Eurasian Conference on Economics, Finance and Entrepreneurship
Full Paper Proceedings Book

7 - 10 September 2022
Belgrade, Serbia

ECONEFE

Eurasian Conference on Economics, Finance and Entrepreneurship
Full Paper Proceedings Book

7 - 10 September 2022
Belgrade, Serbia

ECONEFE

ORGANIZING COMMITTEE

1 Arshian SHARIF
Sunway University, Malaysia

2 Avik SINHA
Goa Institute of Management, India

3 Daniel Balsalobre LORENTE
University of Castilla-La Mancha, Spain

4 Mehmet Fatih BUĞAN
Gaziantep University, Turkey

5 Miloš MILOSAVLJEVIĆ
University of Belgrade, Serbia

6 Muhammad SHAHBAZ
Beijing Institute of Technology, China

SCIENTIFIC COMMITTEE

Alper ASLAN
Erciyes University, Turkey

Aslı ÖZPOLAT
Gaziantep University, Turkey

Arshian SHARIF
Sunway University, Malaysia

Avik SINHA
Goa Institute of Management, India

Aviral Kumar TIWARI
Rajagiri Business School, India

Bojan GEORGIEVSKI
Wittenborg University of Applied Science, Netherlands

Daniel BALSALOBRE LORENTE
University of Castilla-La Mancha, Spain

Emrah İsmail ÇEVİK
Tekirdağ Namık Kemal University, Turkey

Ferda NAKIPOĞLU ÖZSOY
Gaziantep University, Turkey

Festus VICTOR BEKUN
Istanbul Gelisim University, Turkey

Gazi Salah UDDIN
Linköping University, Sweden

Miloš MILOSAVLJEVIĆ
University of Belgrade, Serbia

Kazi SOHAG
Ural Federal University, Russia

Malin SONG
Anhui University of Finance and Economics, China

Müge MANGA
Erzincan Binali Yıldırım University, Turkey

Muhammad Ali NASIR
University of Huddersfield, United Kingdom

Muhammad SHAHBAZ
Beijing Institute of Technology, China

Muntasir MURSHED
North South University, Bangladesh

Nathaniel SOLOMON
University of Lagos, Nigeria

Umer SHAHZAD
Anhui University of Finance and Economics, China

Wasif ZAFAR
Shenzhen University, China

KEYNOTE SPEAKERS

Daniel Balsalobre LORENTE
University of Castilla
La Mancha, Spain

Miloš MILOSAVLJEVIĆ
University of Belgrade,
Serbia

Arshian SHARIF
Sunway University,
Malaysia

PUBLICATION OPPORTUNITIES

Evaluation Review (SSCI)

Annals of Operations Research (SCI, SCI-E)

Journal of Asian Business and Economic Studies (Scopus, ESCI)

Energy and Built Environment (Scopus)

Sustainability (SCI, SCI-E)

Annals of Financial Economics (Scopus, ESCI)

Economic Research (SSCI)

LIST OF COUNTRIES REPRESENTED

155 colleagues from 24 countries have joined to 1st ECONEFE in Belgrade and 115 academic papers have been presented.

	Country	Number of Par-ticipants	%
1	Algeria	1	0.87%
2	Azerbaijan	3	2.61%
3	Bangladesh	3	2.61%
4	China	21	18.26%
5	Germany	2	1.74%
6	Greece	3	2.61%
7	India	4	3.48%
8	Indonesia	1	0.87%
9	Kazakhstan	2	1.74%
10	Korea	3	2.61%
11	Kuwait	1	0.87%
12	Lithuania	1	0.87%
13	Macedonia	1	0.87%
14	Morocco	1	0.87%
15	Nigeria	2	1.74%
16	Norway	2	1.74%
17	Philippines	1	0.87%
18	Russia	4	3.48%
19	Spain	6	5.22%
20	Thailand	1	0.87%
21	Turkey	52	45.22%
	TOTAL	115	100.00%

The Relationship between Financial Development and Environmental Quality: Evidence from Turkey

Sercan Aydın

Gaziantep University, Turkey

Gamze Destek

Gaziantep University, Turkey

Abstract

This study examines the factors that affect environmental quality in Turkey from 1984 to 2018 with a particular emphasis on the contribution of economic growth. Data on carbon emissions, financial development, energy consumption, human capital, and institutional quality are all analyzed using the ARDL bound-test method. The short- and long-term coefficient estimates of the series are made in the model designed to assess the long-term link between the variables after first analyzing the stationarity processes of the series and then validating the cointegration relationship between the series. The results demonstrate that short-term gains in financial development decrease environmental quality, while long-term increases in human capital accumulation and institutional quality increase environmental quality.

Keywords: Financial development, human capital, institutional quality, energy consumption

1. Introduction

A clean natural environment is considered a fundamental element for improving the quality of human life in modern societies. The increased concentration of greenhouse gases in the atmosphere, which leads to global warming, has serious effects on both economic and human development (Acheampong, 2018). Recent concerns about deterioration in environmental quality are one of the prominent issues among economists and environmental experts in both developed and developing countries. The main purpose of every economy is to realize economic development. Undoubtedly, while economic growth provides a better standard of living, it also harms the environment (Shahbaz et al. 2016). This issue has been extensively studied in the past economic and environmental literature. There is a large literature on the relationship between environmental degradation and economic development, known as the Environmental Kuznets curve (EKC), suggested by Grossman and Krueger (1995). Briefly, the EKC hypothesis suggests that economic growth initially lowers the quality of the environment, and as per capita income increases, the deterioration in environmental quality will begin to improve. When the previous literature is examined with the EKC hypothesis, it can be said that the results are contradictory. For example; Although Stern, 2004; Farhani and Ozturk 2015 concluded that the EKC hypothesis is not valid in their studies, Apergis and Payne, 2009; Apergis and Ozturk, 2015; Ahmad et al. 2017 concluded that the EKC hypothesis is valid in their studies. With the phenomenon of globalization, the volume of greenhouse gas emissions in the world has increased considerably and this causes countries to tend to seek sustainable economic growth paths. It is seen that five important targets have started to be implemented especially for energy sustainability. These goals are; reducing harmful environmental impacts, ensuring energy efficiency, establishing energy security, reducing energy costs and finally disseminating green technologies (Ibrahiem et al. 2020).

The financial sector is of great importance for modern societies. It is an important indicator in measuring the development level of a country or region. The effects of financial development, which is so prominent in determining the level of development, on environmental quality should not be ignored. Although many researchers argue that financial development has a significant impact on carbon emissions and therefore environmental quality, its impact on the evolution of carbon emissions stands out as a controversial issue. Namely, some researchers argue that financial development has a reducing effect on carbon emissions. For example, Tamazian et al. 2009 argued that high financial development can attract more foreign direct investments and research and development funds, which will increase economic development and R&D investments can minimize deterioration in environmental quality argue that it can improve environmental quality. Contrary to this view, Sadorsky argues in his 2011 study that financial development increases the volume of

carbon emissions, and therefore, possible increases in financial development will reduce environmental quality. Similarly, Boutabba 2014; Charfeddine and Ben Khediri 2016; Anwar et al. 2021; Khan et al. 2021 argues that a well-developed financial system facilitates access to capital and facilitates investments, which can lead to environmental damage, while other academics, like Salahuddin and Alam (2015), Al-Mulali et al. (2015), Sharif et al. 2020, Sinha et al. 2021 contend that an efficient financial system can help finance the adoption of cutting-edge technology and industrial methods. Therefore, they claimed that it could prevent environmental degradation. Another important concept in providing economic development and improving environmental quality is human capital. Namely, educated people can use financial assets better than uneducated people. Investments in human capital increase awareness of environmental issues, which motivates pro-environmental behavior and acts like recycling and energy conservation (Ahmed et al. 2020). For example, Zafar et al. 2019 in study, they examined the effects of human capital on the ecological footprint for the US and concluded that increases in human capital reduce the ecological footprint and improve environmental quality. In a different study, Pata and Caglar 2021 examined how human capital affected economic development, globalization, and the use of renewable energy in China. Analysis results show that human capital greatly lessens environmental degradation. Recent studies usually incorporate institutional quality as another element that may have a direct or indirect impact on ecological and environmental quality. Through facilitating law enforcement, as well as by strengthening and facilitating the management of public finances, strong institutional qualities contribute to the reduction of corruption to its bare minimum (Ahmad et al. 2022). As a result, the institutional role in environmental sustainability is important and crucial, and it supports the idea that governments may improve incomes and lower the cost of increasing growth by enhancing environmental quality. Additionally, stringent institutional policies and laws may compel organizations to lower their carbon emissions (Shahbaz et al. 2021). For example, Abid, 2016 analyzed the possible effects of institutional quality on carbon emissions by using the GMM method for the 1996-2010 period in SSA countries, and the results are that institutional quality increases significantly reduce carbon emissions. Similarly, Danish and Ulucak, 2020 examined the effects of institutional quality on environmental quality by using FMOLS-DOLS techniques for the 1992-2015 period in APEC countries, and according to the analysis findings, they concluded that a good institutional quality increases the environmental quality in APEC countries.

This study primarily examines the effects of financial development, human capital and institutional quality on environmental quality in Turkey in the 1984-2018 period. The ARDL limit test is used to determine the long-term effects of the explanatory variables used in the model on carbon emissions. In addition, empirical analyzes start with unit root tests in order to determine the stationary of the series, cointegration tests and finally the coefficient estimates of the variables are terminated, respectively.

