanning countries from Australia to Sweden, showcase the diversity of approaches taken by nations worldwide to mitigate climate change through carbon taxation. These implementations vary in terms of tax rates, targeted sectors, and overarching objectives, yet collectively exemplify the global recognition of the need for effective policy measures to curb carbon emissions.

Green finance initiatives have made substantial contributions to sustainable development in various countries through several key mechanisms and impacts:

- i) Financing Renewable Energy Projects: Green finance channels capital into renewable energy projects such as solar, wind, and hydropower. By providing funding for these projects, countries can reduce their reliance on fossil fuels, decrease greenhouse gas emissions, and improve air quality, contributing to both environmental and public health benefits.
- ii) Supporting Energy Efficiency: Green finance encourages investments in energy-efficient technologies and infrastructure. This not only reduces energy consumption but also lowers operating costs for businesses and households, leading to economic savings and job creation.
- iii) Enhancing Infrastructure and Transportation: Funding sustainable infrastructure and transportation projects, such as public transit systems, bicycle lanes, and eco-friendly buildings, can improve urban planning and reduce carbon emissions, making cities more livable and sustainable.

iv) Promoting Sustainable Agriculture: Green finance can be directed toward sustainable agricultural practices, including organic farming, precision agriculture, and agroforestry. These initiatives reduce the environmental impact of agriculture, enhance soil health, and protect biodiversity.

v) Conservation and Biodiversity: Investments in conservation efforts, habitat restoration, and eco-tourism can help protect ecosystems and biodiversity. This not only preserves natural resources but also supports tourism-related industries and local communities.

vi) Climate Resilience: Green finance supports projects aimed at increasing resilience to climate change impacts. This includes infrastructure improvements to withstand extreme weather events, flood control measures, and reforestation efforts to reduce the risk of natural disasters.

vii) Access to Clean Water and Sanitation: Financing green initiatives in the water sector ensures access to clean water and sanitation for communities. This contributes to improved health outcomes, reduced waterborne diseases, and increased overall well-being.

viii) Social Inclusion and Job Creation: Green finance often emphasizes social inclusion by promoting investments in projects that benefit disadvantaged communities. Job creation in green sectors, such as renewable energy and sustainable agriculture, can provide economic opportunities to marginalized populations.

ix) Reduction of Environmental Degradation: Green finance discourages investments in environmentally harmful industries, reducing deforestation, air and water pollution, and habitat destruction. This helps preserve ecosystems and natural resources for future generations.

x) Alignment with Sustainable Development Goals (SDGs): Many green finance initiatives align with the United Nations Sustainable Development Goals (SDGs). By addressing climate change, promoting clean energy, and supporting sustainable practices, these initiatives contribute directly to the achievement of these global goals.

Overall, green finance initiatives play a crucial role in fostering a more sustainable and environmentally responsible approach to economic development. By directing capital toward projects and industries that prioritize environmental and social well-being, countries can make significant progress toward achieving their sustainable development objectives while mitigating the adverse impacts of climate change.

3. DATA AND METHODOLOGY

3.1. Designing a Carbon Tax Framework in Turkey

Developing a well-designed carbon tax strategy in Turkey is extremely important as it is an essential tool in the country's efforts to reduce carbon emissions and facilitate a transition to energy sources that are cleaner and more durable. This section presents an in-depth and systematic approach, summarizing three key stages, each of which plays an important role in implementing an effective carbon tax: establish an appropriate carbon tax, identify the target sectors to be taxed and establish a clear framework for allocating the funds generated by the mechanism.

3.1.2. Setting Carbon Tax Rates in Turkey

To determine appropriate carbon tax rates in Turkey, a meticulous analysis of several factors is imperative. These include:

i) Emission Targets: Turkey should establish clear and ambitious carbon emission reduction targets in line with its international climate commitments.

ii) Social and Economic Impacts: Assessing the potential repercussions of carbon taxes on various sectors, employment, and household incomes is vital to strike a balance between environmental goals and economic stability.

iii) Revenue Allocation: Decisions regarding the allocation of collected carbon tax revenues must be made, whether they are directed toward supporting green energy projects, compensating vulnerable populations, or financing energy-efficient programs.

iv) Tax Rate Progression: Consideration should be given to adopting a progressive tax rate system where higher emissions result in higher tax rates, incentivizing emissions reductions.

v) International Comparisons: Benchmarking Turkey's carbon tax rates against other countries with similar economic profiles and emissions profiles provides valuable insights for policy calibration.

3.1.3. Identifying Target Sectors in Turkey

Effectively reducing carbon emissions in Turkey necessitates the identification of priority sectors for carbon taxation. Potential target sectors include:

i) Energy Generation: Taxing emissions from power plants, with higher rates applied to fossil fuel-based generation.

ii) Transportation: Applying carbon taxes to gasoline and diesel fuels, thereby encouraging the adoption of electric and alternative-fuel vehicles.

iii) Industry: Implementing carbon taxes on emissions-intensive industries, such as cement, steel, and petrochemicals.

iv) Residential and Commercial Buildings: Exploring options for taxing carbon emissions stemming from heating and cooling systems.

v) Agriculture: Considering carbon taxes on agricultural activities with significant emissions, such as livestock farming.

3.1.4. Fund Allocation Mechanisms in Turkey

Once carbon tax revenues are collected, defining clear mechanisms for allocating these funds to support green energy projects is crucial. Potential approaches include:

- i) Green Energy Fund: Establishing a dedicated fund to finance renewable energy projects, including nuclear power.
- ii) Energy Efficiency Programs: Allocating a portion of carbon tax revenues to energy efficiency initiatives in residential and commercial sectors.
- iii) Compensation Mechanisms: Implementing mechanisms to compensate low-income households for potential energy cost increases resulting from carbon taxes.
- iv) Innovation and Research: Investing in research and development of clean energy technologies, including advanced nuclear reactors.

3.2. Adapting the Carbon Tax Framework for Nuclear Power Projects in Turkey

To channel carbon tax revenues into funding Small Modular Reactor (SMR) projects in Turkey, several strategic steps can be taken:

- i) Project Identification: Identifying specific SMR projects that align with Turkey's energy goals and emissions reduction targets is imperative. Furthermore, stringent adherence to safety and environmental standards is essential.
- ii) Cost Assessment: Conducting a comprehensive cost assessment for each SMR project is crucial. This assessment should consider factors such as construction, operation, maintenance, and decommissioning costs.
- iii) Revenue Allocation: Dedicating a portion of the carbon tax revenues to support SMR projects is vital. The determination of this amount should be based on the outcomes of the cost assessment and the desired timeline for project implementation.
- iv) Public and Private Partnerships: Exploring partnerships with private companies and international organizations can be instrumental in securing additional financing for SMR projects.
- v) Regulatory Framework: Establishing a clear and efficient regulatory framework for SMR development is necessary to avoid delays and uncertainties, fostering investor confidence.
- vi) Community Engagement: Engaging with local communities is crucial to address concerns and garner support for SMR projects. Transparency and open dialogue are key components of this engagement.
- vii) Monitoring and Reporting: Implementing a robust system to monitor the progress of SMR projects and report on their environmental and economic benefits is essential for accountability and informed decision-making.

3.3. A Suggestion on Carbon Tax Calculation Mechanism for Turkey

In this section, we designed a pricing method for the carbon tax under the projected green investment in Turkey. This method should be applied to all countries planning to invest in clean energy and looking for project financing. By providing a case study of our methodology in the next section, we aim to enhance our research's overall credibility and reproducibility, allowing readers to assess the soundness of our methods and the trustworthiness of our results.

In this method, the financing budget of green investment projects of the Turkish Government's plan for the following year is considered a year lacking financing. That lack of funds is planned to meet with the carbon tax to be collected in accordance with the emitted carbon for the previous year. The carbon tax is calculated as the total projected green investment in USD in Turkey for the following year divided by total carbon emission as tons in Turkey for the previous year.

The carbon taxes will be gathered in a carbon tax fund, and in case funds are needed for green investments, the fund will finance the green projects with fiscal incentives and direct financing.

$$CT = \sum_{n=1}^{\infty} \frac{GI(t+1)}{CE(t)}$$

Where;

GI: Total projected green investment in USD in Turkey for the following year

CE: Total carbon emission and carbon equivalent as ton in Turkey for the previous year

CT: Carbon tax for the current year

Case Study

We present a case study of our methodology in this section. Our objective is to bolster our research's overall credibility and replicability, enabling readers to evaluate the robustness of our approaches and the reliability of our findings. We benefited from empirical figures, which

are shown in Table 4. for two years sequentially. The empirical figures are parallel with the following news published on temizenerji.org. According to the news (Temiz Enerji Vakfi, 2022), the investment requirement for Turkey's energy transformation is estimated to be between 5.3-7 billion dollars annually by 2030.

Table 1: Turkey's Projected Green Investment Plan

Projects to be financed	2023	2024
Small Modular Reactor Project	3.476.686.000 USD	3.824.354.600 USD
Electric Vehicle	129.999.500 USD	110.499.575 USD
Wind Power Plant	245.400.000 USD	208.590.000 USD
Solar Power Plant	560.000.000 USD	476.000.000 USD
Decommissioning fund for existing fossil fuel power station	600.000.000 USD	510.000.000 USD
Energy Efficiency	1.213.000.000 USD	1.031.050.000 USD
Other	900.000.000 USD	765.000.000 USD
TOTAL	7.125.085.500 USD	6.925.494.175 USD

Table 2: Total Carbon Emission Breakdown in Turkey

	2022	2023
Energy	366.600.000 ton	402.500.000 ton
Industry	68.000.000 ton	75.100.000 ton
Agriculture	73.200.000 ton	72.100.000 ton
Waste	16.300.000 ton	14.700.000 ton
Total Emission	524.100.000 ton	564.400.000 ton

Carbon Tax Calculation for 2023:

$$7.125.085.500 \text{ USD} / 524.100.000 \text{ ton} = 13,59 \text{ USD Carbon Tax per ton}$$

In parallel with increasing existing green investments, fund needs for clean energy projects are expected to decrease gradually. Therefore, the following year's carbon tax is supposed to be lower than the current year, especially within the first years.

Carbon Tax Calculation for 2024:

$$6.925.494.175 \text{ USD} / 564.400.000 \text{ ton} = 12,27 \text{ USD Carbon Tax per ton}$$

By using the calculation method above, all green investments in Turkey should be financed and Turkey should reduce its carbon emission and reached the zero-carbon emission target.

4. FINDINGS

Implementing a carbon tax framework to finance nuclear power projects in Turkey presents several complex challenges and considerations:

- i) **Political Will:** The success of such an initiative hinges on sustained political support and a deep commitment to addressing climate change. Political stability is pivotal for long-term planning and implementation.
- ii) **Public Acceptance:** Convincing the public about the benefits and safety of nuclear power, particularly SMRs, is paramount. Robust public outreach and education efforts are required to foster understanding and trust.
- iii) **International Collaboration:** Turkey may benefit significantly from international collaboration and partnerships to access expertise, technology, and financing for SMR projects. Collaboration with established nuclear nations can facilitate knowledge transfer and capacity building.
- iv) **Regulatory Hurdles:** Establishing clear and efficient regulatory processes for SMR development is necessary to avoid delays and uncertainties, thereby ensuring a conducive investment environment.
- v) **Economic Viability:** SMR projects must demonstrate economic viability and competitiveness with other energy sources to attract investors and secure long-term financing.
- vi) **Environmental Impact:** Rigorous assessment and mitigation of the environmental impact of SMR projects, particularly in terms of nuclear waste management and the potential release of radioactive materials, are essential.
- vii) **Security Concerns:** Ensuring the security of SMR facilities and materials is imperative to prevent unauthorized access, theft, or malicious activities, safeguarding both the public and the environment.

This article serves as a comprehensive exploration of the intricate interplay between green finance, carbon taxes, and their potential application in Turkey's transition to sustainable energy sources, particularly nuclear power. It highlights the transformative potential of innovative financing mechanisms in the global effort to combat climate change, all while ensuring the energy needs and environmental

responsibilities of Turkey are met. The challenges are formidable, but with strategic planning, collaboration, and unwavering commitment, the vision of a low-carbon, sustainable energy future in Turkey can be realized.

As for nuclear power's financing issue, countries like Turkey do not have enough funds to finance large power plants due to high upfront capital. Conversely, SMRs' capital upfront is considered affordable rather than large plants. Locatelli (Boarin, M.E., Mancini, & Locatelli, 2015) indicated that the modular approach of SMRs has some excellent opportunities to replace large plants. Their modular structure feature can make them more affordable than large plants by reducing the capital upfront and construction duration.

Although there is an ongoing construction of a large reactor power plant to meet Turkey's electricity demand, which was started in 2015, to meet the growing energy demand, electricity generation still needs to be increased because of the insufficiency of generation. Therefore, investing in SMR plants should be an alternative to meet the energy demand in the long run. In fact, several studies mentioned that SMR could also provide positive contributions to nuclear energy. For example, Kessides and Kuznetsov (Kessides & Kuznetsov, 2012) indicated that SMRs could be attractive and affordable in many developing countries with limited financial resources.

According to Mian and Ramana (Ramana & Mian, 2014), investing in a nuclear power plant could have some minimum metrics like GDP or income per capita in a country. The countries that have such minimum metrics will be able to afford SMRs.

The results align with Lovering's (Lovering, 2020) research, which emphasized the significance of carbon pricing within a country in order to enhance the cost competitiveness of constructing nuclear power plants in comparison to natural gas.

5. CONCLUSION

The imperative to urgently address climate change and curtail carbon emissions compels us to explore innovative financing mechanisms. Among the array of options, carbon taxes have emerged as a promising avenue, already embraced by numerous countries, to mobilize funds for green energy initiatives, including the promising domain of nuclear power. This article has underscored the potential for designing a comprehensive carbon tax framework, meticulously tailored to the unique context of Turkey, as a pivotal strategy. This not only serves as a means to reduce emissions but also as a mechanism to secure vital financing for the realization of Small Modular Reactor (SMR) projects in the nation.

Central to this endeavor is the intricate calibration of carbon tax rates, the strategic identification of target sectors, and the formulation of astute fund allocation mechanisms. These elements collectively constitute the framework's bedrock, which, when fortified with sound policy and meticulous planning, promises to steer Turkey toward a sustainable and low-carbon energy future.

Intrinsically linked with the technical and economic aspects are the nuanced challenges on the horizon. These encompass the formidable terrain of political will, which, when fortified, can provide the steady ground for the long and arduous journey ahead. Overcoming the hurdles of regulatory intricacies, bolstering public acceptance, and nurturing international collaborations will undoubtedly prove to be instrumental.

Nevertheless, we stand at a juncture where Turkey's proactive engagement with carbon taxation and nuclear power offers not only the prospect of substantial reductions in emissions but also the opportunity to enhance its competitiveness on the global stage. This approach aligns Turkey's aspirations with broader international climate objectives, positioning the nation as a beacon of responsible energy transition.

In conclusion, this comprehensive exploration has illuminated a path forward. One that, when navigated with foresight, diligence, and unwavering commitment, can lead Turkey towards a sustainable, resilient, and low-carbon energy future. As we embark on this transformative journey, the fusion of innovative financing mechanisms, such as carbon taxes, with the burgeoning potential of nuclear power projects beckons a new era for Turkey—one that harmonizes economic prosperity with environmental stewardship, while making a profound impact on the global stage in our collective pursuit of a greener and more sustainable world. Introducing carbon pricing mechanisms holds the potential to enhance Turkey's SMR power plant investments and further solidify its position on the path to a cleaner energy future.

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TOOLS FOR HIDING CURRENCY RISK: APPLICATION OF DATA ANALYSIS

DOI: 10.17261/Pressacademia.2023.1848

PAP- V.18-2023(6)-p.38-46

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To cite this document

Aydogdu, A. , Calis, E., (2023). Tools for hiding currency risk: application of data analysis. PressAcademia Procedia (PAP), V.18, p.38-46

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1848>

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ABSTRACT

Purpose- The fluctuations in the exchange rate expose companies that perform foreign currency forward transactions to exchange rate risk. Exchange rate risk affects the international balance of payments, capital and credit flows, foreign currency denominated debts and receivables, even if they do not participate in international commercial activities, at the end of the change in the value of the national currency. For this reason, businesses use various methods to hedge currency risk. This paper summarizes some of the key issues regarding the measurement and management of exchange rate risk faced by firms, the currently dominant methodologies for measuring exchange rate risk, and widely accepted best practices in currency risk management. The purpose of this research is to introduce the strategies used by businesses against exchange rate risks caused by fluctuations in exchange rates. In addition, the sub-objectives of this study are to determine the companies' awareness of exchange rate risk hedging tools according to the titles of the financial officers and the size of the businesses, their usage levels, the reasons why those who do not use these tools, and to reveal their internal strategies and economic risk hedging strategies.

Methodology- The main body of the research consists of businesses operating in the Marmara region. The sample of the research consists of 200 enterprises engaged in foreign trade in the Marmara region of Turkey. Strategies Applied by Businesses to Hedge Transaction Risk Scale was used to collect data. The data obtained from the techniques used by the companies to protect themselves from the exchange rate risk they are exposed to are interpreted with descriptive statistics. In addition, the resulting one-way ANOVA test is conducted.

Findings- Based on the data obtained from 200 foreign trade enterprises in the Marmara region of Turkey, looking at the findings of descriptive statistics based on the methods used by companies to protect against exchange rate risk, exchange rate risk is important for the company's solidity. We see that companies are knowledgeable about exchange rate risk hedging tools, but they are hesitant to use them. Businesses use various techniques to protect against exchange rate risk. However, when the strategies used by businesses to protect themselves from exchange rate risks, transaction risks and economic risks according to the titles of the financial officers and business sizes are examined with the ANOVA test, the strategies used by the financial officers according to their titles and the size of the companies are examined, their usage levels, awareness levels and economic and transaction risk hedging tools. There appears to be variability.

Conclusion- This study, which applied data analysis on exchange rate hedging instruments, shows that businesses use complex and diverse strategies to manage exchange rate risk. Businesses have to resort to these strategies to resist exchange rate risk and maintain their profitability. These findings also show that managing exchange rate risk has a significant impact on the financial performance and business soundness of businesses.

Keywords: Currency, exchange rate, exchange rate risk, hedging currency risk, currency hedging tools

JEL Codes: G23, G10, G32

KUR RISKİNDEN KORUNMA ARAÇLARI: VERİ ANALİZİ UYGULAMASI

ÖZET

Amaç- Döviz kurunda yaşanan dalgalanmalar yabancı para cinsinden vadeli işlem gerçekleştiren şirketleri kur riskine maruz bırakmaktadır. Kur riski işletmeleri uluslararası ödemeler dengesi, sermaye ve kredi akımları, yabancı para cinsinden borç ve alacaklar, hatta uluslararası ticari etkinliklere katılmasa dahi ulusal para biriminin değerinin değişmesinin sonunda olumlu ve olumsuz şekilde etkilemektedir. Bu nedenle işletmeler kur riskinden korunmak için çeşitli yöntemler kullanmaktadır. Bu çalışma ise firmaların karşı karşıya kaldığı döviz kuru risklerinin ölçümü ve yönetimine ilişkin bazı temel konuları, döviz kuru riskini ölçmede şu anda baskın olan metodolojileri ve kur riski yönetiminde geniş çapta kabul görmüş en iyi uygulamaları özetlemektedir. Bu araştırmanın amacı, döviz kurlarındaki hareketliliğin sebep olduğu kur risklerine karşı işletmelerin kullandıkları stratejileri tanıtmaktır. Bununla birlikte bu çalışmanın alt amaçları, işletmelerin finans yetkililerinin ünvanlarına

ve iřletmelerin büyüklüklerine göre döviz kuru risklerinden korunma araçlarından haberdar olma durumlarını, kullanım düzeylerini, bu araçları kullanmayanların kullanmamadaki sebeplerini belirlemek, iřletme içi stratejileri ve ekonomik riskten korunma stratejilerini de ortaya koymaktır.

Yöntem- Arařtırmanın ana kütesini Marmara Bölgesinde faaliyet gösteren iřletmeler oluşturmaktadır. Arařtırmanın örnekleme ise Türkiye’de Marmara Bölgesinde dış ticaret yapan 200 iřletmeden oluşmaktadır. Verilerin toplanmasında ise iřletmelerin İşlem Riskinden Korunmak İçin Uyguladıkları Stratejiler Ölçeđi kullanılmıştır. Firmaların maruz kaldıkları kur riskinden korunabilmek için kullandıkları tekniklerin üzerinden elde edilen veriler tanımlayıcı istatistikler ile yorumlanmıştır. Bununla birlikte, elde edilen verilere tek yönlü ANOVA testi uygulanmıştır.

Bulgular- Türkiye'nin Marmara Bölgesindeki 200 dış ticaret iřletmesinden elde edilen verilere dayalı olarak, řirketlerin kur riskinden korunmak için kullandıkları yöntemlere dayalı betimsel istatistiklerin bulgularına bakıldığında řirketler için kur riski řirket sağlamlığı için önem arz etmektedir. Şirketlerin kur riskinden korunma araçları konusunda bilgili olduklarını ancak buna rağmen kullanmak konusunda çekimser davrandıklarını görmekteyiz. İşletmeler kur riskinden korunmak için çeşitli teknikler kullanmaktadır. Bununla birlikte, ANOVA testi ile iřletmelerin finans yetkililerinin ünvanlarına ve iřletme büyüklüklerine göre döviz kuru risklerinden işlem riskinden ve ekonomik riskten korunmak için uyguladıkları stratejiler incelendiğinde finans yetkililerinin ünvanlarına göre ve řirketlerin büyüklüklerine kullandıkları stratejiler, kullanım düzeyleri, haberdar olma düzeyleri ve ekonomik ve işlem riskinden korunma araçlarında deđişkenlik olduđu görülmektedir.

Sonuç- Kur risinden korunma araçları üzerine veri analizi uygulaması yapılan bu çalışmada, döviz kuru riskini yönetmek için iřletmelerin karmaşık ve çeşitli stratejiler kullandığını göstermektedir. İşletmeler, döviz kuru riskine karşı koyabilmek ve karlılıklarını korumak için bu stratejilere başvurmak zorundadır. Bu bulgular aynı zamanda, döviz kuru riskinin yönetilmesinin iřletmelerin finansal performansı ve iřletme sağlamlığı üzerinde önemli bir etkisi olduğunu göstermektedir.

Anahtar Kelimeler: Döviz, döviz kuru, döviz kuru riski, kur riskinden korunma, kur risklerinden korunma araçları

JEL Kodları: G23, G10, G32

1. GİRİŐ

1944 yılında düzenlenmiş sabit kur rejimi temelinde oluşturulan Bretton Woods sisteminin 1973 yılında işlevini yitirmesinin ardından, dünyanın belli başlı para birimleri açısından dalgalı kur rejimi başlamıştır. Döviz kurları yeniden esnek hale geldikten hemen sonra, New York'ta Uluslararası Ticaret Borsası (1970) kurulmuştur. Uluslararası Ticaret Borsası döviz vadeli işlemlerinin alınıp satıldığı ilk borsa olmuştur. Ardından Chicago Uluslararası Para Piyasası (1972) kurulmuştur. Bretton Woods sisteminin sona ermesinin ardından yaşanan bu iki gelişme 1980'lerde para birimi türevlerinin yayılmasını teşvik etmiştir. Bu gelişmeler döviz türevlerine olan talebi artırmış ve 1985 yılında gelindiğinde döviz kuru oynaklığı rekor seviyelere ulaşmıştır (Calió ve Straathof, 2012, s. 2-3). Dalgalı kur sistemi ile birlikte döviz kurlarında yaşanan dalgalanmalar birçok iřletme yönetimini zorlaştırmıştır. Özellikle dış ticaret yapan iřletmeler açısından kur riski ortaya çıkmıştır (Sezer ve Canpolat, 2017, s. 33).

Döviz kurunun piyasa güçlenince belirlendiđi dalgalı kur döviz kuru rejiminde döviz kuru günlük olarak deđişmekte ve döviz kurlarının gelecekteki deđerini dođru bir şekilde tahmin etmek mümkün olmamaktadır. Öte yandan, döviz kurunda yaşanan dalgalanmalar yabancı para cinsinden vadeli işlem gerçekleřtiren řirketleri kur riskine maruz bırakmaktadır. Bu kapsamda, döviz kurundaki tahmin edilemeyen dalgalanma ne kadar yüksekse, firmaların kur riski de o kadar yüksek olmaktadır (Öztürk, 2006, s. 85).

Bu durum yalnızca finans sektöründeki oyuncuları deđil reel sektördeki řirketlerin ve bireylerin ekonomik kararlarını da etkilemektedir. Özellikle son yıllarda küresel ölçekte döviz kurlarındaki deđişimlerin mal fiyatlarına etki ettiđi ve bu deđişimin küresel ölçekte başka ülkeleri veya tüm sektörleri etkilediđi görülmektedir. Döviz kurlarındaki deđişimler, doğrudan ihracat-ithalat işlemleri yapan firmalar için yönetilmesi gereken bir risktir (Dođanay, 2016, s. 151). Çünkü karar vericiler ekonomik faaliyetleri ile ilgili yatırım kararlarını vermeden önce karşılaştıkları temel risk, gelececekte oluşacak döviz kurunu tahmin edememelerinden kaynaklanır. Firmaların aktiflerinde ve pasiflerinde aynı cins para biriminin bulunmamasından kaynaklı kur riski, ulusal para biriminin yabancı para birimleri karşısındaki deđerindeki deđişimler nedeniyle ortaya çıkmaktadır. Bir iřletmenin döviz cinsinden varlıkları yükümlülüklerini aşması durumunda ulusal para biriminin yabancı para birimi karşısında deđerlenmesi firma açısından zarar anlamına gelmektedir (Akarsu ve Alacahan, 2019, s. 80).

Döviz kuru riskleri kendi içerisinde ekonomik, işlem ve muhasebe etkisi olarak ayrılmıştır ve kur riskinden korunmak için kullanılan yöntem ve araçlar iřletme içi ve iřletme dışı olmak üzere iki grupta incelenmektedir. Bu noktada döviz kuru riskini etkileyen bazı faktörlerin faiz, enflasyon, beklentiler, iktisadi büyüme, ödemeler dengesi, spekülasyon, kur rejimi, ülkenin ekonomik politikaları, teknolojiye deđişmeler ve son olarak yurt içi ve dışı beklenen ve beklenmedik gelişmeler olarak gösterilmiştir.

Küresel ölçüde sermaye ve mal akımlarındaki artış ve döviz kurlarında yaşanan dalgalanma göz önünde bulundurulduğunda, döviz dayalı işlemlerin de arttığı ve dış ticaret řirketleri ve diđer uluslararası işlemlerin de kur riski daha yoğun olarak karşı karşıya kaldıkları söylenebilir. Bu nedenle kur riskinden korunma, başka bir ifade ile açık döviz pozisyonları ve dolayısıyla kuru risk yönetimi küresel alanda faaliyetlerini yürüten řirketler açısından temel bir konudur. Bu kapsamda bu çalışma, dalgalı kur sistemi ile birlikte ortaya çıkan kur riskinden korunmak için iřletmeler tarafından kullanılan finansal teknikleri incelemeyi ve iřletmelerin kur riski yönetimleri ve bu risklere karşı kullandıkları korunma araçlarını ortaya koymayı amaçlamaktadır.

Bu makalede, Türkiye’de Marmara Bölgesinde dış ticaret yapan firmalar ile anket aracılığıyla toplanan veriler ışığında SPPS programında analizler gerçekleştirilmiş, firmaların 2023 yılına ait finansal rakamlarından ve uygulamalarından çeşitli verilerin elde edilmesi ile bir durum tespiti yapılmış, ardından firmaların maruz kaldıkları kur riskinden korunabilmek için kullandıkları tekniklerin üzerinden elde edilen veriler ile tanımlayıcı analizler gerçekleştirilmiştir. Arařtırmanın amaçları dođrultusunda elde edilen verilere tek yönlü ANOVA testi uygulanmıştır. Yapılan analizler neticesinde finans yetkililerinin ünvanına ve iřletmelerin büyüklüklerine göre, iřletmelerin finansal yöntemlerden

haberdar olma durumu, finansal yöntemleri kullanmayanların kullanmamasının sebepleri, ekonomik riskten korunmak için uyguladıkları stratejileri, işletme içi stratejileri ve finansal yöntemleri kullanım düzeylerini etkileme durumu analiz edilmiştir.

2. LİTERATÜR TARAMASI

Risk kavramı; gerçekleşen gelirler ile öngörülen gelirler arasındaki fark neticesinde gerçekleşmesi muhtemel olan zarar ihtimalidir. Tanımın da ortaya koyduğu gibi risk gerçekleşmesi istenilmeyen bir olayın oluşmasıdır (Aven, 2012, s. 33). Başka bir bakış açısıyla risk, bir plan dâhilinde beklenenler ile sonuçta gerçekleşenler arasındaki farktır (Uzunoglu, Kızıl ve Onar, 2003, s. 40).

İlk defa 1984 yılında Adler ve Dumas kur riskini döviz kurundaki beklenmeyen değişimler şeklinde açıklamıştır. Bu tanıma göre, döviz kuru nda meydana gelebilecek muhtemel ve beklenen değişimler kur riski oluşturmamaktadır (Ksendzuk ve Syvak, 2017, s. 56). Daha çok gelişmekte olan ülkelerin ekonomilerini etkileyen kur dalgalanmaları söz konusu olduğunda, hükümetlerin bu etkiyi azaltmak için gerekli adımları atması gerekmektedir (Williams, 2018, s. 2). Faiz oranları da kur riski üzerinde etkili olan faktörlerden birisidir. Faiz oranının artması hazineye fazladan yük getirir, ödemeler dengesi bozulur ve ülkedeki risk primi yükselir. Bu da döviz kurunda artışa neden olmaktadır (Demirgil ve Türkay, 2017).

"Hedging" veya "Hedge", İngilizcede belirli bir riski hafifletme veya korunma stratejisi anlamına gelir. Hedge işlemi, potansiyel bir kayıp riskini dengelemek amacıyla, mevcut bir işlemin tam tersi yönünde aynı değerde bir başka işlem yapmayı içerir. Bu şekilde, mevcut işlemden kaynaklanabilecek olası bir zarar, yeni yapılan işlemde elde edilecek kazançla dengelenmiş olur (Karluk, 2009).

Spekülasyon, döviz, ticari mal veya menkul kıymet gibi ekonomik varlıkların gelecekteki değerini tahmin ederek, bu tahminler üzerinden kar elde etmeyi amaçlayan ticari bir eylemdir. Spekülasyon süreci, fiyatı gelecekte artacağı düşünülen ekonomik bir varlığı şimdi alıp, fiyatının gelecekte düşeceği düşünülen varlığı şimdi satarak kar elde etmeye yöneliktir. Spekülasyonu gerçekleştiren kişi spekülâtör olarak adlandırılır. Spekülâtör, beklenen fiyat değişikliklerinden kar elde etmeye çalışırken aynı zamanda bu eylemin risklerini de üstlenir. Çünkü tahminin tersi bir durumda, olumsuz sonuçlardan korunmak için herhangi bir önlem almaz. Bu nedenle, spekülasyonun en büyük özelliği risk taşımasıdır, bu da onu arbitrajdan ayırır (Karluk, 2009).

Risk yönetiminin amacı, işletmelerin faaliyetlerini etkileyebilecek riskleri belirlemek, ölçmek, yönetmek ve kontrol altında tutmaktır. Bu, işletmenin faaliyetlerinin sürdürülebilirliğini, karlılığını ve itibarını korumak için gereklidir. Risk yönetimi, işletmenin karşı karşıya kaldığı riskleri belirleyerek, bunların olumsuz etkilerini en aza indirmek veya ortadan kaldırmak için alınacak önlemleri belirler (Akdeniz, 2016). Risk yönetiminin önemi, işletmenin sürdürülebilirliği ve başarısı için hayati önem taşır. İşletmelerin finansal, operasyonel, stratejik, hukuki, itibari ve diğer birçok alanda riskleri yönetmeleri gerekmektedir.

Risk yönetimi sayesinde, işletmeler potansiyel riskleri belirleyerek, bu risklerin önlenmesi veya azaltılması için alınacak önlemleri belirleyebilirler (Koçel, 2015). Risk yönetimi, işletmelerin faaliyetlerini etkileyebilecek her türlü riski belirlemek için tasarlanmış bir sistemdir. Bu riskler, finansal riskler, operasyonel riskler, piyasa riskleri, stratejik riskler, itibar riskleri, hukuki riskler ve daha birçok risk türü olabilir. Risk yönetimi, bu riskleri belirleyerek, bunların olumsuz etkilerini en aza indirmek veya ortadan kaldırmak için alınacak önlemleri belirler (Özkan ve Teker, 2018). Risk yönetimi, işletmeler için birçok fayda sağlar. İşletmeler, risklerin önlenmesi veya azaltılması için alınacak önlemler sayesinde kaynaklarını daha verimli bir şekilde kullanabilirler. Ayrıca, risklerin kontrol altında tutulması, işletmenin sürdürülebilirliğini ve karlılığını korur. Risk yönetimi ayrıca, işletmelerin piyasada rekabet edebilir olmalarına ve daha iyi bir itibar kazanmalarına yardımcı olur (Kaplan ve Mikes, 2012).

Döviz kurundaki dalgalanmaların, firmalar üzerine etkileri genel olarak ekonomik etki (economic exposure), işlem etkisi (transaction exposure) ve muhasebe etkisi (accounting exposure) şeklinde üç başlık altında incelenmekte olup bunlar çalışmanın sıralı başlıklarında açıklanmaktadır: İşlem Riski, Ekonomik Risk ve Muhasebe Riski (Dinçer, 2019).

Mali riskler, yalnızca döviz kuru riskinden etkilenmediği için firmalar diğer risklerden korunmak için banka ve diğer mali kuruluşlardan yardım almaktadırlar. Bankalar, korunma işlemlerinde belirli bir komisyon ya da prim karşılığı risk altına girmektedirler. Bu prim, riskin düzeyine göre yüksek ve düşük olmaktadır. Bankalar gerek müşterilerinin gerekse de kendilerinin aktif-pasif bünyelerini korumak için birtakım korunma araçlarına yönelmektedirler (Karluk, 2009, s. 509).

Kur riskinden korunma araçlarından forward işlemi, gelecekte yapılması gereken bir işlemin kur, tutar ve kesin valör tarihinin belirlenmesidir. Forward işlemlerde işlem günü para değişimi yapılmaz ve işlem geri alınamaz. Bununla birlikte, ticaretin sonuçları ters ticaret ile ortadan kaldırılabilir ve kar veya zarar, yalnızca ticaretin yapıldığı tarihte belirtilen noktada belirlenir (Yavrutürk, 2008, s. 60). Diğerleri ise vadeli işlem sözleşmesi, standart bir miktar ve kalitede fiziksel veya finansal bir varlığı, gelecekte belirli bir tarih ve yerde önceden belirlenmiş bir fiyattan teslim etmek veya almak için yapılan bir sözleşmedir (Bartram, Brown ve Fehle, 2009, s. 188). Döviz forward sözleşmeleri, belirli bir miktar yabancı paranın sözleşme tarihindeki belirli bir kur üzerinden başka bir para birimi karşılığında alım satımı ve söz konusu yabancı paranın ileri bir tarihte belirli bir tarihte teslimine ilişkin sözleşmelerdir. Başka bir deyişle, kur riskini yönetmek için kullanılan vadeli döviz sözleşmeleri, belirli bir tutardaki yabancı para birimini gelecekte belirli bir tarihte başka bir para birimine çevirme yükümlülüğünü ifade eder. Bu sözleşme, alıcıya sözleşme tarihinde belirli bir süre içinde belirli miktarda döviz almayı, satıcı ise satmayı taahhüt eder (Yavrutürk, 2008, s. 74).

Başka bir korunma aracı olan opsiyon sözleşmesi, gelecekte veya vadesinden önce belirli bir fiyattan alım veya satım hakkı veren bir vadeli işlem aracıdır (Fitzgerald, 1987, s. 1). Finansal korunma tekniklerinden swaplar, farklı finansal piyasalardaki iki veya daha fazla tarafın farklı kredibiliteye sahip olduğu durumlarda, önce piyasalardaki rekabet avantajlarından yararlanmak için farklı kuruluşların arbitraj yapmasına izin veren finansal işlemlerdir (Arce, Mayor domo ve Peña, 2013, s. 128).

Karadağ (2020) işletmelerin döviz kuru risklerini nasıl yönettikleri ve bu risklerden nasıl korundukları üzerine odaklanmıştır. İlk olarak, genel risk kavramı, döviz kuru riski ve döviz kuru risk yönetimi ele alınmış ve döviz kuru riskinin çeşitleri ve korunma yöntemleri üzerinde

durulmuştur. Çalışma, Türkiye'deki mobilya sektöründeki 83 işletme üzerine bir anket uygulayarak ilerlemiş ve elde edilen verileri SPSS programı ile analiz etmiştir. Araştırmanın sonucunda, mobilya sektöründe dış ticaret yapan işletmelerin döviz kuru risklerini yönetmek ve bu risklerden korunmak konusunda yeterli bilgi ve donanımına sahip olmadıkları sonucuna ulaşılmıştır.

Demir (2022) Borsa İstanbul'daki belirli sanayi alt sektörlerin döviz kuru duyarlılıklarını, özellikle ABD Doları ve Euro para birimleri açısından incelemiştir. Döviz kuru riski, ekonomik belirsizliklerin yükseldiği dönemlerde önemli bir faktördür ve işletmeler ve sektörler üzerinde önemli etkileri olabilir. 2013-2019 yılları arasındaki aylık verileri kullanan bu çalışma, 7 farklı alt sektörü temel almaktadır. Bulgular, ABD Doları açısından 5 alt sektörde ve Euro açısından 2 alt sektörde istatistiksel olarak anlamlı sonuçlar elde ettiğini göstermektedir. Tüm bu alt sektörlerin negatif forex betaya sahip olduğu sonucuna varılmıştır, yani döviz kurlarındaki artışlar bu sektörlerin getirilerinde düşüşe neden olmaktadır.

Oflaz'ın (2020) hazırlamış olduğu çalışma, Türkiye'deki makroekonomik faktörlerin bankaların döviz kuru riski üzerindeki etkisini incelemektedir. Bankaların karşılaştığı kredi riski, operasyonel risk ve piyasa riski gibi çeşitli riskler bulunmaktadır. Bu risklerden biri olan döviz kuru riski, döviz kurlarındaki dalgalanmalar nedeniyle beklenmedik ve öngörülemez zararlarla karşılaşma olasılığıdır ve etkin yönetilmediği takdirde bankaların iflasına yol açabilir. Çalışma, makroekonomik faktörler olarak ekonomik büyüme ve enflasyon verilerini dikkate almıştır. Veriler, 1988-2019 yılları arasında toplanmıştır ve Toda-Yamamoto nedensellik analizi kullanılarak analiz edilmiştir. Çalışmanın hipotezleri, ekonomik büyümenin ve enflasyonun döviz kuru riski üzerindeki etkisidir. Analiz sonuçlarına göre, ekonomik büyüme, bankaların döviz kuru riski üzerinde nedensellik etkisine sahip değilken, enflasyon oranının arttığı durumlarda bankaların döviz kuru riski artmaktadır. Bu sonuç, özellikle yüksek enflasyon dönemlerinde Türkiye'deki yetkili otoritelerin bankaların döviz pozisyonu üzerindeki kontrollerini artırmaları gerektiğini göstermektedir. Aksi halde, yüksek döviz kuru riskine maruz kalan bankalar nedeniyle sistemin etkinliği azalabilir.

Höçük (2022) Fama-French Beş Faktör modeli ve bu modelin döviz kuru risk faktörünü içeren bir versiyonunun Borsa İstanbul'daki hisse senetlerinin getiri tahminleri üzerindeki performansını karşılaştırmıştır. Çalışmanın özgünlüğü, Fama-French modeline döviz kuru risk faktörünü eklemesi ve Borsa İstanbul hisse senetlerinin portföy getirilerini tahmin etmek için destek vektör regresyonu (DVR) kullanmasıdır. Bu çalışma, Borsa İstanbul'da Fama-French çoklu faktör modellerinin DVR ile uygulandığı ilk çalışma olabilir. Sonuçlar, DVR tahminlerinin genellikle basit doğrusal regresyon tahminlerinden daha güçlü olduğunu göstermektedir. Bu sonuç, doğrusal olmayan faktör etkilerini hesaba katan varlık fiyatlama modellerinin, doğrusal regresyon yönteminden daha sağlıklı tahminler üretebileceğini düşündürmektedir.