2. Empirical Analysis

The empirical model created in the study in which the relationship between financial development, human capital, institutional quality and environmental quality in Turkey is examined for the period 1984-2018 is as follows;

$$CO_{2_t} = a_0 + a_1 FD_t + a_2 HC_t + a_3 EC_t + a_4 IQ_t + u_t$$

CO_2 from the variables used in the model; shows the annual amount of carbon emissions and from Our World in Data database, FD; shows the financial development index and from the IMF database, EC; shows energy consumption and from the World Bank WDI database, HC; human capital indicator from Penn World Table database and finally IQ; It is obtained from the WGI database as an index obtained from the Voice and Accountability, Political Stability and Absence of, Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption indicators.

The stationarities of the series in the first stage of the empirical analysis are examined using the ADF unit root test developed by Dickey and Fuller (1981) and the PP unit root test developed by Phillips-Perron (1988), and the findings are presented in Table 1. When the unit root test results given in Table 1 are examined, it is seen that all the variables used in the model have unit roots in the level values and all the variables become stationary in the difference values. Since unit root test results indicate that the variables in the empirical model are stationary at the first difference, this allowed the ARDL limit test to be used, which gives consistent and reliable results in stationary series at different levels. The ARDL limit test results, which allow the analysis of the long-term relationship between the series, are also presented in Table 2. When the results obtained in Table 2 are examined, it is concluded that the calculated F-statistic is above the 10% significance level upper limit, therefore, the long-term relationship between the variables is valid.

Table 1. Unit Root Test Results

Variable	ADF	PP
	t-statistics	t-statistics
CO_2	-2.055007	-2.594117
FD	-2.367250	-2.182559
HC	3.332122	0.223861
EC	-1.616589	-1.840164
IQ	-2.223733	-2.088007
ΔCO_2	-6.380960***	-6.608448***
ΔFD	-6.023830***	-6.021646***
ΔHC	-5.887394***	-5.353911***
ΔEC	-6.576298***	-6.703363***
ΔIQ	-5.454170***	-8.062095***

Note: ***,**,* indicate the significance level of 1%, 5%, 10%, respectively.

Table 2. ARDL Bound Test Results

Estimated models	Optimal lag length	F-statistic
$CO_2=f(FD,HC,EC,IQ)$	(1,1,0,0,0)	3.321792*
Critical values	**I (0)**	**I (1)**
%1	3.07	4.44
%5	2.26	3.48
%10	1.90	3.01

Note: Critical values taken Pesaran et al. (2001).

After the unit root tests and the determination of the long-term relationship, respectively, the step of analyzing the short- and long-term coefficient estimates of the series is started. However, before the short- and long-term coefficient estimation, some specification tests are applied to test the reliability of the established model and the results are presented in Table 3 together with the coefficient estimates. When the model diagnostic test findings are examined, it is seen that the probability value of the Breusch-Godfrey (LM) test applied to determine whether there is an autocorrelation problem in the model is meaningless. This result indicates that there is no autocorrelation problem in the model. The fact that the probability value of the ARCH test for the existence of changing variance is also meaningless shows that there is no problem of varying variance in the model. Then, the Jarque-Bera (JB) test probability value, which shows whether the series is normally distributed or not, is also meaningless, indicating that the series meet the normal distribution condition. Finally, the results of the Ramsey-Reset test applied to analyze whether the correct functional form is used show that the correct functional form is used in the model. In addition to these, CUSUM and CUSUMQ tests are applied and it is concluded that the parameters are stable in the model.

After testing the assumptions and testing the validity of the cointegration relationship between the variables used in the model, the dependent variable carbon emission (CO_2), which is the independent variable, financial development (FD), human capital (HC), energy consumption (EC) and institutional quality (IQ) is determined in the long run. The coefficient estimation results of the Autoregressive Distributed Lag Bound Test applied for the purpose of examining the effects are presented in Table 3.

When the short- and long-term coefficient estimation results presented in Table 3 are examined, it is seen that financial development, which increases carbon emissions in the short term, does not have a statistically significant effect on carbon emissions in the long term. Looking at other independent variables, it is seen that energy consumption increases carbon emissions in the short and long term as expected, and thus increases environmental damage. For this result, it can be said that green energy consumption in Turkey has not reached the desired levels yet and that most of the production is made with fossil fuels. Although the human capital and institutional quality variables, which have a significant effect on environmental quality and have

been frequently used in empirical studies in recent years, do not have a statistically significant effect on carbon emissions in the short run, but the human capital variable, which has a positive effect on human capital and labor productivity in the long run, It reduces carbon emissions and thus increases the environmental quality, and similarly, the increase in the quality of public institutions eliminates negative factors such as corruption and causes a decrease in carbon emissions in the long term. In addition, when Table 3 is examined, it is seen that the coefficient of the term ECT has a negative sign and the probability value is statistically significant. This result indicates that a possible shock in CO_2, which is the dependent variable in the short term, will be adapted in the long term.

Table 3. Short- and Long-Run Coefficient Estimators

Dependent variable: CO_2	Coefficient	Prob.
Short run results		
FD	0.145651**	0.001
HC	-0.823249	0.364
EC	0.731041***	0.000
IQ	0.871800	0.279
ECT	-0.813593***	0.000
Long run results		
FD	-0.042885	0.530
HC	-2.327049**	0.009
EC	0.992066***	0.000
IQ	-2.830721**	0.007
Diagnostic tests		
LM	0.074418	0.928
ARCH	1.879407	0.180
JB	0.311295	0.855
RAMSEY	1.059177	0.322
CUSUM	Stable	Stable
CUSUMQ	Stable	Stable

Note: *, **, *** denote statistical significance at 10%, 5% and 1% levels, respectively. F-statistics are used when performing the assumption tests
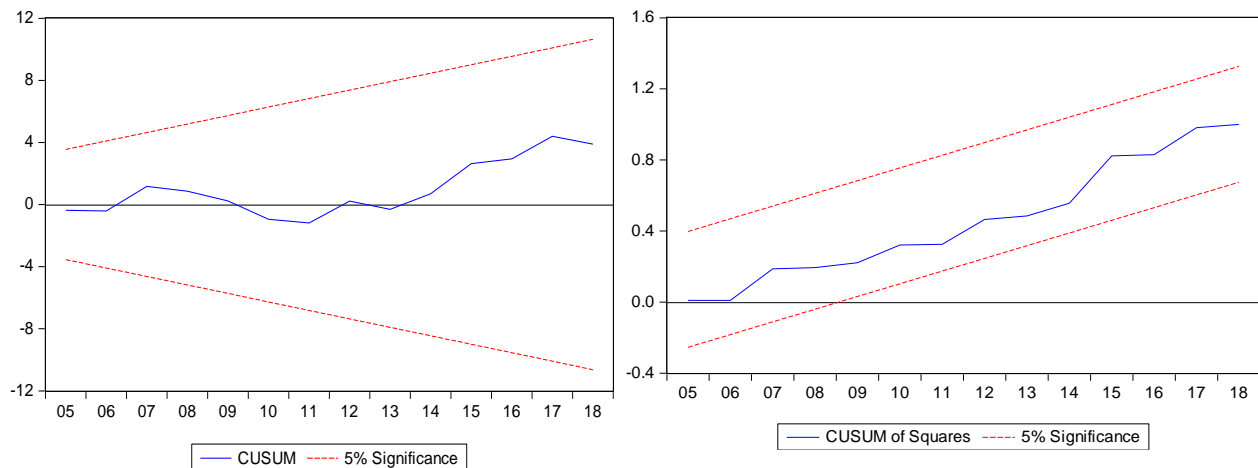
3. Conclusion and Policy Recommendations

In recent years, global warming and environmental degradation have attracted attention as serious global environmental problems. It is the unpredictable increases in carbon emission emissions that continue to be discussed among states and that have reached alarming levels. Therefore, reducing carbon emission levels has become a contemporary imperative for world economies. Financial development, which is one of the important determinants of carbon emissions and economic growth, is one of the most important factors affecting environmental quality. Although there is no consensus on this issue, there are two different views that argue that financial development reduces environmental quality and increases environmental quality. On the other hand, the importance of human capital and corporate quality factors in ensuring sustainable and environmentally friendly economic growth has recently come to the fore. In the light of all this information, in this study, the role of financial development, human capital and corporate quality in determining environmental quality in Turkey, using annual data for the period 1984-2018, is analyzed through ARDL bounds test. The results of the analysis show that financial development causes environmental deterioration in the short term, that it does not have a significant effect on environmental quality due to the lack of reforms to be made in the long term in the financial sector, human capital and corporate quality that do not have a significant effect in the short term, with the right policies made in the long term. It shows that it reduces the emission of emissions and therefore increases the environmental quality.

Based on these findings, Turkey, a developing nation, should support the creation of new and improved financial tools to aid in the mitigation of environmental issues, as the growth of the financial sector has a substantial impact on the deterioration of the environment. At the same time, financial support for programs that promote environmental protection should be given preference over projects that favor environmental pollution. Based on the widely held belief that financial development improves environmental quality through human capital, it should also commit

7

financial resources primarily to the education and health sectors to establish a human capital promotion strategy that will reduce carbon emissions. Finally, in order to create and control frameworks for sustainable growth, policymakers should strengthen management capabilities and carry on with the establishment of top-notch institutions.

References

Abid, M. (2016). Impact of economic, financial, and institutional factors on CO2 emissions: evidence from sub-Saharan Africa economies. Utilities Policy, 41, 85-94.

Acheampong, A. O. (2018). Economic growth, CO2 emissions and energy consumption: what causes what and where?. Energy Economics, 74, 677-692.

Ahmad, M., Ahmed, Z., Yang, X., Hussain, N., & Sinha, A. (2022). Financial development and environmental degradation: Do human capital and institutional quality make a difference?. Gondwana Research, 105, 299-310.

Ahmad, N., Du, L., Lu, J., Wang, J., Li, H. Z., & Hashmi, M. Z. (2017). Modelling the CO2 emissions and economic growth in Croatia: is there any environmental Kuznets curve?. Energy, 123, 164-172.

Ahmed, Z., Asghar, M. M., Malik, M. N., & Nawaz, K. (2020). Moving towards a sustainable environment: the dynamic linkage between natural resources, human capital, urbanization, economic growth, and ecological footprint in China. Resources Policy, 67, 101677.

Al-Mulali, U., Weng-Wai, C., Sheau-Ting, L., & Mohammed, A. H. (2015). Investigating the environmental Kuznets curve (EKC) hypothesis by utilizing the ecological footprint as an indicator of environmental degradation. Ecological indicators, 48, 315-323.

Anwar, A., Sinha, A., Sharif, A., Siddique, M., Irshad, S., Anwar, W., & Malik, S. (2022). The nexus between urbanization, renewable energy consumption, financial development, and CO2 emissions: evidence from selected Asian countries. Environment, Development and Sustainability, 24(5), 6556-6576.

Apergis, N., & Ozturk, I. (2015). Testing environmental Kuznets curve hypothesis in Asian countries. Ecological indicators, 52, 16-22.

Apergis, N., & Payne, J. E. (2010). The emissions, energy consumption, and growth nexus: evidence from the commonwealth of independent states. Energy policy, 38(1), 650-655.

Boutabba, M. A. (2014). The impact of financial development, income, energy and trade on carbon emissions: evidence from the Indian economy. Economic Modelling, 40, 33-41.

Charfeddine, L., & Khediri, K. B. (2016). Financial development and environmental quality in UAE: Cointegration with structural breaks. Renewable and Sustainable Energy Reviews, 55, 1322-1335.

Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. Econometrica: journal of the Econometric Society, 1057-1072.

Farhani, S., & Ozturk, I. (2015). Causal relationship between CO_2 emissions, real GDP, energy consumption, financial development, trade openness, and urbanization in Tunisia. Environmental Science and Pollution Research, 22(20), 15663-15676.

Grossman, G., & Krueger, A. (1995). Economic environment and the economic growth. Quarterly Journal of Economics, 110(2), 353-377.

Ibrahiem, D. M. (2020). Do technological innovations and financial development improve environmental quality in Egypt?. Environmental Science and Pollution Research, 27(10), 10869-10881.

Khan, I., Hou, F., Le, H. P., & Ali, S. A. (2021). Do natural resources, urbanization, and value-adding manufacturing affect environmental quality? Evidence from the top ten manufacturing countries. Resources Policy, 72, 102109.

Pata, U. K., & Caglar, A. E. (2021). Investigating the EKC hypothesis with renewable energy consumption, human capital, globalization and trade openness for China: evidence from augmented ARDL approach with a structural break. Energy, 216, 119220.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics, 16(3), 289-326.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. Biometrika, 75(2), 335-346.

Sadorsky, P. (2011). Financial development and energy consumption in Central and Eastern European frontier economies. Energy policy, 39(2), 999-1006.

Salahuddin, M., & Alam, K. (2015). Internet usage, electricity consumption and economic growth in Australia: A time series evidence. Telematics and Informatics, 32(4), 862-878.

Shahbaz, M., Shahzad, S. J. H., Ahmad, N., & Alam, S. (2016). Financial development and environmental quality: the way forward. Energy Policy, 98, 353-364.

Shahbaz, M., Sharma, R., Sinha, A., & Jiao, Z. (2021). Analyzing nonlinear impact of economic growth drivers on CO_2 emissions: Designing an SDG framework for India. Energy Policy, 148, 111965.

Sharif, A., Baris-Tuzemen, O., Uzuner, G., Ozturk, I., & Sinha, A. (2020). Revisiting the role of renewable and non-renewable energy consumption on Turkey's ecological footprint: Evidence from Quantile ARDL approach. Sustainable Cities and Society, 57, 102138.

Sinha, A., Mishra, S., Sharif, A., & Yarovaya, L. (2021). Does green financing help to improve environmental & social responsibility? Designing SDG framework

through advanced quantile modelling. Journal of Environmental Management, 292, 112751.

Stern, D. I. (2004). The rise and fall of the environmental Kuznets curve. World development, 32(8), 1419-1439.

Tamazian, A., Chousa, J. P., & Vadlamannati, K. C. (2009). Does higher economic and financial development lead to environmental degradation: evidence from BRIC countries. Energy policy, 37(1), 246-253.

Ulucak, R. (2020). The pathway toward pollution mitigation: does institutional quality make a difference?. Business Strategy and the Environment, 29(8), 3571-3583.

Zafar, M. W., Zaidi, S. A. H., Khan, N. R., Mirza, F. M., Hou, F., & Kirmani, S. A. A. (2019). The impact of natural resources, human capital, and foreign direct investment on the ecological footprint: the case of the United States. Resources Policy, 63, 101428.

The Relationship between Investor Sentiment and The Green Bond Market

Turhan Korkmaz
Mersin University, Turkey

Tuğba Nur
Sirnak University, Turkey

Abstract

There is increasing investor interest in green bonds, which finance environmental projects that promote sustainability. Therefore, investor sentiment has begun to be considered as a source of information not only for the stock market but also for the green bond market. Although there are studies on green bonds, the number of studies dealing with the relationship with investor sentiment has been limited. In this context the study, it is aimed to investigate the relationship between investor sentiment and green bond market in the period of 02/07/2012-13/07/2022 with time series analysis. Investor sentiment cannot be observed directly from the market therefore daily data on the VIX index for investor sentiment and daily data on the S&P Green Bond Index for the green bond market were included in the analysis. As a result of the analyzes carried out, it has been determined that there is a one-way causality relationship from the VIX Index to the S&P Green Bond Index. According to the results of the impulse-response analysis, it was determined that a shock in the VIX Index caused a negative shock in the S&P Green Bond Index until the 5th day, and it disappeared after the 5th day and converged to zero. In addition, it was determined that a shock in the S&P Green Bond Index caused a positive shock in the VIX index until the 5th day, and it disappeared after the 5th day and converged to zero. The findings obtained from the study are important for green bond investors in terms of forming investment strategies by considering the relationship between sentiment indices and green bond market.

Keywords: Investor Sentiment, Green Bond, VIX, S&P Green Bond Index

1. Introduction

Green bonds are innovative fixed income products that offer investors the opportunity to help reduce the impact of climate change and support their countries' environmental strategies. Although green bonds are not significantly different from conventional bonds, they differ in that the returns from green bond sales must be invested in projects that aim to create environmental benefits. The Copenhagen Accord (2009) provided a significant boost to the green bond market and assigned it a critical role in combating climate change through the mobilization of private investments (Pineiro-Chousa et al., 2021: 1; Pineiro-Chousa et al., 2022: 520). The way to effectively finance green projects and to come up with a market mechanism that can effectively mobilize the capital market to support green projects have been a center of attention (Mzoughi et al., 2021:2). In the literature, there are studies that identified a relationship among stocks, volatility, and the green bond market (e.g. (Deribew (2017), Roboredo (2018), Baulkaran (2019), Roboredo and Ugolini (2020), Gao et al., (2021), Hung (2021), Mensi et al., (2022)). With the increasing interest of investors in the green bond market, the impact of investor attention and investor sentiment has become a new area for research (e.g., Broadstock and Cheng (2019), Pham and Hyunh (2020), Pineiro-Chousa et al. (2021), and Cepni (2022)). For this reason, the purpose of this study is to examine the relationship between investor sentiment (VIX), which is considered to be a field covered on a limited basis, and the green bond market (S&P Green Bond Index) between July 2, 2012 and July 13, 2022. During the recent years, the investors' attention has been increased on green bonds, which are similar to conventional bonds in terms of the method of issuance and are relatively easier to incorporate into portfolios. It is therefore important for green bond investors to develop investment strategies considering the relationship between sentiment indices and the green bond market.

2. Methodology

Purpose, Scope, Data Set, and Methodology of the Study

The purpose of the study is to examine the relationship between investor sentiment and the green bond market through time series analyses. For this reason, the VIX index was used for the investor sentiment variable, which is a concept that cannot be measured directly. For the green bond market, data on the S&P Green Bond Index was included in the analysis. The scope of research is made up of daily data on the indices between July 2, 2012 and July 13, 2022. All variables were included in the analysis by taking their logarithms.

3. Findings

In the study, the findings regarding the descriptive statistics of the first of the analyzes carried out to examine the relationship between the VIX index, which represents investor sentiment, and the S&P Green Bond index are shown in Table 1.