Öztürk (2020) küreselleşme ile beraber ticaretin uluslararası boyuta taşınmasının firmalar üzerinde yarattığı döviz kuru riskini ve bu riskin yönetimini incelemiştir. Çalışma, farklı para birimi kullanan ülkelerle ticaretin firmalar için döviz kuru riskini artırdığını ve bu riskin yönetilmesinin önemini vurgulamaktadır.

3. VERİ VE YÖNTEM

Veri toplama aracı olarak geliştirdiğimiz anket formu kullanılmıştır. Bu form oluşturulurken Veysel Kula (2002), Ayşe Tülay Yücel (1996) ve John Malinderetos (1995) tarafından kullanılan anket formlarından istifade edilmiştir.

Ankette işletme özellikleri, döviz kuru riski yönetimi, etkilendiği döviz kuru dalgalanmaları, işlem riskinden korunmak için uygulanan stratejiler ve ekonomik riskten korunma stratejileri hakkında sorular bulunmaktadır. Anket formu, işletmelerin finansal yöneticilerine gönderilmiş, cevaplanan anket formlarından elde edilen veriler, SPSS formatında bilgisayara aktarılmıştır. Verilerin analizinde tanımlayıcı testlerinden frekans dağılımları ile yüzde yöntemi kullanılmış ve Marmara Bölgesinde dış ticaret yapan 200 firmanın 2023 yılına ait finansal rakamlarından ve uygulamalarından çeşitli verilerin elde edilmesi ile bir durum tespiti yapılmış ardından firmaların maruz kaldıkları kur riskinden korunabilmek için kullandıkları tekniklerin üzerinden elde edilen veriler ile tanımlayıcı analizler gerçekleştirilmiştir. Verilerin ortalama değerleri üzerinden tek yönlü ANOVA testi yapılmıştır.

"İşletmelerin İşlem Riskinden Korunmak İçin Uyguladıkları Stratejiler Ölçeği" içinde yer alan İşletme İçi Stratejiler, Finansal Yöntemlerden Haberdar Olma, Finansal Yöntemleri Kullanım Düzeyi, İşletmelerin Finansal Yöntemleri Kullanmamasının Sebepleri, İşletmelerin Ekonomik Riskten Korunmak İçin Uyguladıkları Stratejiler başlıkları altında yer alan alt bileşenler ayrı ayrı analiz edilmiştir. Bu yöntemdeki güvenilirlik katsayıları 0 ile 1 arasında değer alır. Alfa katsayısı, ölçeğin güvenilirlik durumunu belirlemek için kullanılır. Bu duruma göre, 0,00 ile 0,40 arasındaki bir alfa katsayısı ölçeğin güvenilir olmadığını gösterirken, 0,40 ile 0,60 arasındaki bir katsayı düşük güvenilirlik düzeyini gösterir. 0,60 ile 0,80 arasındaki bir alfa katsayısı, ölçeğin oldukça güvenilir olduğunu ifade ederken, 0,80 ile 1,00 arasındaki bir katsayı, ölçeğin yüksek derecede güvenilir olduğunu gösterir (Akgül ve Çevik, 2003, s. 435-436).

Table 1: Cronbach Alfa Test Sonuçları

Bölüm Başlığı	Cronbach Alfa Katsayısı
İşletme İçi Stratejiler	0.641
Finansal Yöntemlerden Haberdar Olma Durumu	0.930
Finansal Yöntemleri Kullanım Düzeyi	0.851
İşletmelerin Finansal Yöntemleri Kullanmamasının Sebepleri	0.899
Ekonomik Riskten Korunmak İçin Uygulanan Stratejiler	0.837

Cronbach Alfa test sonuçları, ölçeğin oldukça güvenilir olduğunu ortaya koymuştur.

4. BULGULAR

Arařtırmamıza toplam 200 adet iřletme katılmıř olup, bu iřletmelere iliřkin en önemli ozellikler Tablo 2'de sunulmuřtur.

Table 2: iřletmelerin Ozellikleri

Faaliyette Bulunduđunuz Bölge	Sayı	Yüzde
Marmara	200	100,0
Faaliyette Bulunduđu Sektör	Sayı	Yüzde
Bankacılık, finans ve sermaye piyasası	14	7,0
Eđitim	6	3,0
Endüstriyel üretim ve enerji	21	10,5
Gıda	39	19,5
Kimya, petrol	16	8,0
Mühendislik, inřaat ve gayrimenkul	36	18,0
Otomotiv	14	7,0
Perakende ticaret	9	4,5
Reklam ve pazarlama	9	4,5
Sađlık ve turizm	7	3,5
Teknoloji	5	2,5
Tekstil	24	12,0
Satım Alımları İindeki İthalat Oranı	Sayı	Yüzde
%0 - %25 arası	128	64,0
%26 - %50 arası	28	14,0
%51 - %75 arası	25	12,5
%76 - %100 arası	19	9,5
Satıřlar İinde İhracat Oranı	Sayı	Yüzde
%0 - %25 arası	118	59,0
%26 - %50 arası	31	15,5
%51 - %75 arası	21	10,5
%76 - %100 arası	29	15,0
Toplam	200	100,0

Marmara Bölgesinde ve İstanbul'da yer alan firmaların 12 genel sektörel grupta faaliyet göstermekte olup en fazla firma %19,5'lik oranla gıda alanında, yüzde 18'lik bölümün mühendislik, inřaat ve gayrimenkul alanında, en az sayıda firmanın da %2.5 ile teknoloji alanında faaliyet gösterdiđi tespit edilmiřtir.

Firmalar, satım alımları iindeki ithalat oranlarına göre incelendiđinde, iřletmelerin %64'lük büyük bir bölümü ithalat oranlarının %0 ila %25 arasında olduđunu beyan etmiřtir. %26 -%50 arası diyenlerin oranı %14.0 iken %51 - %75 arası diyenlerin oranı %12.5 olarak gerekleřmiřtir. %76 ila %100 arası olduđunu söyleyen firmaların oranı ise %9.5 olarak tespit edilmiřtir. Bu iřletmelerin satıřları iindeki ihracat oranına baktığımızda ise, firmaların %59.0'ı ihracat oranlarının %0 - %25 arasında olduđunu, %15.5'i bu oranın %26 - %50 arası olduđunu, %10.5'lik kısmı %51 - %75 arası olduđunu ve %15.0'lik bölümü ise %76 ila %100 arasında olduđunu bildirmiřtir.

Table 3: Anket Formunu Yantılayanların Ünvanı

Ünvan	Sayı	Yüzde
Finans Müdürü	31	15,5
Finans Direktörü	114	57,0
Muhasebe Müdürü	55	27,5
Total	200	100,0

Finans yetkililerinin ünvanlarına göre, %57,0'lik oranla finans direktörlerinin ilk sırada gelmekte, ardından %27,5 ile muhasebe müdürleri, %15,5 ile finans müdürleri gelmektedir. Ayrıca daha dođru ve anlamlı sonuçlar elde etmek iin finans müdür yardımcısı ve finans müdürü "Finans Müdürü", muhasebe müdür yardımcısı ve muhasebe müdürü grubu birleřtirilerek "Muhasebe Müdürü" olarak sunulmuřtur.

iřletmelerin yurtdıřı alım-satımlarda kullandıkları döviz türleri sorulduđunda firmaların %64.5'inin Amerikan Doları, %32'sinin Euro, %2'sinin Türk Lirası ve %1,50'sinin ise İngiliz Sterlini cevabını verdikleri görülmüřtür. Firmaların dövizden kaynaklanan risklerle nasıl bařa çıktıklarına bakıldıđında, řirketlerin %56'sında bu iř iin özel bir birim bulunmadıđını, %44'ünün ise döviz risk yönetim birimine sahip olduđu tespit

edilmiştir. Döviz risklerini kimlerin yönettiği incelendiğinde, firmaların %73,5 gibi ezici bir oranla bu görevi finans müdürüne verdikleri görülmüştür. Geri kalan işletmelerde bazen muhasebe müdürünün, bazen de yönetim kurulu veya yönetim kurulu başkanı tarafından bu görevin üstlenildiği anlaşılmıştır.

Firmaların döviz kurlarındaki değişiklikleri ne sıklıkta izlediklerini sordüğümüzda, işletmelerin %73'lük kısmının her hafta kurları günden geçirdiği cevabı alınmıştır. İşletmelere döviz kurlarındaki değişiklikleri neden takip ettikleri sorulduğunda, %40'ı nakit akımlarındaki dengesizliği azaltmak, %28,5'i kazançlardaki dalgalanmaları azaltmak, %25'i ise karlılığı artırmak için döviz kurlarını izlediklerini beyan etmiştir.

Table 4: İşletmelerin Döviz Kurlarındaki Değişikliklerden Etkilenme Düzeyi

Etkilenme Derecesi	Sayı	Yüzde
Hiç etkilenmemekte	21	10,5
Biraz etkilenmekte	79	39,5
Çok etkilenmekte	100	50,0
Total	200	100

Şirketlerin döviz kurlarındaki dalgalanmalardan ne ölçüde etkilendiklerini incelediğimizde, Tablo 4.8'de görüldüğü üzere firmaların yarısı kur değişimlerinden çok etkilendiklerini, yaklaşık %39,5'lik kısmının az etkilendiğini, %10,5'lik bir bölümünün ise hiç etkilenmediğini görmekteyiz. Firmaların döviz riskini, işlem riskinin ne ölçüde etkilediğine bakıldığında, "1.Derecede etkiler" diyenlerin oranı %42,5, "2. Derecede etkiler" diyenlerin oranı %32, "3. Derecede etkiler" diyenlerin oranının ise %25,5 olduğu tespit edilmiştir.

İşletmelerin işlem riskinden korunmak için uyguladıkları taktikleri araştırdığımızda, öncelikle firmaların Türk Lirasının değer kaybetmesi ihtimaline karşın bir dizi işletme içi stratejiler geliştirdiklerini görmekteyiz. Bu yaklaşımlar arasında ilk sırayı %94,5 ile her zaman "TL cinsinden olan alacaklarımızı kısa sürede tahsil etmeye çalışırız" ifadesi almıştır. Ardından, %55,3'lük bir oran ile her zaman "Nakit fazlalıklarımızı, borcumuz olan döviz cinsinden döviz olarak değerlendiririz" cevabı gelmiştir. Daha sonra, %52,3'lük bir oranla her zaman "Üretimde kullandığımız hammadde (yerli/yabancı) oranlarının ayarlamasını yaparız" cevabı alınmıştır. Bu cevapları takiben sırasıyla %49 ile her zaman "TL cinsinden kasa mevcudunu azaltırız", %43,7 ile her zaman "Dövizle bağlı borçlarımızın ödemelerini hızlandırırız" cevapları gelmiştir. Bu cevaplardan en ilginç firmaların %45,5'i hiçbir zaman "TL üzerinden olan borçlarımızın ödenmesini geciktirmeyiz" yanıtını vermiştir. Bu cevaptan, işletmelerin büyük bir bölümünün ekonomik olarak firmalarının aleyhine olsa da ticari etik olan davranışı gösterdikleri anlaşılmaktadır.

Table 5: İşletmelerin Döviz Riskinden Korunmak İçin Kullanılan Finansal Yöntemlerden Haberdar Olma Durumu

Değişkenler	Ortalama	Standart Sapma	1 (%)	2 (%)	3 (%)	4 (%)
Forward Sözleşmeleri hakkında bilgi sahibi olma	3,63	0,604	1,0	3,5	26,6	68,8
Döviz Swapları hakkında bilgi sahibi olma	3,64	0,577	1,0	2,0	29,1	67,8
Futures (Gelecek) Sözleşmeleri hakkında bilgi sahibi olma	3,53	0,710	3,5	2,0	32,8	61,6
Opsiyonlar hakkında bilgi sahibi olma	3,52	0,673	2,5	2,5	35,2	59,8

Firmaların döviz risklerinden korunmak için ne tür finansal yöntemler hakkında bilgi sahibi olduklarını incelediğimizde, firmaların %60'dan fazlasının hem forward sözleşmeleri hem döviz swapları hem futures (gelecek) sözleşmeleri, hem de opsiyonlar hakkında detaylı bilgi sahibi olduklarını görmekteyiz. Şirketlerin, döviz risklerinden korunmak için bu finansal yöntemleri ne düzeyde kullandıklarını araştırdığımızda ise, maalesef şirketlerin bütün bu yöntemler hakkında detaylı bilgiye sahip olmalarına karşın bu yöntemleri kullanma düzeylerinin son derece düşük olduğu tespit edilmiştir. Firmaların %41,4'ü forward sözleşmelerini, %50,8'i döviz swaplarını, %58,4'ü futures sözleşmelerini, %58,6'sı ise opsiyonları hiç kullanmadıklarını beyan etmiştir. Firmaların döviz risklerinden kaçınmak için bu finansal yöntemleri neden kullanmadıklarını incelediğimizde, işletmelerin %67,1'i "Finansal yöntemlerin muhasebeleştirilmesi konusunda bilgi eksikliğinin olması"ni, %65,2'si "Risk yönetimine karşı işletmenin yaklaşımı"ni, %78,2'si "Hukuki çerçevede eksikliğinin olması"ni, %81,6'sı "Finansal yöntemlerin bilinmemesi"ni, %83,6'sı "Vergi mevzuatının yetersiz olması"ni, %89,1'i ise "Forward (vadeli işlem) piyasaları dışında TL ile işlem yapan piyasaların gelişmesi"ni sorun olarak gördüklerini bildirmişlerdir.

İşletmelerin ekonomik riskten korunmak için uyguladıkları stratejilere baktığımızda, işletmeler %87,2 gibi büyük bir oranda "Ürünümüzün fiyatını belirlerken döviz kuru değişikliklerini dikkate alırız" cevabını vermiştir. %86'sı "Aynı döviz üzerinden olan borç ve alacaklarımızın vadelerinin aynı olmasına dikkat ederiz", %73,7'si "Birden fazla döviz cinsi ile işlem yaparız", %76,2'si "Borç ve alacaklarımızın aynı döviz cinsinden olmasına özen gösteririz", %69,9'u "Hammadde alımını iç piyasadan mı yoksa dış piyasadan mı yapacağımıza döviz kurundaki dalgalanmalara bakarak karar veririz", %58,7'si "Yerel paramız değer kaybettiğinde, uluslararası piyasalara yeni bir ürün sunarak, bu durumdan avantaj sağlarız", %48,7'si "Dış piyasalarda yapılacak olan reklam ve tutundurma çabaları için ayırdığımız fon, döviz kuru dalgalanmalarına göre değişir", %47'si "Üretim tesislerimizin bulunduğu ülkelerden hangisinde, ülke parasının değeri düşük ise o ülkede üretimi artırırız", %43,9'u "Daha fazla kar elde etmek için, ülke parası değer kaybeden diğer ülkelere yatırım yapmak avantaj sağlar, biz bunu yaparız" ve son olarak %40,8'i "Parasının değer kazandığı ülkeleri Pazar olarak seçeriz" cevabını vermişlerdir.

Araştırmaya dahil olan katılımcıların, finansal yöntemlerden haberdar olması, ünvana göre istatistiksel olarak anlamlı farklılaşmaktadır. Diğer bir ifade ile katılımcıların ünvanının, finansal yöntemlerden haberdar olmasını etkilediği belirlenmiştir. Finans direktörlerinin, finans müdürü ve muhasebe müdürüne göre finansal yöntemlerden daha çok haberdar olduğu belirlenmiştir. İşletmelerin finans yetkililerinin finansal yöntemleri kullanım düzeyi, ünvana göre istatistiksel olarak anlamlı farklılaşmaktadır. Finans direktörlerinin muhasebe müdürü ve finans

müdüdüne göre finansal yöntemleri kullanım düzeyinin daha yüksek olduđu belirlenmiştir. Katılımcıların ünvanının, kullanılan işletme içi stratejilerin düzeyini etkilediđi belirlenmiştir. Bununla birlikte, finans direktörlerinin muhasebe müdüdü ve finans müdüdülerine göre işletme içi stratejileri kullanma düzeyinin daha yüksek olduđu belirlenmiştir.

Table 6: İşletmelerin Büyüklüklerine Göre Net Satış Hasılasından Elde Edilen Skorların Farklılaşma Durumu

Deđişkenler	Net Satış Hasılası	f	\bar{X}	SS	F	p
Finansal Yöntemlerden Haberdar Olma Durumu	Küçük İşletme	52	3,30	,83	7,713	,001
	Orta İşletme	54	3,66	,46		
	Büyük İşletme	94	3,67	,45		
Finansal Yöntemleri Kullanım Düzeyi	Küçük İşletme	52	1,54	,67	2,087	,127
	Orta İşletme	54	1,67	,61		
	Büyük İşletme	94	1,77	,67		
İşletmelerin Finansal Yöntemleri Kullanmayanların Kullanmamasının Sebepleri	Küçük İşletme	52	2,21	,79	,441	,644
	Orta İşletme	54	2,15	1,13		
	Büyük İşletme	94	2,30	1,00		
Ekonomik Riskten Korunmak İçin Uygulanan Stratejiler	Küçük İşletme	52	3,18	,70	2,316	,101
	Orta İşletme	54	3,45	,56		
	Büyük İşletme	94	3,29	,66		
Kullanılan İşletme İçi Stratejiler	Küçük İşletme	52	2,10	,42	3,912	,022
	Orta İşletme	54	2,19	,41		
	Büyük İşletme	94	2,27	,30		

Tablo 6'ya göre, araştırmaya dahil olan firmaların, finansal yöntemlerden haberdar olması ve kullanılan işletme içi stratejileri net satış hasılasına göre istatistiksel olarak anlamlı farklılaşırken, finansal yöntemleri kullanma düzeyi, işletmelerin finansal yöntemleri kullanmasının sebepleri ve ekonomik riskten korunmak için uygulanan stratejileri net satış hasılasına göre istatistiksel olarak anlamlı farklılaşmamaktadır. Firmaların net satış hasılasının, finansal yöntemlerden haberdar olmasını ve kullanılan işletme içi stratejilerini etkilediđi belirlenmiştir. Büyük işletmelerin, küçük işletme ve orta işletmelere göre finansal yöntemlerden haberdar olma ve kullanılan işletme içi stratejilerini kullanma düzeyinin daha yüksek olduđu belirlenmiştir.

5. SONUÇ

Bu bölümde Türkiye'nin Marmara Bölgesindeki 200 dış ticaret işletmesinden elde edilen verilere dayalı olarak, şirketlerin kur riskinden korunmak için kullandıkları yöntemlere dayalı betimsel istatistiklerin sonuçlarına ve şirketlerde çalışan finans yetkililerinin ünvanlarına ve şirketlerin büyüklüklerine göre yapılan ANOVA testlerinin sonuçlarına yer verilmiştir. Marmara Bölgesindeki 200 işletmenin %19.5'i gıda, %18'i inşaat, mühendislik ve gayrimenkul alanlarında çalışmalar yaparken, teknoloji sektöründe faaliyet gösteren firmaların oranı sadece %2.5'tir. İşletmelerin genellikle yerel tedarikçilere dayandıkları ve aynı zamanda belirli bir oranda ihracat yaptıkları gözlemlenmiştir. Bu durum, işletmelerin yerel ekonomiyi destekleme eğiliminde olduğunu ve uluslararası rekabetçiliklerinin olduğunu göstermektedir.

Döviz risk yönetimi konusunda firmaların çoğunlukla finans direktörlerine güvendiđi ve finansal kararları yönetmek konusunda kendilerine güvenildiđi görülmektedir. Muhasebe müdüdüleri ve finans müdüdüleri de bu konuda önemli bir rol oynamaktadır, ancak sayıları finans direktörlerine kıyasla daha azdır. Bu durum, döviz risk yönetiminin finansal stratejinin önemli bir parçası olduğunu ve genellikle finansal karar vericiler tarafından yönetildiđini göstermektedir. Ayrıca, muhasebe müdüdü veya yönetim kurulu üyelerinin bazen bu görevi üstlendiđi belirtilmiştir.

Şirketler, işlemlerinde Amerikan Doları ve Euro gibi majör dövizleri en yaygın olarak tercih ediyor. Bu durum, uluslararası ticarete bu iki para biriminin önemini ve güvenilirliğini göstermektedir. Ayrıca şirketlerin çođu, Amerika ve Avrupa ile ticaret yaparak güçlü ekonomik bağlar oluşturmuş durumdadır. Bu da Marmara Bölgesindeki firmaların büyük ölçüde Batı ülkeleri ile ticaret yaptığını ve bu bölgelerle ekonomik ilişkilerinin yoğun olduğunu göstermektedir. Firmaların dövizden kaynaklanan risklerle başa çıkma stratejilerine ilişkin uygulama sonuçlarına bakıldığında %56'sında döviz riskiyle ilgilenen özel bir birim bulunmadığı %44'ünde döviz risk yönetim birimi olduğu görülmüştür. Bu durum, döviz dalgalanmalarının firmalar üzerindeki etkisini yönetmek ve kontrol altında tutmak için özel bir yetenek ve anlayış gerektirdiđini göstermektedir.

İşletmeler, döviz kurlarındaki dalgalanmalara karşı çeşitli stratejiler kullanmaktadır. Bu durum, işletmelerin farklı risk profillerine ve operasyonel gereksinimlere sahip olabileceđini ve bu nedenle döviz riski yönetiminde farklı yaklaşımlar benimsediklerini göstermektedir. Döviz kurlarındaki dalgalanmalar, işletmelerin finansal durumunu, gelir-gider dengesini ve karlılığını etkileyeceđi sonucuna ulaşılmıştır. Araştırma sonuçları, firmaların kur riskiyle başa çıkmak için geliştirdiđi bu stratejilerin temel olarak belirsizlikleri yönetmeyi, riskleri azaltmayı ve finansal performansı korumayı amaçladığını göstermektedir. Bunun yanında firmaların %86'sı aynı döviz cinsinden borç ve alacaklarının vadelerini eşitlemeye çalışmaktadır. Bu durum, işletmelerin döviz kuru dalgalanmalarının potansiyel etkilerini azaltmak için uyguladıkları bir risk yönetimi stratejisi olarak değerlendirilebilir. Döviz kuru riski, bir işletmenin finansal performansını ve istikrarını önemli ölçüde etkileyebilmektedir. Bu sebeple, borç ve alacakların vadelerini eşleştirmek, bir işletmenin bu riski yönetmesine ve mali sağlamlığını korumasına yardımcı olabileceđi düşünülebilir. Firmaların %69,9'u ise hammadde alımlarını iç veya dış piyasaya göre ayarlamakta ve bu kararlarını döviz kurundaki dalgalanmaları dikkate alarak almaktadır. İşletmelerin döviz riskini yönetmede tedarik zinciri ve hammadde alımları önemli bir rol oynamaktadır. Tedarik zincirindeki hammadde alımları, döviz kurlarındaki dalgalanmaların etkisini azaltma veya

yönetme stratejileri olarak kullanılmaktadır. Arařtırma sonucunda firmaların kur riskinden korunma yöntemlerinin ve bu yöntemlerin kullanımına etki eden faktörlerin anlaşılması konusunda önemli sonuçlara ulařılmıştır. Bu bağlamda firmaların ağırlıklı olarak Türk lirası alacaklarını kısa sürede tahsil etme, fazla döviz nakitlerini değerlendirme ve hammadde fiyatlarını ayarlama gibi içsel stratejiler uyguladıkları görülmüştür.

Döviz kurlarındaki dalgalanmalar, işletmelerin ürün ve hizmet fiyatlandırılmalarını önemli ölçüde etkilemektedir. İşletmelerin %87,2'sinin ürün fiyatlarını belirlerken döviz kuru değışikliklerini dikkate alması, globalleşen bir ekonomide işletmelerin kararlarının ne kadar fazla döviz kuru hareketlerine duyarlı olduğunu göstermiştir. Bu, işletmelerin döviz kuru dalgalanmalarını kar marjlarına ve rekabet gücüne etkisini dikkate alarak fiyat belirleme stratejileri geliřtirdiğini göstermektedir.

Çođu firmanın kur riskinden korunmak için finansal yöntemler kullanmamasına rağmen forward sözleşmeleri, para swapları, vadeli işlem sözleşmeleri ve opsiyonlar hakkında bilgi sahibi oldukları tespit edilmiştir. İşletmelerin döviz riskini yönetmek için finansal yöntemlere dair bilgi sahibi olmalarına rağmen, bu yöntemleri düşük seviyede kullanmaları, risk yönetimi konusunda çekimser davrandıklarını ve eya finansal yöntemlerin uygulanmasında zorluklar yaşadıklarını gösterebilir.

İşletmelerin %73,7'sinin birden fazla döviz cinsiyle işlem yaptığı gözlemlenmiştir. Bu durum, firmaların döviz kuru riskini çeşitlendirmeyi ve dağıtmayı amaçlayan bir stratejiyi benimsediğini göstermektedir. Birden fazla döviz cinsiyle işlem yapmak, döviz kuru riskini azaltmada etkili bir yöntem olabilir. Aynı zamanda bu durum belirli bir döviz kurunun olumsuz hareketlerinin etkisini azaltmaktadır. Ancak, firmaların mali ve operasyonel karmaşıklığı yönetmelerini gerektirmekte ve bu da ilave maliyetler ve zorluklar yaratabilmektedir.

Neden döviz kurlarını takip ettiklerine gelince, firmaların çeşitli amaçları olduğu anlaşılmıştır: nakit akımlarındaki dengeyi azaltmak (%40), kazançlardaki dalgalanmaları azaltmak (%28,5), ve karlılığı artırmak (%25). Bu sonuç, firmaların döviz kurlarındaki dalgalanmaların etkisini minimize etme ve karlılıklarını koruma ve artırma stratejileri geliřtirdiklerini göstermiştir.

Döviz kurlarındaki dalgalanmalardan etkilenme dereceleri, işletmelerin döviz riskine karşı ne kadar hassas olduklarını göstermektedir. Firmaların yarısının kur değışimlerinden çok etkilendiklerini belirtmesi, döviz kurlarındaki dalgalanmaların Marmara Bölgesindeki firmalar üzerinde önemli bir etkisi olduğunu ortaya koymuştur. Döviz riskinin işlem riskine etkisi konusuna gelince, en yüksek oranı (%42,5) "1. derecede etkiler" seçeneđi almıştır. Bu durum, döviz riskinin, işlemlerin maliyetini, kazançlarını ve genel olarak iş performansını önemli ölçüde etkileyebileceđini göstermektedir. Döviz riskinin ekonomik risk üzerindeki etkisi de önemli bir bulgu olarak ön plana çıkmaktadır. İşletmelerin %50'si döviz riskinin ekonomik riski "1. derecede etkilediđini" belirtmiştir. Bu durum, döviz kurlarındaki değışikliklerin ekonomik risk üzerinde doğrudan ve önemli bir etkisi olduğunu göstermektedir. Bu bilgiler, döviz riskinin işletmelerin genel risk profili üzerinde ne kadar etkili olduđuna dair bir perspektif sunmaktadır.

Yapılan analizler neticesinde, finans yetkilisinin ünvanının, finansal yöntemlerden haberdar olma durumunu etkilediđi belirlenmiştir. Finans yetkilisinin ünvanının, işletmelerin finansal yöntemleri kullanmamasının sebeplerini etkilemediđi belirlenmişken, ekonomik rishten korunmak için uyguladıkları stratejileri de etkilemediđi saptanmıştır. Finans yetkilisinin ünvanının, kullanılan işletme içi stratejilerin düzeyini etkilediđi sonucuna varılmıştır. Finans yetkilisinin ünvanının, finansal yöntemleri kullanım düzeyini etkilediđi sonucu çıkmıştır ve finans direktörlerinin muhasebe müdürü ve finans müdürüne göre finansal yöntemleri kullanım düzeyinin daha yüksek olduđu ve daha çok finansal yöntemlerden haberdar oldukları belirlenmiştir. Büyük, orta ve küçük işletmelerin net satış hasılasına göre, finansal yöntemlerden haberdar olması durumu ve kullandıkları işletme içi stratejilerini etkilediđi belirlenmiştir. Büyük işletmelerin, küçük işletme ve orta işletmelere göre finansal yöntemlerden haberdar olma ve kullanılan işletme içi stratejilerini kullanma düzeyinin daha yüksek olduđu belirlenmiştir.

İşletmeler, döviz kuru riskinden korunmak ve dalgalanmaların olumsuz etkilerini azaltmak için çeşitli stratejiler benimsemektedir. Bu stratejiler arasında finansal türev ürünler kullanma, döviz cinsinden alacak ve borçları dengeleme, hammadde alımlarını çeşitlendirme ve döviz kuru dalgalanmalarına karşı güncellemeler yapma gibi yöntemler bulunabilir. Döviz kurlarındaki dalgalanmalar, işletmelerin mali sağlamlığı üzerinde belirsizlik yaratabilir ve risk oluşturabilir.

Bütün değerlendirme sonucunda, işletmeler döviz kuru riskinden korunarak ve finansal stratejileriyle uyumlu hareket ederek mali sağlamlıklarını korumaya çalışırlar. İşletmeler, döviz kuru riskine karşı koyabilmek ve karlılıklarını korumak için bu stratejilere başvurmak zorundadır. Bu bulgular, aynı zamanda, döviz kuru riskinin yönetilmesinin işletmelerin finansal performansını ve işletme sağlamlığı üzerinde önemli bir etkisi olduğunu göstermektedir. Bu nedenle, döviz kuru riskini yönetme stratejileri hem akademik hem de uygulamalı finansal yönetim arařtırmalarında önemli bir konu olmaya devam etmektedir.

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DETECTING FRAUDS IN FINANCIAL STATEMENTS: A COMPREHENSIVE LITERATURE REVIEW BETWEEN 2019 AND 2023 (JUNE)

DOI: 10.17261/Pressacademia.2023.1849

PAP- V.18-2023(7)-p.47-51

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To cite this document

Gaffaroglu S., Alp S., (2023). Detecting frauds in financial statements: a comprehensive literature review between 2019 and 2023 (June). PressAcademia Procedia (PAP), V.18, 47-51.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1849>

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ABSTRACT

Purpose- The purpose of this study is to determine studies on detecting different types financial frauds, financial statement frauds and methods used in these studies. Financial statement fraud is one of the most common types of white-collar crime that has plagued various industries worldwide. It involves manipulating financial information in order to deceive stakeholders, such as investors and regulators, for personal gain or advantages. Financial statement fraud has significant implications for stakeholders, including investors, regulators, and the general public. Detecting fraudulent activities in financial statements is crucial for ensuring transparency, reliability, and trust in financial reporting.

Methodology- This paper presents a comprehensive literature review of studies focused on detecting frauds in financial statements in between 2019 and first half of 2023 inclusive on Science Direct.

Findings - The review encompasses a range of research articles, providing insights into various methodologies, techniques, and advancements in fraud detection. The findings of this review contribute to the understanding of fraud detection mechanisms in financial statements and inform future research directions in this critical area.

Conclusion - This paper presents a comprehensive literature review on the topic of detecting financial statement fraud, focusing on current trends and approaches employed in the field. By examining a wide range of scholarly articles, research studies, and industry reports, this review aims to provide an overview of the existing knowledge, methodologies, and tools utilized in the detection of financial statement fraud. In recent years, it has been observed that studies using machine learning in the field of fraud detection have increased.

Keywords: Fraud detection, machine learning, data mining literature review, financial statements

JEL Codes: M42, M21, M41

1. INTRODUCTION

Financial statement fraud can take many forms, including revenue recognition manipulation, understating or overstating expenses, manipulating cash flow statements, and misrepresenting assets or liabilities. Such fraudulent activities can have devastating effects on companies' reputations and lead to significant losses for investors and other stakeholders (Xiaoyu et al., 2018).

Financial statements form the core of external financial reporting by companies. It presents the company's financial position, performance, and cash flows to stakeholders. Therefore, they need to be accurate, reliable, and transparent (Dimitrijevic et al, 2021). Unfortunately, financial statement fraud is a growing concern in organizations worldwide. There have been prominent cases of financial statement fraud in recent years, such as Enron, WorldCom, Satyam, and Tesco. Financial statement fraud is the intentional manipulation of financial statements that distort the actual financial position of the organization for personal gain or to meet management's objectives. (ACFE Report, 2022; Xiaoyu et al., 2018).

Financial statement fraud poses a significant threat to the integrity of financial markets and the trust of investors. Detecting such fraudulent activities is crucial for maintaining transparency and ensuring accurate financial reporting.

According to the Association of Certified Fraud Examiners (ACFE), financial statement fraud is "a deliberate misrepresentation of the financial condition of an enterprise accomplished through the intentional misapplication of accounting rules, misrepresentation or omission of facts, or through fictitious transactions" (ACFE Report, 2022). Financial statement fraud is usually motivated by the desire of management to meet analyst expectations, inflate stock prices, and increase executive compensation (Mongwe et al., 2021). The most common methods used to

commit financial fraud include: premature revenue recognition, understating expenses, capitalizing expenses instead of recording them as expenses, and hiding liabilities (Wang, 2010).

The consequences of financial statement fraud can be severe and long-lasting. Financial statement fraud can result in significant losses to investors, employees, and other stakeholders. Companies that engage in financial statement fraud typically suffer reputational damage, reduced market capitalization, legal sanctions, and failure. There are also social impacts, such as job losses, negative impacts on the overall economy, and trust in the financial reporting system.

2. SIGNIFICANCE OF FRAUD DETECTION IN FINANCIAL STATEMENTS

The importance of detecting financial statement fraud cannot be overstated as it helps prevent fraudulent activities before they cause severe damage to companies' reputation or finances. Early detection also saves resources that would have been expended during litigation processes that follow after fraudulent practices are discovered.

Preventing and detecting financial statement fraud requires a robust control environment, effective policies and procedures, sound ethical culture, and vigilant internal and external auditors. A well-designed internal control system with appropriate segregation of duties, sound internal audit functions, and independent external audit is critical to preventing and detecting financial statement fraud. Furthermore, companies need to have a code of conduct and ethics to promote ethical behavior and foster a culture of integrity (Simsek et al., 2018).

The effects of financial statement fraud on a company and its stakeholders can be devastating. The followings can be given as examples (Roszkowska, 2020; Bauer et al. 2020; Simsek et al., 2018; Wang, 2010):

- ✓ *Loss of investor confidence:* The discovery of financial statement fraud can shake investor confidence in a company and lead to a significant drop in stock prices.
- ✓ *Legal consequences:* Companies that engage in financial statement fraud may face legal consequences, such as fines and penalties from regulators or lawsuits from investors.
- ✓ *Damage to reputation:* Financial statement fraud can severely damage a company's reputation, leading to a loss of business and difficulty in attracting new customers.
- ✓ *Deterioration of relationships:* Financial statement fraud can also damage the company's relationships with its partners, vendors, and suppliers, leading to further negative impacts on the company's business.
- ✓ *Job losses and decreased employee morale:* If the company's financial situation deteriorates due to financial statement fraud, it may result in layoffs, decreased compensation, and lower employee morale.

The manipulation of financial statements can have significant impacts on both investors and financial institutions. When financial statements are manipulated, they may present a distorted or inaccurate picture of a company's financial health and performance. This can mislead investors and cause them to make uninformed investment decisions based on false information. As a result, investors may suffer financial losses if they invest in companies with manipulated financial statements.

Financial institutions, such as banks and lending institutions, rely on accurate financial statements to assess the creditworthiness and risk profile of companies. Manipulated financial statements can lead to incorrect assessments of a company's financial stability, potentially resulting in loans or credit being extended to companies that are actually at higher risk of default. This can expose financial institutions to increased credit risk and potential losses (Thennakoon et al., 2019).

Overall, the manipulation of financial statements undermines the integrity and transparency of financial markets, erodes investor confidence, and poses risks to the stability of financial institutions. It is therefore crucial to detect and prevent financial statement fraud to protect the interests of investors and maintain the soundness of financial systems.

It's important for companies to have strong internal controls and ethical standards to prevent financial statement fraud from happening in the first place.

Financial statement fraud remains a significant concern in organizations worldwide. Companies that engage in financial statement fraud not only face severe legal and financial consequences but also harm their reputation and stakeholders. To prevent and detect financial statement fraud, organizations need to establish robust internal control systems, effective policies and procedures, sound ethical culture, and vigilant auditors. Therefore, it is essential for organizations to focus on ensuring integrity and transparency in their financial reporting practices, which can ultimately benefit all stakeholders involved.

The objectives of this study are, to provide an overview of the existing research on detecting frauds in financial statements and to identify research gaps and opportunities for future investigation. This way, it is aimed to provide these acquisitions, to give readers a perspective and to provide them with information about fraud detection.

3. METHODOLOGY

This study tries to utilize a combination of bibliometric analysis and topic modeling approach to conduct an in-depth examination of relevant articles from the selected references within the stated time frame. Research Definition is the first phase in which Research Area is defined, Review Research's Aim is formulated and Research Scope is identified. The second phase is Research Methodology where after defining the scope the online search through digital libraries and final result filtration are done. As the last phase, Research Analysis is conducted with the analyzing of the selected articles and constitution of results and conclusion (Al-Hashedi and Magalingam, 2021).

The searches were done on the ScienceDirect website (www.sciencedirect.com) with the keywords provided in Table 1, between the publications that were published between 2019 and 2023 (June 19th), inclusively. The numbers of the papers listed as a result are shown next to the related keywords. While we focus on the Financial Statement Fraud in this research, we also enhanced our research on determining the categories of which most of the Fraud Detection studies are done and also the models which are used most for Fraud Detection.

In this study, the words used for searches on issues involving fraud and the words used in searches regarding the methods used to detect fraud are given in Table 1.

Table 1: Search keywords

Issues Involving Fraud	Methods Used to Detect Fraud
Fraud + Detection + "Financial Statement"	Fraud + Detection + "Machine Learning"
Fraud + Detection + "Credit Card"	Fraud + Detection + "Data Mining"
Fraud + Detection + "Fintech"	Fraud + Detection + "Artificial Intelligence"
Fraud + Detection + "Insurance"	Fraud + Detection + "Heuristic"
Fraud + Detection + Audit	Fraud + Detection + "Fuzzy"
Fraud + Detection + Banking	Fraud + Detection + Optimization
Fraud + Detection + "e-Commerce"	Fraud + Detection + "Deep Learning"
Fraud + Detection + "Bank Transaction"	

The selected papers are analyzed to find which methodologies and models are used to detect frauds in financial statements. The papers are summarized especially with these information and also their results and additional findings.

4. APPLICATION

The findings reveal several studies conducted by researchers globally with diverse backgrounds ranging from accounting experts, computer science professionals among others who contributed significantly to detecting financial statement fraud through their works across different fields; these studies include both qualitative and quantitative methods conducted using secondary data sources such as annual reports provided by firms themselves related publications among others which were analyzed thoroughly with varied results obtained.

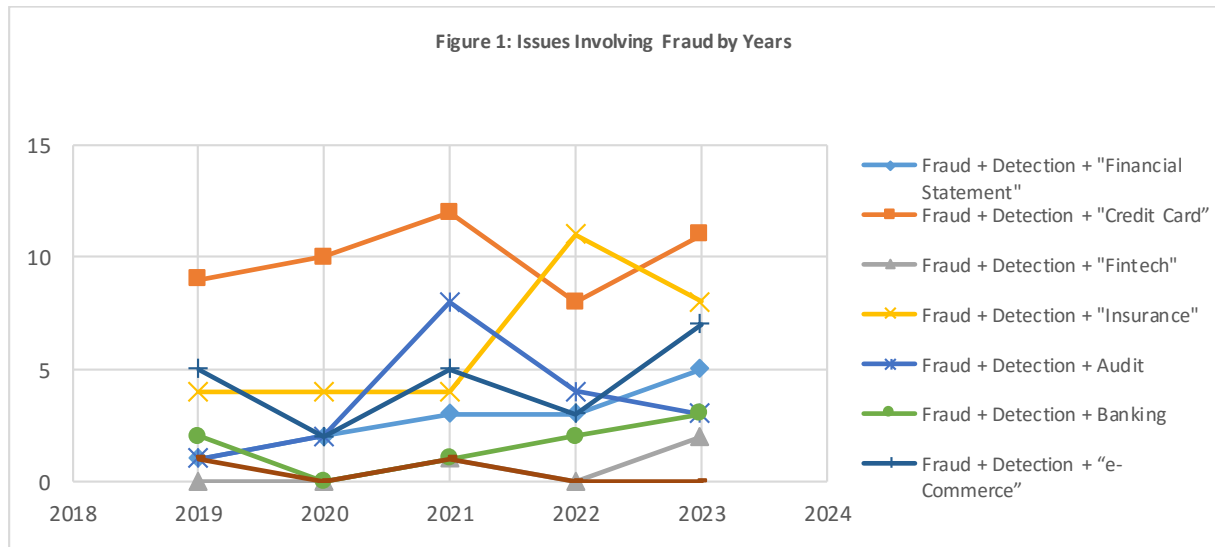
The article numbers were found in Science Direct (www.sciencedirect.com) by the search in between 2019 and 2023(June) publishment years, with the keywords shown in Table 1. During these years there have been increasing in the publishment numbers. The most studies are done about the credit card transactions and insurance frauds.