Table 1. Descriptive Statistics

	LNVIX	LNGBOND
Mean	0.000178	-2.73E-05
Median	-0.006417	7.33E-05
Maximum	0.768245	0.020127
Minimum	-0.299831	-0.024239
Std. Dev.	0.080319	0.003305
Skewness	1.202421	-0.614970
Kurtosis	9.624811	8.357453
Jarque-Bera	5246.540	3191.465
Probability	0.000000	0.000000
Observation	2535	2535

According to the descriptive statistics on the series, the mean value for the LNVIX and LNGBOND series were 0.000178 and -2.73E-05, respectively. With regards to standard deviation, it is safe to say that there are no major changes in the series in terms of period and the standard deviation in the LNVIX series is higher than that of the LNGBOND series. The J-B probability of both of the series was found to be less than 0.05, which is the critical value, thus, the series did not exhibit a normal distribution. Since the series did not exhibit normal distribution, the correlation relationship between them was examined by Spearman Correlation analysis, which is used in cases where there is no normal distribution. The analysis results are shown in Table 2.
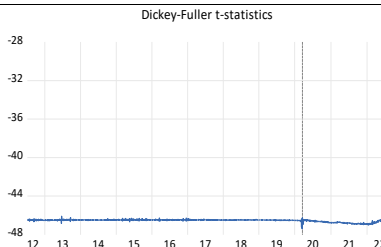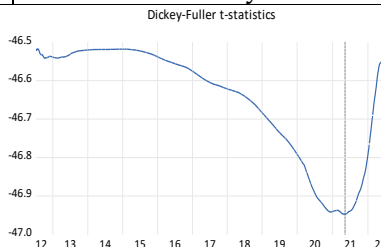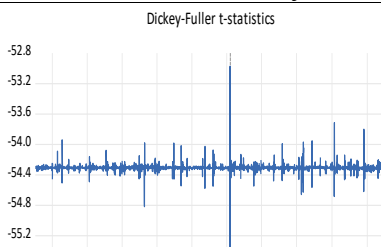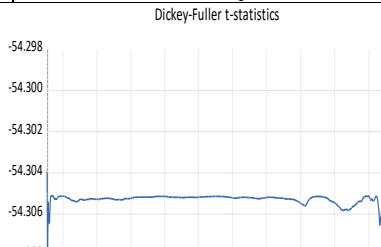
Table 2. Spearman Correlation Analysis

Correlation	LNVIX	LNGBOND
LNVIX	1.000000	
LNGBOND	0.030370	1.000000
t-Statistic	LNVIX	LNGBOND
LNVIX	-----	
LNGBOND	1.529183	-----
Probability	LNVIX	LNGBOND
LNVIX	-----	
LNGBOND	0.1263	-----

Looking at the correlation relationship between the series, it is safe to say that there is a positive relationship that is not at a high level. Then, the stationarity of the series was examined using the structural break ADF unit root test. The unit root test results are shown in Table 3.

Table 3. Unit Root Test Results

LNGBOND			
Constant		**Constant and Trend**	
t-statistics	-47.40399	t-statistics	-46.94683
Probability	< 0.01	Probability	< 0.01
Break Date: March 18, 2020		Break Date: May 7, 2021	
LNVIX			
Constant		**Constant and Trend**	
t-statistics	-55.88992	t-statistics	-54.30874
Probability	< 0.01	Probability	< 0.01
Break Date: February 5, 2018		Break Date: July 16, 2012	

According to the ADF unit root test results for the LNGBOND and LNVIX series, the probability value both for the constant and the constant and trend is smaller than the critical value of 0.05. Therefore, the null hypothesis suggesting that it is a unit root is rejected. In this context, it was found that both series are stationary at level values, that is, they are I(0). In addition, during the research period, structural breaks were identified for both series. The breaks took place for the LNGBOND series on March 18, 2020 and May 7, 2021 and for the LNVIX series on July 16, 2012 and February 5, 2018. After examining the stationarity of the series, the VAR model was developed. The results of the tests performed to determine the VAR model lag duration are shown in Table 4.

**Table 4.** VAR Model Lag Duration Determination Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	13633.63	NA	7.07e-08	-10.78879	-10.78417	-10.78711
1	13661.30	55.27326	6.94e-08	-10.80752	-10.79367*	-10.80249*
2	13666.54	10.44843*	6.93e-08*	-10.80850*	-10.78541	-10.80012
3	13669.00	4.916880	6.94e-08	-10.80728	-10.77496	-10.79555
4	13673.12	8.202341	6.94e-08	-10.80738	-10.76581	-10.79230
5	13676.53	6.783283	6.94e-08	-10.80691	-10.75611	-10,78847
6	13679.01	4.948127	6.95e-08	-10.80571	-10.74568	-10.78393
7	13682.11	6.166319	6.96e-08	-10.80500	-10.73573	-10.77986
8	13685.93	7.584312	6.96e-08	-10.80485	-10.72635	-10.77637

The lag duration of the VAR model was determined to be 2 according to the LR, FPE, and AIC information criteria. VAR model results are shown in Table 5.

Table 5. VAR Model Results

	LNGBOND	LNVIX
LNGBOND(-1)	0.079457	0.414680
	(0.01972)	(0.48158)
	[4.02838]	[0.86109]
LNVIX(-1)	-0.003972	-0.076557
	(0.00081)	(0.01982)
	[-4.89328]	[-3.86333]
C	-2.40E-05	0.000212
	(6.5E-05)	(0.00159)
	[-0.36811]	[0.13313]

Before the analyses to be performed on the VAR model, the stationarity of the model and the autocorrelation assumption regarding the error terms were tested. The inverse roots of the AR characteristic polynomial for the stationarity of the model are shown in Figure 1.
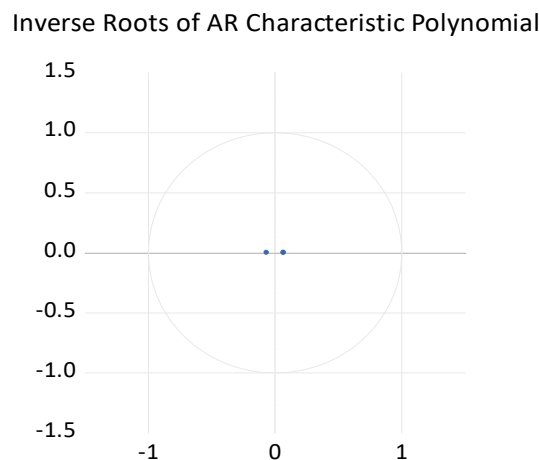
Figure 1. VAR Model Stationarity Graph

According to Figure 1, the inverse AR roots are within the unit circle and the model is stationary. The results of the tests performed on the autocorrelation assumption are shown in Table 6.

Table 6. Autocorrelation - LM Test Results

| Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	10.10367	4	0.0387	2.527943	(4, 5056.0)	0.0387
5	6.569495	4	0.1605	1.643116	(4, 5056.0)	0.1605
10	2.168329	4	0.7048	0.542091	(4, 5056.0)	0.7048
20	0.860614	4	0.9301	0.215129	(4, 5056.0)	0.9301
30	6.310182	4	0.1772	1.578218	(4, 5056.0)	0.1772
50	4.597625	4	0.3311	1.149702	(4, 5056.0)	0.3311
100	3.349140	4	0.5012	0.837397	(4, 5056.0)	0.5012
150	5.754890	4	0.2182	1.439257	(4, 5056.0)	0.2182
200	3.557976	4	0.4691	0.889631	(4, 5056.0)	0.4691

The LM test results shown in Table 6 indicate that the test probability values measured for the 200th and subsequent lag values are higher than 0,05, which is the critical value. Therefore, it was determined that there is no autocorrelation problem in the model. The causality relationship between the series was analyzed using the standard Granger causality analyses. The analysis results are shown in Table 7.

Table 7. Granger Causality Analysis Results

Standard Granger Causality Test					
Causality	Wald	Asym. Prob.	Bootstrap Prob.	Lag	Frequency
LNVIX=>LNGBOND	24.628	0.000	0.000	2	0.000
LNGBOND => LNVIX	0.701	0.704	0.717	2	0.000

According to the results of the standard Granger causality, a one-way causality relationship was found from the LNVIX series to the LNGBOND series at a significance level of 1%. Then, the reaction of the LNGBOND variable to a standard deviation stochastic shock that may occur in the LNVIX series was examined using the impulse-response analysis. The analysis results are shown in Figure 2.
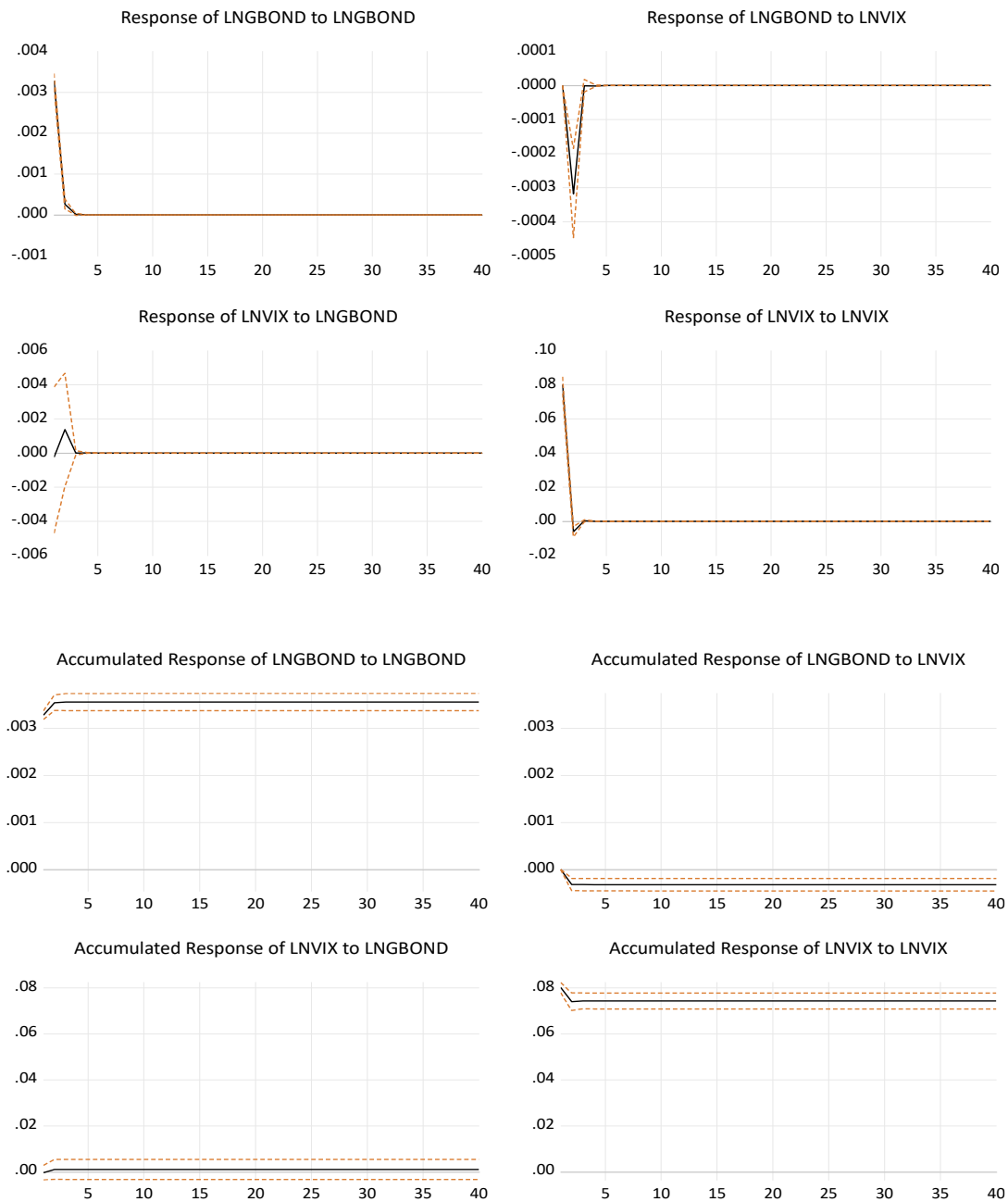
Figure 2. Impulse-Response Analysis Results