Financial Statement Frauds also show an increasing tendency through years; in the first half of 2023 there have been 5 publications in this area on ScienceDirect while there was only 1 publishment in 2019.

Fraud Detection Papers Grouped by Fraud Topics are provided in Table 2 and Figure 1.

Table 2: Fraud Detection Papers Grouped by Issues

Issues Involving Fraud	2019	2020	2021	2022	2023
Fraud + Detection + "Financial Statement"	1	2	3	3	5
Fraud + Detection + "Credit Card"	9	10	12	8	11
Fraud + Detection + "Fintech"	0	0	1	0	2
Fraud + Detection + "Insurance"	4	4	4	11	8
Fraud + Detection + Audit	1	2	8	4	3
Fraud + Detection + Banking	2	0	1	2	3
Fraud + Detection + "e-Commerce"	5	2	5	3	7
Fraud + Detection + "Bank Transaction"	1	0	1	0	0
Fraud + Detection	76	115	151	139	102

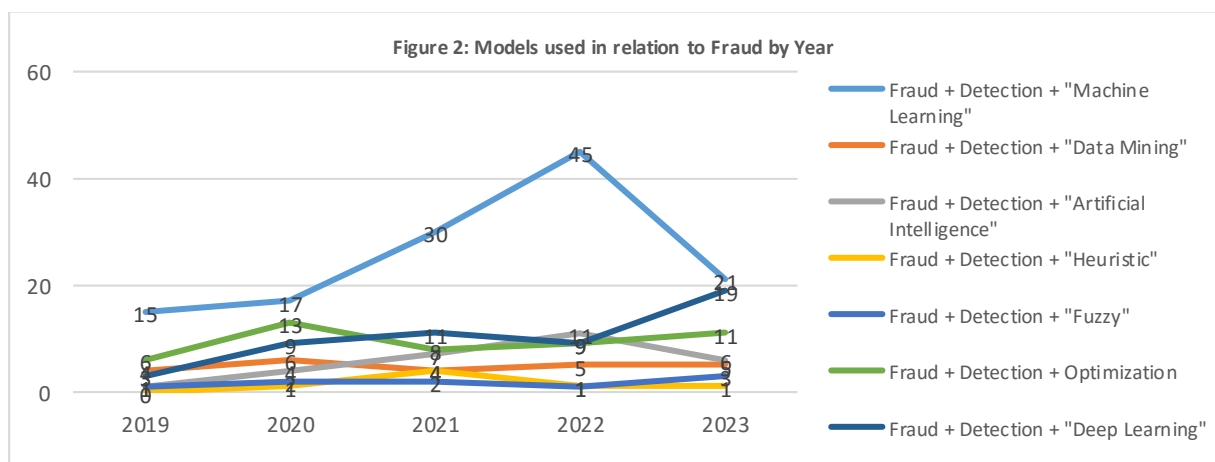


Recently, the most of the researches about "Fraud Detection" have been in Credit Card and Insurance issues.

Fraud Detection Papers Grouped by Fraud Detection Models Used are provided in Table 3 and Figure 2.

Table 3: Fraud Detection Papers Grouped by Models Used

Methods Used to Detect Fraud	2019	2020	2021	2022	2023
Fraud + Detection + "Machine Learning"	15	17	30	45	21
Fraud + Detection + "Data Mining"	4	6	4	5	5
Fraud + Detection + "Artificial Intelligence"	1	4	7	11	6
Fraud + Detection + "Heuristic"	0	1	4	1	1
Fraud + Detection + "Fuzzy"	1	2	2	1	3
Fraud + Detection + Optimization	6	13	8	9	11
Fraud + Detection + "Deep Learning"	3	9	11	9	19
Fraud + Detection	76	115	151	139	102



Most of the studies on Fraud Detection are the ones which use machine learning models with a big difference to other models. Deep learning is also in an increasing trend while heuristic and fuzzy models are being used least.

5. CONCLUSIONS

This paper has provided an overview of literature on detecting financial statement fraud from 2019 to first half 2023 while highlighting different approaches/methodologies employed by researchers globally to identify fraudulent behavior using different datasets.

The research articles reviewed highlight different approaches used in detecting financial statement frauds over the years. These articles reveal that various methodologies are used in detecting financial statement fraud; these methods include statistical analysis, machine learning models, neural networks among others.

Detecting fraud in financial statements is a very important issue. Recently, many academic studies have been conducted using machine learning methods for this fraud detection. With this study, we tried to draw a general framework about the studies that have been done on this subject in the recent period and tried to provide information about the existing studies and what can be done for future studies.

Overall findings from this literature review suggest that significant advancements have been made concerning detecting financial statement fraud over the past few years using various methodologies highlighted above which could be improved by increasing awareness amongst auditors to improve their detection skills or incorporation of model-based decision making based on AI/ML algorithms.

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CAUSALITY RELATIONSHIP BETWEEN BANK INDICES: AN APPLICATION ON SELECTED COUNTRIES

DOI: 10.17261/Pressacademia.2023.1850

PAP- V.18-2023(8)-p.52-56

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To cite this document

Sezal, L., Serbetci, A. (2023). Causality relationship between bank indices: an application on selected countries. PressAcademia Procedia (PAP), V.18, 52-56.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1850>

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ABSTRACT

Purpose- If price volatility in one stock exchange has an impact on other stock exchanges, this is called volatility spillover effect. Along with volatility, the change in returns in one stock exchange can also affect other stock exchanges in the short term. This situation is called interconnectedness, co-movement and furthermore, interdependence of stock markets. Therefore, this study aims to investigate the causality relationship between the bank indices of the 5 countries with the highest income (USA, China, Japan, Germany and India) in 2022 according to IMF data.

Methodology- In the study, the daily frequency data set between 04/01/2018 -16/11/2023 was used. In the analysis phase, firstly, ADF and PP unit root tests were applied to determine whether the variables are stationary or not. Causality relationships between variables were tried to be determined by Granger Causality test.

Findings- When the relationship between the bank indices of the 5 major economies subject to the research is analysed, a granger causality relationship was found between DAX variable and FTSE, TR INDIA and NIKKEI, between FTSE index and NASDAQ and NIKKEI, between TR INDIA and NIKKEI.

Conclusion- Ülke borsası arasında bağımlılık ilişkilerinin kendini göstermesi ve konjonktür dalgalarının bu sürece etki etmesi, finans piyasasında alınan kararlar ile ortaya çıkan etkilerin diğer finans piyasasına etki edebileceğini ve bu doğrultuda da yatırımcı hareketlerini yönlendirebileceğini göstermesi bakımından oldukça önemlidir.

Keywords: International stock exchanges, bank indices, Granger Causality Test

JEL Codes: C22, G15, G20

BANKA ENDEKSLERİ ARASI NEDENSELLİK İLİŞKİSİ: SEÇİLMİŞ ÜLKELER ÜZERİNDE BİR UYGULAMA

ÖZET

Amaç- Bir borsada meydana gelen fiyat oynaklıkları diğer borsalar üzerinde etkiye sahipse buna volatilité yayılma etkisi denmektedir. Volatilité ile birlikte bir borsada görülen getiri değişimi kısa vadede diğer borsaları da etkileyebilmektedir. Bu durum borsaların birbirine karşılıklı bağıllığı, eşhareketlilik ve daha ileri safhası borsaların birbirinden etkilenmesi olarak adlandırılır. Buradan hareketle bu çalışmada, IMF verilerine göre 2022 yılında en yüksek gelire sahip 5 ülkenin (ABD, Çin, Japonya, Almanya ve Hindistan) banka endekslerinin birbirleri arasındaki nedensellik ilişkisi araştırılmak istenmiştir.

Yöntem- Çalışmada 04/01/2018 -16/11/2023 tarihleri arası günlük frekanstaki veri seti kullanılmıştır. Analiz aşamasında ilk olarak, değişkenlerin durağan olup olmadıklarının tespiti için ADF ve PP birim kök testleri uygulanmıştır. Değişkenler arasında nedensellik ilişkileri Granger Nedensellik testi ile saptanmaya çalışılmıştır.

Bulgular- Araştırmaya konu olan 5 büyük ekonominin banka endeksleri arasındaki ilişki incelendiğinde, DAX değişkeni ile FTSE, HND ve NIKKEI arasında, FTSE endeksi ile NASDAQ ve NIKKEI arasında TR HİNDİSTAN ve NIKKEI arasında granger nedensellik ilişkisi tespit edilmiştir.

Sonuç- Ülke borsası arasında bağımlılık ilişkilerinin kendini göstermesi ve konjonktür dalgalarının bu sürece etki etmesi, finans piyasasında alınan kararlar ile ortaya çıkan etkilerin diğer finans piyasasına etki edebileceğini ve bu doğrultuda da yatırımcı hareketlerini yönlendirebileceğini göstermesi bakımından oldukça önemlidir.

Anahtar Kelimeler: Uluslararası borsalar, banka endeksleri, Granger Nedensellik Testi

JEL Kodları: C22, G15, G20

1. GİRİŞ

1980'li yıllardan bu yana finansal atmosferin bir hayli değişkenlik göstermesi ve ülkeler arası piyasaların birbirleriyle olan etkileşimleri birçok araştırmacının dikkatini çekmiş ve bu konuyla ilgili olarak finans literatürü zenginlik kazanmaya başlamıştır. Küreselleşmeyle birlikte sermayenin global ve bağımsız bir güç haline gelmesi, uluslararası finansal piyasaların oluşmasına hız kazandırmıştır (Akıncı ve Küçükçaylı, 2018). Finansal liberalizasyon ile kazanılan özgürlük, sermayenin uluslararası olarak rahat bir şekilde dolaşımına sebep olmuş ve piyasaların birbirleriyle olan etkileşimlerini arttırmıştır. Finansal piyasalar arasındaki etkileşimde yaşanan yükselişle birlikte, yaptığı yatırımlarda riskli yaymak isteyen uluslararası tasarruf sahipleri için yatırım kararı almak daha da zorlaşmaktadır (Evlimoğlu ve Çundur, 2012).

Finansal piyasalarda yatırımcı olan tasarruf sahiplerinin dikkate aldığı iki önemli unsur bulunmaktadır. Söz konusu bu iki temel unsur yatırımın riski ve sağladığı gelirdir (Şahin ve Sümer, 2014). Finansal piyasaların bütünleşmesi, ayrı piyasalarda faaliyet gösteren yerel piyasalarda yatırım araçlarının benzer risk ve fiyatla bulunmaları olarak tarif edilebilmektedir. Diğer bir anlatımla, birden fazla piyasa ayla entegre olan menkul kıymetler bu piyasalarda benzer şekilde fiyatlandırılmadıkları. Piyasalar arasındaki bütünleşme, bütün piyasalardaki yatırım araçlarının benzer risk unsurlarının etkisi altında olduklarını ve her bir faktöre tesir eden risk seviyesinin bütün piyasalarda benzer olduğunu belirtmektedir (Şenol ve Polatgil, 2020). Uluslararası yatırımcılar korelasyon içerisinde olan borsaları ve korelasyon içerisinde olmayan borsaları göz önünde bulundurarak portföylerine ekleyecekleri menkul kıymetleri seçmektedir. Borsalar bütünleşik değilse birbirlerine alternatif olabilmeleri ve portföy çeşitlendirmesi ile arbitraj fırsatı ortaya çıkar. Borsalar aralarında bütünleşik ise de portföy çeşitlendirmesinin ve arbitraj fırsatının bulunmadığı söylenebilir (Kocabiyik ve Kalaycı 2014). Borsaları günümüz dünyasında kendi değişkenleri ile analiz etmek nispeten eksik kalmaktadır. Bilhassa aynı coğrafyada bulunan veya bezer karakteristiklere sahip ülke piyasalarının ilişkileri daha yüksektir. Bu sebeple tasarruf sahiplerinin menkul kıymet yatırımları için karar alırken yüksek ilişki ve etkileşime sahip ülkeleri bir arada değerlendirmeleri gereklidir (Polat ve Kılıç, 2022).

Bu çalışmada, bu çalışmada, IMF Dünya Ekonomik Görünümü veri setine göre, 2022 yılında en yüksek gelire sahip 5 ülkenin (ABD, Çin, Japonya, Almanya ve Hindistan) banka endekslerinin birbirleri arasındaki nedensellik ilişkisi araştırılmak istenmiştir. Konu ile ilgili literatür taraması yapılmış olup, çalışmada kullanılan veri seti ve değişkenler hakkında bilgi verildikten sonra araştırma kullanılan analiz yöntemlerinden bahsedilmiştir. Araştırma son bölümde bulgular ve sonuç kısmı ile sonlandırılmıştır.

2. LİTERATÜR

Son yirmiyıllık süre içerisinde araştırmacıların uluslararası borsaların birbirleriyle ilişkisini anlamaya yönelik çalışmalara ilgi oldukça artmıştır. Bu ilginin artışı uluslararası fonların ulaştığı büyüklük, borsalardaki birleşme eğilimi, teknolojik gelişmeler, para ve sermaye piyasalarının liberalleşmesi ve küreselleşme, temel nedenlerdir.

Dokuz ülke borsasının hareketlerinde uluslararası aktarım mekanizmasının etkisini araştıran Eun ve Shim (1989), 1979-1985 yıllarını kapsayan günlük kapanış verilerini kullanarak çalışmalarında VAR analiz tekniğini uygulamışlardır. Çalışma bulgularında Amerikan borsasının diğer ülke borsalarını etkilediğini ve Amerika'da meydana gelen bir şokun diğer ülkeleri bir gün içerisinde etkilediği görülmüştür. İngiltere, Japonya ve ABD borsaları arasındaki dinamik ilişkileri çok değişkenli GARCH modeli ile inceleyen Theodossiou vd. (1997), araştırma bulgularında ABD borsasından İngiltere ve Japonya borsalarına doğru getiri ilişkisinin bulunduğunu, yalnız ülkelerin borsaları arasında volatilité ilişkisinin olmadığını tespit etmişlerdir. Bala ve Premaratne (2003), Singapur, İngiltere, ABD, Japonya ve Hong Kong borsaları arasındaki etkileşimi incelemişlerdir. Çalışmalarında GARCH ve çok değişkenli asimetrik GARCH tekniklerini uygulamışlardır. Yapılan analizler doğrultusunda Singapur borsası ile ABD, Japonya, İngiltere, ve Hong Kong borsaları arasında volatilité ilişkisinin olduğu tespit edilmiştir.

Wong vd. (2004), Asya'da bulunan gelişen piyasalar borsaları ile gelişmiş ülke piyasaları borsaları arasındaki bütünleşik hareketin varlığını araştırmıştır. Çalışmalarında 1981-2002 yıllarını kapsayan günlük hisse senedi fiyatlarını kullanarak eşbütünleşme analizleri uygulanmıştır. Araştırma bulgularında bazı yükselen ve gelişmiş ülke borsaları arasında uzun dönemli ilişkinin varlığı görülmüştür. Bilhassa 1987 yılında oluşan borsa krizi sonrasında ilgili ülke grubu borsaları arasında karşılıklı bağımlılık etkileşiminin yükseldiği tespit edilmiştir. Benzer sonuçlara, 1997 Asya Finansal Krizi sonrasında da rastlanmıştır. Sharkasi vd. (2006) çalışmalarında İngiliz ve Amerikan hisse senedi piyasaları ile Portekiz ve İrlanda'da bulunan hisse senedi piyasaları arasındaki karşılıklı bağımlılık ilişkilerini araştırmışlardır. Çalışmalarında 1993-2003 yıllarını kapsayan veriler kullanılarak zaman serisi analizlerinden faydalanmışlardır. Çalışma sonucunda İngiltere, İrlanda ve Portekiz hisse senedi piyasaları arasında bir ilişkinin var olduğunu tespit etmişlerdir. Bunun yanı sıra Amerika, Portekiz ve İrlanda hisse senedi piyasalarının birlikte hareket etme davranışında olduğunu görmüşler, yalnız ilişkinin düşük seviyede bulunduğunu ifade etmişlerdir. Ek olarak Amerikan hisse senedi piyasalarından İngiliz hisse senedi piyasalarının etkilenmediği görülmüş ve tersi bir ilişkinin var olmadığı sonucuna ulaşılmıştır.

Asya Krizi öncesi ve sonrasında, Amerika ile Hong Kong, Tayvan ve Çin hisse senedi piyasaları arasındaki ilişkiyi inceleyen Cheng ve Glascock (2006), çalışmalarında 1995-2000 yıllarını kapsayan verileri kullanmışlardır. Çalışma sonucu olarak Asya Krizi sonrasında hisse senedi piyasalarındaki gelirlerin ortak unsurlardan etkilendiği ve bu hisse senedi piyasalarının dış etkilere karşı daha hassas bir hale dönüştüğünü ifade etmişlerdir. Hindistan ile 12 Asya arasındaki hisse senedi piyasalarının birbirlerine olan bağımlılıklarını ve oynaklığın yayılmasını inceleyen Mukherjee ve Mishra (2010) araştırmalarında 1997 Kasım-2008 Nisan tarihlerini kapsayan günlük verilerden yararlanmışlardır. Çalışmalarında ARCH ve GARCH tekniği kullanılarak çalışma bulgusu olarak Hindistan ve Asya ülkeleri arasında karşılıklı ilişkinin var olduğu sonucuna ulaşılmıştır.

ABD ile 22 gelişmekte ve gelişmiş olan ülkelerin borsaları arası uzun dönemli etkileşimlerini inceleyen Khan (2011), çalışmada Avusturya, Çin ve Malezya borsalarının ABD borsası ile aralarında bir etkileşimin bulunmadığı, ek olarak da bu sonucun yatırım yapacak tasarruf sahiplerine portföy çeşitlendirmesi ve risk yönetimi konusunda avantaj sağlayacağı sonucuna varmıştır. G-8 ülkeleri borsa endeksleri ile BIST100 endeksi arasındaki eşbütünleşmeyi inceleyen Kocabiyik ve Kalaycı (2014), çalışmalarında günlük ve haftalık verileri kullanarak Johansen Eşbütünleşme ve Vektör Hata Düzeltme tekniklerinden yararlanmışlardır. Çalışma sonucunda Türkiye ile diğer ülkeler arasında bir

korelasyona ulaşılmamıştır. BIST ve BRICS ülkelerinin borsaları arası etkileşimlerini inceleyen Şimşek (2016), çalışmada Ocak 2008-21 Ocak 2015 sürecini kapsayan günlük veriler kullanılarak ARCH ve GARCH modellerinden yararlanılmıştır. Araştırma bulgularında BIST'in BRICS ülke borsalarıyla ilişki içerisinde olduğu ve bu ilişkinin en çok son dönemlerde Güney Afrika ve Hindistan ülke borsaları ile görüldüğü ifade edilmiştir. Ek olarak yine son dönemlerde Hindistan hariç diğer ülke borsalarıyla Türkiye borsasının pozitif olarak ayrıştığı görülmüştür. BRICS ülkeleri borsaları ile Türkiye borsası arasındaki ilişkiyi inceleyen Özşahin (2017), 2000-2016 sürecini kapsayan aylık MSCI yükselen piyasalar endeksi verilerinden yararlanılmıştır. Analizlerde çoklu yapısal kırılmalı birim kök testi ve çoklu yapısal kırılmalı eşbütünleşme testleri kullanılmıştır. Araştırma bulgularında Brezilya haricindeki diğer ülke borsaları ile Türkiye borsası arasında uzun dönemde bütünlük, pozitif ve anlamlı bir ilişkinin varlığı görülmüştür. MIST ülke borsaları ile gelişmiş ülkeler borsaları arasındaki kısa ve uzun dönemli ilişkiyi araştırarak Madhavan (2017), çalışmada gelişmiş ülkeler olarak İngiltere, Almanya, ABD, Hong Kong, Japonya ve Singapur borsa verilerini kullanmıştır. Kısa dönemli ilişki için Dinamik Koşullu Korelasyon ve uzun dönemli ilişki için de Johansen eşbütünleşme testi kullanılmıştır. Uzun dönemde gelişmiş ülkelerin borsaları ile MIST ülkeleri borsaları arasında zayıf bir ilişkinin olduğu görülmüştür. Kısa dönemde ise ABD ve Meksika arasında güçlü, Meksika ve Japonya arasında zayıf; Hong Kong, Singapur ve Endonezya arasında güçlü, ABD ile zayıf; ABD ile Güney Kore arasında zayıf, Japonya, Singapur ve Hong Kong ile güçlü bir ilişkinin varlığı tespit edilmiştir.

3. VERİ VE YÖNTEM

Bu çalışmada, IMF verilerine göre 2022 yılında en yüksek gelire sahip 5 ülkenin (ABD, Çin, Japonya, Almanya ve Hindistan) banka endekslerinin birbirleri arasındaki nedensellik ilişkisi araştırılmaktadır. Çalışmada 04/01/2018 -16/11/2023 tarihleri arası günlük frekanstaki veri seti kullanılmıştır. Tarih aralığının bu şekilde seçilmesinin temel sebebi, Covid-19 pandemi dönemini de içerecek şekilde öncesi, pandemi dönemi ve sonrası tarihler arasındaki ilişkiyi keşfetmektir. Çalışmada değişken olarak analize tabi 5 ülkelerin bankacılık endeksleri kullanılmıştır. Tablo 1'de veri seti tanımsal istatistikler sunulmuştur.

Tablo 1: Seçili Ülkeler Banka Endekslerine İlişkin Veri Seti ve Tanımlayıcı İstatistikler

Değişkenlerin Kısaltması	Değişken Açıklaması	Zaman Aralığı	Veri Frekansı	Kaynak
DAX	Almanya DAX Bankalar Endeksi	04/01/2018 -16/11/2023	Günlük	investing.com
FTSE	Çin Banka Endeksi			
HND	TR Hindistan Bankalar Endeksi			
NAS	Nasdaq Banka Endeksi			
NIK	Nikkei 500 Japonya Banka Endeksi			

Analizlerde kullanılan serilerin birim kök içerip içermediğinin tespit edilmesinde Genişletilmiş Dickey-Fuller birim kök testi araştırmacılar tarafından sıklıkla kullanılmaktadır. Bu birim kök testini, AR(1) sürecini temel alan Genişletilmiş Dickey-Fuller (ADF) birim kök testinin farklı bir versiyonu olarak nitelendirmek mümkündür. Ancak zaman serisinde, serilerinde daha yüksek mertebeden (dereceden) bir korelasyon bulunması halinde, et (hata/artık terimleri) temiz dizi özelliğini kaybetmektedir. ADF testinde ise bu problemin çözümü için AR(1) sürecinden ziyade AR(p) sürecinden faydalanarak eşitliğe "p" gecikmeli fark terimleri dâhil edilmiştir (Dickey & Fuller, 1979). Böylelikle, sabit terimsiz ve trendsiz (none), sabit terimli (intercept) ve sabit terimli ve trendli (intercept&trend) ADF denklemleri sırasıyla:

$$\Delta y_t = \delta y_{t-1} + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \varepsilon_i \quad (1)$$

$$\Delta y_t = \mu + \delta y_{t-1} + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \varepsilon_i \quad (2)$$

$$\Delta y_t = \mu + \beta t + \delta y_{t-1} + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \varepsilon_i \quad (3)$$

şeklinde. 1, 2 ve 3 numaralı denklemlerde μ sabit terime, t trende, p gecikme sayısına ve ε ise hata terimi serisine karşılık gelmektedir. ADF denklemlerinin her üçü için de, temel hipotezler aynı şekilde oluşturulmakta ve serinin birim kök içerdiğini ifade etmektedir. Dolayısıyla temel hipotezde durağan dışı bir serinin varlığı belirtilir (Gujarati, 2015: 328). Bu modeller için birim kökün varlığına ilişkin hipotezler aşağıdaki gibidir:

$$H_0: \delta = 0 \text{ (Seri durağan değildir)}$$

$$H_1: \delta < 0 (\phi < 1) \text{ (Seri durağandır)}$$

Granger nedensellik ilişkisinin anlamı, regresyonda bağımsız değişken X 'in bağımlı değişken Y ile bir nedensellik ilişkisi içinde olduğudur ve bunun için iki temel koşulun sağlanması gerekir. Bunlardan birincisi; bağımlı değişken X 'in, bağımsız değişken Y 'yi tahmin etmeye aracılık etmesidir. İkinci varsayım ise, Y 'nin X 'i tahmin etmede etkili olmayacağıdır. Buna tek yönlü nedensellik denir. Nedensellik testlerinde, testlerin yönü önem arz eder, yani değişkenlerin bağımlı ve bağımsız olduğunu belirleme açısından çok önemlidir. Nedenselliğin yönü, iki veya daha çok değişkenin birbiri arasındaki ilişkilerin; tek yönlü mü, çift yönlü mü veya hiçbir ilişkinin olmamasını anlamada çok önemlidir (Granger, 1969: 424-438, Kennedy, 2006: 81-82, Gujarati, 2006: 620-623). Granger nedensellik testi "kısa dönem" sürecinde bağımlı ve bağımsız değişkenler arasındaki nedensellik analizine imkân sağlamaktadır.

$$y_t = a_1 + \sum_{i=1}^n \beta_i x_{t-i} + \sum_{j=1}^m \gamma_j y_{t-j} + e_{1t} \quad (4)$$

$$x_t = a_2 + \sum_{i=1}^n \theta_i x_{t-i} + \sum_{j=1}^m \delta_j y_{t-j} + e_{2t} \quad (5)$$

Eğer H_0 hipotezi red edilirse bunun anlamı X 'in Y ile Granger nedensellik ilişkisi içinde olduğudur. Granger nedensellik testinde, hem X 'ten Y 'ye doğru, hem de Y 'den X 'e doğru olabilir. Bu durum, çift yönlü nedensellik olarak adlandırılır. $X \leftrightarrow Y$ olarak gösterilir. Her iki H_0 hipotezi reddedilirse X ve Y değişkenleri arasında iki taraflı bir nedensellik olduğunu söylemek mümkündür. X ve Y serileri arasındaki Granger nedensellik testinin yapılabilmesi için, her iki değişkenin kovaryans durağan ve stokastik olması gerekmektedir.

4. BULGULAR

Nedensellik analizine geçmeden önce serilerin birim kök içerip içermediğine yani durağan olup olmadığına bakmak gereklidir. Bu amaçla, ADF (Augmented Dickey-Fuller) ve PP (Phillips Perron) testleri yapılmıştır. Bu testlerin yapılmasının amacı ise yalnızca regresyonu önlemektir. ADF ve PP birim kök testlerinin sonuçları aşağıda Tablo 2'de sunulmuştur.

Tablo 2: ADF ve PP Birim Kök Testi Sonuçları

Değişkenler	ADF Test İstatistiği		Phillips-Perron Test İstatistiği	
	Düzye	Birinci Fark (Δ)	Düzye	Birinci Fark (Δ)
DAX	-2,7895	-23,6991*	-2,9985**	-
FTSE	-2,8459	-32,7105*	-3,2463**	-
HND	-1,0424	-35,7806*	-1,0865	-35,7870*
NAS	-1,7955	-37,0203*	-1,8063	-37,0074*
NIK	-1,7330	-33,9058*	-1,8053	-33,9123*
	1%	-3,4351	-3,4351	-3,4351
Anlamlılık Düzeyi	5%	-2,8635	-2,8635	-2,8635
	10%	-2,5678	-2,5678	-2,5678

Not: *%1, **%5, ***%10 önem seviyesinde anlamlıdır.

Araştırmada kullanılan serilerin duranlığının kontrolü için uygulanan test sonuçlarına göre, ADF ve PP test istatistiğine göre ise tüm değişkenlerin durağan hale geldiği görülmüştür. Serilerin seviye değerinde durağan olduğu tespit edildikten sonra Granger nedensellik testinin uygulanabilmesi için uygun gecikme uzunluğu belirlenmiştir. Optimal gecikme uzunluğunun belirlenmesinde bilgi kriterleri kullanılmıştır. Seriler arasındaki nedensellik belirlenirken serilerin gecikme uzunluğu (k) "Akaike Bilgi Kriteri (AIC)" ne göre bulunmuştur. Daha sonra bu modelin (k) gecikmeli değerlerine "Wald İstatistiği" uygulanmış ve değişkenler arasında nedensellik ilişkisi olup olmadığı tespit edilmiştir.

Tablo 3: Granger Nedensellik Testi Sonuçları

Nedensellik İlişkisi		F-Statistic	Prob.	Karar
FTSE	DAX	396.146	0.0193	İlişki var
DAX	FTSE	0.72559	0.4842	İlişki yok
HND	DAX	720.801	0.0008	İlişki var
DAX	HND	118.234	0.3069	İlişki yok
NAS	DAX	256.001	0.0777	İlişki yok
DAX	NAS	245.261	4.E-11	İlişki yok
NIK	DAX	0.29459	0.7449	İlişki yok
DAX	NIK	679.916	0.0012	İlişki var
HND	FTSE	223.916	0.1070	İlişki yok
FTSE	HND	101.451	4.E-05	İlişki yok
NAS	FTSE	877.921	0.0002	İlişki var
FTSE	NAS	150.579	0.2222	İlişki yok
NIK	FTSE	202.033	0.1330	İlişki yok
FTSE	NIK	752.198	0.0006	İlişki var
NAS	HND	113.238	1.E-05	İlişki yok
HND	NAS	0.69282	0.5004	İlişki yok
NIK	HND	0.41639	0.6595	İlişki yok
HND	NIK	890.407	0.0001	İlişki var
NIK	NAS	0.29580	0.7440	İlişki yok
NAS	NIK	188.260	0.1526	İlişki yok

Tablo 3 Granger Nedensellik ilişkisini göstermektedir. Tablo 4 incelendiğinde olasılık değerinin 0,05'ten küçük olan değişkenlerin nedensellik ilişkisi olduğunu göstermektedir. DAX değişkeni ile FTSE, HND ve NIK arasında, FTSE endeksi ile NAS ve NIK arasında HND ve NIK arasında granger nedensellik ilişkisi tespit edilmiştir. Bu değişkenlere ilişkin kurulan hipotezlerde H_0 hipotezi reddedilmiş ve H_1 hipotezi kabul edilmiştir.

5. SONUÇ

Bu çalışmada, 04/01/2018 -16/11/2023 dönemi günlük verileri kullanılarak IMF verilerine göre 2022 yılında en yüksek gelire sahip 5 ülkenin (ABD, Çin, Japonya, Almanya ve Hindistan) banka endekslerinin birbirleri arasındaki nedensellik ilişkisini tespit edilebilmesi amacıyla zaman serisi analizlerinden yararlanılmıştır. Analiz aşamasında ilk olarak, değişkenlerin durağan olup olmadıklarının tespiti için ADF ve PP birim kök testleri uygulanmış ve test sonucu bütün değişkenlerin birinci fark düzeylerinde durağan olduğunu göstermiştir. Değişkenler arasında nedensellik ilişkileri Granger Nedensellik testi ile saptanmaya çalışılmıştır. Granger nedensellik analizi sonucunda, DAX değişkeni ile FTSE, HND ve NIK arasında, FTSE endeksi ile NAS ve NIK arasında HND ve NIK arasında granger nedensellik ilişkisi tespit edilmiştir.

Ülke borsası arasında yüksek bağımlılık ilişkilerinin kendini göstermesi ve konjonktür dalgalarının bu sürece etki etmesi, bir finans piyasasında alınan kararlar ile ortaya çıkan etkilerin diğer finans piyasasına sirayet edebileceğini ve bu doğrultuda da yatırımcı hareketlerini yönlendirebileceğini göstermesi bakımından oldukça önemlidir. Diğer taraftan, uluslararası borsalar arasındaki karşılıklı etkileşim konjonktürün genişleme evresinde bir taraftan spekülasyon hareketleri de beraberinde getirerek finansal balonlara da yol açabilmekte ve diğer taraftan da sınırları zorlanan balonun patlaması ile birlikte konjonktürü tersine çevirebilmektedir. İktisadi ve finansal nitelikli krizlerin borsa hacimleri üzerinde ortaya çıkardığı negatif yönlü etkiler, bu olguyu destekler niteliktedir. Dolayısıyla finansal piyasalar arasındaki bulaşma sistematığının varlığı, ekonomik refahı ya da krizi bir bütün olarak etkileyebilmektedir.

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ANALYSIS OF THE RELATIONSHIP BETWEEN SUSTAINABILITY SCORES AND FINANCIAL PERFORMANCE OF THE COMPANIES IN THE BIST SUSTAINABILITY INDEX

DOI: 10.17261/Pressacademia.2024.1851

PAP- V.18-2023(9)-p.57-62

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To cite this document

Bumin, M., Ertugrul, A., (2023). Analysis of the relationship between sustainability scores and financial performance of the companies in the BIST sustainability index. PressAcademia Procedia (PAP), V.18, 57-62.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1851>

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ABSTRACT

Purpose- The inclusion of companies in the BIST Sustainability Index and the disclosure of sustainability scores provide not only benefits in terms of making companies' sustainability practices better known by stakeholders and the public, but also may increase stock returns. Therefore, this study aims to analyse the relationship between sustainability scores and financial performance of companies in the BIST Sustainability Index.

Methodology- In order to analyse the relationship between the sustainability scores of 62 companies in the BIST Sustainability Index and their financial performances, the sustainability scores of the companies and the companies' firm value, return on assets and stock rate of return as the financial performance indicators is examined by multiple regression analysis method over the data of 2022.

Findings- A negative relationship was found between the sustainability scores of the companies and the firm value, while no significant relationship was found between the sustainability scores and the other financial performance indicators, namely return on assets and stock rate of return.

Conclusion- The reason for the negative relationship between the sustainability scores of the companies and the firm value may stem from the investors' perception that the environmental investments to be made by the the company will increase the company's costs, which will have a negative impact on the company's financial statements and thus on the stock return.

Keywords: Sustainability, sustainability scores, financial performance, multiple regression analysis.

JEL Codes: E44, G11, G32

BIST SÜRDÜRÜLEBİLİRLİK ENDEKSİNDEKİ ŞİRKETLERİN SÜRDÜRÜLEBİLİRLİK NOTLARI İLE FİNANSAL PERFORMANSLARI ARASINDAKİ İLİŞKİNİN ANALİZİ

ÖZET

Amaç- Şirketlerin BIST Sürdürülebilirlik Endeksinde yer alması ve sürdürülebilirlik notlarının paylaşılması, bu şirketlerin sürdürülebilirlik alanındaki uygulamalarının paydaşları ve kamuoyu tarafından daha iyi bilinmesine katkı sağlamakta, aynı zamanda bireysel ve kurumsal yatırımcıların şirket hisselerine yatırım yapmasına da neden olarak hisse senedi getirilerini artırabilmektedir. Bu nedenle, çalışmada BIST Sürdürülebilirlik Endeksinde yer alan şirketlerin sürdürülebilirlik notları ile finansal performansları arasındaki ilişkinin analiz edilmesi amaçlanmıştır.

Yöntem- BIST Sürdürülebilirlik Endeksinde yer alan mali sektör kuruluşları dışında kalan 62 adet şirketin sürdürülebilirlik notları ile finansal performansları arasındaki ilişkinin analiz edilmesi amacıyla şirketlerin sürdürülebilirlik notu ile şirketlerin işletme değeri, aktif karlılığı ve hisse getirisi arasındaki ilişki 2022 yılı verileri üzerinden çoklu regresyon analizi yöntemi ile incelenmiştir.

Bulgular- Şirketlerin sürdürülebilirlik notları ile finansal performans göstergesi olarak belirlenen işletme değeri arasında negatif bir ilişki tespit edilmiş, diğer finansal performans göstergeleri olan aktif karlılık oranı ve hisse senedi getiri oranları ile sürdürülebilirlik notları arasında ise anlamlı bir ilişki tespit edilememiştir.

Sonuç- Şirketlerin sürdürülebilirlik notları ile işletme değeri arasındaki negatif ilişkinin nedeninin, yatırımcıların şirketlerin çevre konusunda yapacağı yatırımların şirketlerin maliyetlerini artırabileceği, bu maliyet artışlarının da şirketin finansal tabloları ve dolayısıyla hisse senedi getirisi üzerinde olumsuz etkiye neden olabileceği beklentisinden kaynaklandığı değerlendirilmektedir.

Anahtar Kelimeler: Sürdürülebilirlik, sürdürülebilirlik notları, finansal performans, çoklu regresyon analizi.

JEL Kodları: E44, G11, G32

1. GİRİŞ

Son yıllarda gündemde olan sürdürülebilirlik kavramı çerçevesinde işletmeler faaliyetlerini yürütürken sadece finansal ve ekonomik faktörlere odaklanmak yerine, paydaşları için uzun vadeli değer yaratmak amacıyla faaliyetlerinde çevresel, sosyal ve yönetim (E-environmental, S-social ve G-governance - ESG) faktörlerini de dikkate almaktadırlar. İşletme faaliyetlerinde çevresel, sosyal ve yönetim faktörlerinin uygulanması, şirketler açısından hem hisse senedi fiyatlarına, hem de kurumsal imajlarına olumlu katkı sağlayarak şirket değerini artırabilmektedir (Bumin ve Demir, 2021). Kurumsal sürdürülebilirlik, gelecekte ihtiyaç duyulacak insan ve doğal kaynakların korunmasına katkı sağlarken ve geliştirirken, işletmenin ve paydaşlarının bugünkü ihtiyaçlarını karşılayan iş stratejilerini ve faaliyetlerini de aynı zamanda gerçekleştirmek olarak tanımlanmaktadır (Labuschagne vd., 2005). Kurumsal sürdürülebilirlikle bağlantılı bir kavram olan sürdürülebilir kalkınma uygulamaları ise, güçlü strateji ve performans sonuçlarına ulaşmak amacıyla gerçekleştirilen iş uygulamalarının bir alt kümesi olarak tanımlanmakta ve sürdürülebilir kalkınma uygulamalarının üç temel stratejik alanı olarak kabul edilen sürekli paydaş desteği, pazar fırsatlarının geliştirilmesi ve işletmenin finansal performansına katkı sağlanması alanlarından bir veya daha fazlasını geliştirmeye odaklanılmasını içermektedir (Goldsmith ve Samson, 2005).

Bu çerçevede, kurumsal sürdürülebilirliğin artan önemi kapsamında işletmelerin çevresel, sosyal ve yönetim alanlarındaki performanslarının kamuoyu ile paylaşılması amacıyla dünya üzerindeki farklı ülkelerde bulunan hisse senedi piyasalarında sürdürülebilirlik endeksi oluşturulmuş ve bu endekslerde yer alan şirketlerin sürdürülebilirlik notları (ESG notları) düzenli olarak yayımlanmaya başlamıştır. Borsa İstanbul'da ilk olarak Kasım 2014 tarihinden itibaren Sürdürülebilirlik Endeksi (XUSRD) oluşturulmuş ve bu Endekse gönüllü olarak dahil olmak isteyen şirketlerin endeks değeri hesaplanmaya başlanmıştır. Şirketler açısından ESG notlarının yayımlanması, şirketlere sürdürülebilirlik alanlarındaki uygulamalarını paydaşları ve kamuoyu ile paylaşmak için imkan sağlarken, aynı zamanda bireysel ve kurumsal yatırımcıların şirket hisselerine yatırım yapmasına da katkı sağlamaktadır (Scalet ve Kelly, 2010). Sürdürülebilirlik endekslerinde yer alan ESG notları yüksek şirketlerin daha düşük risk seviyelerine sahip olduğu ve ekonomik istikrarsızlık dönemlerinde diğer şirketlere göre daha dayanıklı olduğu da tespit edilmiştir (Ferriani ve Natoli, 2020).

Sürdürülebilirlik endeksinde yer alan şirketlerin sürdürülebilirlik notları ile finansal performansları arasındaki ilişkinin analizi önemli bir araştırma konusu olarak ortaya çıkmaktadır. Sürdürülebilirlik notunun yüksek olmasının şirketlerin finansal performanslarına olumlu etki edebileceğinin tespit edilmesi, şirketleri çevresel, sosyal ve yönetim alanlarındaki politika ve işlemleri uygulama koyma konusunda teşvik edebilecektir. Bu kapsamda, çalışmada BIST Sürdürülebilirlik Endeksinde yer alan şirketlerin sürdürülebilirlik notları ile finansal performansları arasındaki ilişkinin analiz edilmesi amaçlanmıştır. Çalışma beş bölüme ayrılmıştır. İkinci bölümde, konuya ilişkin yapılan çalışmalar literatür başlığı altında aktarılacak, üçüncü bölümde çalışmanın verileri ve yöntemi sunulacak, dördüncü bölümde elde edilen bulgular verilecek, sonuç bölümünde ise genel bir değerlendirme yapılacaktır.