According to the results of the impulse-response analysis, a shock in the VIX index caused a negative shock in the S&P Green Bond Index until day 5 which disappeared and converged to zero from that day onward. Also, a shock in the S&P Green Bond Index caused a positive shock in the VIX index until day 5 which disappeared and converged to zero from that day onward.

According to the cumulative response functions, it is observed that the shock effect converges to zero, and both error bands are below or above zero. Therefore, it is safe to say that a shock in the long-term LNVIX series has a negative lasting effect on the short-term LNGBOND series.

4. Conclusion

With the climate change risk, the interest in green finance has increased and businesses have started to focus more on green projects. Green bonds have emerged to finance green projects and have become a rapidly developing market to which investor attention is increasing. The purpose of this study was to examine the relationship between investor sentiment, which is measured using the VIX index, and the S&P Green Bond Index between July 2, 2012 and July 13, 2022 using time series analyses. In the study, the VAR model was first developed and Granger causality, impulse-response, and variance decomposition analyses were performed using the model. According to the results of the standard Granger causality, a one-way causality relationship was found from the LNVIX series to the LNGBOND series at a significance level of 1%.

According to the results of the impulse-response analysis, a shock in the VIX index caused a negative shock in the S&P Green Bond Index until day 5 which disappeared and converged to zero from that day onward. Also, a shock in the S&P Green Bond Index caused a positive shock in the VIX index until day 5 which disappeared and converged to zero from that day onward. According to cumulative response functions, it is safe to say that a shock in the long-term LNVIX series has a negative lasting effect on the short-term LNGBOND series.

The findings are important for green bond investors to develop investment strategies by considering the relationship between the sentiment index and the green bond market.

References

Baulkaran, V. (2019). Stock market reaction to green bond issuance. *Journal of Asset Management, 20*, 331-340.

Broadstock, D. C., & Cheng, L. T. (2019). Time-varying relation between black and green bond price benchmarks: Macroeconomic determinants for the first decade. *Finance research letters*, *29*, 17-22.

Deribew, H. N. (2017). *Risks and returns of green bonds* (Master's thesis, Norwegian University of Life Sciences, Ås).

Gao, Y., Li, Y., & Wang, Y. (2021). Risk spillover and network connectedness analysis of China's green bond and financial markets: Evidence from financial events of 2015–2020. *The North American Journal of Economics and Finance*, *57*, 1-25.

Hung, N. T. (2021). Nexus between green bonds, financial and environmental indicators. *Economics and Business Letters, 10*(3), 191-199.

Mensi, W., Shafiullah, M., Vo, X. V., & Kang, S. H. (2022). Spillovers and connectedness between green bond and stock markets in bearish and bullish market scenarios. *Finance Research Letters*, *49*, 103-120.

Mzoughi, H., Hchaichi, R., & Guesmi, K. (2021). Is there a relationship between investor sentiment and green finance? *Question (s) de management*, *36*(6), 37-57.

Pham, L., & Huynh, T. L. D. (2020). How does investor attention influence the green bond market? *Finance Research Letters*, *35*, 1-7.

Piñeiro-Chousa, J., López-Cabarcos, M. Á., & Šević, A. (2022). Green bond market and Sentiment: Is there a switching Behaviour? *Journal of Business Research*, *141*, 520-527.

Piñeiro-Chousa, J., López-Cabarcos, M. Á., Caby, J., & Šević, A. (2021). The influence of investor sentiment on the green bond market. *Technological Forecasting and Social Change*, *162*, 1-7.

Roboredo, J. C. (2018). Green bond and financial markets: Co-Movement, diversification and price spillover effects. *Energy Economics, 74*, 38-50.

Roboredo, J. C. & Ugolini, A. (2020). Price connectedness between green bond and financial markets. *Economic Modelling*, *88*, 25-38.

Sustainability of Cultural Heritage: The Case of Konya Zazadin Han

Duygu İlkhan Söylemez

Selçuk University, Turkey

Abstract

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Cultural heritage and sustainable development are fields that are strongly linked to each other. The goal of sustainable development is to help raise awareness for the protection of cultural heritage and cultural identity. Sustainable cultural heritage can be seen as a vital resource for production and competitiveness, and an initiator to deliver environmentally friendly solutions. The Seljuks of Anatolia, the Muslim state established on the conquered Byzantine lands and peoples of Anatolia (Rûm) following the entry of the Seljuk Turks into Anatolia, the capital after the Battle of Malazgirt (1071) was first the city of Iznik and then the city of Konya. The Seljuks of Anatolia at the end of the 12th century and the beginning of the 13th century, it reached the peak of its power by taking important Byzantine ports on the Mediterranean and Black Sea coasts. Konya reached its highest level of prosperity under the rule of the Anatolian Seljuks and became one of the brightest cities in the world. Many structures were built in the city during this period, including some of the finest examples of Seljuk art available. Restoration works have been carried out to protect this cultural heritage today. One of the most spectacular hans in Turkey, the Zazadin Han is famous for its off-axis entrance into the courtyard, its two intact inscriptions, its dazzling striped portal, the extensive spolia stones in its walls and the notoriety of its patron and architect, the vizier Sadeddin Köpek. In this study, it is aimed to reveal the changes that a historical building has undergone upon ensuring its sustainability through reuse, and Zazadın Han, located in Konya city, was determined as the study area. In the study, literature review, archive research and on-site detection studies were carried out. Re-functionalizing these structures for preservation and moving them to the future is important both for the sustainability of the cultural heritage and for the efficient use of existing resources.

Keywords: Sustainability, Cultural Heritage, Re-functionalize, Konya, Zazadin Han

1. Cultural Heritage

Cultural heritage is the accumulation of values that emerged in the process from the beginning of human history to the present. This definition is essentially a broad and controversial one. Because, cultural heritage sites can be defined on a wide scale, from whole landscapes to small pieces of bone, stone and wood in archaeological sites, from ordinary residences to large palaces, from untouched nature areas to modern cityscapes (Harrison, 2013: 5). Although it is perceived as a nation's day and tomorrow, it is actually international and universal. Because these works were also revealed as a result of intercultural relations.

The physical destruction and damage caused to societies by the First and Second World Wars revealed the necessity of taking new measures for the protection of cultural heritage sites. He brought the view that the area should be protected by considering the historical and culturally important assets as a whole with their natural and built environment. In 1931, the 1st International Conference of Architects and Technicians on the Preservation of Historic Monuments was held in Athens. In 1933, the "Athens Agreement" was accepted for the protection of cultural heritage. According to this agreement; The issue of protecting the cultural heritage as a whole by functionalizing it with its environment has been discussed. In this context, organizations such as UNESCO, ICCROM, ICOMOS, European Council, Europa Nostra have been established in the international arena and steps have been taken regarding cultural heritage and its sustainability. The aims and objectives of these organizations are as follows;

Established in 1949, the Council of Europe acts in cooperation with member states and provinces on the protection and development of cultural heritage. Founded in 1965, ICCROM (International Center for the Study of Preservation and Restoration of Cultural Property) is an organization that was established to promote the preservation of cultural heritage and carries out its activities for this purpose. Established in 1963, Europa Nostra (Pan -Europa Federation for Heritage) is an organization that tries to protect cultural heritage and raise awareness of cultural heritage preservation in the society, and provides trainings and organizes campaigns in this direction (Eryılmaz, 2022: 8-9).