2. LİTERATÜR

Şirketlerin BIST Sürdürülebilirlik Endeksinde dahil edilmesinin bu şirketlerin finansal performansları ve hisse senedi getiri oranları üzerindeki etkilerine yönelik olarak çeşitli çalışmalar gerçekleştirilmiştir. Bu çerçevede, Çıtak ve Ersoy (2016) BIST Sürdürülebilirlik Endeksinde yer alan şirketleri hisse senedi getiri oranları ve piyasa değeri/defter değeri oranları üzerinden incelemiş ve Sürdürülebilirlik Endeksi hakkında yatırımcıların bilgisinin arttıkça yatırımcıların bu Endekse yönelik ilgilerinin de arttığı sonucuna ulaşmıştır. Akyüz ve Yeşil (2017) BIST Sürdürülebilirlik Endeksinde kayıtlı üretim sektöründe faaliyet gösteren 19 şirketin 2011-2015 yıllarına ait verilerini esas alarak bu şirketlerin finansal performanslarını çeşitli oranlar aracılığıyla incelemiştir. Gündüz (2018) şirketlerin BIST Sürdürülebilirlik Endeksinde dahil edildikten sonra hisse senedi değerlerinde bir değişim yaşanıp yaşanmadığını 42 şirketin 2014-2016 dönemindeki finansal verilerini kullanarak panel veri analiz teknikleri ile incelemiş ve Sürdürülebilirlik Endeksinde dahil olmanın şirketlerin hisse senedi değerleri üzerinde herhangi bir etkisinin bulunmadığını ortaya koymuştur. Gürünlü (2019) BIST Sürdürülebilirlik Endeksinde dahil olmanın şirketlerin itibarını artırarak finansal başarıyı etkileyip etkilemediğini 2014-2018 döneminde çeşitli panel veri tahmin yöntemleri ile analiz etmiş ve sürdürülebilirlik alanındaki yüksek performans ile finansal başarı arasında zayıf bir ilişkinin olduğunu tespit etmiştir. Parlakkaya vd. (2019) şirketlerin BIST Sürdürülebilirlik Endeksinde alınmasının hisse senedi getirileri üzerindeki etkisini 2014-2016 döneminde 43 şirketin verileri ile olay çalışması yöntemi ile incelemiş ve şirketlerin Endeks kapsamına alınmasının hisse senedi getirisi üzerinde etkisinin olmadığı sonucuna ulaşmıştır. Sevim (2021) işletmelerde çevresel yatırım harcamalarının finansal performans üzerindeki etkisini BIST Sürdürülebilirlik Endeksindeki şirketlerin sürdürülebilirlik raporları ve mali tabloları üzerinden çoklu doğrusal regresyon analizi yöntemiyle analiz etmiş ve şirketlerin çevresel yatırım harcamalarının finansal performans üzerinde olumsuz bir etkiye sahip olduğunu ortaya koymuştur. Acar vd. (2021) şirketlerin BIST Sürdürülebilirlik Endeksinde girmesinde etkili olan faktörleri 2011-2018 yılları arasında finansal ve finansal olmayan değişkenler üzerinden doğrusal ve lojistik regresyon testleri kullanarak tespit etmiştir. Aydoğmuş vd. (2022) şirketlerin ESG performanslarının işletme değeri ve karlılıkları üzerindeki etkilerini farklı ülkelerdeki 1720 şirkete ait verileri kullanarak 2013 -2021 döneminde incelemiş ve ESG notları ile şirket değeri ve şirket karlılığı arasında pozitif ve güçlü ilişkinin olduğunu ortaya koymuştur. Saygılı vd. (2022) çevresel, sosyal ve kurumsal yönetim alanında seçilen yirmi değişkenin Borsa İstanbul Kurumsal Yönetim Endeksinde işlem gören şirketlerin performans göstergelerini nasıl etkilediğini 2007-2017 döneminde incelemiş ve şirketlerin çevresel değişkenler alanındaki açıklamalarının performans göstergeleri üzerinde olumsuz etkisi olduğu, paydaşların yönetime katılmasının sosyal alanda operasyonel etkinliğe katkı sağladığı, kurumsal yönetim alanında hissedar hakları ve yönetim kuruluna ilişkin düzenlemelerin ise performans göstergeleri üzerinde pozitif etkisi olduğu sonucuna varmıştır. Dağistanlı ve Dağistanlı (2023) BIST Sürdürülebilirlik Endeksinde yer alan 44 şirketin 2014-2021 yılları arasındaki verilerini kullanarak şirketlerin finansal performans göstergelerinin sürdürülebilirlik raporu yayımlamada etkisinin olup olmadığını lojistik regresyon yöntemi ile incelemiş ve finansal performans göstergelerinden büyüklük dışındaki değişkenlerin anlamlı etkisinin olmadığı, ancak şirketlerin finansal büyüklüğü arttıkça sürdürülebilirlik raporu yayımlama eğiliminde olduklarını tespit etmişlerdir.

Sürdürülebilirlik kapsamında şirketlerin ESG notları ve bu notlar ile şirketlerin finansal performansları arasındaki ilişkinin incelenmesine yönelik farklı ülkelere ait veriler üzerinden yapılan çalışmalarda mevcut bulunmaktadır. Alshehhi vd. (2018) şirket sürdürülebilirlik uygulamalarının şirket finansal performansı üzerindeki etkisine yönelik yapılan 132 adet çalışmayı incelemiş ve bu çalışmaların % 78'inin şirket sürdürülebilirlik uygulamaları ile şirket finansal performansı arasında pozitif ilişki olduğunu ortaya koyduğunu, çalışmaların sürdürülebilirliğin sadece sosyal boyutunu dikkate alan sosyal sorumluluk boyutundan çevresel ve ekonomik boyutlarına doğru yöneldiği ve bu alanda gelişmekte olan ülkeler üzerine yapılan çalışmaların sınırlı olduğunu tespit etmiştir. Yu ve Zhao (2015) şirketlerin sürdürülebilirlik uygulamalarının hisse senedi piyasaları tarafından olumlu tepki alıp almadığını Dow Jones Sürdürülebilirlik Endeksinde yer alan şirketlerin 1999-2011 dönemi arasındaki verilerini esas alarak inceledikleri çalışmalarında, şirketlerin sürdürülebilirlik performansı ile finansal performans arasında pozitif ilişki olduğu, bu pozitif ilişkinin de özellikle yatırımcı haklarının güçlü bir şekilde korunduğu ve yüksek seffaflik ilkelerinin hakim olduğu piyasalarda gözlemlendiği sonucuna ulaşmıştır. Manrique ve Martí-Ballester (2017) ülkelerin ekonomik gelişmişlik düzeylerine bağlı olarak şirketlerin çevresel faaliyetlerinin finansal performanslarına olan etkilerini 2008-2015 döneminde farklı ülkelerde faaliyet gösteren 2982 şirkete ait veriler üzerinden analiz etmiş, gelişmiş ve gelişmekte olan ülkelerdeki şirketlerin çevresel politikaları uygulamaya başlamalarının şirket finansal performansını pozitif yönde etkilediğini, bu etkinin gelişmekte olan ülkelerde daha yüksek oranlarda gözlemlendiği sonucuna varmıştır. Phan vd. (2020) Vietnam'daki 289 şirketin sürdürülebilirlik uygulamaları ile finansal performansları arasındaki ilişkiyi anket yöntemi ile inceledikleri çalışmalarında, şirketlerin gerçekleştirdiği sürdürülebilirlik faaliyetlerinin finansal performansını doğrudan, müşteri sadakati, çalışan memnuniyeti ve şirket itibarını dolaylı yoldan pozitif olarak etkilediğini ortaya koymuştur. Dobre vd. (2015) Bükreş Borsasında işlem gören şirketlerin çevresel ve sosyal faktörleri faaliyetlerinde dikkate alıp almadığı ve bu alandaki uygulamalarının finansal performans üzerindeki etkilerini inceledikleri çalışmalarında, çevresel korumaya yönelik alınan tedbirlerin özkaynak getirisini olumsuz etkilediği, ancak aktif getirisi ve hisse senedi getirisi üzerinde bir etkisinin olmadığını tespit etmiştir.

3. VERİ VE YÖNTEM

Borsa İstanbul tarafından şirketlere çevresel, sosyal, kurumsal yönetim alanlarındaki risklerine ilişkin politika oluşturmaları sürecinde yol göstermek ve şirketlerin sürdürülebilirlik politikalarına ilişkin bilgiyi de yatırımcılara iletmek amaçları çerçevesinde 2014 yılından itibaren BIST Sürdürülebilirlik Endeksi (XUSRD) hesaplanmaktadır. Borsa İstanbul, bu endekste yer alacak şirketlerin belirlenmesinde 2021 yılından itibaren Refinitiv şirketinin sadece kamuya açık bilgileri dikkate alarak hesapladığı sürdürülebilirlik değerlendirme sonuçlarını kullanmaktadır. Refinitiv tarafından şirketler için sürdürülebilirliğin üç ana başlığı olan; i) çevresel (E-Environment) başlığı altında üç kategori (emisyon, kaynak kullanımı, yenilenebilirlik), ii) sosyal (S-Social) başlığı altında dört kategori (insan hakları, ürün sorumluluğu, çalışanlar, toplum), iii) kurumsal yönetim (G-Governance) başlığı altında üç kategori (üst yönetim, hissedarlar, kurumsal sosyal sorumluluk stratejisi) olmak üzere toplam üç başlık ve on kategoride ayrı notlar hesaplanmakta, daha sonra bu üç ana başlık için hesaplanan bu notlar çevre için % 34, sosyal için % 35,5 ve kurumsal yönetim için % 30,5 oranında ağırlıklandırılarak şirketin genel sürdürülebilirlik notu (ESG Notu) hesaplanmaktadır. BIST Sürdürülebilirlik Endeksinde yer alabilmek için şirketlerin genel sürdürülebilirlik notunun 50 veya üzerinde, her bir ana başlık notunun 40 veya üzerinde, kategori notlarından en az 8'inin 26 veya üzerinde olması gerekmektedir. BIST Sürdürülebilirlik Endeksinde halen 77 şirket bulunmaktadır (Borsa İstanbul, 2023).

Bu çalışmada, BIST Sürdürülebilirlik Endeksinde yer alan şirketlerin genel sürdürülebilirlik notları ile finansal performansları arasındaki ilişkinin analiz edilmesi amaçlanmıştır. Bu amaç doğrultusunda sürdürülebilirlik notu olarak seçilen şirketlerin genel ESG notu bağımlı değişken; şirketlerin işletme değeri, aktif karlılığı ve hisse getiri oranları bağımsız değişkenler olarak alınmıştır. Söz konusu değişkenlerin belirlenmesi amacıyla literatür taranmış ve yapılan benzer çalışmalar esas alınarak çalışmanın bağımsız değişkenlerine karar verilmiştir (Çıtak ve Ersoy, 2016; Manrique ve Martí-Ballester, 2017; Alshehhi vd., 2018; Sevim, 2021; Aydoğmuş vd., 2022; Dağistanlı ve Dağistanlı, 2023). Bağımlı değişken olan şirketlerin ESG notları Refinitiv internet sayfasından (Refinitiv, 2023), finansal performansa ilişkin bağımsız değişkenler ise Finnet veri tabanından (Finnet, 2023) elde edilmiştir. Analiz dönemi olarak 2022 yıllık verileri kullanılmış, bilanço yapıları reel sektör kuruluşlardan farklı yapıda olan 15 adet mali sektör kuruluşu analiz dışında bırakılarak, BIST Sürdürülebilirlik Endeksinde yer alan ve belirlenen dönemde tüm verilerine ulaşılan 62 adet şirket analize dahil edilmiştir. Analiz yöntemi olarak çoklu regresyon analizi kullanılmış ve SPSS 24 paket programı ile analizler gerçekleştirilmiştir. Çalışmada kullanılan bağımlı ve bağımsız değişkenler ile değişkenlere ait kısaltma ve formülasyonlar Tablo 1'de verilmektedir.

Tablo 1: Bağımlı ve Bağımsız Değişkenler

Bağımlı Değişken	Kısaltmalar	Formülasyon
Sürdürülebilirlik Notu	ESG	Genel ESG Notu
Bağımsız Değişkenler		
İşletme Değeri	PDDD	Piyasa Değeri/Defter Değeri
Aktif Karlılık	ROA	Net Kar/Toplam Aktifler
Hisse Getirisi	HGO	(Hisse Fiyatı _t - Hisse Fiyatı _{t-1}) / Hisse Fiyatı _{t-1}

Araştırmanın ana amacını gösteren hipotezler ise aşağıdaki şekilde oluşturulmuştur.

H_{1A}: Sürdürülebilirlik notu ile işletme değeri arasında anlamlı bir ilişki vardır.

H_{1B}: Sürdürülebilirlik notu ile aktif karlılığı arasında anlamlı bir ilişki vardır.

H_{1C}: Sürdürülebilirlik notu ile hisse getirisi arasında anlamlı bir ilişki vardır.

Araştırmada kullanılan değişkenlere ait tanımlayıcı istatistikler Tablo 2’de sunulmaktadır.

Tablo 2: Değişkenlerin Tanımlayıcı İstatistikleri

Değişkenler	Ortalama	Maksimum	Minimum	Standart Sapma	Gözlem Sayısı
ESG	75.9839	90.00	48.00	10.10193	62
PDDD	6.6623	203.28	0.64	25.49824	62
ROA	12.4405	42.33	-6.96	10.61627	62
HGO	215.7126	603.79	-28.16	119.97237	62

Tanımlayıcı istatistikler incelendiğinde BIST Sürdürülebilirlik Endeksinde yer alan şirketlerin ESG notu ortalamasının 75.9839 olduğu görülmektedir. En yüksek ESG notuna sahip olan şirketin notunun 90.00 olduğu, en düşük değere sahip olan şirketin notunun ise 48.00 düzeyindedir. ESG notu ortalamasının genel olarak standart sapmasının yüksek olmadığı, şirketlerin bu değer bağlamında birbirlerine yakın düzeyde nota sahip olduğu görülmektedir. PDDD ortalama değerinin 6.6623 olduğu, maksimum işletme değerine sahip olan işletme 203.28 değerine sahipken, en düşük işletme değerine sahip olan işletmenin ise 0.64 değerine sahiptir. Analize dahil edilen 62 adet şirketin 2022 yılı işletme değerlerinin önemli ölçüde dalgalı bir seyir izleyerek standart sapmalarının yüksek olduğu görülmektedir. Şirketlerin aktif karlılığı değişkeninin ortalama değerinin % 12.4405 olduğu, en yüksek aktif karlılığa sahip olan şirketin aktif karlılık oranının % 42.33, en düşük aktif karlılığa sahip şirketin ise % - 6.96 oranına sahip olduğu görülmektedir. Şirketler için önemli bir gösterge olan hisse getiri oranının ortalama değerinin % 215.71 olduğu görülürken, en yüksek getiri oranının % 603.79, en düşük getiri oranının ise % -28.16 olduğu görülmektedir. BIST Sürdürülebilirlik Endeksinde yer alan 62 adet şirketin hisse getiri oranlarının 2022 yılında yüksek dalgalanma gösterdiği gözlenmektedir.

4. BULGULAR

Çalışmada öncelikle kullanılan değişkenler arasındaki ilişkinin gözlemlenmesi amacıyla korelasyon analizi yapılmış ve korelasyon analizi sonuçları Tablo 3’te sunulmuştur. ESG notu ile PDDD arasındaki ilişki incelendiğinde aralarında zayıf negatif yönlü bir ilişkinin olduğu görülmüştür. PDDD’de yaşanacak olan bir birimlik artışın, ESG notunu 0.326 birim azaltacağı görülürken, ilişkinin % 5 anlam düzeyinde anlamlı olduğu görülmektedir. ESG notu ile ROA ve HGO değişkenleri arasındaki ilişkinin ise oldukça zayıf olduğu ve ilişkinin % 5 ve % 10 anlamlılık düzeyinde anlamlı olmadığı görülmektedir.

Tablo 3: Değişkenlerin Korelasyon Analizi Sonuçları

ESG		PDDD	ROA	HGO
	Korelasyon	-0.326**	0.015	0.169
Olasılık	0.010	0.908	0.190	

**%5 ve %10’da anlamlı

Çalışmanın ana konusu olan BIST Sürdürülebilirlik Endeksinde yer alan şirketlerin sürdürülebilirlik notları ile finansal performansları arasındaki ilişkinin analiz edilmesi amacıyla çoklu regresyon analizi gerçekleştirilmiş ve elde edilen bulgular aşağıda detayları ile sunulmuştur. Çoklu regresyon analizi sonucunda elde edilen bulguların gerçeği yansıttığından emin olmak amacıyla regresyon analizi varsayımlarının sağlanmış olması gerektiğinden, bu amaçla öncelikle regresyon sonucunda değişkenlerin ve hataların normal dağılım özelliği gösterip göstermediği test edilmiştir. Normallik varsayımı için kurulan hipotezler aşağıda verilmektedir.

H₀: Anakütle normal dağılıyor.

H₁: Anakütle normal dağılmıyor.

Normal dağılım varsayımı için Kolmogorov-Smirnov testi uygulanmış ve değişkenlere ait sonuçlar Tablo 4’te sunulmuştur.

Tablo 4: Kolmogorov-Smirnov Testi Sonuçları

K-S Testi		PDDD	ROA	HGO	Hatalar
	Test Değeri	1.114	0.887	0.324	0.995
Olasılık	0.070	0.705	0.540	0.276	

Tablo 4 incelendiğinde tüm değişken ve hataların normal dağılım özelliği gösterdiği, buna bağlı olarak da H₀ hipotezinin kabul edildiği görülmektedir. Değişkenlerin normal dağılım özelliği gösterdiği görüldüğünden değişkenler için logaritma alınmasına gerek kalmamıştır. Analizin bu aşamasında regresyon analizi uygulanmış ve elde edilen bulgular Tablo 5’te sunulmuştur.

Tablo 5: Regresyon Analizi Sonuçları

Bağımlı Değişken: ESG	Katsayı	t testi	Olasılık	VIF
Sabit	74.711	25.948	0.000	-
PDDD	-0.127	-2.575	0.013	1.024
ROA	-0.045	-0.381	0.705	1.033
HGO	0.012	1.190	0.239	1.022
F = 2.843 p (F) = 0.045, R ² = 0.358, Durbin Watson = 1.965				

BIST Sürdürülebilirlik Endeksindeki şirketlerin sürdürülebilirlik notları ile finansal performansları arasındaki ilişkinin analiz edildiği çalışmada, PDDD bağımsız değişkeninin % 5 anlam düzeyinde anlamlı olduğu ($0.013 < 0.05$) ve ilişkinin yönünün negatif olduğu görülmektedir. PDDD değişkeninde yaşanacak olan bir birimlik artışın ESG değerini 0.127 birim azaltacağı ifade edilebilmektedir. ESG notunu etkileyen diğer değişkenler olan ROA ve HGO incelendiğinde ise, % 5 anlam düzeyinde anlamlı bir ilişkinin olmadığı görülmüştür (ROA:0.705 > 0.05, HGO:0.209 > 0.05). Modelin bir bütün olarak anlamlılığı olup olmadığı incelendiğinde ise, modelin anlamlı olduğu sonucuna varılmıştır ($0.045 < 0.05$). Modelin R^2 değerinin % 35.8 olduğu bulgusuna ulaşılmış ve değerinin düşük olduğu görülmüş olmakla birlikte, modelde tek bağımsız değişkenin anlamlı olduğu görüldüğünden açıklama gücünün düşük olmasının makul düzeyde olduğu değerlendirilmektedir. Modelde elde edilen sonuçların geçerliliğinden emin olabilmek için regresyon varsayımlarının da sağlanması gerekmektedir. Model için daha önce hataların normal dağıldığı bulgusuna ulaşılmış ve bunu takiben oto korelasyon sorunu olup olmadığının test edilmesi için Durbin Watson değeri incelenmiştir. Modelde oto korelasyon sorunu olmadığının testi için $du < 1.95 < 4$ -du değerinin sağlanması gerekmektedir. ($Du=1.317$, $n=62$, $k=3$). Bu çerçevede, söz konusu değer $1.317 < 1.915 < 2.683$ olduğundan oto korelasyon sorunu olmadığı görülmüştür. Bir diğer varsayım olan hataların eş varyanslı olması varsayımına ait test sonuçları ise Tablo 6 'da sunulmuştur.

H_0 : Hatalar eş varyanslıdır.

H_1 : Hatalar eş varyanslı değildir.

Tablo 6: Spearman Korelasyon Testi Sonucu- Eş Varyanslık Sınaması

Mutlak Hata		PDDD	ROA	HGO
	Korelasyon	-0.030	0.029	0.070
Olasılık	0.815	0.820	0.589	

Mutlak hata ile bağımsız değişkenler arasındaki ilişki incelendiğinde her bir değişkenin olasılık değerlerinin 0.05 anlam düzeyinden büyük olduğu görülmüş ve dolayısıyla H_0 hipotezi kabul edilmiştir.

Bu çerçevede, modelin tüm varsayımlarının sağlanmasının ardından sonuç olarak model denklemi aşağıdaki şekilde oluşmuştur.

$$ESG = 74.711 - 0.127 * PDDD$$

5. SONUÇ

Şirketlerin BIST Sürdürülebilirlik Endeksinde yer alması ve ESG notlarının paylaşılması, bu şirketlerin sürdürülebilirlik alanındaki uygulamalarının paydaşları ve kamuoyu tarafından daha iyi bilinmesine katkı sağlamakta, aynı zamanda bireysel ve kurumsal yatırımcıların şirket hisselerine yatırım yapmasına da neden olarak hisse senedi getirilerini artırabilmektedir. Ayrıca, bu şirketler BIST Sürdürülebilirlik Endeksinde yer almayan ve ESG notu olmayan şirketlere göre son dönemde özellikle önem kazanan yeşil finansman olanaklarından daha fazla faydalanarak uygun koşullarda finansman sağlama imkanına da kavuşabilmektedirler.

BIST Sürdürülebilirlik Endeksinde yer alan şirketlerin sürdürülebilirlik notları ile finansal performansları arasındaki ilişkinin analiz edilmesinin amaçlandığı bu çalışmada, sürdürülebilirlik notları ile finansal performans göstergesi olarak belirlenen işletme değeri, aktif karlılık ve hisse senedi getirisi göstergelerinden sadece işletme değeri arasında negatif bir ilişki tespit edilmiştir. Söz konusu negatif ilişkinin nedeninin, yatırımcıların şirketlerin çevre konusunda yapacağı yatırımların şirketlerin maliyetlerini artırabileceği, bu maliyet artışlarının da şirketin finansal tabloları ve dolayısıyla hisse senedi getirisi üzerinde olumsuz etkiye neden olabileceği beklentisinden kaynaklandığı değerlendirilmektedir. Çalışmadan elde edilen bu bulgu, çevresel uyum yatırımlarına yönelik gelişmelerin şirketlerin hisse senedi getirisi üzerindeki etkisinin negatif olarak tespit edildiği çalışmaların (Griffin ve Sun, 2013; Jiang ve Luo, 2018; Ramiah vd., 2013; Pham vd., 2019) bulguları ile benzerlik göstermektedir.

Diğer taraftan, bu çalışmada BIST Sürdürülebilirlik Endeksinde yer alan şirketlerin genel sürdürülebilirlik notları bağımlı değişken olarak alınmakla birlikte, gelecek dönemdeki çalışmalarda genel sürdürülebilirlik notunu oluşturan çevresel, sosyal ve kurumsal yönetim alt kategorileri notları ile finansal performans arasındaki ilişkinin incelenmesi de mümkün bulunmaktadır.

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CURRENCY PROTECTED DEPOSIT ACCOUNT IMPLEMENT AS A MACROPRUDENTIAL MONETARY POLICY INSTRUMENT

DOI: 10.17261/Pressacademia.2023.1852
PAP- V.18-2023(10)-p.63-68

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To cite this document

Tunali, H., Kalkay, D. (2023). Exchange rate hedged deposit account as a macroprudential monetary policy instrument. PressAcademia Procedia (PAP), V.18, 63-68.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1852>

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ABSTRACT

Purpose - In the aftermath of the 2008 global financial crisis, central banks have resorted to macro discretionary monetary policies in order to prevent the risks that the fragility of macroeconomic indicators in national economies may pose on financial stability. Accordingly, in December 2021, the CBRT initiated a comprehensive monetary policy process that will provide long-term and permanent returns in the fight against high inflation and high exchange rates, and introduced the "Currency Protected Deposit" instrument to encourage and support real persons to make their investment preferences in TL. The liraization process and exchange rate-protected deposits are aimed to make a lasting contribution to price stability in the medium term. In this study, the purpose of the Exchange Rate Protected Deposit (ERD) scheme and its impact on macroeconomic indicators will be evaluated for the 2021-2023 period.

Methodology - After explaining the implementation, characteristics and the need for the KKM, the impact of the utilization rate of the KKM on the exchange rate and interest rates in the December 2021-December 2023 period is evaluated.

Findings - With the KKM implementation, which aims to contribute to strengthening macro financial stability by supporting Turkish lira time deposits, the utilization rate of the KKM is seen to have contributed to the strengthening of the monetary transmission mechanism through the increase in the policy rate, the increase in the demand for Turkish lira instruments, and the rise in loan and deposit rates together. Turkish lira deposits are on the rise while FX-protected deposits are on the decline.

Conclusion - It is observed that the KKM' implementation contributed to the lira appreciation process and partially contributed to the recovery in exchange rates between December 2021 and July 2023.

Keywords: Currency protected deposit, macroprudential monetary policy, exchange rate

JEL Codes: H30, E52, F31

MAKRO İHTİYATİ PARA POLİTİKA ARACI OLARAK KUR KORUMALI MEVDUAT HESABI UYGULAMASI

ÖZET

Amaç- 2008 Küresel finans krizi sonrasında Ülke ekonomilerinde makro ekonomik göstergelerde yaşanan kırılganlıkların finansal istikrar üzerinde oluşturabileceği riskleri önlemek amacıyla ülke merkez bankaları makro ihtiyadi para politikalarına başvurmuşlardır. Bu doğrultuda TCMB Aralık 2021'de yüksek enflasyon ve yüksek kur ile mücadelede uzun vadeli ve kalıcı getiriler sağlayacak kapsamlı bir para politikası oluşturma sürecini başlatarak, gerçek kişilerin yatırım tercihlerini TL cinsinden yapmaya yönlendirmek ve desteklemek amacıyla "Kur Korumalı Mevduat" aracını uygulamaya sokmuştur. Liralaşma süreci ve kur korumalı mevduat uygulamaları ile orta vadede fiyat istikrarına kalıcı katkı sağlanması hedeflenmiştir. Bu çalışmada Kur Korumalı Mevduat (KKM) uygulamasının amacı ve bu uygulamanın makro ekonomik göstergeler üzerindeki etkisi 2021-2023 dönemi kapsamında değerlendirilecektir.

Yöntem-KKM uygulaması, özellikleri, neden ihtiyaç duyulduğu açıklandıktan sonra Aralık 2021-Aralık 2023 döneminde KKM'nin kullanım oranının, döviz kuru ve faiz oranları arasındaki ilişki değerlendirilmiştir.

Bulgular- KKM uygulaması ile Türk lirası vadeli mevduat desteklenerek makro finansal istikrarın güçlendirilmesine katkı sağlanması hedeflenmiştir. Bu doğrultuda KKM' kullanım oranı, politika faizindeki artış, Türk lirası enstrümanlarına olan talebin artması, kredi ve mevduat faizlerinin birlikte yükselmesi ile parasal artırım mekanizmasının güçlenmesi katkı sağladığı görülmektedir. Türk lirası cinsi mevduatlar artışa geçerken kur korumalı mevduatlarda azalma yaşanmıştır.

Sonuç- KKM' uygulamasının Aralık 2021- Temmuz 2023 döneminde liralaşma sürecine katkı sağladığı ve döviz kurlarında kısmen iyileşmeye katkı sağladığı gözlemlenmiştir.

Anahtar Kelimeler: Kur korumalı mevduat, makro ihtiyadi para politikası, döviz kuru

JEL Kodları: H20, E52, F31

1. GİRİŞ

Finansal kriz ile birlikte dünya genelinde finansal risklerle başa çıkmak için Merkez Bankaları geleneksel politika araçlarını makro ihtiyati politikalarla genişletmişlerdir. Kriz sonrasında gelişmiş ülke merkez bankalarının uyguladıkları politikalar neticesinde sermaye fazlası gelişmekte olan ülkelere yönelmiştir. Finansal kırılganlıkları yüksek olan bu ülkeler sermaye akışındaki volatilenin yarattığı duruma mücadele etmek amacıyla ek makroekonomik ve mali politikalara ihtiyaç duymuşlardır. Türkiye 2010 yılı itibarıyla makro ihtiyati cephede oldukça aktif olmuştur. Ülke ekonomisinin kırılganlıkları kapsamında dönem dönem yaşanan yüksek enflasyon, yüksek kur ve faiz politikalarının farklı amaçla kullanımı socunda oluşan istikrarsızlıkla mücadele farklı kombinasyonlardan oluşan para politikaları uygulanmıştır.

Makro ihtiyati politikalar özellikle 2008 finans krizi sonrasında finansal istikrarın sağlanması bakımından para politikalarını desteklemek amacıyla sıklıkla başvurulan uygulamalardır. Bu politikaların temelde kullanım amacı finansal istikrarı negatif etkileyen sistemik risklerle mücadeledir. Makro ihtiyati politikalar, küresel krizi sonrasında sıklıkla üzerinde durulan ekonomiyi bir bütün olarak ele alma konusunda ve çözüm sunması bakımından oldukça etkili uygulamalardır (Eşsiz, 2017). Ciddi panik ortamlarında ekonominin genelinde önemli hasarlar görülmesi neredeyse kaçınılmazdır. Belirsizlik ortamında yaşanan korku ile birlikte yatırımcılar ve şirketler yatırım yapmak yerine güvenli ve likit varlıklarını kısa vadeli yatırımlara yönlendirirler. Finansal piyasalarda yaşanan karışıklık, çeşitli riskler ile birlikte durgunlukları da artırmaktadır. Bu sebeple 2008 krizi ile birlikte oluşan yeni dünyada artık ekonomik gerilemede baş rol enflasyondan, finansal karışıklıklara geçmiştir (Mohan,2011).

Geleneksel olmayan para politikası araçları piyasaları rahatlatan çok geniş araçlara sahip bir yaklaşımı ifade etmekte ve bir dizi önemi kapsamaktadır. Geleneksel olmayan politikalar, Merkez bankalarının bilançolarının boyutunu ve bileşimini değiştirmeyi ve/veya kısa vadeli faiz oranlarının gelecekteki yolu hakkında duyurular yayınlamayı içerir. Bu politikalar, para politikası şoklarının uluslararası finans piyasalarına, özellikle de döviz kurlarına yansıma şeklini etkilemeyi amaçlar. Makro ihtiyati politikaların temel amacı, finansal çöküş olasılığını azaltmak ve etkilerini hafifletmek için finansal risklerin birikimini sınırlamaktır. Bu hedefe ulaşmak için makro ihtiyati otoritenin politika araçlarını dinamik bir şekilde ayarlaması gerekebilir. Bu, ekonomik yükseliş dönemlerinde risk birikimine karşı önlemler almayı ve ekonomik gerileme dönemlerinde kredi daralmasını ve aşırı riskten kaçınmayı azaltmayı içerir. Bu şekilde, makro ihtiyati politikalar, finansal sistemin istikrarını koruma ve olası krizlere karşı direnç oluşturma amacını taşır (Inoue ve Rossi,2019).

Para politikası, kısmen finansal kurumlar üzerindeki etkileriyle reel ekonomiyi etkiler. Makro ihtiyati politikaların tasarımı ve uygulanması büyük ölçüde ülkeye özgüdür. Ülke ekonomilerinin başlangıçtaki konjonktürel ve yapısal özelliklerinin yanı sıra kurumsal arka planında hangi politikanın tercih edileceğinde oldukça önemlidir. Bu doğrultuda makrofinansal riskleri kontrol altına almak için TCMB önemli rol oynamaktadır. TCMB 2008 finans krizi ile birlikte makro-f finansal riskleri kontrol altına alma ve değişken sermaye akımlarının yarattığı riskleri kontrol altına almak amacıyla farklı zamanlarda farklı kombinasyonlarla geleneksel olmayan politikalara başvurmuştur. Makro ekonomik koşullar ve yapısal özellikler, bu araçların belirlenmesi ve uygulanması açısından oldukça önemlidir. Bu doğrultuda ülke kategorilerine göre uyguladıkları geleneksel olmayan politikalarda farklılaşmaktadır. Bu açıdan Türkiye'deki makro ihtiyati politikalar ile, küresel likidite değişikliklerinin ve buna bağlı sermaye akışındaki dalgalanmalarının ekonomi üzerindeki olumsuz etkilerini sınırlamaya ve finansal sistemin küresel şoklara karşı dayanıklılığını artırmaya odaklanılmıştır (Kara,2016).

Küresel kriz sonrasında dünya ekonomilerinde hızlı bir büyüme görülmesine rağmen, COVID-19 salgını nedeniyle alınan önlemler dünya genelinde ve Türkiye'de birçok soruna yol açtı. Salgın dönemindeki kapanmalar, tedarik zincirinde bozulmalar ve üretimde azalmalara neden oldu. Ayrıca, stokların azalması arz talebini karşılamada zorluk yarattı. Bu durum, dünya genelinde olduğu gibi Türkiye'de de emtia, enerji ve gıda fiyatları üzerinde baskı oluşturdu. Özellikle enerji ve emtia fiyatlarında yaşanan yüksek artışlar ithalat kalemleri arasında etkili oldu. Bu faktörler enflasyonun hızla yükselmesine neden oldu. Ayrıca, Türk Lirası'nın değer kaybı para ikamesi talebini artırdı (TBB,2022).

2008 Küresel finans krizi makroekonomik istikrar için fiyat ve finansal istikrarı aynı anda sağlayan yeni para politikalarına ihtiyaç oluşturmuştur. Özellikle Türkiye gibi gelişmekte olan ülkeler dönem dönem Bu kapsamda makro ekonomik istikrarın sağlanması amacıyla makro ihtiyati para politikaları uygulanmaktadır. 2018 yılı itibarıyla kurda yaşanan dengesizlik ve 2020 itibarıyla covid 19 etkisiyle Türkiye ekonomisinde makro ekonomik göstergelerde kırılganlıkların yaşanmıştır. Yüksek kur, yüksek enflasyonla birlikte TL'nin hızlı değer kaybı karışısında Türkiye Cumhuriyeti Merkez Bankası ekonomide yaşanan dengesizliklerin önüne geçmek amacıyla geleneksel para politikaları ile birlikte Aralık 2021 de Liralaşma Starteji kapsamında Makro ihtiyadi para politikası olan Kur Kurumalı Mevduat uygulamasını devreye almıştır.

2. LİTERATÜR

TCMB'nin 2021 Aralık ayı itibarıyla yüksek kur kaynaklı finansal kırılganlıklarla mücadele etmek amacıyla Kur Kurumalı Mevduat uygulamasını devreye almıştır. Makro ihtiyadi para politikası uygulaması olan KKM uygulandığı süre bakımından kısıtlı bir literatür mevcuttur. Bu kapsamda KKM uygulamasının uygulandığı süre zarfında finansal göstergelerle arasındaki ilişkinin ve etkinliğinin ele alındığı çalışmalar yapılmıştır. Bu uygulama Türkiye'de yüksek döviz kuru ile mücadele etmek amacıyla TCMB'nin uyguladığı bir politika olduğu için literatür ulusal çapta yer almaktadır.

Yıldırım vd. (2023) çalışmalarında Türkiye özelinde Finansal Piyasalarındaki Gelişmelerin (kredi hacmi, Borsa İstanbul işlem hacmi ve KKM'nin) finansal derinlik üzerindeki etkisini 2010M1:2023M2 dönemini kapsayan verilerle yapısal VAR (SVAR) yöntemi analiz etmişlerdir. Bulgulara göre, finansal derinleşme Borsa İstanbul işlem hacmi ve kredi hacmi artışlarından negatif etkilenmektedir. Bu sonuç enflasyonist süreçte likiditenin reel varlık alımlarına yöneldiğini ortaya koymaktadır. Diğer taraftan benzer olarak Borsa İstanbul işlem hacmindeki artış finansal derinleşmeyi azaltmaktadır. Sonuç olarak söz konusu dönemde Borsa İstanbul işlem hacmi ve kredi hacmi finansal derinleşmeyi negatif yönde etkilerken KKM politikasının uygulamaya koyulmasıyla birlikte finansal derinleşmede makul oranda iyileşme yaşandığı ifade edilmiştir.

Kartal (2024) KKM sisteminin kurgusunu, özelliklerini ve neden uygulandığını açıkladığı çalışmada Aralık 2021-Eylül 2023 döneminde KKM'nin TCMB, Hazine ve bankacılık sektörü üzerinde yarattığı etkiler değerlendirilmiş olup, söz konusu dönemde, dövizde endeksli KKM dâhil

edildiğinde yabancı para mevduatın payında bir değişiklik olmadığı, kısa vadeli mevduat miktarının toplam mevduat içindeki oranının %92'den %74'e düştüğünü, sonuç olarak uygulamanın toplam maliyetinin büyük bir kısmının TCMB bünyesinden karşılandığı için parasal genişlemeye neden olunduğu, ayrıca swap ve dövizden dönüşümlü KKM sonrasında rezervlerin 85 milyar USD düştüğü belirlenmiştir.

Bulut ve Erdil (2023) çalışmalarında Dövizden Dönüşümlü Kur Korumalı Mevduat Hesabının amacını ve kapsamını sayısal örnekler çerçevesinde açıklayarak ilgili uygulamayı avantaj ve dezavantajları kapsamında değerlendirmişlerdir. Sonuç olarak söz konusu uygulamanın kısa vadede uygulama amacına hizmet ettiği ancak uzun vadede kamuya ve dolaylı olarak hane halklarına yük oluşturacağını belirtmişlerdir. Köstekçi ve Özbay (2023) Para politikası uygulamalarında yapılan değişiklikleri neticesinde Türkiye'de yaşanan kur şoku ile mücadele amacıyla uygulamaya alınan KKM Sistemi ve vergilemenin amaçlarını değerlendirmişlerdir. Buna göre döviz kurunu kontrol altına almak için oluşturulan uygulamanın vergilemenin amaçları ile uyumadığı sonucuna ulaşmışlardır.

Zuhal ve Göcen (2023) Türkiye'de özellikle 2018 yılı itibarıyla döviz kurlarında yaşanan dalgalanmaya bağlı olarak döviz kurlarında istikrarın sağlanmasına amacıyla uygulanan KKM hesabının kurlar üzerindeki etkinliğini Birim kök testleri ile analiz etmişlerdir. Bulgulara göre, kur korumalı mevduat hesabı uygulamaya başlandığı dönem itibarıyla ABD doları ve Euro üzerinde önemli bir kırılmaya yol açtığı ve döviz kurlarının volatilesinin azaltılmasında etkili olduğu belirtilmiştir.

Yurttadur ve Tasci (2023) çalışmalarında CRITIC ve WASPAS yöntemlerinden oluşan hibrid bir ÇKKV yöntemini kullanarak, KKM uygulamasının katılım bankalarının finansal performansı üzerindeki etkisinin ölçülme çalışmalarıdır. Çalışma kapsamında 2021 yılına ait 12 aylık, 2022 yılı için ise 9 aylık veriler analize dahil edilmiştir. Analiz sonuçlarına göre söz konusu uygulama sürecinde katılım bankalarının finansal performansında yükseliş gerçekleştiği ve çoğunlukla 2022 yılı içerisinde performansın sürekli olarak artış gösterdiği Eylül 2022 de performansının zirve yaptığını ortaya koymuşlardır.