Among all these organizations, UNESCO and ICOMOS are two prominent organizations. UNESCO was established in 1945 as a result of a conference attended by representatives of 44 countries in London. The founding agreement has been accepted by 20 countries, including Turkey. Article 4 of the Convention defines all heritage policies and legislation, from local heritage projects to global policy, that we must preserve the remnants of the past for the benefit of future generations. In addition, they clarified the concept of Cultural Heritage, which is valid all over the world. According to this; In order to introduce the cultural and natural assets with universal values, which are accepted as the common heritage of all humanity, to the

world, to create the awareness in the society to protect this universal heritage, and to ensure the necessary cooperation for the survival of the cultural and natural values that have disappeared due to various reasons, the "World Convention on the Protection of Cultural and Natural Heritage" was accepted by UNESCO (Tunçer, 2017:430). According to the Convention on the Protection of the World Cultural and Natural Heritage, the places considered within the scope of cultural heritage are classified as monuments, building communities and sites (Öz and Güner, 2007: 593).

Founded in 1945, ICOMOS (International Council on Monuments and Sites), International Council on Monuments and Sites, is an international non-governmental organization that promotes the protection, development and functioning of cultural heritage sites and monuments. According to the definition of cultural heritage of ICOMOS; Although it is a non-renewable resource, it is identified with the idea of "trust" for the society and is a social duty that should be transmitted to future generations with all the values it encompasses (ICOMOS, 2013), while UNESCO is an organization that helps the World Heritage Committee for the implementation of the "World Heritage Convention". (ICOMOS, 2020).

Although cultural heritage and the components of cultural heritage are complex, UNESCO evaluates them under two different headings as tangible and intangible cultural heritage. When tangible cultural heritage is mentioned, movable and immovable cultural assets such as paintings, sculptures, coins, manuscripts, monuments, archaeological sites, shipwrecks, underwater ruins and cities come to mind. In short, we can say that communication resources that can be seen, identified and contacted, and in a sense transmit information from the past to the future (Salvatore and Lizama, 2018: 3-4).

Intangible cultural heritage was defined and accepted by UNESCO in 2003. According to this; language, performing arts, rituals, festive events, traditional craftsmanship, etc., through representations, expressions and skills, and the related tools, objects, and artifacts that gain continuity by being transferred from generation to generation (Scovazzi, 2015: 105-106).

After the concepts of tangible and intangible cultural heritage were accepted in the international arena, Turkey officially became a party to the Intangible Cultural Heritage Convention on March 26, 2006, after it was accepted by the Turkish Grand National Assembly on January 19, 2006 (Oğuz, 2009: 167). The issue that we should preserve the remnants of the past for the benefit of future generations has been stated in the goals of local heritage projects through heritage policy and legislation all over the world, up to global policy. Article 4 of the UNESCO World Heritage Convention is a good example. According to this article; The duty of each state party to the convention is defined as the identification, protection, preservation, presentation and transfer to future generations of the cultural and natural heritage in its territory (Holtorf and Högberg, 2021: 1).

As of July 2012, 962 properties (745 cultural, 188 natural, 29 mixed) located within the borders of 157 states parties have achieved the status of extraordinary universal values. Because heritage acts as a building block for sustainable development and as a catalyst for social harmony and reconciliation. In a changing world, cultural heritage is not only an element that unites humanity, but also an element that reminds and strengthens the ties of society within the same triangle of culture, nature and human being (Labadi, 2013:1).

The term heritage was accepted internationally when it was stated in the Venice Charter of 1964. The concept of "historical monument" in the charter includes not only architectural structures, but also regions that witnessed the life of a civilization in history (ICOMOS 1964). The monuments in these regions are defined as an environment or architectural expression determined by their characteristics or typical elements (Kuban, 2016:302). The preservation and sustainability of cultural heritage is of great importance in order to create a future for generations, to transfer the existence of the past between generations and for societies to survive (Ahunbay, 1999: 116).

The concept of sustainability, on the other hand, emerged and began to be examined in the 1970s with the idea that the development of societies should be considered not only from an economic point of view, but also from a social, human and environmental point of view (Han and Kaya, 2006: 257). We can say that one of the most important reasons for the emergence of this idea is the economic development that started with the industrial revolution, the spread of excessive production and excessive consumption not only to developed countries but also to developing countries, as well as the increasing pressure and wear on the environment, and as a result, the uneasiness of not being able to leave a legacy to future generations. (Kahraman and Türkay, 2012: 52). The word sustainability is in Latin, and "Subtenir" means "to hold or support from below" (Özmehmet, 2012:2). This concept, which also means continuity, can be briefly explained as providing the balance between production and consumption and transferring it to future generations by supporting (Karaaslan and Örs, 2007: 425). The first serious name taken on this subject was the "United Nations (UN) Human Environment Conference, which was held in Stockholm, Sweden in 1972 with the participation of 113 countries, and important decisions regarding sustainability were taken (Çavuş and Tanrısevdi; 2000: 150). In 1987, the World Commission on Environment and Development prepared the report "Our Common Future". According to this report, the concepts of development and sustainable development have been defined as an economic growth that considers economic growth and sustainability with a holistic approach and considers equality between present and future generations (Garrod And Fyall, 1998: 200). In short, although the word sustainability emerged with the concept of "Sustainable Development", it is used in many fields such as "Sustainable Life", "Sustainable Health Services", "Sustainable Education", "Sustainable Design", "Sustainable Historical Building" and "Sustainable Architecture" (Erşan). and Demirarslan, 2020: 190). One of the main reasons why the

word sustainable is used in every field is that globalization has an important share (Akış, 1999:46). In this regard, important steps were taken in 1992 with the UNCED (United Nations Conference on Development and Environment) conference held in Rio De Janeiro, Brazil. In this conference, the concept of sustainability, which is valid for all countries, was examined and studies on the wise use of resources were put forward (Ramanausklene and Martinkus, 2009: 29). At the conference, the contradiction between transferring cultural heritage to future generations and making this heritage accessible to the public for education and entertainment under the name of sustainability is one of the topics discussed. Because there is a fragile balance between access and protection (Labadi, 2013: 102). As a result, it was agreed that many components should come into play in order to achieve this balance. Namely; First of all, those living in the historical environment should have the will and consciousness to transfer this environment to the future without destroying it, which should be provided by education. Other factors are the transfer of resources by local administrations and governments, and it is necessary to purify this type of environment and structures from polluting elements (Tunçer, 1996:3). At the same time, the physical capacity should be evaluated correctly, the number of visitors, their expectations and the characteristics of the visitors should be determined. In short, controlled access to historical environments and structures should be encouraged, and policies that are compatible with the realities of our country and social and economic structure should be developed (Ahunbay, 1996: 132).

Although the concept of sustainability in Turkey is not explicitly mentioned, in the environmental law numbered 2872, which was enacted in 1983, in which its basic features are specified, there are expressions of the use of natural resources, the protection of natural and historical riches and their transfer to future generations. In 2006, the subject of sustainable development was included in the environmental law numbered 5491 (Balık, 2015: 24).

2. Conservation and Reuse of Sustainable Historic Buildings

The historical environment and buildings are a legacy not only to the history of the nations they contain, but also to the history of the world. Preserving these heritages of great importance and transferring them to future generations is possible with education, knowledge and continuous care. In addition to the struggle of historical buildings against natural disasters, adverse environmental conditions, physical and chemical deterioration, there is also a struggle against accelerating the destruction process of historical structures with the attitude of human beings towards these structures (Erşan and Demirarslan, 2020: 193). In this direction, the Council of Europe convened in Amsterdam, the capital of the Netherlands, in 1975, declaring the Year of World Heritage and putting forward a declaration. According to this declaration, it was stated that historical buildings should be re-functioned in many countries of the

world, with emphasis on the preservation of the social fabric, the determination of the appropriate function for the building, the application of sensitive restoration techniques and the care of the people living in the physical environment of the historical building (Tanrisever-Sarac and Aydoğdu, 2016: 1069). However, this process of re-functioning and ensuring sustainability needs to be carried out with great care. In order to keep the historical structure alive, the right applications should be chosen. It should be ensured that the originality of the building is not deteriorated with the right material selection and technique, and if an item is to be added to the building and later, it can be easily removed in the event that the use of this item has ended (Zeren, 2019: 25). In this context, adapting the building to be protected to its new function in line with contemporary requirements and using it in this way should be an indispensable element of conservation policies. Reuse, which is a dimension of conservation, is a tool for the sustainability of historical buildings. The main purpose is to protect the structure. While realizing this aim, functional and structurally appropriate functions should be assigned to historical buildings (Kincaid, 2002: 2). While choosing these functions, functions that respect the historical document and aesthetic values of the building, and are suitable for its spatial formation, volumetric dimensions, structural system, functional setup, facade layout and environmental factors should be prioritized (Büyükçam, 2021: 571). The re-functioned building should respond to the material, physical and symbolic needs of the society and meet the comfort needs depending on the changing living conditions. Adaptation of the building to the new function determined to the extent of internal and external factors brings along structural interventions. At this point, a minimum amount of intervention should be taken as a principle, and the originality of the building should not be damaged as much as possible (Fielden, 2003: 277-278). Because, if the building is reused in this way, we can talk about leaving a real legacy to future generations. One of this heritage is Zazadın Han, which is one of the most important works of the Seljuk period.