3. KUR KORUMALI MEVDUAT HESABI

2018 yılı itibarıyla yaşanan yüksek kur ve Covid-19 salgını sonucunda bir çok ülkede olduğu gibi ülkemizde de cari dengenin bozulması, yüksek enflasyon ve TL de yaşanan ciddi değer kayıpları sonucunda TCMB geleneksel para politikalarının yanında geleneksel olmayan para politikalarına 2010 yılında olduğu gibi tekrardan başvurmuştur. Makro ihtiyati para politikaları 2008 finans krizinde olduğu gibi ülke ekonomisinde yaşanan finansal istikrarsızlık ile mücadelede dönemin koşullarına göre devreye alınmıştır. 2010 yılında TCMB daha ziyade gelişmiş ülke Merkez bankalarından ülkemize kayan sermayenin oluşturduğu istikrarsızlıkla mücadele kapsamında bu politikaları devreye almıştır. Aralık 2021 tarihinde söz konusu politikalar kapsamında farklı kombinasyonlara sahip yöntemlere başvurmuşlardır. Çünkü 2018 itibarıyla ülkemize kayan sermayeden daha ziyade ülkemizden çıkan yabancı sermaye ekonomimizde ciddi dengesizlikler oluşturmuştur.

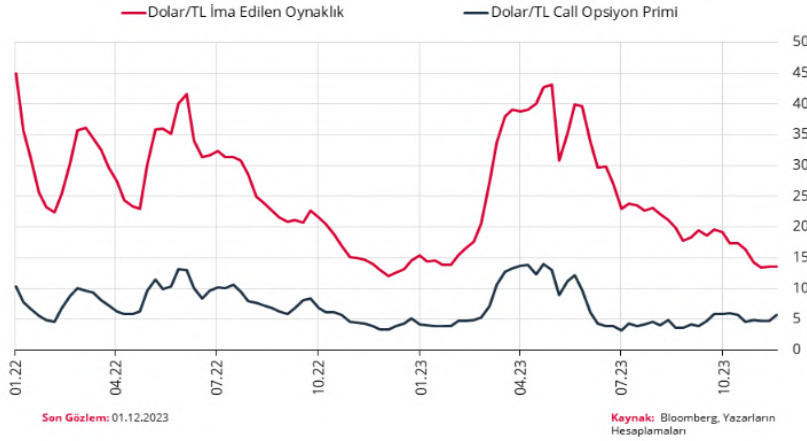
TCMB Aralık 2021 tarihi itibarıyla enflasyonla orta ve uzun vadede mücadele ederek temel hedefi olan sürdürülebilir fiyat istikrarı kapsamında, uzun vadeli ve kalıcı getiri sağlayacak geniş çaplı bir para politikası oluşturmuştur. Böylece Liralaşma süreci ve KKM politikaları ile enflasyon mücadeleye destek sağlanacaktır. Ayrıca, TCMB'nin TL erişiminin kolaylaştırılması ve desteklenmesi ile birlikte TL'de yaşanan değer kaybı azaltılacaktır. Son olarak üretim hacminin genişleterek enflasyon ile mücadelede uzun vadeli getiriler elde edilecektir. (TCMB, 2022). Merkez Bankası "liralaşma stratejisi" çerçevesinde TL'yi güçlendirmek adına "Kur Korumalı TL Vadeli Mevduat" "Menkul Kıymet Tesisi uygulamasında" aracını devreye sokmuştur. Böylece banka bilançolarındaki Türk lirası oranının yükselmesi ve fonlama sürelerini uzatarak finansal istikrarı katkı sağlanması hedeflenmiştir TCMB, 2021a Aralık 2021 itibarıyla TL'nin desteklenmesi amacıyla Altın, ABD doları, Euro ve İngiliz Sterlin cinsinden mevduatların TL'ye dönüştürülmesini sağlayacak yeni mevduat araçları devreye alınmıştır. Burda gerçek kişilerin TL birikimi olanları Ani kur artışlarına karşı korunması amaçlanmıştır. Böylece TL den kaçışların önüne geçilecektir.

KKM uygulaması, döviz kurlarında yaşanan dalgalanmalara karşı yatırımcılara koruma sağlamak amacıyla devreye alınmıştır. Özellikle döviz kurlarının ve ekonomik belirsizliklerin yüksek olduğu dönemlerde, yatırımcıların TL'den kaçmasını önlemek temel amaç olarak belirlenmiştir. Yatırımcılara bu enstrüman ile hem kurdan korunmak hemde farklı risk yönetimi kombinasyonu oluşturma fırsatı sunmaktadır (Yıldırım vd. 2023:76).

TCMB 20 Ağustos 2022 tarihli Makro ihtiyati Tedbirler Hakkındaki Basın duyurusunda politika-kredi faiz oranı arasındaki dengenin bozulması sebebiyle parasal aktarımın mekanizmasının etkinliğinin zayıfladığını vurgulamıştır. Bu durum makro ihtiyati politika uygulamalarının güçlendirilmesi gerekliliğini doğurmuştur. Bu çerçevede, yabancı para katılı/mevduat fonu yükümlülükleri üzerinden TL cinsinden menkul kıymet tesisi uygulamasının başlatılmıştır. Bu düzenleme ile TCMB bankalara, Türk lirası mevduat/katılma hesaplarına dönüşüm hedeflerine göre belirlenen oranlarda menkul kıymet tesisi verme fırsatı vermektedir (TCMB, 2022).

KKM, yatırımcılara Türk Lirası mevduatında oluşan değer kayıplarını telafi etme opsiyonu sunmaktadır. Yatırımcı, birikimini Türk Lirası mevduatında değerlendirdiğinde, anapara üzerinden Türk Lirası mevduat faiziyle nemalanmaktadır. KKM tercih edildiğinde, getiri döviz kuru değişimine bağlı olarak, asgari KKM faizi kadar gerçekleşmektedir. KKM'nin vade sonundaki getirisi, kurdaki değer kaybının KKM faizinden az olduğu durumda, KKM faizine eşit olmaktadır. Değer kaybı KKM faizini aştığı durumda ise, vade sonundaki getiri kur değişimine eşit olmaktadır (Aydın, ve Kormaz, 2023),

Grafik 1: İma Edilen Kur Oynaklığı ve TL/Dolar Alım Opsiyon Primi (3 Ay %)



Son dönemdeki kararlı politika adımları, Türk Lirası (TL) mevduata geçiş teşvik etmeye yönelik düzenlemelerin, kur korumalı mevduatın sağladığı opsiyonun fiyatı ve faiz farkları ile sıkı bir ilişkisi olduğunu göstermektedir. Bu politika adımları, öncelikle döviz kuru oynaklığını düşürerek opsiyonun fiyatını azaltmaktadır (Grafik 1). İkinci olarak, uygulanan parasal sıkılaştırma politikaları, TL mevduatın çekiciliğini artırmaktadır. Son olarak, 20 Ağustos tarihinden sonra alınan makroihtiyati tedbirler, bir yandan bankalara faiz farkını belirlemede esneklik sağlarken diğer yandan bankaları TL mevduat faizini artırmaya teşvik etmektedir.

4. KUR KORUMALI MEVDUAT UYGULAMASINDA SADELEŞME SÜRECİ

TCMB Aralık 2021 de Yüksek döviz kuru ile mücadele amaçlı uyguladığı KKM uygulamasını, Haziran 2023 itibarıyla kademeli olarak kaldırdığını duyurmuştur. TCMB Ekim 2023'te mevcut mikro ve makro ihtiyati çerçeve, piyasa mekanizmalarının işlevselliğini artırmak ve makro finansal istikrarı güçlendirmek amacıyla sadeleştirilmiştir. Bu sadeleşme süreci, etki analizleri dikkate alınarak kademeli olarak ilerlemektedir. Ayrıca, Türk lirası mevduat payının artırılması ve parasal aktarım mekanizmasının güçlendirilmesi hedeflenmektedir. Sadeleşme adımları şu şekildedir:

1. Bankalar tarafından kullanılan Türk lirası cinsinden nakdi kredilerde yüzde 30 oranındaki menkul kıymet tesisi uygulamasına son verilmiştir. Ancak, bu uygulamadan hariç tutulan kredi türlerinin harcama karşılığı kullanılmaması durumunda menkul kıymet tesisine tabi olma uygulaması da sona ermiştir.
2. Bankaların satın aldığı reel kesimin ihrac ettiği menkul değerler üzerinden yüzde 30 oranında menkul kıymet tesisi uygulamasına son verilmiştir.
3. Bankaların Türk lirası ticari kredilere referans oranının 1,8 katının üzerinde uyguladıkları faiz/kâr payı oranına göre menkul kıymet tesisi uygulaması kaldırılacaktır.
4. Faktoring şirketlerinin faktoring alacaklarına referans oranının 2,7 katının üzerinde uyguladıkları faiz oranına göre menkul kıymet tesisi uygulaması kaldırılmıştır.
5. Yatırım mali ithalatının net ihracatçılık şartından hariç tutulmasıyla, ihracat kredilerine erişim kolaylaştırılacaktır.
6. Kur korumalı hesapların (döviz dönüşümlü) yenilenmesi ve Türk lirasına geçiş ile Türk lirası payının artırılmasına ilişkin maddeler menkul kıymet düzenlemesinden çıkarılmıştır.

Türk lirası mevduatın payının artırılmasına yönelik adımlar ise şu şekildedir:

1. Yabancı para mevduat için tesis edilen zorunlu karşılıklar üzerinden komisyon alınması uygulamasında, kur korumalı hesapların (döviz dönüşümlü) yenilenmesi ve Türk lirasına geçiş ile Türk lirası payının artırılmasına yönelik değişiklikler yapılacaktır.
2. Gerçek kişilere ait Türk lirası mevduatın payı için daha önce belirlenmiş olan yüzde 2,5 artış hedefi yüzde 3,5'e yükseltilecektir.

Bu adımların amaçları arasında piyasa mekanizmalarının daha etkin çalışması, finansal istikrarın güçlendirilmesi ve Türk lirasının kullanımının teşvik edilmesi bulunmaktadır (TCMB.2023c).

Para Politikası Kurulu'nun 20 Temmuz 2023 tarihli kararında makro finansal istikrarı güçlendirecek ve piyasa mekanizmalarının işlevselliğini artıracak sadeleşme sürecinin kademeli olarak devam edeceği ifade edilmiştir. Yapılan düzenlemelerle Türk lirası mevduatlar artarken, kur korumalı hesaplardan Türk lirası mevduata geçiş sağlanarak kur korumalı mevduatın azaltılması gözetilmektedir. Böylece, Türk lirası vadeli mevduat desteklenerek makro finansal istikrarın güçlendirilmesine katkı sağlanması amaçlanmaktadır. Sadeleşme süreci kapsamında yabancı para mevduattan kur korumalı mevduata dönüşüm hedefi uygulamasına ve TL payına göre menkul kıymet tesis ve zorunlu karşılık

uygulanmasına son verilmiştir. Yapılan düzenlemelerle Türk lirası mevduatlar artarken, kur korumalı hesaplardan Türk lirası mevduata geçiş sağlanarak kur korumalı mevduatın azaltılması gözetilmektedir.

Türkiye Cumhuriyet Merkez Bankası, Haziran 2023'te başlayan parasal sıkılaşma sürecini desteklemek, parasal aktarım mekanizmasını daha etkili hale getirmek ve makro finansal istikrarı güçlendirmek amacıyla makroihtiyati politika çerçevesinde bazı değişikliklere gitti. Tablo 1'de bu değişikliklere dair detaylar yer almaktadır. (Aydın, ve Sümer, 2023),

Tablo 1: Türk Lirası Mevduatı Teşvik Etmeye Yönelik Düzenlemeler

Düzenleme Başlığı	Hedef
Kur Korumalı Mevduattan (KKM) TL'ye Geçiş	Vadesi gelen KKM'nin %50'sinin standart TL vadeli mevduata dönüştürülmesi
Dövizden Dönüşümlü Mevduattan (DDM) TL'ye Geçiş	Vadesi gelen gerçek kişi DDM'nin %10'unun standart TL vadeli mevduata dönüştürülmesi
Gerçek Kişi TL Mevduat Payı	Standart TL gerçek kişi mevduatın toplam gerçek kişi mevduattaki payının önceki hesaplama dönemine kıyasla 2 yüzde puan artırılması*
Tüzel Kişi TL Mevduat Payı	Standart TL tüzel kişi mevduatın toplam tüzel kişi mevduattaki payının 18/08/2023 tarihindeki paya kıyasla azalmaması

Kaynak:TCMB

Finansal istikrarsızlık dönemlerinde yoğunlukla başvurulan mahro ihtiyati uygulamalar kapsamında Haziran 2023 itibariyle KKM uygulamasında sadeleşme sürecine girilmiştir. Bankacılık sektörünün sağlıklı işleyişini sağlamak amacıyla alınan tedbirler öncelikli olarak TL cinsi ticari kredi akışına destek sağlamıştır. Makroihtiyati çerçevede sadeleşme kapsamında son düzenlemeler ve politika faizinin artırılması ile birlikte Türk lirası enstrümanların cazib hale gelmesi, kredi ve mevduat faizlerinin birlikte artması ile birlikte pozulan parasal aktarım mekanizmasının etkinliğinin artacağı belirtilmiştir (TCMB,2023a). Kasım ayında faiz oranlarının artırılması ile birlikte, TL mevduat oranlarının artırılmasına yönelik düzenlemelere öncelik verilmesi, hem aktarım mekanizmasını hemde bankacılık sektöründe fonlama kompozisyonunda düzelenin devam edeceği belirtilmiştir. Sıkı para politikası ve TL mevduatını destekleyici politikalar ile Dış finansman koşullarının düzelmesi rezervlerdeki artışın devam etmesi, talepteki iyileşiminin cari işlemler hesabına desteği ve TL mevduatlarına yurt dışı ve yurt içi talebin artması, döviz kuru istikrarı ve para politikasının etkinliğine önemli destek sağlamaktadır (TCMB,2023b).

5. SONUÇ

2008 yılında yaşanan ve gelişmiş ülkelerden başlayarak tüm dünyayı etkisi altına alan küresel finansal krizin etkileri, finansal sistemin tümüne yönelik proaktif önlem ve düzenlemelerin hayata geçirilmesinin önünü açmıştır. Finas krizi ile birlikte fiyat istikrarı ile birlikte finansal istikrarı sağlamak önem kazanmıştır. Bu doğrultuda Merkez bankalarının kullandığı geleneksel politika faiz ile birlikte istikrarsızlık dönemlerinde makro ihtiyati para politikaları uygulanmamaya başlanmıştır. Bu kapsamda TCMB KKM uygulamasını makro ihtiyati uygulama olarak finansal istikrara katkı sağlanması amacıyla devreye almıştır. Kur Korumalı Mevduat (KKM), Yüksek kur ile TL değer kaybı ile mücadelede kullanılan makro ihtiyati para politikasıdır. KKM Aralık 2021-Haziran 2023 dönemleri arasında aktif olarak kullanılmıştır. Bu süreçte amacına uygun olarak makro ekonomik göstergelere katkıda bulunduğu ifade edilmektedir. Yatırımcıları TL'ye yönlendiren dolarizasyonu azaltan bir rol oynayarak finansal istikrara katkıda bulunmuştur.

TCMB tarafından atılan TL mevduatı güçlendirici adımların etkisi ile TL mevduatın görece cazibesinin artırılmasıyla KKM bakiyelerinin azalmaya başlamıştır. KKM'nin toplam hacmindeki azalma ve dövizden gelen KKM'lerin çözümü konusundaki temkinli yaklaşım, Türk Lirası üzerinden yapılan geçişlerin daha cazip hale gelmesine rağmen, dövizden geçişlerin hala belirli zorluklarla karşılaştığını göstermektedir. TCMB yeni politika kapsamında belirlenen hedeflere ulaşılabilmesi için uygulanan ekonomi politikalarının birbirini tamamlar nitelikte olması ve toplumsal mutabakatın yüksek oranda sağlanması gerekmektedir. KKM uygulandığı süreçte yatırımcıların TLden kaçışlarının kısmen önüne geçtiği ancak sürekli ve TL'yi desteklemekte yeterli olmadığıdır. Makro ihtiyati politika kapsamında değerlendirilen KKM, ekonomik istikrarın yeniden sağlanması hususunda katkıda bulunmuştur. Yapısal düzenlemeleri destekleyici uygulamalar olmakla birlikte makro ekonomik istikrarsızlıklarla ortadosk politikalarla mücadele daha önemli olacaktır. Cari açığın fazla olması, TL kaçırların olması ve yüksek enflasyonla mücadelede dönemsel araçlar kullanılsada bütün dengeleri koruyacak stratejilerin desteklenmesi önem arz etmektedir.

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INNOVATION AND FINANCIAL PERFORMANCE: AN EUROPEAN EVIDENCE

DOI: 10.17261/Pressacademia.2023.1853

PAP- V.18-2023(11)-p.69-70

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To cite this document

Intrisano, C., Calce, A.M., Cafolla, E., Lentini, M., (2023). Innovation and financial performance: an European evidence. PressAcademia Procedia (PAP), V.18, 69-70.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1853>

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ABSTRACT

Purpose- The purpose of this study is to explore the relationship between innovation and financial performance in the context of European listed companies. Starting from the initial thesis of Schumpeter, this topic attracts the interest of academics and managers because innovation is included among the factors capable of influencing the value, profitability and competitive advantage of companies. The empirical evidence in this regard appears divergent: the existing literature shows positive or negative impacts or indicates the absence of a relationship between innovation (summarised in research and development expenditure) and financial performance.

Methodology- The study employs correlation analysis in order to figure out the existence of a link between innovation and financial performance. In accordance with the literature review, we use R&D expenses divided by sales as proxy of innovation and return on equity (ROE), return on capital employed (ROCE), EBITDA margin and profit margin as measures of financial performance. Data are obtained from the Amadeus Bureau van Dijk database and refers to the year 2020. Given the need to consider companies for which all the quantities mentioned are available for 2020, the final sample is made up of n. 224 European listed companies.

Findings- Pearson's correlation coefficient with EBITDA margin is 0.027, with ROA is 0.016, with Net profit margin is 0.034 and with ROE is 0.025, highlighting a weak positive relationship between the independent variable and each dependent variables (that means the R&D activities will increase the profitability of firms on the same financial year). However the p-value, higher than the $\alpha=0.05$ threshold, makes the correlation coefficient not statistically significant. The analysis reveals that innovation, measured by the ratio R&D expenses to sales, does not show any correlation with financial performance instantly, that is on the same financial year. Our results are consistent with the branch of studies according to which R&D activity has no effects on company performance.

Conclusion- The analysis conducted does not prove the existence of a significant relationship between innovation and financial performance. A possible explanation can be found in the circumstance whereby the effect of research and development activities, as well as for all intangible assets, on the performance of companies is mainly observable in the medium-long term (what is known in the literature as the "lagged effect" of intangible assets on performance); therefore limiting the analysis to just one year does not allow us to fully grasp the impact itself. The conclusion reached is not to be understood in an absolute sense since innovation can also be measured by other indicators other than research and development expenses, such as the use of ICT, graduate employees, etc. Hence the possibility of further research developments and points of reflection considering the impact of R&D on the firm's long-run performance and including other factors in the analysis.

Keywords: Innovation, firm performance, financial performance, listed companies

JEL Codes: G30, L29, O30,

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FINANCIAL SUSTAINABILITY OF HIGHER EDUCATION SYSTEM

DOI: 10.17261/Pressacademia.2023.1854

PAP- V.18-2023(12)-p.71-72

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To cite this document

Eskinat, A., Teker, S., (2023). Financial sustainability of higher education system. PressAcademia Procedia (PAP), V.18, 71-72.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1854>

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ABSTRACT

Purpose- Financial sustainability is vital for the higher education systems in the global competitive atmosphere of the world of 2020s. This paper reviews a comparative analysis between the budgets and expenditures of the Turkish and British higher education systems, beside a view on those of the OECD countries. This paper intends to clarify Turkish higher education system's difficulties in financial sustainability to provide required academic standards due to increasing costs and number of students versus the economic strength of significant actors such as the United Kingdom in the globalized competition. For this reason, this paper advocates cost advantages provided by the application of effective online education model to acquire financial sustainability clarifying the rise of digital universities by the 2030s.

Methodology- The study employs a literature review aiming to perform a comparative analysis on the financial structures of Turkish and British higher education systems. Moreover, OECD data were also reflected. The aim was to identify the possible difficulties of Turkish higher education system in financial sustainability to provide required academic standards in the competitive global area and find a contemporary solution.

Findings- The analysis reveals that the Turkish higher education system have disadvantages in providing financial sustainability under the conditions of increasing costs as well as number of students in order to reach the required standards in the global league. Notably, it is clearly seen that effective application of online education strategy is an opportunity to balance revenues and expenditures in this way. As a matter of the fact, the effect of digital transformation era and the attitude of Generation Z students have already prepared this atmosphere.

Conclusion- Governments highly financed higher education systems after 20th Century. However, financial problems emerged due to increasing number of students and increasing costs. Eventhough the budgets had continuously been increased, Turkish higher education system have realized lower expenditures in the OECD average. Problems in financial sustainability to provide required academic standards have clearly been noticed in the global competitive atmosphere while compared with the example of the United Kingdom. Over the Covid-19 crisis, universities successfully implemented hybrid education around the world increasing the effect of online systems forced by Generation Z's perspective on embracing Digital Technologies. So, effective application of online education model appeared as a new opportunity for Turkish higher education system to provide financial sustainability decreasing costs and also efficiently compete in the global area. Indeed, blended learning in traditional universities and inevitable growth of digital higher education institutions named as University 5.0 will be seen after 2030s.

Keywords: Higher education, university, financial sustainability, Turkiye, United Kingdom, online education

JEL Codes: I22, I23, M10, M21

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THE RELATIONSHIP BETWEEN MONEY SUPPLY AND INFLATION: ANALYSIS WITH PANELVAR APPROACH*

DOI: 10.17261/Pressacademia.2023.1855

PAP- V.18-2023(.)-p.73-75

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To cite this document

Altinisik, E.O., Yucememis, B.T., (2023). The relationship between money supply and inflation: analysis with PANELVAR approach. PressAcademia Procedia (PAP), V.18, 73-75.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1855>

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ABSTRACT

Purpose- Central banks serve as institutions responsible for executing monetary policy in countries, with the primary objective of managing the money supply and ensuring price stability in the economy. These institutions formulate and implement monetary policies, controlling interest rates, maintaining price stability, managing exchange rates, and overseeing the banking sector. Through the use of both traditional and modern tools, such as policy interest rates, reserve requirements, rediscount policies, and open market operations, central banks aim to uphold stability in the economy and financial system. The economic literature extensively explores the theoretical and empirical effects of central banks' expansive and contractionary policies on inflation. This study specifically investigates the practices of selected country central banks regarding monetary policy, with a focus on understanding the relationship between money supply and inflation. The objective is to unveil the impacts of these policies on countries' macroeconomic variables and identify determinants influencing the selection of effective policies and tools in central banks' pursuit of price stability-oriented monetary policy practices.

Methodology- One of the tools central banks employ to intervene in the market is the manipulation of the money supply, influencing macroeconomic variables through expansive and contractionary policies. This study analyzes the impact of central banks' monetary policies using PanelVAR analysis for the period 2005–2022. The initial model features inflation as the dependent variable, while independent variables include money supply, policy interest rates, growth, current account deficit, budget deficit, and unemployment. These variables are modeled as annual percentage changes, with the money supply variable included as a level value after logarithmic transformation. Subsequent models are constructed with each independent variable as the dependent variable, adhering to the assumptions of VAR models. To address the stationarity condition of unit roots, cross-sectional dependencies in panel data series are tested. Following the identification of cross-sectional dependency issues, second-generation unit root tests are applied. After stationary analyses, VAR analysis is conducted, cointegration vectors are identified, and error correction models are established for further analysis. Finally, impact response analysis determines the size of the effects of the macroeconomic variables used in the analysis, and Granger causality analysis is applied to ascertain the direction of causality.

Findings- In the model for controlling the money supply, the alternative hypothesis is accepted, supporting a statistically significant relationship or a cause-and-effect relationship among policy interest rate, growth, inflation, unemployment rate, current account deficit, and budget deficit variables. In the analysis where inflation is the dependent variable, long-term cointegration between money supply, inflation, and policy interest rate is identified. There is a bidirectional causal relationship between the money supply variable and inflation and policy interest rate. A causality relationship from the current account deficit variable to the money supply is determined, but causality from the money supply to the current account deficit variable cannot be established. Causality relationships are identified between policy interest rate and inflation, money supply, growth, and current account deficit variables, with the direction of the relationship being from inflation to policy interest rate, from growth variable to policy interest rate, and from the current account deficit variable to policy interest rate. A bidirectional causality relationship is found between unemployment and growth variables, and a unidirectional causality relationship from inflation. Additionally, a bidirectional causality relationship is identified between growth and inflation variables. From the growth variable to the budget deficit variable, a unidirectional causality relationship is found. When examining impact-response graphs, a unit change in the money supply variable results in a sudden increase in the inflation variable, and this response does not dampen for 12 periods. When examining the inflation variable, a unit change in itself requires 10 periods from the perspective of money supply and 7 periods from the perspective of policy interest rate to dampen the effect.

Conclusion-The formulation of monetary policy within the framework of country dynamics, specifically through policy interest rates and inflation, ensures measured responses from other macroeconomic variables. Conscious management of the long-term cointegration between money supply, inflation, and policy interest rate plays a crucial role in effectively managing the economy. A unit shock applied to the money supply variable has a prolonged impact on inflation, lasting for 12 periods without damping. An uncontrolled inflation problem in the long term could lead to chronic issues. Balancing the impact of money supply through policy interest rates is thus crucial. In line with economic theories, policymakers and economists are advised to implement monetary policies under the assumption of the Post-Keynesian view, which asserts that money supply is intrinsic for maintaining economic stability and controlling inflation. Considering the bidirectional causality relationship between inflation and money supply, it is emphasized that structural factors are essential in controlling price changes, and solely relying on money supply may not be an effective tool. Therefore, within this framework, a structural approach is recommended.

Keywords: Money supply, inflation, monetary policy, central banks, PanelVAR.

JEL Codes: E51, E52, E31, C32

*Bu çalışma Marmara Üniversitesi Bankacılık ve Sigortacılık Enstitüsü Bankacılık Ana Bilim Dalı'nda Prof. Dr. Başak TANINMIŞ YÜCEMEMİŞ danışmanlığında yürütülen "Para Arzının Kontrolü ve Enflasyon İlişkisi: Para Politikası Uygulamaları ile Analizi" adlı doktora tezinden üretilmiştir.

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DETERMINANTS OF BANK CREDIT IN JORDAN AND PALESTINE: A COMPARATIVE STUDY

DOI: 10.17261/Pressacademia.2023.1856

PAP- V.18-2023(14)-p.76-77

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To cite this document

Dirani, R., Khataibeh, M., Omet, G., (2023). Determinants of bank credit in Jordan and Palestine: a comparative analysis. PressAcademia Procedia (PAP), V.18, 76-77.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1856>

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ABSTRACT

Purpose- This paper analyzes the determinants of the annual changes in conventional banks' credit in Jordan and Palestine. In addition, the paper examines whether the differences in the determinants of bank credit in both economies are due to country or bank-specific factors. As one might expect, the argument behind this paper rests on the fact that the Israeli occupation of Palestine makes the political and economic environments of the two countries very different.

Methodology- A panel of data of all thirteen (13) Jordanian conventional banks and 12 Palestinian conventional banks are used in the econometric analyses (2010 – 2021). For each set of banks, the annual percentage changes in credit are regressed on the percentage annual change in bank deposits, equity is equity capital, bank size, and bank income diversification level. Following this exercise, the differences in both sets of coefficients are examined using the F-test. If different, one can argue that the difference can be due to the differential effects of either bank-level differences or country-level differences. To examine this issue, we re-estimate the main model by controlling for the presence of fixed effects in the bank credit relationship and re-estimate the F-test. If the F test is significant, this implies that the differences in the magnitude of the relationship are due to country factors and not to bank-specific factors.

Findings- Based on the estimated results, several interesting observations are noted. First, there are differences in the determinants of the annual change in bank credit between banks in Jordan and in Palestinian in terms of the signs of the independent variables and their values. Second, the significant differences in the determinants of the annual change in bank credit between banks in Jordan and in Palestinian are due to country-specific factors and not the bank-specific factors. Finally, given the differences in the political and economic environments in which banks in Jordan and Palestine operate, one should not be surprised of the main finding of this thesis.

Conclusion- It would be informative to examine the performance of both sets of banks in terms of other issue including the determinants of cost of intermediation, stability, bank discipline, and bank competition.

Keywords: Jordan, Palestine, banks, credit growth, equity capital, seemingly-unrelated regression.

JEL Codes: G20, G21, G24

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THE EFFECTS OF POLICY RATE ANNOUNCEMENTS ON THE EXCHANGE RATES

DOI: 10.17261/Pressacademia.2023.1857

PAP- V.18-2023(15)-p.78-79

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To cite this document

Teker, S., Teker, D., Gumustepe, E.D. (2023). The effects of policy rate announcements on the exchange rates. PressAcademia Procedia (PAP), V.18, 78-79.

Permant link to this document: <http://doi.org/10.17261/Pressacademia.2023.1857>

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ABSTRACT

Purpose- Exchange rate is the value of a country's national currency against foreign national currencies. In this context, the exchange rate is considered an important macroeconomic indicator in evaluating the country's economy. The failure to control the exchange rate may damage economy significantly. It is possible to understand this from the 2001 crisis in Turkey, known as 'Black Wednesday', and the foreign exchange crisis that started in Thailand in 1997 and affected many East Asian countries. Interest rate is one of the critical determinants affecting the exchange rates. Therefore, changes in interest rates are expected to affect the level of exchange rates. When there is an increase in interest rates, foreign capital flow is expected for that particular country. Hence, a decrease in exchange rates is expected for the excess capital flows. This study aims to analyze the relationship between exchange rates and interest rates, considering the last 10 announcements of the interest policy of the Central Bank of the Republic of Turkiye. These announcements are between January 19, 2023 and October 26, 2023. The study used the TL/USD exchange rates and 10-year government bond interest rates to measure the relationship in between these two variables.

Methodology-The aim of this study is to analyze the relationship between the dollar exchange rate and government bond interest rates for Turkiye. For this purpose, data is collected for the days when the last 10 policy rates published by the CBRT were announced. Data is obtained from investing.com. Vector Autoregression (VAR) is used to measure the relationship in between two variables. The VAR system is based on empirical regularities embedded in the data. The VAR model may be viewed as a system of reduced form equations in which each of the endogenous variables is regressed on its own lagged values and the lagged values of all other variables in the system. Vector Autoregressive models are widely used in time series research to examine the dynamic relationships exist in between variables that interact with one another. In addition, VAR models are viable forecasting tools used often by macroeconomic or policy-making institutions. In this study first, the stationary levels of the variables are determined by using Unit Root Test. Second, pre-tests of autocorrelation, heteroscedasticity and normality are conducted for the validity of the VAR model. Third, the short-term relationship between variables is tested by using VAR Granger Causality Test. Fourth, VAR analysis is utilized by applying Impulse-Response Analysis and Variance Decomposition Analysis. And finally, the long-term relationship between variables is tested by using Johansen Cointegration Test. Vector Autoregression model is employed in this study.

Findings- According to the results of Granger Causality test, government bond interest rates strongly affect the changes of exchange rate. However, there is no causality from exchange rates to interest rates. Therefore, the changes of interest rates are the main determinants of the changes of exchange rates in this short period. The results of Impulse-Response Test show that an unexpected shock (an unexpected increase) in government bond interest rates affects the exchange rates and increases it significantly. More, an unexpected increase in the exchange rates causes the interest rates on government bond to increase. The results of the variance decomposition test show that 50% of the change in the variance of the exchange rates in the first period is explained by changes in bond interest while 30% of the change in the variance of bond interest rates is explained by the changes in exchange rates. The results of Johansen cointegration test support that there is a stable long-term relationship between dollar exchange rates and government bond interest rates.

Conclusion-This study focuses on the relationship between government bond interest rates and the dollar exchange rates in Turkiye for the last 10 policy interest rates announcements by Central Bank of Turkiye. In summary, the changes in interest rates on bonds affect the changes in exchange rates more. Data for the days that the CBRT issued the last ten policy rates is gathered for this purpose. The association between two variables is measured using Vector Autoregression (VAR). According to overall results, the changes in interest rates on bonds affect the changes in exchange rates more.

Keywords: Policy rate, exchange rate, interest rate, Turkiye, Granger Causality, VAR model

JEL Codes: E40, E50, C10, C58

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THE CLOSE CONNECTION BETWEEN LIQUIDITY AND PROFITABILITY: ANALYSIS OF THE RETAIL MARKET

DOI: 10.17261/Pressacademia.2023.1858

PAP- V.18-2023(16)-p.80-81

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To cite this document

Maxim, L.G., (2023). The close connection between liquidity and profitability: analysis of the retail market. PressAcademia Procedia (PAP), V.18, 80-81.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1858>

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ABSTRACT

Purpose- Analyzing profitability and liquidity indicators are essential for healthy financial management. Liquidity refers to the extent to which a company can convert its assets into cash quickly and without significant loss of value while profitability refers to the extent to which a company generates profits and returns investments for its owners. An important dimension in the relationship between liquidity and profitability is time. A company may be liquid and profitable at one point in time, but this may not hold true over time. In addition to these things, the Romanian retail industry is an industry that contributes massively to the achievement of the GDP and is also an important employer, offering employment opportunities to a significant part of the population. The purpose of this study is to determine the relationship between liquidity indicators and the profitability of retail companies.

Methodology- STATA software was used to model the data and estimate the results, using multiple linear regressions.

Findings- The analysis reveals that shows that liquidity rates have a low impact on the profitability of Romanian companies in the retail trade industry.

Conclusion- Based upon the analysis, it may be concluded that managers must establish more favorable policies regarding the credit granted by suppliers, which can lead to a decrease in the cash conversion cycle and implicitly to an increase in the profitability of retail companies. At the same time, the simple conclusion is to pay more attention to the company's liquidity, observing the direct relationships between liquidity rates and profitability in the sense of increasing the last one.

Keywords: business economics, financial management, liquidity, market, profitability, retail

JEL Codes: L21, L81, M21

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FACTORS AFFECTING COUNTRY FINTECH: AN EUROPEAN ANALYSIS

DOI: 10.17261/Pressacademia.2023.1859

PAP- V.18-2023(17)-p.82-83

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To cite this document

Di Nallo, L., Micheli, A.P., Giangrande, N., (2023). Factors affecting country fintech: an European analysis. PressAcademia Procedia (PAP), V.18, 82-83.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1859>

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ABSTRACT

Purpose- FinTech represents all innovation related to how businesses seek to improve the process, delivery, and use of financial services and it is not a mere technological phenomenon. Considering that the various innovations in the financial and technological fields require the use of explanatory indices, the aim of this work is to propose an analysis of the factors that influence the degree of adoption of Fintech in the European countries.

Methodology- We use a correlation model in order to highlight the first results on the relationship between the degree of Fintech at a geographical level and some explanatory variables. The final sample consists of 28 European countries that have all variables requested in the analysis. Specifically, the level of Fintech is measured by The Global Fintech Index developed by Findexable, while the factors that influence the Fintech come from dataset of International Monetary Fund (IMF): the number of ATMs, number of commercial bank branches, while the intensity of outstanding deposits with commercial banks and outstanding loans from commercial banks is lower

Findings- Regarding the analysis of the year 2021, our result indicates preliminarily that Fintech is negatively affected by the number of ATMs, number of commercial bank branches, while the intensity of outstanding deposits with commercial banks and outstanding loans from commercial banks is lower. This findings are consistent with this assumption: one of the driver of the Fintech is the digitalization.

Conclusion- The result of our model indicates that the degree of Fintech at a geographical level seems to be linked to explanatory variables that are related to the banking world. This represents a useful information to academic, practitioners and policymakers. In fact, according to literature, Fintech has an effect on financial system and financial stability. Therefore the explanation of Fintech phenomenon and its measurement represent a crucial point. Future extensions of research could consider additional measures of Fintech and a focus on the most representative explanatory variables.

Keywords: Fintech, financial system, banks, banking, digitalization.

JEL Codes: G20, G29, O30

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DIGITALIZATION-GROWTH NEXUS: SOME EMPIRICAL EVIDENCE FROM FOUR REGIONS WITH A MUSLIM MAJORITY

DOI: 10.17261/Pressacademia.2023.1860

PAP- V.18-2023(18)-p.84-85

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To cite this document

Ganić, M., (2023). Digitalization-growth nexus: some empirical evidence from four regions with a Muslim majority. PressAcademia Procedia (PAP), V.18, 84-85.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1860>

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ABSTRACT

Purpose- The purpose of this study is to investigate whether regional variations exist in the development of the digital economy and how they impact growth in the four global regions where Muslims predominate.

Methodology- The study employs empirical examination of 48 countries with Muslim majority divided in four regions (Middle East and North Africa region, Europe and Eurasia region, South Asia, East Asia region and the Pacific and Africa region) between 2000 to 2021. The study employs Kao Residual Cointegration Test, and the Long-run Valuation of Fully Modified Ordinary Least Squares (FMOLS/DOLS-Dynamic). A certain number of specific variables in the econometric model will be employed to measure the level of digitization on economic growth, such as: Digital economy infrastructure proxied by Individuals using the internet, Digital economic openness proxied by ICT product exports and Digital technology competitiveness proxied by Research and Development as share of GDP.

Findings- The analysis reveals that despite the fact that the digital economy made a positive contribution to economic growth in both Sub-Saharan Africa and Europe and Euroasia, the impact on these regions is less than that on the Middle East and North Africa, South Asia, East Asia, and the Pacific countries due to the underdeveloped infrastructure of the digital economy The least effect of digitalization on growth was found in Sub-Saharan African countries with low incomes.

Conclusion- Based upon the analysis, it may be concluded that digitalization can considerably boost economic growth, but its benefits may differ depending on how developed a nation is. There is a clear geographical imbalance in the development of the digital economy across 48 nations with a majority of Muslims .To increase overall GDP growth, those countries need to look into policies that will help increase ICT and the digital economy use.

Keywords: Digital economy, economic growth, ICT, the Muslim World, panel cointegration model.

JEL Codes: O40, O47, E22.

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THE COMPETITIVENESS DISPARITY BETWEEN CORE AND PERIPHERAL EU COUNTRIES: AN EMPIRICAL ANALYSIS WITH PANEL ARDL APPROACH

DOI: 10.17261/Pressacademia.2023.1861

PAP- V.18-2023(19)-p.86-87

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To cite this document

Tosun, T.T., (2023). The competitiveness disparity between core and peripheral EU countries: an empirical analysis with panel ARDL approach. PressAcademia Procedia (PAP), V.18, 86-87.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1861>

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ABSTRACT

Purpose- This study empirically investigates whether there is an asymmetry between the competitiveness of the core and peripheral EU countries in the post-monetary union period, which includes the public debt crisis.

Methodology- This paper analyzes the long and short-term effects of the interest rate for public bond yields and real effective exchange rate on public debt in core (Germany, Austria, Belgium, Denmark, and the Netherlands) and peripheral (Greece, Ireland, Italy, Portugal, and Spain) EU countries using the panel linear Autoregressive Distributive Lag model. In the study, second-generation unit root tests, Westerlund's (2007) cointegration test, and short and long-term MG, PMG, and DFE panel econometric methods are employed.

Findings- According to the primary findings of the study: (i) while the interest rate for public bond yields is not effective on public debt in core EU countries, it has an increasing effect on public debt with a high positive coefficient in peripheral EU countries. (ii) The long-term coefficient of the real effective exchange rate in the peripheral EU countries is higher than in the core EU countries. According to this conclusion, the increase in the real effective exchange rate augments the public debt of the peripheral EU countries at a higher level than the core EU countries.

Conclusion- Contrary to the monetarist approach that relies on the role of one last funder, these findings contribute to the literature by supporting the first two conditions of the Optimum Currency Area, the Varieties of Capitalism, Comparative Political Economy, and Fundamentalist approaches, which reveal the asymmetrical structure between the competitiveness of the core and peripheral EU countries.

Keywords: EMU public debt crisis, core EU countries, peripheral EU countries, panel ARDL model, competitiveness differences

JEL Codes: C45, F45, N14, N24

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ESG SUSTAINABLE TECHNOLOGIES LITERATURE REVIEW USING CLUSTER-BASED METHODS

DOI: 10.17261/Pressacademia.2023.1862

PAP- V.18-2023(20)-p.88-89

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To cite this document

Alqudah, M.Z., Garcia, L.S., Benau, M.A.G., (2023). ESG sustainable technologies literature review using cluster-based methods. PressAcademia Procedia (PAP), V.18, 88-89.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1862>

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ABSTRACT

Purpose- This study aims to address the existing gaps in the body of knowledge on sustainable technologies in the Environmental, Social, and Governance (ESG) field. It achieves this by employing a rigorous systematic review methodology and using VOSviewer and Biblioshiny software to analyze a comprehensive dataset of 1,603 papers from the ABS 2023 journal list, covering various knowledge domains.