3. Konya Zazadin Han

Caravanserais; They are the most important products of Seljuk art and architecture. Especially Seljuk architecture is best known and followed by caravanserais. After Anatolia was taken from the Byzantines with the Battle of Manzikert in 1071, the Turks began to conquer the Anatolian lands very quickly, with their efforts to make Anatolia their homeland. Starting from the Manzikert Victory, they came to Iznik in a short time like four years, and in 1075 they took the city from the hands of the Byzantine Empire and made it the capital city (Cahen, 1987: 1404). With Konya being the capital, especially at the end of the 12th century, the Seljuk lands became so Turkic as to be referred to as Turkey, and with the political domination of the Seljuk sultans, Konya allowed the establishment of a strong central administration in a short time. In addition to its conquest, the Anatolian Seljuk state, which became a bridge between

Central Asia-Europe and Asia-Africa with its capture in centers such as Eskişehir and Denizli, became the manager, director and protector of trade (Kuban, 2004: 107-108). Of course, the fact that the Anatolian Seljuk state has an important place in world trade and has a say in trade is an important factor in the hands of trade routes, but it is not enough on its own. In addition, the role of Seljuk sultans and statesmen cannot be denied. The applied trade policies and intensive construction activities on trade routes made Seljuk Anatolia the apple of the eye of world trade (Çavuşdere, 2009: 55).

Anatolian Seljuks had caravanserais built on trade routes in order to develop trade and make Anatolian lands more reliable for commercial activities. These caravanserais were built by sultans, statesmen and other influential people. As a result of their determination to make Anatolian trade center, the Seljuk sultans connected almost every part of the country with caravan routes in the east-west, north-south direction. They had caravanserais built on these roads. According to the information obtained from the sources, he can say that today's facilities defined as five-star, not only fulfill their duties, but are even better than these facilities. Because, free service was provided in these caravanserais, regardless of religion, language, race, poor or rich (Baş, 1998: 61-62). The first caravanserai in Anatolia II. It is thought to be Alay Han, which is estimated to have been built in the time of Kılıçarslan. However, the epitaph of this building has not survived until today. The oldest inn whose exact date of construction is known is Altunapa Han, dated 1201 (Özergin, 1965: 145). While O. Cezmi Tuncer wrote that there were 179 caravanserais in Anatolia during the Anatolian Seljuk period, A.T. Yavuz, on the other hand, is of the opinion that the number of caravanserais built in this period could be more than 250 (Tuncer, 2007: 91- Yavuz, 2006: 435-445). Considering the policies implemented by the rulers of the Seljuk state, the conquests they made, the works they produced, the breakthrough they showed in art and science, and the increase in the economic and social situation of the country in general, it is reasonable and logical that the number of caravanserais is so high. The purpose of the caravanserais is to protect the caravans carrying rich commercial goods from looters around the borders, and from the raids of nomads and bandits inside, as well as accommodation and safe structures that meet all their needs (Turan, 1946: 471). The first examples of caravanserais are seen in Central Asia during the Karakhanids, Ghaznavids and Great Seljuks. These caravanserais, called Ribat, are in ruins today. While these structures were used as military bases in times of war, they were used for accommodation of caravans in times of peace. The caravanserais of the Anatolian Seljuks are more monumental, unlike those of the Karakhanids, Ghaznavids and Great Seljuks, and resembles a tower with their high walls covered with cut stone and reinforced with support towers (Eravşar, 2011: 26-27). Caravanserais were usually built at a distance of 7-8 hours on a camel walk, which corresponds to a distance of approximately 35-40 km (Acun, 2007: 15). These caravanserais in the Anatolian Seljuk period had their heyday both in terms of architecture and the mission they undertook.

One of these caravanserais is Zazadın Han, near the Tömek village, located 5 km from the Aksaray-Konya road. It started in the era of Alaeddin Keykubad (1236) and finished in the era of his son Gıyaseddin Keyhüsev. It was built by Vizier Sadettin Dog Bin Muhammed (Bektaş, 1999: 28). Thanks to the two inscriptions, one of which is located at the crown gate of the part with the courtyard on the southern façade of the building and the other at the gate of the closed part, we have information about the construction date and process of the building. Han Seljuk period is an important example of stonemasonry (Aslanapa, 1991: 43). Zazadın Han shows a longitudinal rectangular plan scheme in the east-west direction. Like other caravanserais built in the same period, it has closed and open sections, and unlike other structures, its northern wall was built gradually (Baş, 2001: 101). It is seen that many reused materials from the ancient period were used among the stones of the building whose body walls are made of stone (Yıldız and Altuntaş, 2009: 55). Although the entrance is entered with a monumental portal designed with bi-colored material, this facade is enlivened by the portal and buttresses. Passing through the crown gate, the courtyard is surrounded by spaces and porticoes in three directions. A feature that distinguishes Zazadin Han from other caravanserais is that while porticoes and spaces are located on separate wings in many caravanserais, the portico and spaces are intertwined in Zazadin Han. provided with. The closed section consists of a central nave extending in the east-west direction in the middle and six naves in the north-south direction connected perpendicularly to this nave on the sides. The middle nave, covered with a barrel vault, was kept wider and higher than the side naves, and a luminous lantern was placed in the middle. The side aisles are completely covered with barrel vaults (Önge, 2007: 204). The mosque of the building is located above the entrance, as in many caravanserais of the period. The masjid is accessed from the left of the entrance iwan with a design created by using stones carried over from the wall as stair steps. This part, which was quite devastated, was rebuilt with repairs. The octagonal mihrab niche on the south wall of the mosque, which is understood to be surrounded by stepped moldings, was rebuilt and completed as a half-round niche, and the space was covered with a star vault (Parla, 1997: 687).

Unlike the other inns of the period, it does not have much ornamentation in terms of decoration, the use of two-color materials at the entrances and simple geometric compositions, the friezes under the eaves in the courtyard and the geometric motifs on the altar of the mosque constitute the existing decoration. Although the Zazadın Han is one of the best preserved examples of the caravanserais that have survived from the Seljuk period, many parts have been destroyed. Some of the cloisters in the courtyard were destroyed, and collapses occurred on the upper cover and walls.

A major cleaning was carried out in 1996 for the restoration work in the caravanserai, and this work was carried out both in the courtyard and in the closed part (Baş, 2001: 105,107). A project was proposed to be restored after cleaning, and the Han and its surroundings were registered as the 1st protected area. In the restoration that started

in 2007, the roof and upper parts of the walls were covered with aluminum sheets. Matte coated gray glass was used in the luminous lantern, and the missing parts of the portal arches were made with original material, based on Kurt Erdmann's drawings. After cleaning, the paved floor was unearthed, the good ones were preserved, the bad ones were rebuilt with similar types of stones. The star dome and the northern wall of the mosque were rebuilt and its flooring was rebuilt based on the existing parts. All door wings in the building are made of solid wood and impregnated against rot. Doors are painted as coating (Önge, 2004: 189-190).

After the restoration under the leadership of the Seljuk municipality, it has started to serve as a restaurant since 2007. While the masjid preserves its place in its original form, the courtyard, which will be used as a restaurant, is the most important area. Because, its capacity is limited due to the indoor terraces. On the other hand, the fact that the courtyard is wide increases its importance even more. There is only one place that has undergone changes on the new function of the building after the restoration. The room door is the conversion of a space that opens to the courtyard into a toilet and sink. The floor of this place, which is not divided into men and women, is covered with ceramics, and no intervention has been made on its walls. Since Zazadin Han is far from the city center, it is used as a temporary restaurant. There is no kitchen area as food services are brought by the organization companies. Zazadin Han has a service capacity of five hundred people (Özkafa, 2015:39-40).

4. Conclusion

As long as a building can maintain its function, it can preserve its feature of being an architectural work, otherwise it remains inactive and remains an archaeological element. On the other hand, depending on the changing needs of the society, which is in constant change and development, structures that lose their original function are given new functions in order to serve different purposes from the one they were built (Pehlivan, 2018: 540).

This is one of the buildings that gained new functionality in Zazadın Han. Today, it is used as a temporary restaurant where special organizations are held, unlike the concept of a restaurant that provides continuous service. One of the reasons for this is that it is far from the center of Konya and the lack of kitchens necessitated the use of the building in this way. In fact, such a situation both ensures the sustainability of the structure and prevents the structure from being damaged too much.

While Zazadın Han's re-functioning was successful in general, there are issues that can be seen as unsuccessful. For example, while the project proposal of the building was to be built below ground level, close to the northeast corner of the toilet, outside the Han, the largest closed room in the courtyard was considered as the toilet-sink area and was covered with ceramics during the restoration. Although this is a correct

approach in terms of restoration principles and even need-based sustainability, this understanding has not been an aesthetic solution.

As a result; Thanks to the restoration and re-functioning of Zazadın Han and its surroundings as a restaurant, measures were taken against the destructive factors of nature and humans, and its identity and historical value were emphasized by promoting the economic and functional value of the building, increasing its popularity with a new function. Thus, it was ensured that Zazadın Han and its surroundings were brought to future generations as cultural heritage. An important step has been taken to restore Zazadın Han, one of the symbolic structures of both the Seljuk period and Konya, by putting it into a new function, gaining the reputation that it had been deprived of for many years, and ensuring its sustainability. Zazadın Han is not only a restaurant, but also acts as a bridge between the past, present and future, providing the flow of information.

References

Acun, H. (2007). Giriş ve Yol Haritası, (Editör: Hakkı Acun), Anadolu Selçuklu Kervansarayları İçinde, Ankara: Kültür ve Turizm Bakanlığı Yayınları , 3101, Kütüphaneler ve Yayınlar Genel Müdürlüğü Eserleri Dizisi, 13-17.

Ahunbay, Z. (1999). Tarihi Çevre Koruma ve Restorasyon, İstanbul: Yem Yayınları.

Akış, S. (1999). Sürdürülebilir Turizm ve Türkiye, Anatolia: Turizm Araştırmaları Dergisi, Haziran, 36-47.