Methodology- This research undertakes a systematic analysis of the multifaceted ESG domain using a cluster-based approach rooted in bibliographic coupling analysis. This methodology reveals intricate network associations within distinct clusters of ESG literature. The study identifies four significant literature clusters: sustainable financial technology (FinTech), sustainable artificial intelligence (AI), sustainable big data, and sustainable cryptocurrency.

Findings- The analysis conducted in this study reveals four distinct clusters of literature within the ESG field, shedding light on the interconnectedness of these areas. The identified clusters are sustainable financial technology (FinTech), sustainable artificial intelligence (AI), sustainable big data, and sustainable cryptocurrency. Each cluster represents a specific facet of ESG and provides valuable insights into its individual development and interrelationships.

Conclusion- This research offers valuable insights into the state of knowledge in the ESG field, providing a well-structured understanding of the ESG landscape. It not only highlights the key clusters of literature but also offers a qualitative analysis, providing researchers with a roadmap for exploring research opportunities and specific areas within the ESG literature. By identifying these clusters and their relationships, this study contributes to the advancement of sustainable technologies within the ESG domain and sets the stage for future research in this evolving field.

Keywords: ESG, sustainability, financial technology, artificial intelligence, big data, cryptocurrency, Cluster analysis.

JEL Codes: G34, G38, G39

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GENDER DIFFERENCE IN FINANCIAL BEHAVIOR: A COMPARATIVE ANALYSIS

DOI: 10.17261/Pressacademia.2023.1863

PAP- V.18-2023(21)-p.90-91

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To cite this document

Teker, D., Donmez, S., (2023). Gender difference in financial behavior: a comparative analysis. PressAcademia Procedia (PAP), V.18, 90-91.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1863>

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ABSTRACT

Purpose- Definition of financial inclusion; FI enables adults to access and efficaciously use a range of proper financial services. It plays a crucial role in raising economic growth in point of industry, firm and national level. Accessing to the products and services are achievable with financial inclusion. In the world, financial access is not reachable due to socio-economical reasons. Financial inclusion should involve the obstacles facing, reaching out access. This has an effect on decision makings and financial behaviors. However, gender disagregated statistics are not common in literature. All economies may reach economic growth, recognizing gender differences, and enhancing awareness among households. Aim of this study is to figure out the investing / borrowing behaviors of households. This study seeks "is there a gender difference in the level of financial behavior for Turkiye?".

Methodology- We employ a questionnaire to figure out if there exists a gender difference about various metrics in financial behavior. In the research method of this study, comparative analysis was made to reach out gender differences of respondents regarding financial behavior using excell with the help of coding. Google questionnaire prepared by authors was pre-tested and then authors maintaing to send the questionnaire via social media. 102 respondents were reached out. Firstly, it was made demographic analysis of respondents, and then it was analysed the financial behavior of respondents.

Findings- Findings prove the fact that there is gender difference in behavior of making payments, savings, daily life, auto and home needs, making decisions, QR Code usage, awareness of Fintech products and number of credit cards. Majority of respondents feel confident about private pension system.. However, there is slightly difference in number of private pension contracts. In general, all respondents own a bank account. Money transfer, using a bank application behavior, does not differ among individuals.

Conclusion- Based upon the analysis, it may be concluded that financial behavior affects individuals' choices and this generates differences in terms of usage, needs, decisions and awareness. Socio-economical factor plays a crucial role regarding generating awareness in financial behavior.

Keywords: Financial behavior, gender differences, financial inclusion, financial literacy, behaviors of households.

JEL Codes: G40, G41, M10

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EXAMINING THE RELATIONSHIP BETWEEN BITCOIN AND ALTCOINS

DOI: 10.17261/Pressacademia.2023.1864

PAP- V.18-2023(22)-p.92-94

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To cite this document

Aksoylu, E., (2023). Examining the relationship between bitcoin and altcoins. PressAcademia Procedia (PAP), V.18, p.92-94

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1864>

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ABSTRACT

Purpose- The purpose of this study is to examine the long and short-term relationship between Bitcoin and altcoins selected based on their market capitalization through an empirical analysis. For this purpose, the daily data of Bitcoin and nine altcoins consisting of Ether, Ripple, Tether, Litecoin, Monero, Stellar, Dash, Nem, Dogecoin for the period 07/08/2015-08/01/2020 were used.

Methodology- The long-run relationship between Bitcoin and altcoins is first analyzed by Vector Autoregression (VAR) analysis. Granger causality test was utilized to determine the short-run causality relationship between the variables. The tests were conducted with the Eviews program.

Findings- According to the results of the VAR analysis conducted to investigate the long-run relationship, there is a long-run relationship between Dogecoin, Dash, Litecoin, Nem, Stellar and Ripple and Bitcoin. After determining the long-run relationship between the variables, the relationships between the variables were analyzed with the help of impulse response functions. Impulse response function shows the effect of a one-unit shock to one variable on the other variable. Accordingly, when the results of impulse response functions are analyzed; it is seen that a one-unit random shock in Bitcoin has a negative effect on Ripple, Nem, Litecoin, Dash, Litecoin, Dogecoin in the first two periods, the effect decreases in the second period, and this effect disappears in the third period. A random shock to Bitcoin causes a positive effect on Stellar that lasts for two periods. This positive effect ends in the third period. After analyzing the relationship between Bitcoin and altcoins with impulse response functions, the source of the changes in the variance of the variables is analyzed through variance decomposition. According to the variance decomposition results, the effect of Bitcoin on Dogecoin is 25% in the first period and 22% in the other periods. The variance decomposition of Dash shows that approximately 18% of the change in standard deviation was caused by Bitcoin in the first period and this percentage increased to 25.5% in the following periods. Litecoin's variance decomposition results show that 33% of the change in standard deviation from the first period to the last period was caused by Bitcoin. It is observed that approximately 8% of the change in Nem's standard deviation in the first period was caused by Bitcoin, while this rate increased to 21.5% in the last period. From the first period to the last period, 13.5% of the change in Stellar's standard deviation was caused by Bitcoin. When the variance decomposition of Ripple is analyzed, it is observed that 10% of the difference in the standard deviation is due to Bitcoin. This situation continued similarly from the first period to the last period. Following the VAR analysis, Granger causality test was conducted to explain the short-term relationship between the variables. According to the test results, there is a bidirectional Granger causality between Bitcoin and all altcoins. Accordingly, when Bitcoin is taken as the dependent variable, it is the Granger cause of Ether, Ripple, Tether, Litecoin, Monero, Stellar, Dash, Nem, Dogecoin. When the Granger causality relationship between altcoins is analyzed, a causality relationship was observed from Tether to Stellar, while no causality was found from Stellar to Tether. Similarly, while Granger causality is observed from Tether to Ripple, there is no causality from Ripple to Tether. The variance decomposition of Stellar and Ripple shows that Tether does not contribute to the change in standard deviation. The variance decomposition test supports the Granger test results. All altcoin variables except these are Granger causes of each other.

Conclusion- At the end of the study, according to the results of the VAR analysis to determine the long-run relationship, there is a long-run relationship between Dogecoin, Dash, Litecoin, Nem, Stellar and Ripple and Bitcoin. There is no long-run relationship between Tether, Monero, Ether and Bitcoin. According to the Granger causality analysis test results conducted to observe the short-term relationship, there is a bidirectional Granger causality between Bitcoin and all altcoins. Accordingly, when Bitcoin is taken as the dependent variable, it is the Granger cause of Ether, Ripple, Tether, Litecoin, Monero, Stellar, Dash, Nem, Dogecoin. As a result, it is observed that Bitcoin has a short-term relationship with all 9 altcoins subject to the study, and a long-term relationship with Dogecoin, Dash, Litecoin, Nem, Stellar and Ripple. These results show that the price movements in Bitcoin have an impact on altcoins.

Keywords: Bitcoin, altcoin, cryptocurrency, causality analysis, VAR analysis.

JEL Codes: G17, G10, C58

BITCOIN VE ALTCOINLER ARASINDAKİ İLİŞKİNİN İNCELENMESİ

ÖZET

Amaç- Bu çalışmanın amacı Bitcoin ile piyasa büyüklükleri baz alınarak seçilmiş olan altcoinler arasındaki uzun ve kısa dönemli ilişkinin ampirik bir analiz ile incelenmesidir. Çalışmada bu amaçla 07/08/2015-08/01/2020 dönemine ait Bitcoin ve Ether, Ripple, Tether, Litecoin, Monero, Stellar, Dash, Nem, Dogecoin'den oluşan dokuz altcoinin günlük verileri kullanılmıştır.

Yöntem- Bitcoin ile altcoinler arasındaki uzun dönemli ilişki öncelikle Vektör Otoregresyon (VAR) analizi ile incelenmiştir. Değişkenler arasındaki kısa dönem nedensellik ilişkisinin tespiti için ise Granger nedensellik testinden faydalanılmıştır. Testler Eviews programı ile gerçekleştirilmiştir.

Bulgular- Uzun dönemli ilişkinin araştırmasına yönelik olarak yapılan VAR analizi sonucuna göre; Dogecoin, Dash, Litecoin, Nem, Stellar ve Ripple ve Bitcoin arasında uzun dönemli bir ilişki olduğu görülmektedir. Değişkenler arasındaki uzun dönemli ilişki belirlendikten sonra değişkenler arasındaki ilişkiler etki tepki fonksiyonları yardımıyla incelenmiştir. Etki tepki fonksiyonu bir değişkene verilen bir birimlik bir şokun diğer değişken üzerindeki etkisini göstermektedir. Buna göre etki tepki fonksiyonları sonuçları incelendiğinde; Bitcoin'de meydana gelen bir birimlik rassal şokun Ripple, Nem, Litecoin, Dash, Litecoin, Dogecoin üzerinde ilk iki dönem negatif bir etki yaratmakta olduğu ikinci dönemde etkinin azaldığı, üçüncü dönem itibarıyla bu etkinin kaybolduğu görülmektedir. Bitcoin'e verilen rassal bir şok Stellar üzerinde ise iki dönem boyunca süren pozitif bir etkiye neden olmaktadır. Bu pozitif etkinin üçüncü dönemde sona erdiği izlenmektedir. Bitcoin ve altcoinler arasındaki ilişki etki tepki fonksiyonlarıyla izlendikten sonra varyans ayrıştırması yoluyla değişkenlerin varyansındaki değişimlerin kaynağı incelenmektedir. Varyans ayrıştırması sonuçlarına göre Bitcoin'in Dogecoin üzerindeki etkisi ilk dönem %25 diğer dönemlerde %22 seviyesinde olduğu izlenmiştir. Dash'a ait varyans ayrıştırması standart sapma değişikliğinin ilk dönemde yaklaşık %18'inin Bitcoin kaynaklı olduğunu ilerleyen dönemlerde bu oranın %25,5 seviyelerine çıktığını göstermektedir. Litecoin'in varyans ayrıştırması sonuçları ilk dönemden son döneme kadar standart sapmadaki değişikliğin %33'lük kısmının Bitcoin kaynaklı olduğunu göstermektedir. Nem'in standart sapmasındaki değişikliğin ise ilk dönemde yaklaşık %8'lik kısmının ise Bitcoin kaynaklı olduğu son dönemde ise bu oranın %21,5 seviyesine çıktığı gözlemlenmektedir. Stellar'ın standart sapmasındaki değişikliğin ilk dönemden son döneme kadar %13,5'inin Bitcoin kaynaklı olduğu görülmektedir. Ripple'in varyans ayrıştırması incelendiğinde ise standart sapmadaki farkın %10'luk kısmının Bitcoin kaynaklı olduğu izlenmiştir. Bu durum ilk dönemden son döneme dek benzer şekilde devam etmiştir. VAR analizinin ardından değişkenler arasındaki kısa dönemli ilişkinin açıklanabilmesi amacıyla Granger nedensellik testi yapılmıştır. Test sonuçlarına göre Bitcoin ile tüm altcoinler arasında çift yönlü bir Granger nedenselliği olduğu görülmektedir. Buna göre Bitcoin bağımlı değişken olarak alındığında Ether, Ripple, Tether, Litecoin, Monero, Stellar, Dash, Nem, Dogecoin'in Granger nedenidir. Altcoinler arasındaki Granger nedensellik ilişkisi incelendiğinde ise Tether'dan Stellar'a doğru bir nedensellik ilişkisi gözlenirken, Stellar'dan Tether'a doğru nedensellik bulunamamıştır. Benzer şekilde Tether'da Ripple'a doğru Granger nedenselliği gözlenirken, Ripple'dan Tether'a doğru nedenselliğin olmadığı görülmektedir. Stellar ve Ripple'in varyans ayrıştırmasında standart sapmada meydana gelen değişikliğe Tether'ın katkısının olmadığı görülmektedir. Varyans ayrıştırması testi Granger testi sonuçlarını destekler niteliktedir. Bunlar dışındaki tüm altcoin değişkenleri birbirinin Granger nedenidir.

Sonuç- Çalışmanın sonucunda VAR analiziyle gerçekleştirilen uzun dönemli ilişkinin tespit edilmesine yönelik analiz sonuçlarına göre Dogecoin, Dash, Litecoin, Nem, Stellar ve Ripple ve Bitcoin arasında uzun dönemli bir ilişki bulunmaktadır. Tether, Monero, Ether ile Bitcoin arasında ise uzun dönemli bir ilişki görülmemiştir. Kısa dönemli ilişkinin gözlemlenmesi için yapılan Granger nedensellik analizi test sonuçlarına göre Bitcoin ile tüm altcoinler arasında çift yönlü bir Granger nedenselliği olduğu görülmektedir. Buna göre; Bitcoin bağımlı değişken olarak alındığında Ether, Ripple, Tether, Litecoin, Monero, Stellar, Dash, Nem, Dogecoin'in Granger nedenidir. Sonuç olarak Bitcoin'in çalışmaya konu edilen 9 altcoinin tümü ile arasında kısa dönemli bir ilişki olduğu, bu altcoinlerden Dogecoin, Dash, Litecoin, Nem, Stellar ve Ripple ile de uzun dönemli bir ilişki olduğu gözlemlenmiştir. Bu sonuçlar Bitcoin'de meydana gelen fiyat hareketliliklerinin altcoinler üzerinde etkili olduğunu göstermektedir.

Anahtar Kelimeler: Bitcoin, altcoin, kriptopara, VAR analizi, nedensellik analizi

JEL Kodları: G17, G10, C58

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ADVANCING FINANCIAL REPORTING IN THE WESTERN BALKANS: A BIBLIOMETRIC ANALYSIS OF AI AND IFRS INTEGRATION FOR SUSTAINABLE ACCOUNTING

DOI: 10.17261/Pressacademia.2023.1865
PAP- V.18-2023(23)-p.95-96

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To cite this document

Vardari, L., (2023). Advancing financial reporting in the Western Balkans: a bibliometric analysis of AI and IFRS integration for sustainable accounting. PressAcademia Procedia (PAP), V.18, 95-96.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1865>

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ABSTRACT

Purpose- This study aims to investigate the current state of financial reporting practices, focusing on integrating International Financial Reporting Standards (IFRS) and utilizing artificial intelligence (AI) for sustainable reporting in the Western Balkans.

Methodology- Our study conducted a comprehensive bibliometric analysis of scholarly articles, conference papers, and research publications in relevant academic databases. The analysis encompassed a range of parameters, including publication trends, thematic content, and geographical distribution.

Findings- Our bibliometric analysis revealed a growing interest in financial reporting, AI, IFRS, and sustainable reporting. Although the Western Balkans have made strides in adopting IFRS, challenges related to implementation and enforcement persist. Notably, research specific to this region is relatively scarce, highlighting the need for more context-specific studies. AI's potential in enhancing financial reporting and its application in sustainable reporting also emerged as promising areas of interest.

Conclusion- This study underscores the importance of advancing financial reporting practices in the Western Balkans by integrating AI technologies and sustainable reporting in line with IFRS. Future research should focus on tailored investigations in the Western Balkans to bridge the existing research gaps and address the region's unique challenges. This research contributes to the region's economic development and global integration while furthering the understanding of financial reporting, AI, and sustainability reporting.

Keywords: Financial reporting, AI, IFRS, sustainable reporting in accounting, Western Balkan, bibliometrics

JEL Codes: M14, M41, G12, G34,

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TURKIYE AS A REGIONAL HUB

DOI: 10.17261/Pressacademia.2023.1866

PAP- V.18-2023(24)-p.97-98

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To cite this document

Teker, S., Teker, D., Orman, I., (2023). Türkiye as a regional hub. PressAcademia Procedia (PAP), V.18, 97-98.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1866>

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ABSTRACT

Purpose- This study examines Türkiye's strategic importance and potential to serve as a pivotal regional hub for businesses. The study also investigates the various fields of businesses for being a potential hub. A review of common concerns that needs further developments are analysed.

Methodology- The study utilizes an analytical literature survey and investigates the various business fields for becoming a regional hub.

Findings- Türkiye is the 7th largest economy by GDP in Europe by IMF among 22 countries for the year 2022. Türkiye is ranked as the 1st in ease of setting and welcoming categories at Expat Explorer Index, and 7th in the world in the year 2019. More, Turkish international airports serve for 342 direct flights for 128 countries with Turkish Airlines and proximity to these markets with a total GDP of 46 trillion USD within 4 hours flight.

Conclusion- Türkiye's unique geographical position bridges Europe and Asia providing a natural gateway between the East and the West. Proximity to major markets enhances its appeal as a strategic center for trade and commerce. Ongoing investments in infrastructure, including transportation networks and logistics facilities, are positioning Türkiye as a key hub for the efficient movement of goods and services. Modern ports, airports, and road networks facilitate seamless connectivity within the region. Türkiye's growing economy attracts foreign investments, fostering the development of financial services and encouraging multinational companies to establish regional headquarters

Keywords: Regional hub, Istanbul Finance Center, strategic location, logistics hub, service hub.

JEL Codes: F10, F18, M20

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TOWARDS BETTER IT GOVERNANCE: A COMPREHENSIVE IT INTERNAL CONTROL MODEL FOR INFORMATION TECHNOLOGY FIRMS

DOI: 10.17261/Pressacademia.2023.1867
PAP- V.18-2023(25)-p.99-100

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To cite this document

Gulesin, Z. (2023). Towards better IT governance: A comprehensive IT internal control model for information technology firms. PressAcademia Procedia (PAP), V.18, 99-100.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1867>

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ABSTRACT

Purpose- The primary objective of this study is to enhance IT governance within the information technology sector by developing a comprehensive IT Internal Control Model. This model is designed to address the unique and evolving challenges in IT internal control processes, providing a structured approach to risk optimization, resource optimization, and benefit management. By introducing this model, the study aims to offer IT firms a robust internal control model that can be adapted to their specific operational needs, promoting a more effective, efficient, and resilient IT governance structure.

Methodology- A thorough literature review, incorporating a wide array of international sources, forms the foundation of this study. The research involved designing an IT Internal Control Model, informed by the processes observed at THY Technology. This model was then applied across 12 distinct operational processes, and feedback from stakeholders was systematically gathered through surveys to evaluate its practicality and impact.

Findings- The feedback from stakeholders was predominantly positive, underscoring the model's efficacy in bolstering IT governance. The model was praised for its thoroughness and adaptability, successfully addressing a broad spectrum of IT internal control issues while remaining flexible enough to be tailored to various IT environments.

Conclusion- This study highlights the importance of dynamic and adaptable IT internal control model in the fast-paced technology sector. The developed IT Internal Control Model opens new avenues for research into effective governance practices and provides a valuable blueprint for IT firms seeking to enhance their governance and control mechanisms in a digitally-driven world.

Keywords: IT internal control model, internal control, IT governance, IT compliance, continuous improvement

JEL Codes: M15, M19, M42

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A REVIEW OF THE SHARES OF THE CENTRAL BANK FROM ITS CREATION UP TO THE SECOND WORLD WAR¹

DOI: 10.17261/Pressacademia.2022.1868

PAP- V.18-2023(26)-p.101-102

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To cite this document

Sayil, G.B., (2023). A review of the shares of the central bank from its creation up to the second world war. PressAcademia Procedia (PAP), V.18, 101-102.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1868>

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ABSTRACT

Purpose - The aim of this study is to observe the movements of the shares of the Central Bank of the Republic of Turkey during the foundation period and to estimate the events under the influence of these movements. An independent central bank is very important for countries to operate an independent monetary policy. In Turkey, the emphasis on "national banking" first came to the fore at the Izmir Economic Congress, and attempts were made to establish a central bank in 1927. In 1931, the Central Bank of the Republic of Turkey began its official activities. This was the most important step towards achieving economic independence in the Republic of Turkey and preserving the value of the Turkish Lira. This study examines the performance of central bank stocks over this period.

Methodology-The data set consists of 1674 observations including daily closing prices for the period 04.01.1934-31.12.1939. The data were obtained from the La Bourse newspaper and the Cumhuriyet newspaper archive was used as a news source. First, the breaks in stock prices over this period are analysed using the Bai-perron test. The Eviews 12 program was used for this purpose. The second step is to examine whether there is a day-of-week effect in stock prices over the period in question. For this purpose, returns were calculated. The non-parametric Man-Whitney U test in SPSS 15 was used to test whether there was a significant difference between these returns on a daily basis.

Findings- The results of the Bai-Perron structural break test showed that two breaks occurred on 01/08/1936 and 06/07/1938. Short and long-term increases in the value of the Central Bank shares were observed on these dates, which coincided with the achievement of the Montreux Convention and the victory of the National Army in Hatay. Moreover, these dates indicate risks associated with global conflict.

During the second step, the compound return for share prices in the period of 1934-1939 was calculated, revealing the absence of any day-of-week effect. In other words, the results of the Man-Whitney U test show that there is no statistically significant difference between the groups.

Conclusion- The Montreux Convention and the independence of Hatay, achieved during this period, had a positive impact on the stock, as the findings suggest. Furthermore, global war risks had a positive impact on the bank's shares. These results can be explained by the fact that the higher the risk, the more confidence is placed in the "national" bank. Finally, the shares of the Central Bank, symbolising the economic independence of the newly established Republic of Turkey, are relatively less sensitive and have low anomalies. This result is in line with expectations, given that financial markets are still under developed.

Keywords: Turkiye, banking, national banking, central bank.

JEL Codes: B41, E58, G21.

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¹ The research was conducted as part of project number 121G200, which was funded by TUBITAK under the 3005 programme.

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HANDLING MISSING VALUES IN MIXED PANEL FINANCIAL DATA: A COMPARISON OF DIFFERENT TECHNIQUES

DOI: 10.17261/Pressacademia.2023.1869

PAP- V.18-2023(27)-p.103-104

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To cite this document

Ekinci, C., Hakkoz, M.A., Kiran, U., Seker, S., (2023). Handling missing values in mixed panel data: a comparison of different techniques. PressAcademia Procedia (PAP), V.18, 103-104.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1869>

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ABSTRACT

Purpose- The purpose of this study is to compare the success of alternative data imputation techniques with missing data. The study distinguishes itself from the rest of the literature by proposing an appropriate technique for mixed data on financial performance and environmental, social and governance (ESG) metrics of companies. In addition to simple imputation techniques, we also use machine learning techniques that allow working with more complex data.

Methodology- We first employ ad-hoc methods such as mean, median, mode, constant, most frequent and regression imputation. In what follows, we handle multivariate imputation techniques such as multiple imputation by chained equations (MICE). Finally, we run imputation methods with machine learning (ML) classification such as K-nearest Neighbor (KNN), Ridge and Random Forest. To consider the assumptions of missing data, we first check the normality of the variables with Kolmogorov-Smirnov test and employ Rubin's classification technique that defines the relationship among variables with the probability of missing data. The success of imputation techniques applied to missing data changes when the missing data are classified with Rubin's technique according to randomness. Consequently, we apply listwise deletion at various levels and alternative data imputation techniques. We then compare their performances. The raw data contain parametric as well as categorical variables (binary and others). Among these are time-series (yearly) financial series such as sales and total assets obtained from financial statements, ESG scores as well as float ratios for firms from several countries and industries. Imputation is done randomly on a sample varying from 5% to 30% of the dataset and results are compared to true data based on accuracy or other measures such as root mean square errors (RMSE) or mean absolute percentage error (MAPE). Several robustness checks have been performed to supplement the analysis.

Findings- Results show that ML methods such as KNN have a superior performance than others. Moreover, when multidimensional nature of the data is taken into account, the prediction performance improves. Hence, an optimality can be reached based on parameters.

Conclusion- Based upon the analysis, we conclude that the selected imputation technique and how it is employed matter to attain a higher accuracy and a better prediction of the missing values on selected mixed panel data in finance.

Keywords: Imputation techniques, Panel data, Machine learning, Financial performance, ESG

JEL Codes: C55, C81, M14, Q51

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TRADING BEHAVIOR BY FOREIGN AND DOMESTIC INVESTORS

DOI: 10.17261/Pressacademia.2023.1870

PAP- V.18-2023(28)-p.105-106

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To cite this document

Sahin, B.C., (2023). Trading behavior by foreign and domestic investors. PressAcademia Procedia (PAP), V.18, 105-106.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1870>

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ABSTRACT

Purpose- Momentum, a well-known anomaly in financial markets, has garnered considerable attention from both academicians and market participants due to its implications for the market efficiency hypothesis and investment plans of investors. While momentum trading can yield excess returns, it is not a possible strategy for all investors because if one segment of investors employs a momentum trading strategy to profit from their trades, it requires another type of investor to take the opposite position to clear the market.

Methodology- I investigate the momentum trading behavior of investors in different segments of Borsa İstanbul. Specifically, I focus on the momentum trading behavior among local and foreign investors and private and institutional investors.

Findings- The results show that foreign investors' stock holdings are positively associated with past returns inferring momentum trading while domestic investors are contrarians. Further analysis of domestic investors' investing strategies reveals that the contrarian trading of domestic investors is mainly driven by individual investors.

Conclusion- The results show that foreign investors' stock holdings are positively associated with past returns inferring momentum trading while domestic investors are contrarians. Also, the contrarian trading of domestic investors is mainly driven by individual investors.

Keywords: Momentum trading, investor behavior, foreign investor, domestic investor, panel data

JEL Codes: G40, G11, G14

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MAPPING THE INTELLECTUAL STRUCTURE AND EVOLUTION OF INFORMATION TECHNOLOGY AND AUDITING: A BIBLIOMETRIC REVIEW

DOI: 10.17261/Pressacademia.2023.1871

PAP- V.18-2023(29)-p.107-108

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To cite this document

Calderon, E. P., Alrahamneh S. A., (2023). Mapping the intellectual structure and evolution of information technology and auditing: a bibliometric review. PressAcademia Procedia (PAP), V.18, 107-108.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1871>

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ABSTRACT

Purpose- The goal of this study is to conduct a bibliometric analysis of papers relevant to information technology (IT) and auditing that were published in the Web of Science Core Collection database between 1978 and 2022.

Methodology- This study does a bibliometric analysis of 2991 audit and information technology publications from a pool of 7738. It works in two steps: descriptive performance metrics and co-word analysis. The descriptive metrics include publishing patterns, productive nations and authors, effect on certain areas and journals, number of citations by country, and publications with the highest citations. The co-occurrence analysis maps the ties between concepts by utilizing social network analysis methods to investigate the field's interconnections.

Findings- This study identifies six major trends in IT and auditing: increased technology use in internal auditing, the demand for information security expertise, transparency in the digital age, technology for ethical auditing, cloud-based auditing with blockchain, and post-COVID IT continuous auditing standards. These trends highlight the need for auditors to adapt to evolving technology and ethical considerations, prioritizing data security and privacy. Additionally, the survey reveals key authors, publications, and countries in this field, offering valuable insights for industry leaders and potential research collaborations.

Conclusion- This study provides a complete overview of the topic of IT and auditing by integrating several methodological techniques. This study provides direction for future research in addition to offering significant insight into the main research trends, issues, and problems in this subject.

Keywords: Information technology, auditing, co-occurrence analysis, bibliometric analysis.

JEL Codes: M41, M42

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RESEARCH METHODOLOGY IN FINANCE

DOI: 10.17261/Pressacademia.2023.1872

PAP- V.18-2023(30)-p.109-110

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To cite this document

Benjana, H., Mesnaoui, O., Yamani, O., (2023). Research methodology in finance. PressAcademia Procedia (PAP), V.18, 109-110.

Permament link to this document: <http://doi.org/10.17261/Pressacademia.2023.1872>

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ABSTRACT

Purpose- Our research aims to explore the different philosophical and epistemological concepts and approaches in traditional finance and behavioral finance, based on the analysis of scientific articles. We aim to provide a comprehensive insight into the theoretical foundations that guide these two branches of finance, with particular emphasis on the epistemological and methodological nuances that distinguish them.

Methodology- Our research is based on a careful analysis of the relevant scientific literature in traditional and behavioural finance. By giving specific importance to epistemological aspects, we try to discover the paradigms of thought that influence the understanding and interpretation of financial phenomena within these two fields. Similarly, our meticulous examination of this research aims to identify the preferred methodological approaches.

Findings- The results of the analysis show that traditional and behavioural finance have different epistemological and methodological approaches. Most traditional financiers follow a quantitative research approach based on numerical data and a purely statistical analysis. However, behaviorists have opted for methodological triangulation, which further explains the combination of qualitative and quantitative approaches to achieve stronger results and that one can modify or complement the other. Behaviorists recognize the importance of cognitive and emotional biases in the decision-making process of individuals, leading to more holistic models and approaches. With regard to epistemology, most research in Finance on the positivist paradigm, on objectivity and on the relationship of cause and effect.

Conclusion- In conclusion, our study highlights the importance of developing research methodologies adapted to each discipline of management sciences, taking into account the specificities of each field. Moreover, the analysis of the scientific literature in traditional and behavioural finance shows that researchers must be aware of the different epistemological and methodological perspectives in order to conduct rigorous and valid research.

Keywords: Epistemology, methodology, management sciences, traditional finance, behavioural finance.

JEL Codes: B40, G10, G40

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REINFORCEMENT LEARNING IN INDIVIDUAL PENSION SYSTEM: THE CASE OF TURKEY

DOI: 10.17261/Pressacademia.2023.1873

PAP- V.18-2023(31)-p.111-112

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Dede, Y., Citci, S. H., Yanikkaya, H., (2023). Reinforcement learning in individual pension system: the case of Turkey. PressAcademia Procedia (PAP), V.18, 111-112.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1873>

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ABSTRACT

Purpose- How individuals make saving/investment decisions and they are subject to learning processes are important questions in economics. Behavioral economics and finance literature tell us that individuals can deviate from bayesian decisions and the personal experiences can be effective in decision making. "Reinforcement learning" provides a framework for individual investors who are weighing on strategies successful and avoid strategies unsuccessful in which they experience. In this study, we investigate the effect of past experiences on individuals' retirement savings/investment decisions and whether individual investors are reinforcement learner. For this purpose, we examine individual contracts in the annual micro panel dataset obtained from the Pension Monitoring Center in Individual Pension System in Turkey.

Methodology- Essentially, we assume that individuals' retirement saving/investment decisions are influenced by returns and variances (represents the risk level) of their available portfolio as well as their time horizon, spending habits, retirement goals, risk tolerance and demographic characteristics. In this context, we estimate a linear model by including returns and variances in order to investigate how much sensitive individual investors are to returns and variances of their portfolio. Moreover, we add lagged returns and variances to our econometric setup to examine whether they are reinforcement learner. After that, we conduct a before-after analysis by looking at the dataset from 3-year window to analyze the impact of the 2013 state subsidy reform on reinforcement learning of individual investors.

Findings- Similar to individuals' age, gender and education level, portfolio returns and variances also have a statistically significant effect on the contributions paid. Increases in portfolio returns affect the contributions paid positively, while increases in portfolio variance affect it negatively. As an indicator of reinforcement learning, respectively, lagged returns and variances have a significant positive and negative effect like the same year returns and variances of individual investors. According to this result, individual investors weigh on successful strategies and avoid unsuccessful strategies they have experienced. Increases in variances and lagged variances of individuals' portfolios have a larger negative effect compared to returns. Additionally, looking at the 3-year window, we report that the reinforcement learning of individual investors has strengthened after the 2013 state subsidy reform.

Conclusion- We show that individual investors in IPS in Turkey exhibit reinforcement learning when making retirement savings/investment decisions. High return or low variance obtained in previous periods causes individuals to pay more contributions paid in the next period. This result reveals that individuals benefit from their past experiences when making logical and optimized decisions based on their available knowledge and expectations. The 25% state subsidy in 2013 caused individual portfolio returns to increase and variances to decrease. With these effects, we report that reinforcement learning has become stronger after 2013.

Keywords: Reinforcement learning, decision-making, pension savings, personal finance, retirement policies**JEL Codes:** D80, D70, H3, D14, J26**REFERENCES**

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EMPIRICAL INVESTIGATION INTO THE INTEGRATION OF CLOUD-BASED ARTIFICIAL INTELLIGENCE IN AUDITING

DOI: 10.17261/Pressacademia.2023.1874

PAP- V.18-2023(32)-p.113-114

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To cite this document

Huson, Y.A.A., García, L.S., Benau, M.A.G., Aljawarneh, N.M., (2023). Empirical investigation into the integration of cloud-based artificial intelligence in auditing. *PressAcademia Procedia (PAP)*, V.18, 113-114.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1874>

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ABSTRACT

Purpose- The increasing prevalence of cloud computing and the rapid proliferation of artificial intelligence technologies have opened up novel prospects for enhancing auditing methodologies. This research aims to scrutinize the consequences of incorporating cloud-based artificial intelligence (CBAI) in auditing, focusing on its implications for audit clients, auditors, and the overall audit process.

Methodology- A method of quantitative research was utilized in this study, where 322 questionnaires were distributed to external auditors in Jordan. The objective was to collect information on the potential enhancements brought about by cloud-based artificial intelligence in the auditing field. The study employed convenience random sampling, a technique involving the collection of data from readily available members of the population, which, in this context, refers to external audit offices in Jordan. Jordan has a total of 454 audit offices with a diverse range of auditors, including partner-owner auditors, assistant auditors, and certified auditors. The analysis of the gathered data was conducted using SmartPLS software, which employs structural equation modeling (SEM).

Findings- The study's outcomes reveal the potential for cost savings associated with the adoption of CBAI, as well as the streamlining of audit procedures and the enhancement of overall efficiency. Moreover, the research observes the transformation of auditors' roles, with a shift towards a greater focus on analytical and advisory responsibilities, departing from traditional manual tasks. These findings underscore the potential advantages for audit clients, auditors, and the audit process, underscoring the significance of embracing these technologies to advance the auditing profession in the digital age.

Conclusion- The study investigates how CBAI influences audit quality and efficiency through a thorough examination of data sourced from a sample of external auditors operating within the context of Jordan. Additionally, it delves into the significant advancements that CBAI can introduce to the auditing field, encompassing its potential for data storage and analysis, the improvement of communication between auditors and clients, the adoption of innovative audit techniques, and the shift from manual to digital auditing methodologies.

Keywords: Cloud-based artificial intelligence, Auditing, Auditors, Cloud computing, Artificial Intelligence, Audit quality.

JEL Codes: O30, O33, O35

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SHARI-AH CONVERGENCE AND STOCK PORTFOLIO RETURNS: A FIELD STUDY

DOI: 10.17261/Pressacademia.2023.1875

PAP- V.18-2023(33)-p.115-116

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To cite this document

Parlak, D. (2023). Shari-ah convergence and stock portfolio returns: a field study. PressAcademia Procedia (PAP), V.18, 115-116.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1875>

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ABSTRACT

Purpose- The aim of this study is to develop a Shari-ah compliance index that measures the degree of convergence to Islamic rules and to examine the relationship between the developed Shari-ah compliance index and the performance of stock portfolios consisted of the shares of the companies in the dataset.

Methodology- Shari-ah compliance criteria was determined after an analysis of the existing literature and the practices of multinational financial institutions. In current practices, Shari-ah compliance is assessed in two stages; in the first stage, companies operating in industries that do not comply with Islamic rules are identified, and in the second stage, Shari-ah compliance is determined with the calculation of certain ratios. In this study, in line with current practices, companies engaged in entertainment, media (except newspapers), conventional finance, gambling, hotel-restaurant-bar management, pork products, cigarettes, weapons and defence, gold and silver trading industries were marked as non-compliant. For the second stage of Shari-ah compliance assessment, there are significant differences in the ratios applied by financial institutions; in the context of this study two ratios measuring indebtedness level (total liabilities/total assets and interest-bearing liabilities/total assets), one ratio measuring liquidity level (the ratio of the sum of cash and financial investments to total assets). and two ratios measuring income compliance level (the ratio of the sum of interest-earning cash and financial investments to total assets and the ratio of financial income to total income) were employed. The variable weights were assessed with IDOCRIW multi-criteria decision-making technique. The dataset consisted of stock exchange listed 1,235 manufacturing, service and technology industry companies located in 10 different Islamic countries (Bahrain, Bangladesh, Jordan, Kuwait, Malaysia, Oman, Pakistan, Qatar, Turkiye, and the United Arab Emirates) that have adopted the international financial reporting standards. The Sharia-ah compliance ratios were calculated for five years between 2017 and 2021 by using financial statement data and food notes obtained from stock exchanges and/or company websites.

Findings- To construct stock portfolios, companies were divided into nine groups according to their degree of compliance for each year for which the Shari-ah compliance index is calculated. The first group included companies with a compliance degree between 90% and 100%, and the last group included companies with a compliance degree between 0% and 50%. 10-year adjusted monthly stock returns of all companies for the 2013-2022 period were obtained from the investing.com website. For each of the five years and for all nine groups, stock portfolio weights were calculated with minimum variance technique developed by Markowitz by using the past five years adjusted stock returns; yearly portfolio returns were computed by applying the calculated stock weights. When five-year portfolio returns are analyzed, the portfolio composed of 0-50% Shari-ah compliant stocks is third in return ranking. Among the remaining eight portfolios four portfolios composed of stocks with Shari-ah compliance degree above 75% take the first four rankings. The return difference is statistically significant at 5% confidence level.

Conclusion- Although the threshold values applied for Shari-ah compliance varies among institutions, the generally accepted level is 70%. The findings of the study show that in Islamic geography, portfolios consisting of stocks of companies that keep the indebtedness, liquidity and non-compliant income levels below the threshold accepted by Sharia rules have higher performance than others. A possible explanation of the findings is the demand of Islam conscious investors.

Keywords: Sharia-ah convergence, multi-criteria decision-making techniques, minimum variance technique, indebtedness, liquidity

JEL Codes: G31, G32, G12

ŞERİAT UYUMU VE HİSSE SENEDİ PORTFÖY GETİRİSİ: BİR SAHA ÇALIŞMASI

ÖZET

Amaç- Bu çalışmanın amacı nüfusunun çoğunluğu İslam dinine mensup ülkelerde yerleşik şirketlerin İslami kurallara uyum derecesini ölçen bir şeriat uyum endeksi oluşturmak ve hisse senetlerinden oluşan portföylerin performansı ile şeriat uyum endeksi arasındaki ilişkiyi incelemektir.

Yöntem- Bu amaca yönelik olarak mevcut literatür ve çok uluslu finans kuruluşlarının uygulamaları incelenerek Şeriat uyum düzeyini belirleyen kriterler saptanmıştır. Mevcut uygulamalarda şeriat uyumu iki aşamada belirlenmekte olup ilk aşamada İslami kurallara uygun olmayan sektörlerde faaliyet gösteren şirketler ayrıştırılmakta ikinci aşamada ise birtakım değişkenlerle şeriat uyumu belirlenmektedir. Bu çalışma kapsamında mevcut uygulamalar ile paralel olarak eğlence, medya (gazete hariç), konvansiyonel finans, şans oyunları, otel-restoran-bar işletmeciliği, domuz ürünleri imalatı, sigara, silah ve savunma, altın ve gümüş ticareti ile iştigal eden firmaların şeriat uyumu 0% olarak belirlenmiştir. Bu kapsamın dışında kalan firmalara uygulanan değişkenler finans kuruluşu temelinde farklılık göstermekte olup bu çalışmada kullanılan değişkenler borçluluk düzeyini ölçen iki oran (toplam yükümlülükler/toplam varlıklar ve faizli yükümlülükler/toplam varlıklar, likidite düzeyini ölçen bir oran (nakit ile finansal yatırım toplamının toplam varlıklara oranı) ve gelir uyumunu ölçen iki orandan (faiz kazandıran nakit ve finansal yatırım toplamının toplam varlıklara oranı ile, finansal gelirlerin toplam gelirlere oranı) oluşmaktadır. Şeriat uyumu endeksi oluşturmada kullanılacak ağırlıklar çok kriterli karar verme tekniği olan IDOCRIW yöntemi ile belirlenmiştir. Veriseti muhasebe uygulaması olarak uluslararası finansal raporlama sistemini benimsemiş 10 farklı İslam ülkesinde (Bahreyn, Bangladeş, Ürdün, Kuveyt, Malezya, Umman, Pakistan, Katar, Türkiye ve Birleşik Arap Emirlikleri) yerleşik ve ilgili ülke borsasına kote 1,235 sanayi, hizmet ve teknoloji sektörü şirketinden oluşmaktadır. Bu şirketlerin şeriat uyum oranları 2017-2021 dönemini kapsayan beş yıllık finansal tablo ve dipnotlarında elde edilen veriler kullanılarak hesaplanmıştır. İlgili tablolara ülkenin borsasının ve/veya ilgili şirketin web sitesinden ulaşılmıştır.

Bulgular- Hisse senetlerinden oluşan portföylerin oluşturulması amacı ile şeriat uyum endeksi hesaplanan her yıl için şirketler uyum derecelerine göre dokuz gruba ayrılmıştır. Birinci grupta uyum derecesi %90-%100 aralığında bulunan şirketler, son grupta ise uyum derecesi 0%-50% aralığında bulunan şirketler yer almaktadır. Tüm şirketlerin 2013-2022 dönemine ait 10 senelik düzeltilmiş aylık hisse senedi getirileri investing.com web sitesinden elde edilmiştir. Şeriat uyumu hesaplanan her yıl ve şeriat uyumuna göre belirlenen dokuz grup için geçmiş beş yılın hisse getiri verileri dikkate alınarak Markowitz tarafından geliştirilen minimum varyans tekniği ile hisselerin portföy ağırlıkları ve bu portföy ağırlıkları kullanılarak aylık ve yıllık portföy getirileri hesaplanmıştır. Beş yıllık getiriler incelendiğinde, Şeriat uyum derecesi %0-%50 arasında bulunan ve içerisinde şeriat kuralları ile uyumsuz iş kollarında faaliyet gösteren şirketlerin de bulunduğu portföy getiri sıralamasında üçüncüdür. Bu portföy dışında bırakıldığında diğer 8 portföy içerisinde şeriat uyum derecesi %75'in üzerinde olan şirketlerin hisse senetlerinden oluşan portföylerin diğerlerine göre daha yüksek getiri sağladığı görülmektedir. Getiri farkları %5 güven seviyesinde istatistik olarak anlamlıdır.

Sonuç- Şeriat uyumu için kabul edilen eşik değer kurumlar arasında farklılık göstermek ile birlikte büyük çoğunluk tarafından %70 olarak uygulanmaktadır. Bulgular İslam coğrafyasında borçluluk, likidite ve kabul gören gelir düzeyini Şeriat kurallarının kabul ettiği eşik değerinin altında tutan şirketlerin hisse senetlerinden oluşan portföylerin diğerlerine göre daha yüksek performans gösterdiği yönündedir. Bu bulguyu İslami kurallara bağlı yatırımcılardan gelen talep ile açıklamak mümkündür.

Anahtar Kelimeler: Şeriat uyumu, çok-kriterli karar verme teknikleri, minimum varyans tekniği, borçluluk, likidite

JEL Kodları: G31, G32, G12

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FINANCIAL LITERACY PRACTICES OF PUBLIC INSTITUTIONS: THE CASE OF TURKIYE

DOI: 10.17261/Pressacademia.2023.1876

PAP- V.18-2023(34)-p.117-118

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To cite this document

Tura, U., (2023). Financial literacy practices of public institutions: the case of Türkiye. PressAcademia Procedia (PAP), V.18, 117-118.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1876>

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ABSTRACT

Purpose- In today's world, where changes and transformations occur rapidly, we see new developments in the field of finance every day. Therefore, the importance of Financial Literacy has increased considerably today and it has started to take a large place in the strategies and development plans prepared by countries. The aim of this study is to investigate what kind of work is carried out by public institutions in Turkey in order to increase the financial literacy of the society and to raise financial awareness in the society.

Methodology- In this study, document analysis, one of the qualitative research methods, was used to investigate what kind of studies were carried out by public institutions in Turkey on Financial Literacy.

Findings- When academic studies conducted in the context of Financial Literacy are examined, it is seen that the financial literacy level of the society in Turkey is quite low, except for some basic financial concepts. When the education curriculum prepared by the Ministry of National Education of the Republic of Turkey is examined, it is seen that some financial issues are actually taught to all students from an early age.

Conclusion- Especially in recent years, it is seen that institutions such as the Ministry of National Education, the Ministry of Treasury and Finance, the Ministry of Family and Social Policies, the Capital Markets Board, the Banking Regulation and Supervision Agency, the Central Bank of the Republic of Turkey and the Turkish Capital Markets Association have been working intensively in order to strengthen the financial awareness of the society.

Keywords: Financial literacy, financial knowledge, financial behaviour

JEL Codes: G53, I25, G51,

KAMU KURUMLARININ FİNANSAL OKURYAZARLIK UYGULAMALARI: TÜRKİYE ÖRNEĞİ

ÖZET

Amaç- Değişim ve dönüşümlerin hızla yaşandığı günümüz dünyasında finans alanında da her geçen gün yeni gelişmelerin yaşandığını görmekteyiz. Dolayısıyla Finansal Okuryazarlığın önemi günümüzde oldukça artmış ve ülkeler tarafından hazırlanan strateji ve kalkınma planlarında geniş bir yer tutmaya başlamıştır. Bu çalışmanın amacı toplumun Finansal okuryazarlığını artırmak ve topluma Finansal farkındalık kazandırmak amacıyla Türkiye’de kamu kurumları tarafından ne gibi çalışmaların yapıldığı araştırılmaktadır.

Yöntem- Bu çalışmada Finansal Okuryazarlık konusunda Türkiye’de kamu kurumları tarafından ne gibi çalışmaların yapıldığını araştırabilmek için nitel araştırma yöntemlerinden döküman analizi kullanılmıştır.

Bulgular- Finansal Okuryazarlık bağlamında yapılan akademik çalışmalar incelendiğinde Türkiye’de toplumun bazı temel Finansal kavramlar dışında Finansal Okuryazarlık düzeyinin oldukça düşük olduğu görülmektedir. Türkiye Cumhuriyeti Milli Eğitim Bakanlığı tarafından hazırlanan eğitim müfredatı incelendiğinde bazı finansal konuların aslında tüm öğrencilere küçük yaşlardan itibaren öğretildiği görülmektedir.

Sonuç- Özellikle son yıllarda toplumun Finansal farkındalığının güçlendirilmesi amacıyla Milli Eğitim Bakanlığı, Hazine ve Maliye Bakanlığı, Aile ve Sosyal Politikalar Bakanlığı, Sermaye Piyasası Kurulu, Bankacılık Düzenleme ve Denetleme Kurumu, Türkiye Cumhuriyet Merkez Bankası ve Türkiye Sermaye Piyasaları Birliği gibi kurumların yoğun çalışmalar yaptığı görülmektedir.

Anahtar Kelimeler: Finansal okuryazarlık, finansal bilgi, finansal davranış

JEL Kodları: G53, I25, G51,

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MONETARY MOMENTUM AND RISK MANAGEMENT IN STOCK MARKET

DOI: 10.17261/Pressacademia.2023.1877

PAP- V.18-2023(35)-p.119-120

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To cite this document

Kilic, E., Sonmezer, S., (2023). Monetary momentum and risk management in stock market. PressAcademia Procedia (PAP), V.18, 119-120.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1877>

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ABSTRACT

Purpose- This study aims to investigate the relationship between monetary interest rate decisions, liquidity mechanisms and risk management issues. As a core interest the significance of a structural change in the data around the FOMC meetings is analyzed. By the help of continuous time models we analyze the kind of dynamics, which can be observed in the stock returns, i.e. conditional volatilities and jumps. A further central interest is given to investment decisions and risk management issues. This encompasses the elaboration of the hedging strategies to achieve higher performance.

Methodology- The study employs GARCH-Ito and GARCH-Ito-Jump models to analyze the stock market returns and their related volatilities on the day of a FED interest decision announcement. The continuous time GARCH model setting allows to model stock market returns with a high flexibility, therefore these models are able to capture jump dynamics in the stock returns.

Findings- The analysis reveals that persistence in conditional volatilities change according to alternative stocks. These stocks can be classified according to alternative market capitalization sizes. Mega market capitalization stocks are better governed by no jump GARCH-Ito models regardless the monetary policy changes, that is, changes in interest rates or not.

Conclusion- Based upon the analysis, it may be concluded that risk management applications effectively might perform under the consideration of stock types in terms of market sizes. The persistence in the conditional volatility massively decreases if a jump component is introduced into the model. Since most of the mega market cap stocks perform better without a jump part component, it might be conjectured that persistence in the conditional volatility for mega cap stocks play a more important role compared to large cap stocks. Regardless the case whether there is an interest rate change or not, the persistence in conditional volatility remains in mega cap stocks, and thus, these stocks are prone to the involvement of prices jumps.

Keywords: Monetary policy, risk management, jump detection, investment decisions

JEL Codes: C22, E49, G11

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FACTORS IMPACTING THE PRICE OF THE GOLD: AN EMPIRICAL STUDY OF EGARCH MODEL

DOI: 10.17261/Pressacademia.2023.1878

PAP- V.18-2023(36)-p.121-129

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To cite this document

Cankaya, S., Konuklar, M., (2023). Factors impacting the price of the gold: an empirical study of EGARCH model. PressAcademia Procedia (PAP), V.18, 121-129.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1878>

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ABSTRACT

Purpose- The gold as a fundamental asset has been displaying a high and sharp price volatility in international financial markets. The price dynamics of gold are believed to be influenced by non-linear dependencies with stock market indices, exchange rates, and commodity prices. Therefore, it is rational to examine the factors contributing to the non linear inferences. As a financial asset for the portfolio investment and hedging, gold prices display multilateral and dynamic data patterns this study aims to focus the analysis of price volatility which will contribute to the volatility structure, persistence, and correlated behaviors of gold prices.

Methodology- To display and analyze the persistence level of volatility in the financial markets, a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) specification is employed. GARCH class models are further applied to determine the relevance of the leverage effect of market news, the progress of spillover pattern, and the effects on the risk-premium.

Findings- Volatility in gold price has become an important feature of the financial markets in terms of volatility trading in adjusting the international portfolio investments. The correlated structure of the financial markets and the contagion effects of the news have displayed the asymmetric and complex but time-fragmented portfolio returns in terms of short and long term volatility formation and forecasting.

Conclusion- Since gold's safe haven status have played a major stake in the determination of the gold price, it is undeniable that the speculators' rising power, the artificial intelligence utilisation in robo-trading, global and regional geo-political tensions, the recent developments in the risk sentiment in investment portfolios have an increasing amount of influence on gold prices.

Keywords: Gold returns, US Dollar Index, exponential generalized autoregressive conditional heteroskedasticity, volatility persistence.

JEL Codes: C58, G12, C22, G17

1. INTRODUCTION

Throughout history, various societies, nations, empires, and states have aimed to accumulate gold due to cultural, economic, and financial motives. Gold is one of the major investment options due to its unique set of characteristics, including being an efficient convertible money as a store and source of value. Historically, it has been used to exchange/pay for resources and as a safe haven financial instrument in times of war or political turmoil.

In the 16th century, the discovery of South America led to the first flood of "new" gold supply into Spain and Europe as a result of the conquistadores dominating this huge gold supply. This accumulation of gold deposits led to an enormous fall in the price of gold at that time.

On the other hand, the availability of reachable gold supply caused significant factors on the price formation. Briefly, the Gold Standard is a monetary system in which a nation's currency is pegged to the value of gold. In the gold standard system, a given amount of paper money can be converted into a fixed amount of gold. The system is based upon the discretionary decisions of the monetary authorities who are not able to increase the amount of paper money in circulation without increasing the equivalent reserves of gold.

In historical perspectives, by the late 1800s until the 1930s, most countries in the world (led by the United States and the United Kingdom) applied an equilateral gold standard. However, the Great Depression in the 1930s caused some countries to abandon the Gold Standard, which brought about an increase in their monetary base and artificially reflat their markets. Physical supply availability is not the only significant factor in the valuation of gold to a higher level.

Gold has unique properties that distinguish it from copper and other metals in terms of corrosion. These properties make gold a prominent store of value, as it holds its value well over time. In 1971 (the end of the Bretton Woods System), the United States unilaterally terminated convertibility of the US dollar to gold, which was a pivotal policy action in terms of monetary imposition. As a result, the US dollar, as a fiat

currency, dominated the global market and trade actions, leading to the free floating of major currencies such as the British Pound Sterling, Deutsche Mark, and Japanese Yen.

These global monetary policy actions strengthened gold's negative correlation to the US dollar and fortified gold as a financial instrument for storing value in portfolio investment dynamics, in line with increasing gold price volatility features. Recently, gold has been traded on seven major official and regulated markets, including the London OTC market, COMEX (New York), the three Shanghai Exchanges, TOCOM (Tokyo), MCX (India), Dubai, and Istanbul. In terms of turnover, the two major markets for gold are the London OTC market and New York (COMEX).

The impact of the gold price should be examined in the context of seven primary interrelated global factors:

- (1) Its relative value compared to other major currencies.
- (2) The expected and realized level of global inflation.
- (3) Global interest rates.
- (4) The vitality of consumer spending and income growth.
- (5) Market-related risks such as concentration or portfolio disposition.
- (6) Short-term investment flows.
- (7) Supply-related factors.

Systemic market disruptions and price anomalies in line with tail risks have a clear influence on the price of gold, as financial crises lead corporate and individual investors to flight to high-quality assets in terms of investors portfolio decisions and liquidity preferences via considering the transformation and preserving the wealth.

Financial crises can have a negative impact on investors' net wealth through portfolio investments, which is often exacerbated by market momentum. However, gold is a liquid and significant financial underlying asset that can partially mitigate losses in portfolio net asset value due to diversification.

To display and analyze the persistence level of volatility in the financial markets, a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) specification is employed. GARCH class models are further applied to determine the relevance of the leverage effect of market news, the progress of spillover pattern, and the effects on the risk-premium.

The objective of this study is to examine and assess the dynamics of volatility estimation on the price of gold for the most common factors. Finally, several GARCH models are used to analyze dynamic modeling and forecasting of gold price volatility. These models, which take asymmetry and long-range dependence into account, allow for the examination of different characteristics of gold price dynamics.

We conducted a study that analyzed four hypotheses. The first hypothesis suggests that the daily return of the gold price is negatively correlated with the daily differences of the Japanese Yen vs US Dollar. The second hypothesis proposes that the daily return of the gold price is negatively correlated with the daily differences of the trade-weighted US Dollar Index, indicating an adverse relationship between the US-denominated gold price and the US Dollar.

The third hypothesis suggests that the daily return of the gold price is negatively correlated with the daily differences of the US 10 Year Treasury rates, indicating an indirect burden of US Dollar interest rate in regard to investors' expectations for future prospects of the global and the US market dynamics. Finally, the fourth hypothesis suggests that the daily return of the gold price is positively correlated with the daily differences of the US Dollar-denominated price of copper, silver, and crude oil.

Our study revealed the effects of the inverted asymmetry and long-range dependence in the conditional volatility process of the gold market. The empirical results showed different forecast error measures, indicating the superior out-of-sample performance for the EGARCH model. Our results provide guidance measures for corporate investors and portfolio managers to optimize and diversify their portfolio risks regarding the international financial asset dynamics.

The remaining sections of the study are as follows: Section 2 presents the literature review. Section 3 describes the nature of the data and methodology for GARCH models. Section 4 portrays the fundamental data findings with the empirical results, and finally, Section 5 concludes the paper.

2. LITERATURE REVIEW

This section aims to examine the literature related to gold prices as an investment asset and contextualize the papers in this study. The global financial crisis of 2007-2009 caused major and emerging markets to experience sharp and historical declines with a simultaneous spillover effect. As a result, the financial markets tend to co-move simultaneously, even though perfect market integration between international markets does not exist completely. Investors tend to readjust their portfolio compositions and relative weight structures away from equities into safer investments such as gold. Therefore, understanding the channels of shock transmission from one market to another is crucial for volatility forecasting in terms of safe haven focused portfolio management.

For instance, Goodman (1956) examined whether the officially set price of gold should be raised to increase international liquidity. Busschau (1949) considered a decrease in the value of all currencies relative to gold that originated from the degree of illiquidity in the international banking position arising from too low a relation of gold to paper money. Johnson (1950), on the other hand, proposed that the reasons for officially adjusting the price of gold were stemmed from issues around macroeconomic variables, such as trade imbalances and wages. Roger C. Van Tassel (1981) has shown that in the long run, the price of gold will go up in real terms. Empirical results have shown that the percentage increase in the gold price will be greater than the percentage fall in the dollar's value.

Hillier et al. (2006) discovered that precious metals, including gold, platinum, and silver, have hedging capabilities, particularly during periods of abnormal stock market fluctuations. They analyzed data from 1976 to 2004 and found that precious metals have low correlations with stock index returns. The authors suggest that commodity metals may provide diversification within broad investment portfolios. They conclude that financial portfolios containing precious metals perform significantly better than standard equity portfolios. The authors proposed two strategies to examine portfolio efficiency: a buy-and-hold strategy and a switching strategy with portfolio efficiency measured as the relative reward-to-risk ratio. Empirical results indicate that in a passive buy-and-hold strategy, the switching strategy for gold, silver, and platinum does not provide significant efficiency gains.

Capie et al. (2005) evaluated the extent to which gold has acted as an exchange rate hedge by analyzing weekly data for the gold price and sterling-dollar and yen-dollar exchange rates. They found a negative and inelastic relationship between gold and these exchange rates, but the strength of this relationship has shifted over time. While gold has served as a hedge against fluctuations in the foreign exchange value of the US dollar, it has only done so to a degree that seems highly dependent on unpredictable political attitudes and events. In brief, empirical results indicate that when the dollar is losing value, investors might exchange their dollars for gold, raising the price of gold on average.

Mark Joy and his colleagues conducted a study on the correlation between dollar pairs and 16 currencies from 1986 to 2008. They used a dynamic model of conditional correlations in which all variables were treated symmetrically. Their findings suggest that gold has acted as a hedge against the US dollar for the past 23 years. Additionally, gold has increasingly acted as an effective hedge against currency risk associated with the US dollar. Similar findings of gold as a potentially useful hedge for currencies are reported in Reboredo and Rivera-Castro (2014), Yang and Hamori (2013), who also examined the safe haven properties of gold for currencies.

While an asset may be a hedge to provide protection under normal market conditions on average, the hedge characteristics may disappear in times of extreme market conditions. The protective feature of gold to investors in times of panic or extreme market stress is widely known.

Gold is predicted to lead both silver and platinum prices as it is seen here as more widely held and visible for investors. Its price changes are assumed to spillover onto the other precious metals.

It has been frequently debated that the US Dollar is one of the significant, but not the primary driver of the gold price. The basis for this argument is that gold is traded primarily in dollars. A weaker US Dollar (as measured by the dollar's trade-weighted exchange rate) makes gold cheaper for other nations to purchase and increases their demand. This then drives up the price of gold, explaining their observed negative relationship.

Tully & Luceyh (2007) and Sjaastad (2008) have both found that the US Dollar is a significant factor in explaining gold price changes. Tully & Luceyh used an APGARCh model to show that the trade-weighted value of the US Dollar is a dominant factor in gold price changes. Sjaastad's study used longer and more recent data from 1991 to 2004 to show that the US Dollar is the most dominant currency, followed by the Japanese Yen.

Byers & Peel (2001) have studied the existence of long-term memory in volatility as a driver of volatility in gold. They found that gold has a long memory, which implies that shocks to the variance are long-lived. This is also the case for other assets they examined. Beckmann & Czudaj (2013) have questioned the relationship between the price of gold and its ability to hedge against inflation by reviewing inflation figures from major economies such as the USA, the UK, the Euro Area, and Japan. Li & Diao (2013) have examined the dynamics of gold pricing in the New York Gold Exchange using a dataset for global macroeconomic indicators regarding financial market indices, quantities, and prices of energy products. Their study found a negative correlation between financial market indices and macroeconomic indicators, indicating that the level of gold reserve and prices of energy products to gold is positive.

3. DATA AND METHODOLOGY

Our study is based on the examination of the volatility structure between the daily return of the gold price and the daily differences of some specific commodities, metals, exchange rates, US Treasury 10 Year rates and stock exchange indices indicated below. The data consists of daily observations of gold price per ounce (Gold Fixing Price 3:00 P.M. London time in London Bullion Market, based in U.S. Dollars), Japanese Yen vs USD, CME Copper Futures price, West Texas Intermediate Crude Oil price per barrel, Silver price per troy ounce in LBMA London fixing, S&P 500 stock exchange index, Trade Weighted U.S. Dollar Index (Broad, Goods, Jan 1997=100), 10-Year US Treasury Constant Maturity Rate regarding the period between January 17, 2008 – April 30, 2019.

The data analysed in this paper were sourced from FRED Economic Data platform (<https://research.stlouisfed.org/about.html>) provided by Federal Reserve Bank of St. Louis and Quandl (www.quandl.com). Data synchronization is provided to eliminate any problem arising out of missing data.

Table 1 : Composition the data Analysed

Ret_GOLD (LBMA)	Daily return of Gold Fixing Price (3:00 P.M. London), London Bullion Market, U.S. Dollars per ounce
DJPYUSD	Daily difference of the Japanese Yen to One U.S. Dollar, Not Seasonally Adjusted,
DSP500	Daily difference of the Standard's&Poors 500 Stock Exchange Index, USA
DCOPPER	Daily difference of the Continuous Contract #1. Non-adjusted price based on spot-month continuous contract calculations.
DUSTREAS	Daily difference of the 10-Year Treasury Constant Maturity Rate Percent, Not Seasonally Adjusted
DDTWEXB	Daily difference of the Trade Weighted U.S. Dollar Index(DTWEXB): Broad, Goods Index Jan 1997=100, Not Seasonally Adjusted
DSILVER	Daily difference of the Silver Futures, Continuous Contract #1. Non-adjusted price based on spot-month continuous contract calculations.
DWTI	Daily difference of the West Texas Intermediate, Cushing, Oklahoma US Dollars per barrel

Return: [(Variablet -Variablet-1)/ Variablet-1, Difference D(Variable): [(Variablet -Variablet-1)

Many financial time series display periods of low volatility followed by periods of high volatility called as volatility clustering. Autoregressive conditional heteroskedasticity (ARCH) model was developed by Engle in 2001 and aims to model and forecast the variance of financial and economic time series over time. ARCH models have been generalized to become the generalized ARCH (GARCH models). These models have become common tools for analysing with time series heteroskedastic models where it is providing a volatility measure that can be used in portfolio selection, risk analysis and derivative pricing.

A GARCH (1,1) model is the most effective and common feature in financial time series data. However, all ARCH and GARCH models have been expanded over the previous two decades to factor in the direction of returns, not just the magnitude (Engle, 2001).

They include, for example, the IGARCH model which allows for volatility shocks to be permanent, the TARARCH (threshold ARCH) and the EGARCH (exponential GARCH) which are asymmetric models which allow negative shocks to behave differently from positive shocks. It should be noted that EGARCH model solves the problem by its superior formation than the standard ARCH/GARCH models where symmetry is imposed on the conditional variance.

It is acknowledged that the coefficients of GARCH constant (α_0), ARCH (α_1) and GARCH (β_1) are significantly different from zero and are within the parametric restrictions. This implies greater impact of shocks (news) on market returns and presence of volatility clustering.

To classify the repercussions in general framework, in case of a large shock in a day leads to a large (conditional) variances the following day, indicating the impact of recent news on price changes. Again, the higher value of GARCH implies long memory of the model to the shocks.

$$h_t = \alpha_0 + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^p \beta_j h_{t-j} \quad \text{Eq.01}$$

where α_0 captures the long-run average volatility. The terms α and β are the ARCH and GARCH coefficients; q is the order of the moving average ARCH terms and p is the number of the autoregressive GARCH terms. Standard GARCH model does not allow to measure asymmetric behaviour of the volatility parameters. Being interested in classifying the outcomes how volatility responds to good and bad news, following Abhyankar (1998), it is fair to apply exponential GARCH (EGARCH) specification popularized by Nelson (1991). McKenzie emphasized that when data is non-normally distributed, the use of a squared power transformation "imposes a structure on the data which may potentially furnish sub-optimal modeling and forecasting performance relative to other power terms" McKenzie and Mitchell (1999).

Brooks et al. (2000, p. 378) puts forward that any positive power term value can be specified as "absolute changes in an asset's price will exhibit volatility clustering and the inclusion of a power term Hence, it is acting so as to the periods of relative tranquillity and volatility by magnifying the outliers". McKenzie and Mitchell (1999) points thatt volatility clustering is not just specific to the use of squared asset returns but are also a component of absolute returns. The use of a power term in these cases acts to emphasize the periods of tranquillity and volatility by amplifying the outliers in the dataset.

A number of standard ARCH and GARCH models are nested within the asymmetric power GARCH model. The mean equation for each model where the model exhibits significant first order autocorrelation, an AR(1) specification is adopted.

In ARCH/GARCH framework, symmetry is imposed on the conditional variance implying that positive and negative shocks have the same impact on the current volatility. However it is well known that many financial time series are influenced by negative shocks more than positive shocks.

Plausible explanations for this phenomenon can be classified as [(Exponential GARCH (EGARCH))] where (1) leverage and (2) volatility feedback effects. Leverage effect points out that an increase in financial leverage level causes an increase in equity volatility level. Thus volatility rises

more following a large price fall than following a price rise of the same magnitude. On the other hand, volatility feedback effect explains how an increase in volatility may result in negative returns.

Here is to capture the asymmetric response of financial variables, exponential GARCH (EGARCH) model proposed by Nelson (1991)

$$\log(h_t) = \omega + \sum_{j=1}^q \beta_j \log(h_{t-j}) + \sum_{i=1}^p \alpha \left| \frac{\varepsilon_{t-i}}{h_{t-i}} \right| + \sum_{k=1}^r \gamma_k \frac{\varepsilon_{t-k}}{h_{t-k}} \quad \text{Eq.02}$$

where ω , β , γ , and α are the model parameters.

EGARCH models the logarithm of conditional variance and an additional term is included in the model to account for asymmetries. Finally, statistically significant and negative asymmetry term implies the existence of a leverage effect and asymmetric response of prices.

In the context of stock markets, the EGARCH model is asymmetric since coefficient γ is usually found to be negative. EGARCH model incorporates the standard GARCH model in the sense that the model analyzes both the effect of past shocks and volatilities on the current variance. It is the superior advantage of the EGARCH model displaying good news and bad news to have a different influence on conditional variance. The EGARCH model also shows big news to have a greater effect on the variance than the standard GARCH model. In addition, the EGARCH model imposes no constraints on the parameters to ensure positivity of the conditional variance.

The EGARCH model is popular, among other reasons, because it can capture both asymmetry, namely the different effects on conditional volatility of positive and negative effects of equal magnitude, and leverage, which is the negative correlation between returns shocks and subsequent shocks to volatility.

The coefficients of ARCH term, γ displays the spillover behavior of the markets in such a way that a significant negative value indicating that for a given decrease in volatility of the market would bring about a decrease in volatility of the other market. Leverage term is expected to be negative to convey that market reacts more to negative news than to positive (good) news. The lag truncation length (p and q) is determined using likelihood ratio (LR) tests.

4. FINDINGS AND DISCUSSION

The quantitative analysis and all the statistic tests, the estimation methods are performed by using the Eviews Software.

To study the properties of data, each time series is subjected to a check for stationarity. When we have a stationary system, effect of a shock will die out gradually. When we have a non-stationary system, effect of a shock is permanent.

Augmented Dickey-Fuller(ADF), Phillips–Perron test (PP), Kwiatkowski–Phillips–Schmidt–Shin (KPSS - to have stationarity as the null hypothesis) test were separately carried out for the daily return of the gold price and the daily difference of all other variable series. Table 2 reports the result of unit root tests.

Table 2: The Results of the Unit Root Test

	Ret_GOLD	DCOPPER	DSILVER	DDTWEXB	DJPYUSD	DSP500	DUSTREAS	DWTI	Critical Value		
									1%	5%	10%
ADF(c,t)*	-54.55954	-57.00596	-18.86116	-52.85771	-55.14583	-56.86210	-41.41797	-56.77176	-3.96116	-3.4113	-3.12751
PP(c,t)*	-54.59558	-56.95917	-60.23528	-52.87385	-55.21181	-57.40650	-55.82957	-56.79901	-3.96116	-3.4113	-3.12751
KPSS(c,t)*	0.06556	0.06088	0.05654	0.06419	0.13339	0.05426	0.02604	0.05696	0.21600	0.146	0.11900

*(c,t), c: Intercept, t: Trend

The unit root hypothesis (i.e., H_0 : Series is non-stationary for DF, ADF, PP) and the KPSS (i.e H_0 : Series is stationary) is rejected given the analysed sample data indicating all the variable series are stationary in 1%, 5%, 10% intervals of the test critical value.

The Mean Equation for the model as follows:

$$\begin{aligned} GOLD_t = & \beta_0 + \beta_1 \Delta COPPER_t + \beta_2 \Delta SILVER_t + \beta_3 \Delta DTWEXB_t + \beta_4 \Delta JPYUSD_t \\ & + \beta_5 \Delta SP500_t + \beta_6 \Delta USTREAS_t + \beta_7 \Delta WTI_t + \varepsilon_t \end{aligned} \quad (3)$$

In order to check the existence of the heteroskedascitiy, we carried out ARCH test (the ARCH test regresses the squared residuals on lagged residuals and a constant) with number of 5, 10, 15 lags respectively. Eventually, the test result displays that the ARCH LM Test concerning 15 lags in the residuals is $N^*R^2 = 449.02$. The residual values indicate that it can easily run ARCH model or GARCH model, because there is clustering volatility in the residual at the same time. There is ARCH effect, so it has all the validity to run ARCH or GARCH model.

The model based on EGARCH(1,1) model with daily returns of the gold price under the normal distribution has both the smallest AIC and largest log-likelihood value. Performing the EGARCH(1,1) model, the results are displayed obtained in the Table 3.

Table 3: EGARCH Model Results

Dependent Variable: RET_GOLD				
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)				
LOG(GARCH) = C(10) + C(11)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(12)*RESID(-1)/@SQRT(GARCH(-1)) + C(13)*LOG(GARCH(-1)) + C(14)*DUSTREAS + C(15)*DWTI + C(16)*DSILVER				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	7.26E-05	9.40E-05	0.772654	0.43970
DCOPPER	0.019529	0.002805	6.963393	0.00000
DSILVER	0.011258	0.000241	46.79891	0.00000
DDWTEXB	-0.005219	0.000377	-13.83597	0.00000
DJPYUSD	-0.003365	0.000211	-15.9832	0.00000
DSP500	-1.44E-05	6.80E-06	-2.116788	0.03430
DUSTREAS	-0.014121	0.002498	-5.653529	0.00000
DWTI	0.000219	9.17E-05	2.385479	0.01710
AR(1)	-0.197626	0.019193	-10.29674	0.00000
Variance Equation				
C(10)	-0.229077	0.025377	-9.026933	0.0000000
C(11)	0.152096	0.01087	13.992	0.0000000
C(12)	-0.015578	0.006982	-2.231077	0.0257000
C(13)	0.988241	0.002201	449.0356	0.0000000
DUSTREAS	-0.444098	0.134205	-3.309096	0.0009000
DWTI	-0.02583	0.005288	-4.885009	0.0000000
DSILVER	-0.02818	0.012253	-2.299887	0.0215000

After performing the EGARCH estimation, we checked the residuals for the existence of the ARCH effect and serial correlation respectively. Diagnostic tests were performed in order to establish the goodness of fit and appropriateness of the model.

First we examined if the standardized residuals and squared standardized residuals of the estimated model were free from serial correlation. The Ljung-Box LB(n) statistics for the standardized residuals proved that in most cases they are not statistically significant and the LB(n) statistics for standardized squared residuals indicate that the ARCH effect has disappeared. The Durbin Watson statistic (1.9988) and the ARCH LM test concerning 15 lags in the residuals ($N \cdot R^2 = 13.69746$) confirm the aforementioned results.

In this study, our intent is to display some fundamental intuitive approaches with the confirmation of quantitative estimation techniques of the parameters.

Regarding the estimation output for the EGARCH(1.1) model in Table 3, the persistence parameter C(13) is statistically significant and very large, implying that the variance moves slowly over time. Further, the asymmetry parameter C(12) is negative, implying that the variance goes up more after negative residuals (gold returns) than after positive residuals (returns). This implies that the volatility spill over mechanism is asymmetric.

In line with our first hypothesis, the return of the gold price is negatively correlated with daily difference of the Japanese Yen vs US Dollar. Gold is one of the favorite trading instruments in the precious metals asset class. Its appeal ranges from the intraday trader/speculator to investors involved in actual purchasing of the bullion. Well known for its status as a safe haven currency, some liken gold to the default currency for mankind. Paying attention to the fundamentals always helps, monitoring specific comments from central banks (Federal Reserve Bank of US, Bank of Japan) that could bring about some short-term noise in the markets. Since 2008, the short borrowing in Japanese Yen has contributed positively in composing US Dollar denominated investment portfolios and this has also displayed its own dynamics mirroring the gold prices. In Table 3, the negative relationship between gold price and Japanese Yen is statistically significant.

Regarding our second hypothesis, the estimation results display that the return of the gold price is negatively correlated with daily difference of the trade weighted US Dollar index. According to the findings, in Table 3, return of the gold prices (Ret_GOLD) is negatively related with the DWEXTB and the coefficient is statistically significant. It is a fact that proves the gold is a feedback hedge for the assets held denominated in US Dollars when the US dollar depreciates against other major currencies. Thus, regarding the periods of US Dollar were depreciating persistently as measured by the dollars trade weighted exchange rate makes gold cheaper for other nations to purchase and increases their demand. Eventually, this effect drives up the price of gold showing a negative relationship between US Dollar and gold price.

Considering the third hypothesis, it is observed that the return of the gold price is negatively correlated with daily difference of the US 10 Year Treasury rates. This relation is statistically significant in Table 3. Since the gold and US Treasury rates are both alternative investment factors in structuring the expected portfolio return while minimizing the portfolio volatility. Since the gold is a hedge against consumer expenditure inflationary pressures, the US 10 Year Rate has embedded the inflationary pressure premium in the level of market rates with a significant lags in line with monetary authorities forward looking policy. In boom times, when interest rates go up it stokes fears of inflation, which pushed the price of gold up. In recovery times, when interest rates go up it suggests the economy is improving, and investors dump gold for other assets like stocks. Regarding the variance equation results, daily differences US 10 Year Treasury rates decreases the daily return volatility of the gold price.

The coefficients of the daily differences of the price of copper, the silver and crude oil display a positive relation with the daily return of the gold price and are statistically significant according to the sample span, since the depreciation of US Dollar against the other major currencies in 2008 has triggered a concentrated tendency towards energy, commodities and precious metals. Hence, in composing the investment portfolios in US denominated assets, due to the growth boosting measures taken internationally by the monetary authorities, the gold prices had strong upward momentum which trailed the price of copper, silver and crude oil in an orchestrated manner. However, the major trading and investment characteristics differ in the short and long term, the price dynamics has changes sharply.

Observed results shows that daily difference of the SP500 stock exchange index exhibits a negative impact on the daily return of the gold price. This concludes that in terms of the boom periods in an economy boosts the investors' choices (since the price of SP500 normally rises as a result of positively expected economic prospects) in favor of the stocks. Therefore, negative changes in the price of stocks are associated with negative financial news that the volatility is transferred from the other markets to the stock market. Since investment in stocks or the gold are alternatives each other in different proportions, in terms of investors' portfolio choices, profit seeking or loss minimizing motivation could lead to an increased volatility.

5. CONCLUSIONS

Volatility in gold price has become an important feature of the financial markets in terms of volatility trading in adjusting the international portfolio investments.

Gold has become an asset class in its own right. Hence, volatility structure in the return of the gold price has become a key measure for gauging in recent years. Briefly, it has become an important tool for hedging systemic risk and uncertainty. The value of such a hedging instrument of course is dependent upon its correlation and volatility structure with the other major underlying financial assets in the means of financial diversification. These diversification properties are enhanced further as they are shown to be leading indicators of the gold price return as a dependent variable.

Finally, in the relevant sample span, return of the gold demonstrates a significant non-linear characteristics. Since gold's safe haven status have played a major stake in the determination of the gold price, it is undeniable that the speculators' rising power, the artificial intelligence utilisation in robo-trading, global and regional geo-political tensions, the recent developments in the risk sentiment in investment portfolios have an increasing amount of influence on gold prices.

In portfolio construction, the major goal is to minimize the portfolio volatility in line with holding a positive alpha return to stabilize the portfolio net wealth. Hence, the gold has distinctive investment facilities by having hedge features against the global inflation and reflationary monetary dynamics. The correlated structure of the financial markets and the contagion effects of the news have displayed the asymmetric and complex but time-fragmented portfolio returns in terms of short and long term volatility formation and forecasting. It has potential to enhance the study of price volatility of the gold as a financial instrument in relation of the complex correlation structures by the high frequency gold data to verify the empirical results shared in this study.

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CROWDFUNDING AS AN INNOVATIVE TRANSFORMATION IN FINANCE: INSIGHTS, OPPORTUNITIES, AND RECOMMENDATIONS

DOI: 10.17261/Pressacademia.2023.1879

PAP- V.18-2023(37)-p.130-140

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To cite this document

Tekeoglu, A.N.T., Kucukcolak, R.A., Kucukcolak, N.I. (2023). Innovative transformation in finance: global and Turkish perspectives on crowdfunding. PressAcademia Procedia (PAP), V.18, 130-140.

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1879>

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ABSTRACT

Purpose- The purpose of this article is to explore and analyze the transformative impact of crowdfunding, with a specific focus on the reward-based Fongogo crowdfunding platform in Turkey. The study aims to understand how crowdfunding disrupts traditional financing models, fosters collaboration and innovation, and contributes to financial inclusion for small businesses and startups. Additionally, the purpose involves comparing the project results of Fongogo with international examples to provide insights into Turkey's crowdfunding landscape.

Methodology- The study employs a case study approach, focusing on the reward-based crowdfunding platform Fongogo. Data is collected and analyzed from the Fongogo platform in Turkey to gain insights into supporter dynamics, project success, and regional influences. Comparative analysis is conducted by comparing Fongogo's results with international crowdfunding examples. Additionally, literature on crowdfunding is reviewed to identify key success factors, such as project presentation, category, funding type, location, and team size.

Findings- The findings of the study reveal the diverse models and advantages of crowdfunding, emphasizing its transformative potential in the financial sector. Insights from Fongogo data shed light on supporter dynamics, the impact of project location, and the influence of technological literacy on crowdfunding success in Turkey. The comparative analysis with international examples provides a broader perspective on crowdfunding success factors, highlighting areas where Turkey's crowdfunding potential can be enhanced.

Conclusion- In conclusion, the study advocates for the strategic positioning of crowdfunding as a vital financial tool in Turkey. The findings underscore the importance of user-friendly platforms, transparent operations, and effective communication by project owners. The impact of the new Crowdfunding Regulation in Turkey is discussed, acknowledging the need for further assessment as its implementation progresses. The study encourages leveraging the lessons learned from successful projects, both locally and internationally, to guide new initiatives and strengthen Turkey's crowdfunding ecosystem. Ultimately, the article aims to contribute insights to researchers, policymakers, and practitioners interested in the dynamic landscape of crowdfunding in Turkey and beyond.

Keywords: Financial inclusion, reward-based crowdfunding, financial innovation, digital platforms

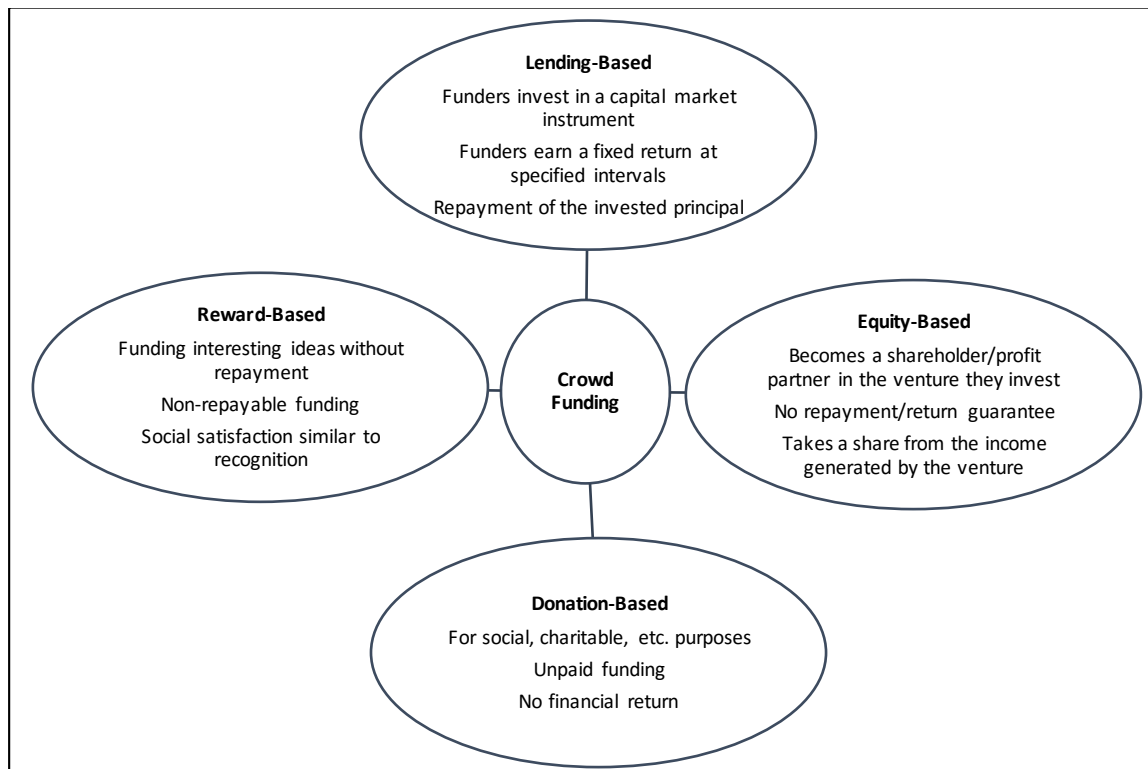
JEL Codes: G23, L26, M13, O16, O35

1. INTRODUCTION

In today's financial landscape, a new era is unfolding, driven by changing customer preferences and the ascent of digital platforms. Financial technology (FinTech) solutions, leveraging technological advancements to reach masses more easily and quickly, have become widespread across various fields. Crowdfunding, originating as an online financing alternative in advanced countries like Austria, the United Kingdom, the Netherlands, Italy, and the United States, has evolved from traditional financing methods conducted within closed and private channels. This method has also expanded to developing countries.

The crowdfunding model fosters collaboration and innovation by bringing together entrepreneurs seeking funding for their projects with small investors. Crowdfunding takes various forms, including reward-based, donation-based, lending-based, or partnership-based (Figure.1). These models can be selected based on the needs and target audience of the projects, providing entrepreneurs and projects with advantages such as flexibility and diversity.

Figure 1: Types of Crowdfunding



The crowdfunding challenges traditional financing models by uniting millions of individuals with small amounts of capital to support projects and entrepreneurs. The strengthening of the internet and mobile technology, the ascent of social media, and the flexibility of raising funds through online platforms are just a few of the significant advantages distinguishing crowdfunding from other financing methods. Traditional financing and crowdfunding each bring unique advantages, and their appropriateness depends on variables such as project type, size, and target audience. Conventional financing, commonly facilitated through banks and financial institutions, instills corporate trust and stability. Typically, it relies on factors like credit history, assets, and financial status, assessing the borrower's creditworthiness. Larger enterprises and projects often find it advantageous to attract substantial investments through traditional financing methods.

On the other hand, crowdfunding has the potential to elevate community interest and engagement in a project, nurturing customer loyalty and bolstering project success. Drawing funds from numerous individuals in small amounts, crowdfunding offers entrepreneurs support from diverse sources. Moreover, it presents a faster and more flexible financing process, enabling entrepreneurs to swiftly raise funds and launch projects.

Crucially, digital marketing trends play a pivotal role, especially in optimizing crowdfunding efforts. Crowdfunding aligns seamlessly with social media and viral marketing trends, allowing projects to reach a broad audience through various social media channels. Crowdfunding campaigns frequently leverage digital platforms and compelling video content to forge emotional connections, aligning with the prevailing trends in digital marketing. These trends further contribute to the widespread popularity of various crowdfunding platforms, empowering individuals to select platforms tailored to their projects and extend their reach to a broader audience.

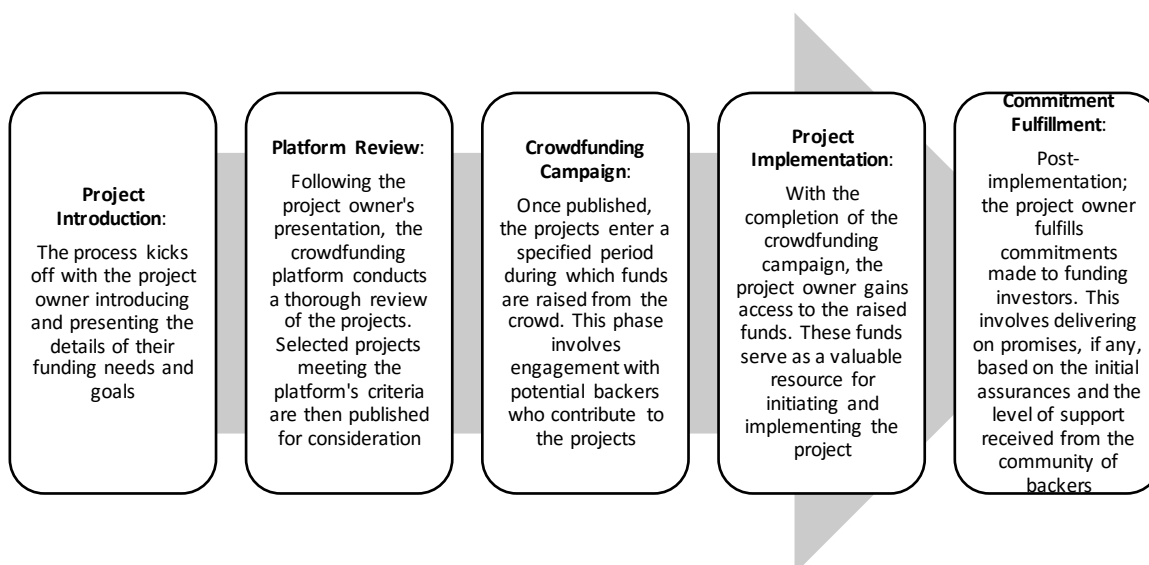
On a global scale, one of the key reasons for the growth of the crowdfunding market is the shift in customer preferences towards supporting innovative and socially impactful projects. The stringent criteria of traditional financing sources lead financial institutions to hesitate in investing in risky or unconventional ideas. Crowdfunding, however, offers an alternative avenue for entrepreneurs and individuals to showcase their projects and receive support from a global audience. The transparency and democratic structure of the crowdfunding model attract supporters who can contribute to projects they believe in directly, witnessing the impact of their investments.

Reward/donation-based crowdfunding, especially in creative projects such as film, music, and video games, has gained popularity in recent years, offering non-monetary rewards to supporters. Equity-based crowdfunding, allowing investors to become shareholders in startups or small businesses, thrives on the tendency of supporters to seek financial returns and support promising ventures. On the other hand, crowdfunding for social causes and charities addresses the inclination of supporters to contribute to projects aligned with their values and those that have a positive impact on society.

Following the global financial crisis of 2008 and amplified by the funding challenges that grew with the 2019 Covid-19 pandemic, new formations and ideas emerged. As funding opportunities diminished for micro, small, and medium-sized enterprises, crowdfunding platforms emerged as alternative and innovative solutions for raising funds. Furthermore, in developed economies, where access to traditional financing is easier, crowdfunding is used as a complementary source, enabling entrepreneurs to validate their ideas and gain market support before approaching institutional investors. In developing economies, crowdfunding plays a more significant role in filling the financing gap for small businesses and startups. Additionally, individuals are turning to alternative investment vehicles like crowdfunding rather than traditional savings and investment options in a low-interest environment.

The crowdfunding process unfolds in five key steps involving main stakeholders: project owners, funding investors, and crowdfunding platforms (Figure.2). First, the project owner introduces and outlines the details of the projects requiring funding. Subsequently, the platform conducts a thorough review and publishes the selected projects that align with their criteria. Within the designated timeframe, funds are accumulated from the crowd in accordance with crowdfunding regulations. Once the funds are raised, the project owner commences utilizing them as a resource for the project, marking the initiation of the implementation phase. Finally, the commitments made to funding investors are honored based on the initially provided assurances and the level of support from project backers. This process underscores the collaborative nature of crowdfunding, where projects receive support from a diverse community of small investors. During this process, the preparation of the project and the determination of the targeted funding amount are strategically crucial for fund procurement. It is essential to present the purpose, scope, expected outcomes, and fund size accurately for both passing the crowdfunding platform's initial review and attracting investors to provide funds. Entrepreneurs typically choose a crowdfunding platform based on the offered fund size and other provided opportunities, aside from financial means.

Figure 2: Key steps in Crowdfunding Process



Reviewing the literature on crowdfunding, project success is analyzed by achieving campaign goals, and projects reaching their support targets within the specified timeframe are considered successful. Various criteria influence the success of a project, including its presentation, category, funding type, location, start date, expected support duration, the number of visuals and content, updates made during the campaign, and the number of frequently asked questions, comments, rewards, team size, project website, tags, target amount, funds collected toward the goal, and support ratio.

In this chapter, we will focus on successful crowdfunding examples and key factors influencing success, examining this dynamic financing model from the perspective of Turkey. Evaluations supported by international examples are crucial for strengthening Turkey's crowdfunding ecosystem and enhancing its position on the global stage. Recommendations will be provided to increase Turkey's crowdfunding potential and encourage the widespread use of this effective financing tool, drawing insights from both local and global success stories. The aim is to contribute to making crowdfunding a strategic financial instrument for Turkey in light of these analyses.

2. LITERATURE REVIEW

The comprehensive literature below provides insights into the diverse factors influencing crowdfunding success across various regions and sectors.

(Yang, Lin, & Chen, 2023) According to research on crowdfunding success criteria, project owners should create a short video, compelling promotional content, and effectively present projects on social media. The study identifies key factors such as role, actors, product, sound effects, and emotion in the most investment-attracting film projects.

(Tanapol Rattanasamaakrn, 2023) Examining the crowdfunding ecosystem in Thailand, the study considers regulatory frameworks, financial literacy, access to financial services for farmers and agricultural stakeholders, and the level of trust in crowdfunding. Three main components—donors, financial portals, and investors—form the crowdfunding ecosystem, with the study suggesting the need for regulatory improvements to facilitate access for cooperative businesses in the agricultural sector.

(Borrero-Domínguez, Cordon-Lagares, & Hernandez-Garrido, 2022) analyzes 134 projects supported by socio-economic organizations in Spain on the Goteo platform. This study identifies founders' experience and project location as key success factors. Projects led by university-educated founders surpass their funding goals, and local project locations play a crucial role in obtaining more funding from local investors. Additionally, non-profit associations outperform cooperatives, for-profits, and foundations in crowdfunding success. (Borrero-Domínguez, Cordon-Lagares, & Hernandez-Garrido, 2020) examines data from 335 reward-based crowdfunding projects on the Goteo platform from January 2017 to October 2018. This study identifies statistically significant correlations between variables such as experience, location, human capital, and gender with crowdfunding project success. Notably, project success is linked to the experience of project members, while geographic location influences backers to support locally situated projects. The study also suggests that crowdfunding does not perform well in supporting social impact initiatives involving ecological typology.

(Miglo, 2022) analyzes crowdfunding campaigns of technology firms in the UK. This research emphasizes the importance of setting realistic campaign goals to enhance success probabilities. Factors such as superior broadband access and a higher number of highly educated individuals in cities contribute significantly to crowdfunding success. Providing regular updates, videos, and images during campaigns is highlighted to address the importance of overcoming information gaps.

(Tatchemo, Nongni, Danmou, & Woukeng, 2022) investigates crowdfunding activities in Cameroon. This study, based on 50 project leaders conducting funding campaigns from 2017 to 2020, reveals a positive correlation between education level, professional experience, capital size, professional investor contributions, and crowdfunding project success. The study also emphasizes the need for improved education on crowdfunding platforms, particularly for entrepreneurs with lower educational levels.

(Zvilichovsky, Danziger, & Steinhart, 2022) Examining success criteria and participant motivations in Kickstarter campaigns, data from the platform was analyzed. Results highlight the importance of individual backers, with up to 33% of successful campaigns relying on the marginal support of the top three average backers.

(Ryoba, Qu, & Zhou, 2020) To determine critical features affecting project success on crowdfunding platforms, 424,980 projects from Kickstarter (October 2018) were analyzed. A subset of nine features, including project description length, reward word count, video count, update count, funding goal amount, reward level count, projects created by content creators (past experience), projects supported by content creators, and comment count, was derived for highly accurate success predictions.

(Ullah & Zhou, 2020) Analyzing 2015 data from Kickstarter, this study reveals that concise project descriptions, realistic funding goals, appropriate campaign durations, and increased interaction with backers contribute to higher crowdfunding success rates. Founder types, project duration, and prior project creation influence crowdfunding success, with certain strategies such as team-based funding being more successful.

(Otterloo, 2022) Analyzing data from 35 crowdfunding projects on Kickstarter, this study emphasizes the importance of understanding project failure from a project management perspective and promoting crowdfunding platforms' perception as fair, transparent, and trustworthy.

(Chen, Chang, Chen, & Chuang, 2022) A research focusing on Kickstarter and Indiegogo projects suggests that promoting and improving advertising in the project feature section to increase supporter numbers and fundraising amounts is beneficial. Additionally, it advises not setting excessively high fundraising targets for campaign success.

(Miglo, 2022) (second reference): Revisiting technology firms' crowdfunding success factors in the UK, this study compares theoretical predictions with empirical results. Analyzing 2,388 campaigns on Kickstarter from 2011 to 2020, the study underscores the effectiveness of direct signaling over indirect signaling. Factors such as the number of project backers, the presence of preliminary information in project sections, and the prominence of information contribute to campaign success.

(Shi, Yang, Wei, & Wang, 2021) searches Kickstarter in the U.S. and underscores the importance of audio in crowdfunding success, with a multi-model deep learning approach proving effective in obtaining more information.

(Wang, Zheng, & Yenchun, 2020) Investigating success criteria and risk reduction in crowdfunding projects in the U.S., this study compares 77,654 Kickstarter projects with 3,260 venture capital projects from 2012 to 2017. Successful crowdfunding activities, particularly in hardware, electronics, and fashion, are found to lead to increased subsequent venture capital.

(Mardiyyah, Rasyidi, & Hidayah, 2020) Investigating factors influencing people's participation in agricultural business investments through crowdfunding, data from 468 agricultural projects organized by PT. XYZ in Indonesia were analyzed. Factors such as project duration, perceived project risk, and project domain significantly affect investor participation.

(Alazazi, Wang, & Allan, 2020) examines data from 9,948 campaigns on the donation-based crowdfunding platform Gofundme.com in the United States. This study concludes that incorporating social media shares, likes, and updates enhances campaign success.

(Prasobpiboon, Ratanabanchuen, Chandrachai, & Triukose, 2021) Examining crowdfunding in Thailand, the study identifies positive impacts of entrepreneurial experience, multimedia usage, and detailed project descriptions on investors. Campaign conditions, including campaign

duration, fundraising goals, and reward delivery time, have a negative relationship with supporter contributions. Individual and social satisfaction significantly influence crowdfunding support.

(Kılıç, Aydın, & Tarhan, 2021) focuses on Fongogo, Turkey's reward-based crowdfunding platform with the highest project count. This study analyzes project data to identify factors influencing success. Location, update frequency, comment count, campaign duration, and target amount are identified as key success factors. Among the methods used to examine the decline in project success are machine learning algorithms, Pearson correlation, mutual information statistics, and univariate feature selection. According to the analysis results, a positive relationship was found between the number of people supporting the project and the success rate. Additionally, an increase in the number of supporters led to an increase in updates and comments. A correlation was also found between location data and the number of supporters, with projects in the Marmara region having a higher number of supporters.

By examining over 26,000 projects on Kickstarter (Desai, Gupta, & Truong, 2015), factors influencing the success of projects were explored. According to the analysis results, language features that positively influence project success include:

- Reciprocity: Expressions such as offering rewards or gifts in return for donation funds.
- Social interaction: Expressions promoting friendship.
- Emotional appeal: Expressions that are inspiring, passionate, influential, or voluntary.
- Gratitude: Expressions of gratitude.
- Plural expression: Usage of plural expressions instead of the first-person singular.

The impact of rewards was also evaluated, leading to the following conclusions:

- Projects with common souvenirs like signed mugs, keychains, shirts tended to be unsuccessful.
- Projects with deliverable rewards were more popular.
- Projects with somewhat exclusive rewards were more popular.
- Personalized thank-you notes and emails had a more positive impact. The study emphasized that positive language use positively influences project success and suggested further research to examine the preferences of fund supporters and the effects of reward types on projects.

3. GLOBAL CROWDFUNDING MARKET OVERVIEW AND REGIONAL INSIGHTS

As mentioned in the literature review, several studies have been conducted using data from Kickstarter, which is one of the most popular and widely used crowdfunding platforms globally. According to its website, as of January 14, 2024; 23 million people have backed a project, \$7,770,181,682 has been pledged, and 252,139 projects have successfully received funding since its launch on April 28, 2009 (Table.1).

Table 1: Kickstarter Platform Summary Statistics

Category	Launched Projects (LP)	Share in LP	Total (Mio USD)	Share in Total	Successful (Mio USD)	Unsuccessful (Mio USD)	Live (Thousand USD)	Live Projects	Success Rate-%
Art	51.930	8%	208	3%	190	18	496	149	49
Comics	26.703	4%	238	3%	228	9	1.040	150	66
Crafts	14.089	2%	29	0%	24	4	135	47	27
Dance	4.562	1%	16	0%	15	1	2	7	61
Design	54.333	9%	1.660	21%	1.540	110	3.220	176	43
Fashion	39.337	6%	245	3%	216	29	509	99	31
Film & Video	85.465	14%	568	7%	482	85	1.140	255	38
Food	34.868	6%	207	3%	177	30	166	68	26
Games	83.252	14%	2.350	30%	2.230	118	4.990	468	49
Journalism	6.375	1%	21	0%	19	3	7	6	23
Music	69.310	11%	291	4%	268	23	695	112	50

Photography	13.955	2%	63	1%	56	7	52	30	35
Publishing	64.106	10%	344	4%	316	27	1.280	236	38
Technology	53.448	9%	1.480	19%	1.340	135	5.380	220	23
Theater	13.180	2%	51	1%	46	5	49	22	60
All	614.913	100%	7.770	100%	7.150	603	19.000	2.045	41

Source: (Kickstarter, 2024)

Most successfully funded projects raise less than \$10,000. As of January 14, 2024, among those projects whose funding is complete; among 252,140 successfully funded projects, 165,725 projects (66% of the successfully funded projects) raised less than USD 10,000 (Table.2).

Table 2: Kickstarter Platform Successfully Funded Project Statistics

	Successful Funded Projects	Less than \$1,000 Raised	\$1,000 to \$9,999 Raised	\$10,000 to \$19,999 Raised	\$20,000 to \$99,999 Raised	\$100 K to \$999,999 Raised	\$1 M Raised
All	252,140	32,418	133,307	36,523	38,451	10,644	797
Games	40,396	4,087	17,223	6,575	8,833	3,338	340
Music	34,899	3,376	24,132	4,975	2,296	118	2
Film & Video	32,551	3,896	18,192	5,058	4,860	533	12
Art	25,143	6,752	14,391	2,255	1,561	179	5
Publishing	24,081	3,267	14,811	3,329	2,391	275	8
Design	23,088	1,587	7,727	3,875	6,861	2,852	186
Comics	17,613	2,002	11,090	2,236	1,976	304	5
Technology	12,307	649	3,190	1,854	3,962	2,432	220
Fashion	12,184	2,174	5,751	1,938	1,956	359	6
Food	9,043	812	3,624	2,178	2,283	134	12
Theater	7,872	1,114	5,690	709	340	19	0
Photography	4,878	897	2,557	768	600	56	0
Crafts	3,797	1,276	1,983	290	226	21	1
Dance	2,793	252	2,168	282	89	2	0
Journalism	1,495	277	778	201	217	22	0

Source: (Kickstarter, 2024)

Among the unsuccessfully funded projects; 15% concluded without receiving a single pledge. Notably, 20% of projects that managed to raise over 20% of their funding goal ultimately achieved successful funding, as illustrated in Table 3.

Table 3: Kickstarter Platform Unsuccessfully Funded Project Statistics

	Unsuccessful Funded Projects	0% Funded	1% to 20% Funded	21% to 40% Funded	41% to 60% Funded	61% to 80% Funded	81% to 99% Funded
All	360,728	56,320	236,315	37,554	16,797	7,318	6,452
Film & Video	52,659	10,298	34,284	4,795	2,030	846	406
Games	42,388	2,986	27,963	5,628	2,956	1,529	1,326
Technology	40,921	5,722	29,542	2,823	1,286	593	955
Publishing	39,789	7,420	26,419	3,691	1,494	515	250
Music	34,299	7,649	21,141	3,593	1,280	391	245
Design	31,069	2,026	20,060	4,446	2,157	1,051	1,327
Fashion	27,054	4,746	17,207	2,771	1,254	553	523
Art	26,638	4,293	15,729	3,462	1,647	773	734
Food	25,757	4,366	18,178	2,001	774	254	184
Crafts	10,245	1,755	6,810	916	409	179	176
Photography	9,047	2,031	5,579	923	318	143	53
Comics	8,940	554	5,599	1,426	796	369	196
Theater	5,286	917	3,418	624	210	75	42
Journalism	4,874	1,268	3,215	268	76	23	24
Dance	1,762	289	1,171	187	80	24	11

Source: (Kickstarter, 2024)

Based on (Statista, 2023), the global crowdfunding market size will surge to 1.41 billion US dollars (USD) by the end of 2023, subsequently doubling and surpassing 3.62 billion USD by the year 2030. Projections for 2023 indicate an average funding per campaign of 7,750 USD. Examining global transaction values, the United States takes the lead with the highest observed transaction value of 451.3 million USD. With a compounded annual growth rate (CAGR) of 2.02%, the total transaction value is predicted to reach 520 million USD by 2027. The average funding per campaign in the United States reached 6,430 USD as of September 2023.

In the European crowdfunding market, the estimated transaction value is 303.1 million USD by the close of 2023, with a projected CAGR of 2.11%, expected to reach 329.50 million USD by 2027. In 2023, the average funding per campaign in crowdfunding stood at 6,100 USD. Notably, the 'Witcher - Old World' tabletop game, securing around 7.4 million USD as of November 2023, claimed the title of the most funded project on Kickstarter in Europe. Another notable project, '7th continent - What Goes Up, Must Come Down,' initiated in Paris, secured the second position with approximately 7.1 million USD in donations. For the United Kingdom, a transaction value of 61.55 million USD is anticipated in 2023. With a CAGR of 1.15% from 2023 to 2027, this figure is expected to reach 64.44 million USD by 2027. The average funding per campaign in 2023 reached 16,390 USD, and as of November 2023, 'Dark Souls - The Board Game' became the highest-funded project on Kickstarter, raising 3.77 million British Pounds. Another noteworthy game, 'Monster Hunter World,' followed with 3.44 million British Pounds in donations (Statista, 2023).

In the Asian crowdfunding market, the estimated transaction value for 2023 is 0.38 billion USD, with an annual growth rate of 1.29% (CAGR, 2023-2027). The average funding per campaign in 2023 is projected to be 25,400 USD. Among other markets, Africa has the smallest scale, with the expected transaction value in the crowdfunding market reaching 1.37 million USD in 2023. Projected to exhibit a 6.31% CAGR from 2023 to 2027, the total is expected to reach 1.75 million USD by 2027. The average funding per campaign in the crowdfunding market was 360 USD in 2023. For Australia and Oceania, the transaction value in the crowdfunding market is estimated to reach 3.13 million USD in 2023. With a 1.48% CAGR (2023-2027), it is expected to reach a total of 3.32 million USD by 2027. The average funding per campaign in the crowdfunding market was 410 USD in 2023. At a national level, the transaction value in the crowdfunding market for Turkey is predicted to reach 15.68 million USD in 2023. With a 5.41% CAGR (2023-2027), it is expected to total 19.36 million USD by 2027. The average funding per campaign in the crowdfunding market was 11,280 USD in 2023 (Statista, 2023).

4. CROWDFUNDING IN TURKEY

Crowdfunding, in Turkey, is an investment system created for the purpose of raising the financial resources needed by business ideas and entrepreneurial companies planning to produce high-value and competitive technological products and services. Various funding platforms operate with the aim of supporting new ideas focused on technology and innovation. These platforms are structured both vertically, focusing on specific sectors, and horizontally, providing funds to ventures in various industries, offering a broad perspective. Particularly, technology and innovative projects are considered a priority area in vertical structures.

The Crowdfunding Regulation (III-35/A.2) was published in the Official Gazette numbered 31641 on October 27, 2021, and came into effect. This regulation consolidates the principles related to equity and debt-based crowdfunding in a single regulation. Crowdfunding platforms that raise funds in exchange for rewards and donations are exempt from the provisions of this regulation.

With the new Crowdfunding Regulation, the definition of a venture company has been updated, a definition for companies funded for the first time has been introduced, and the establishment and operational principles of both equity-based and debt-based crowdfunding platforms have been specified. The regulation has also revised and updated the conditions for being listed on the Capital Markets Board (CMB/SPK) and the establishment of crowdfunding platforms. Another innovation is that, for each campaign, platforms can provide funds up to a maximum of 50% of their total equity, and the targeted fund amount for each campaign is limited to a maximum of 20%.

Another change introduced is the increase in the annual investment limit for non-professional investors outside the scope of qualified investors. For equity-based and debt-based crowdfunding platforms, the maximum annual investment limit for non-qualified individual investors is 50,000 TL. For debt-based crowdfunding platforms, an additional restriction has been imposed: non-qualified investors, excluding qualified investors, can invest a maximum of 20,000 TL in a project. Another investment limit for both platform types is that investors cannot declare more than 10% of their income annually to the platform, and the annual investment amount should not exceed 200,000 TL. The CMB website lists the companies engaged in crowdfunding activities (Table.1)

Table 4: Capital Market Board Listed Equity Based Crowd Funding Companies

Title of the Company	Date of Listing
Vakıf Yatırım Menkul Değerler A.Ş.	01.04.2021
Global Kitle Fonlama Platformu A.Ş.	08.04.2021
Halk Yatırım Menkul Değerler A.Ş.	30.09.2021
Dijital Kitle Fonlama Platformu A.Ş.	14.10.2021
İnfo Yatırım Menkul Değerler A.Ş.	25.11.2021
Fongogo Kitle Fonlama Platformu A.Ş.	06.01.2022
Girişim Kitle Fonlama Platformu A.Ş.	24.02.2022
Basefunder Kitle Fonlama Platformu A.Ş.	21.07.2022
Global Menkul Değerler A.Ş.	21.03.2023

Ecofolio Kitle Fonlama Platformu A.Ş.	13.04.2023
Nar Kitle Fonlama Platformu A.Ş.	05.05.2023
Startupfon Kitle Fonlama Platformu A.Ş.	28.09.2023
Forte Kitle Fonlama Platformu A.Ş.	22.11.2023
Mag Kitle Fonlama Platformu A.Ş.	21.12.2023

Source: (CMB, 2024)

Among the listed companies, the Fongogo Platform hosts equity-based financing as well as reward/donation-based projects. Due to the recent publication of equity-based regulations, there is not yet sufficient data available to conduct an analysis in this area. Therefore, the focus of the study has been directed towards the Fongogo reward-based platform data.

Within the scope of this study, reward/donation-based projects have been analyzed. Between December 20, 2013, and September 7, 2023, 414 projects were successfully completed, with a targeted funding amount of 9,241,782 TL. The total amount of funds raised was 10,039,559 TL, and the average project target achievement percentage was 109%. Half of the total projects are in the "Film and Photography" category. The highest number of supporters was in the music category in 2020 with 976 supporters, while the lowest number of supporters was in the education category in 2021 with 3 supporters. Looking at the numerical distribution of the 414 projects over the years, the highest number of projects was reached in 2019, and there has generally been a decreasing trend since 2019. The project with the highest number of supporters (976) has a duration of 35 days (Table.5).

Table 5: Fongogo Reward Based Project Statistics (2013/12-2023/09)

	# of Supporters	Fund Targeted (TRY)	Fund Collected (TRY)	Target Success Ratio -%
Environment	1.889	386.964	411.320	106%
Dance & Performance	124	31.000	33.240	107%
Other	1900	398.145	439.480	110%
Education	4.153	1.781.713	1.888.375	106%
Film - Photography	12.158	4.568.800	4.998.397	109%
Food & Beverage	513	327.300	351.530	107%
Culture & Art	2637	737.250	843.180	114%
Fashion & Design	149	38.000	38.780	102%
Music	1.890	353.500	393.999	111%
Health & Beauty	802	185.000	198.950	108%
Sports	382	64.110	66.115	103%
Technology	232	242.000	242.553	100%
Tourism	113	43.000	44.740	104%
Publishing/Video/Podcast	181	85.000	88.900	105%
Total	27.123	9.241.782	10.039.559	109%

Source: (Fongogo, 2023)

The global crowdfunding market size is projected to surge to 1.41 billion USD by the end of 2023, with further growth expected to surpass 3.62 billion USD by 2030. In contrast, the predicted transaction value for the Turkish crowdfunding market is expected to reach 15.68 million USD in 2023, with a projected total of 19.36 million USD by 2027. From this, we can infer that the Turkish crowdfunding market is relatively smaller in scale compared to the global market.

Table 6: Fongogo Reward Based Project Statistics (2023)

Category	Number of Projects	Successful Projects	Fund Targeted	Fund Collected
Film & Photography	67	29	1.127.000,00 ₺	1.244.750,00 ₺
Disaster support	5	3	725.000,00 ₺	772.840,00 ₺
Education	8	6	447.750,00 ₺	471.587,00 ₺
Publishing/Video/Podcast	2	2	78.000,00 ₺	101.630,00 ₺
Culture & Art	17	6	407.000,00 ₺	70.400,00 ₺
Technology	5	1	30.001,00 ₺	30.550,00 ₺
Health & Beauty	3	1	30.000,00 ₺	30.000,00 ₺
Entrepreneurship	2	1	1.000,00 ₺	7.830,00 ₺
Others	3	1	7.500,00 ₺	7.600,00 ₺
Environment	3	0	0,00 ₺	0,00 ₺
Food & Beverage	2	0	0,00 ₺	0,00 ₺
Music	4	0	0,00 ₺	0,00 ₺
Total	121	50	2.853.251,00 ₺	2.737.187,00 ₺

Source: Fongogo

6. GENERAL EVALUATION AND CONCLUSION

Crowdfunding serves as a dynamic and versatile means of financial participation, offering diverse models like equity-based financing, debt-based financing, donation, and reward-based funding. This flexibility meets the varied entrepreneurial needs, emphasizing transparency and democratic engagement, exemplified by contributors providing non-financial rewards.

Globally, crowdfunding's growth is fueled by shifting customer preferences towards social impact projects. Developed economies view it as a complement to traditional finance, while in developing economies, it bridges critical financing gaps for small businesses. However, the full potential of crowdfunding in Turkey, especially in sectors like sustainability, agriculture, and education, is yet to be fully realized.

The recent Crowdfunding Regulation in Turkey introduces comprehensive rules for equity and debt platforms, prioritizing investor protection. As it is relatively recent, assessing its success requires more time, and notably, it excludes activities involving rewards and donations.

Analyzing global trends reveals gaming projects achieving global success, in contrast to Turkey where art projects thrive locally. Gaming targets a tech-savvy, global audience, while film and photography projects, with their cultural focus, find success on a local scale. Understanding these dynamics is crucial for project success.

Looking ahead, crowdfunding is poised for continual global growth, appealing to diverse funding sources. Technological integrations like blockchain enhance transparency, security, and efficiency. Regulatory frameworks are expected to adapt, ensuring a stable environment, possibly prompting larger corporations to explore crowdfunding for direct customer engagement and market testing.

The Turkish crowdfunding market, buoyed by a tech-savvy population, is expected to grow. Entrepreneurs can leverage crowdfunding for accessible funding, spurring innovation and entrepreneurship. Increased investor participation, from individual backers to institutional investors, is anticipated as the regulatory environment evolves, aligning with global trends emphasizing social impact and sustainability. Integration with FinTech solutions could further enhance accessibility, attracting a broader audience and streamlining fundraising for entrepreneurs.

Several insights and lessons emerge for the crowdfunding landscape in Turkey:

- i. **Growth Potential and Awareness:** The Turkish crowdfunding market shows growth potential, but increased awareness and participation are needed. Platforms have an opportunity to educate the public on crowdfunding's benefits, especially in underrepresented sectors.
- ii. **Sector-Specific Strategies:** Focusing on sectors with existing interest, like the success seen in art projects in Turkey, can be advantageous for project owners.
- iii. **Technological Literacy:** User-friendly platforms are crucial to facilitate access for audiences with varying technological literacy levels, including clear interfaces and educational initiatives.
- iv. **Transparency and Trust:** Prioritizing transparency and trust-building methods is essential for crowdfunding campaign success.
- v. **Localization Strategies:** Developing strategies based on project locations, considering regional differences, can maximize campaign impact.
- vi. **Regulatory Environment:** Continuous assessment and adaptation of regulations are necessary for investor protection and platform accountability.
- vii. **Diversification of Funding Sources:** Diversifying funding sources, including crowdfunding, can contribute to the growth of innovative projects and startups.
- viii. **Social Impact Projects:** The global trend towards sustainability and social responsibility may lead to a shift in Turkey towards social impact projects, aligning with backers' preferences.

From the individual investors' perspective, the followings are recommended:

- i. **Project Viability:** Investors look for well-defined and feasible project plans. Detailed breakdowns of how funds will be used and the project's potential impact contribute to investor confidence.
- ii. **Communication and Updates:** Regular communication and project updates are crucial. Investors appreciate being kept informed about project progress, milestones achieved, and any challenges faced. This builds trust and demonstrates commitment.
- iii. **Financial Transparency:** Clarity on financial matters is essential. A breakdown of budget allocation, funding goals, and how the funds will be utilized assures investors that their contributions are being managed responsibly.
- iv. **Rewards and Incentives:** Providing attractive and meaningful rewards can significantly impact investor interest. Offering exclusive incentives or early access can motivate backers to contribute more.
- v. **Community Engagement:** Investors value projects that actively engage with their communities. Responding to comments, addressing concerns, and involving backers in decision-making processes create a sense of belonging and investment in the project's success.

- vi. **Creator Credibility:** The credibility of the project creator is a key consideration for investors. A transparent creator profile, showcasing relevant experience, and highlighting past successful projects can instill confidence.

In this respect, insights for project owners can be summarized as followed:

- i. **Clear Project Description:** Clearly articulate your project, its goals, and the impact you aim to achieve. Use language that is easily understandable to a broad audience.
- ii. **Regular Updates:** Keep backers informed with regular updates throughout the campaign and after funding. Share progress, achievements, and any challenges you're addressing.
- iii. **Detailed Budget Breakdown:** Provide a detailed breakdown of how funds will be allocated. Transparent budgeting builds confidence and demonstrates responsible financial management.
- iv. **Compelling Rewards:** Design attractive rewards that align with different contribution levels. Consider exclusive perks, early access, or personalized items to entice backers.
- v. **Engaging Multimedia:** Utilize high-quality visuals, videos, and infographics to make your campaign visually appealing. Multimedia content helps convey your message effectively.
- vi. **Community Building:** Foster a sense of community by actively engaging with backers. Respond promptly to comments, seek input, and involve backers in decision-making when appropriate.
- vii. **Demonstrate Impact:** Clearly outline how the funds will contribute to the project's success. Showcase the positive impact backers can make by supporting your initiative.
- viii. **Creator Profile:** Develop a comprehensive creator profile that highlights your expertise, experience, and any relevant accomplishments. A strong creator profile builds trust with potential investors.

In conclusion, while the Turkish crowdfunding market is still developing, numerous opportunities for growth and improvement exist. These lessons emphasize the importance of understanding local dynamics, technological literacy, and continuous adaptation to regulatory changes, fostering a thriving crowdfunding ecosystem in Turkey.

Contributors

We would like to express our gratitude to Gamze Kızılay and Ekin Ezgi Kalender for their contributions to the compilation of statistics related to the platforms.

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IS SUSTAINABLE INVESTING GOOD FOR THE ENVIRONMENT?

DOI: 10.17261/Pressacademia.2023.1880

PAP- V.18-2023(38)-p.141-142

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To cite this document

Hens, T., Benli, V.B., (2023). Is sustainable investing good for the environment? PressAcademia Procedia (PAP), V.18, 141-142

Permanent link to this document: <http://doi.org/10.17261/Pressacademia.2023.1880>

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ABSTRACT

Purpose- The primary objective of this research initiative is to gain insight to the conceptual layers of sustainable investing and to shade light on the ESG impact, ESG rating diversities and on the counterproductivity issues with respect to sustainable investment strategies. Conceptually, the Sustainable Investing are numerous and evolving. The old definition of “An investment is sustainable if the investment is fortified with “financial returns only” is transformed into an ESG-investing mode. Within this transformatory process a new and rapidly evolving type of investment called ‘Impact Investment’ has heated the debate. The strategic focus might be on the “Impact First Investors” or on the “Financial First Investors” on many sectors and themes (Jaquier, 2011:25). A more recent definition “Fiduciary Investing” defines an Investment as sustainable, if the investor seeks to minimize the negative impact or the losses from ESG related investments. Major impact areas are financial services, agriculture, energy, environment, community housing, water, education and health. Given the broad range of definitions and areas, the global sustainable fund assets under management rose by 8% over the last quarter to USD 3 trillion at the end of December 2023 (Morningstar Manager Research, Jan. 25, 2024). Within the impact capacity of the Sustainable Investments, investor impact happens through three different impact mechanisms called Shareholder Engagement, Capital Allocation and the Indirect impacts (Köbel, J.F. et al, 2020). Hartzmark, S. M., and Shue, K., aims to reveal empirically the granularity of the “impact elasticity” and hence the emission levels and ratios for green and brown firms based on the changes of their implied cost of capital, financial performance, interim returns, financial distress, leverage, productivity shocks and portfolio holdings of sustainable funds. Investors can screen out investments further based on the ESG ratings criteria. In this respect, Sustainable Investors representing over USD 100 trln in combined asstes are heavily used the ESG ratings of different rating agencies (Berg, F., et al, 2022). However, ESG ratings which increasingly influence Sustainable Investment decisions, are very much diversified by different rating companies. The divergence of ESG ratings introduces uncertainty and performance evaluation difficulties for the decision makers (Berg, F., Köbel J.F., Rigobon, R., 2022:1316).

Methodology- The ESG Divergence research is based on the critical evaluation of the data stemming from six different ESG rating providers such as KLD, Sustainalytics, Moody’s ESG, Refinitiv, MSCI and S&P Global. A new taxanomy is developed for the divergence of ratings are evaluated on the basis of scope, measurement and weightings diversities of the models. The counterproductivity analysis for Sustainable Investing strategies is based on the definition of “impact elasticity”. The impact elasticity is measured as the level change in a firm’s emissions intensity for a unit change of its cost of capital.

Findings- Sustainable Investing differs from conventional investments considerably. According to Köbel, J.F. et al, Sustainable Investors, whose decisions are based primarily on the layer of social impact, mechanisms, should pursue shareholder engagement throughout their portfolio, allocate capital to sustainable companies whose growth is limited by external financing conditions, and screen out companies based on the absence of specific environmental, social, and governance practices that can be adopted at reasonable costs.

Conclusion- A very important conclusion stems from the fact that, in the absence of green substitutes for entire brown industries, the diminishing sustainable investments could contribute to more emission levels. Accordingly, the greening of a sector should come from the internal and revolutionary Dynamics withing the brown industries.

Keywords: Sustainable investing, ESG ratings, corporate social responsibility, ethical investing.

JEL Codes: G4, O44, Q56, D81

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