Balık, M. (2015). Sürdürülebilir Turizm Kalkınması Kapsamında Kültürel Mirasın Korunması Açısından Kentsel Yenilemenin Yeri ve Önemi: Fener- Balat Örneği, İstanbul Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, İstanbul.

Baş, A. (1998). Anadolu Selçuklu Dönemi Konya Kervansarayları, Sanatsal Mozaik, 3/33, İstanbul, 61-69

Baş, a. (2001). Yeni Buluntular Işığında Zazadin Hanının Değerlendirilmesi, I. Uluslararası Selçuklu Kültür ve Medeniyeti Kongresi, C.1, 101-109.

Bektaş, C. (1999). Selçuklu Kervansarayları Korunmaları, Kullanımları Üzerine Bir Öneri. İstanbul: Yem Yayınları.

Büyükçam, F. S. (2021).Kültürel Mirasın Sürdürülebilirliğinde Bir Yaklaşım Olarak Yeniden Kullanım: Samsun Taşhan, Uluslararası Sosyal Araştırmalar Dergisi, C.14, S.77, 669-579.

Cahen, C. (1987). Türklerin Anadolu'ya ilk Girişi (XI. Yüzyılın İkinci Yarısı). (Çeviren: Yaşar Yücel- Bahaeddin Yediyıldız), Belleten, C.LI (201), Ankara: Türk Tarih Kurumu Yayınları, 1375-1431.

Çavuş, Ş. Ve Tanrısevdi, A.(2000). Sürdürülebilir Turizm ve Yerel Ölçekli bir Sürdürülebilir Turizm Gelişme Modeli Önerisi, Anatolia Turizm Araştırmaları Dergisi, Eylül-Aralık, 149-159.

Çavuşdere, S. (2009). Selçuklular Dönemimnde Akdeni Ticareti, Türkler ve İtalyanlar, Tarih Okulu Dergisi, C.4, S.55, 53-75.

Eravşar, O. (2011). Anadolu Selçuklu Kervansarayları. Konya: Selçuklu Belediyesi Özel Koleksiyon.

Erşan, R.R. ve Demirarslan, D. (2020). Tarihi Yapılarda Sürdürülebilirlik İlkesi Bağlamında Eskişehir Odunpazarı Evleri, Eskişehir Osmangazi Üniversitesi, Sosyal Bilimler Dergisi, 21 (1), 187-213.

Eryılmaz, G. (2022). Kültürel Miras Alanları Etki Değerlendirme Yönetimi. Uludağ Üniversitesi, Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi, Bursa.

Fielden, M. B. (2003). Conservation of Historic Buildings. (3. Edition), Elsevier Architectural Press.

Garrod, B. and Fyall, A. (1998). Beyond the Rhetoric of Sustainable Tourism, Tourism Management, Volume 19, Issue 3, 199-212.

Han, E. Ve Kaya, A. (2006). Kalkınma Ekonomisi: Teori ve Politika. (5. Baskı), Ankara: Nobel Basımevi.

Harrison, R. (2013). Heritage-Citical Approaches. London: Routledge.

Holtorf, C and Högberg, A. (2021). Cultural Heritage As a Futuristic Field, cultural Heritage and the Future, Newyork, 1-28.

Kahraman, N ve Türkay, O. (2012). Turizm ve Çevre. (5. Baskı), Ankara: Detay Yayıncılık.

Karaaslan, Ş ve Örs, H. (2007) Uluslararası Sürdürülebilir Turizm Yaklaşımları ve Türkiye'de Sürdürülebilir Turizm Uygulamalarında Kamu Arazilerinin Turizm Yatırımlarına Tahsisi, Kent ve Bölge Üzerine Çalışmalar. Gazi Üniversitesi Mühendislik Mimarlık Fakültesi Şehir ve Bölge Planlama Bölümü, Ankara.

Kartal, S.N. – Engür, M. ve Köse, C. (2006). Emprenye Maddeleri ve Emprenye Edilmiş Ağaç Malzeme ile İlgili Çevre Problemleri, İstanbul Üniversitesi Orman Fakültesi Dergisi, C.56, S.1, 17-23.

Kincaid, D. (2002). Adopting Building For Chancing Uses. London and Newyork: Spon Press, Taylor&Francis Group.

Kuban, D. (2004). Çağlar Boyunca Türkiye Sanatının Anahatları. (1. Baskı). İstanbul: Yapı Kredi Yayınları.

Kuban, D. (2016). Anıtsal bir yapının Korunması ve Geleceğe Bırakılmasıyla İlgili İlkeler, Doğan Kuban Yazıları Antolojisi, C.2, Boyut Yayınları, 302-307.

Labadi, S. (2013). UNESCO Cultural Heritage and Outstanding Universal Value. Alta Mira Press, USA.

Oğuz, Ö.M. (2009). Somut Olmayan Kültürel Miras Nedir? Ankara: Geleneksel Yayıncılık.

Önge, M. (2007). Zazadin Han (Sadeddin Köpek Kervansarayı), (Editör: Hakkı Acun), Anadolu Selçuklu Kervansarayları İçinde , Ankara: Kültür ve Turizm Bakanlığı Yayınları , 3101, Kütüphaneler ve Yayınlar Genel Müdürlüğü Eserleri Dizisi, 195-209.

Önge, M. (2004). Restoration of Zazadin Han A 13. th. Century Seljukid Caravanserai Near Konya, The Middle East Technical University, Master, Ankara.

Öz, A.K ve Güner, S. (2007). Kültürel Mirasın Dostları Derneği, AB Kültürel Miras Mevzuatı ve Türkiye Projesi. (1. Basım), İstanbul.

Özergin, K. (1965). Anadolu Selçuklu Kervansarayları, Tarih Dergisi, 15/200, 140-165.

Özkafa, E. (2015). Konya Anadolu Selçuklu Hanlarının Restoran İşleviyle Yeniden Kullanımının İrdelenmesi, Selçuk Üniversitesi, Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi, Konya.

Özmehmet, E. (2012). Dünyada ve Türkiye'de Sürdürülebilir Kalkınma Yaklaşımları.

Parla, C. (1997). 1. Alaeddin Keykubad Dönemi Yapılarında Biçim ve Estetik. Hacettepe Üniversitesi, Ssosyal Bilimler Enstitüsü, Doktora Tezi, Ankara.

Pehlivan, G. F. (2018). Anıtsal Türk Mimarlık Örneklerinden Deveci Han'ın Yeniden İşlevlendirilmesi, Sutad Dergisi, S. 43, 537-559.

Ramanausklene C. and Martinkus. (2009). The Concept of Sustainable Development and its us efor Sustainability Scenarios, Engineering Economics, Volume 62, Issue 2, Page 28-37.

Salvatore, L.S and Lizama, J.T. (2018). Cultural Heritage Components, Cultural Heritage Care and Management, USA, Page, 3-6.

Scovazzi, T. (2015). Intangible Cultural Heritage as Defined in the 2003 UNESCO Convention, Cultural Heritage and Value Creation, Switzerland, 105-126.

Tanrısever, C; Saraç, Ö ve Aydoğdu,A. (2016). Eskişehir Odunpazarı ve Sivrihisar Evlerinin Cephe Örnekleri, Eskişehir: Anadolu Üniversitesi Edebiyat Fakültesi Yayınları.

Tunçer, M. (1996). Tarihsel Çevre Koruma Yazıları. Ankara.

Tunçer, M. (2017). Dünden Bugüne Kültürel Miras ve Koruma. Ankara: Gazi Kitabevi, Ankara.

Tuncer, O.C. (2007). Anadolu Kervan Yolları. Ankara. Vakıflar Genel Müdürlüğü Yayınları

Turan, O. (1946). Selçuk Kervansarayları, Belleten, C.39, Ankara: Türk Tarih Kurumu Basımevei, 471-496.

Yavuz, A.T. (2006). Kervansaraylar, Anadolu Selçuklu ve Beylikler Dönemi Uygarlığı. 2, Ankara: Kültür Bakanlığı Yayınları.

Yıldız, F ve Altuntaş, C. (2009). Yersel Lazer Tarayıcı Nokta Bulutlarının Jeodezik Koordinat Sistemine Dönüştürülmesi, Harita Dergisi, S.142, 51-58.

Zeren, M.T. (2019). Tarihi Çevrede Yeni Ek ve Yeni Yapı Olgusu. İstanbul: Yalın Yayıncılık.

Tax Advantage on Angel Investment in Turkey

Hakkı M. Ay

Selçuk University, Turkey

Nihal Güneş Ay

Selçuk University, Turkey

Abstract

Capital is one of the production factors necessary for the production of a good or service. Angel investment, called Individual Participation Capital, has a number of positive economic and social effects: increasing production, no need for foreign capital, preventing unemployment, reducing the current account deficit, increasing income, etc. The importance of capital in countries that lack savings, such as Turkey, is quite large. Reasons such as low income in Turkey, lack of habit of saving, religious prohibitions on interest, lack of development and widespread lack of the capital market cause dependence on foreign countries and organizations in terms of capital. Entrepreneurs have problems with achieving financial support. Capital-deprived entrepreneurs can enter the production process more easily and quickly by receiving the support of both financial capital and human capital from angel investors. Tax regulations in the field of angel investment may be a more attractive financing model for entrepreneurs. There are obstacles that can stand in the way of bright ideas of talented entrepreneurs. Angel investment helps to partially remove these obstacles.

The aim of the study is to reveal the importance and prevalence of angel investments, the role of angel investments in economic development, legal regulations in Turkey, tax regulations on angel investments.

Keywords: Capital, Entrepreneur, Angel Investment, Tax, Public Policies, Turkey

1.Entrepreneurship and Financing of Entrepreneurship

The production of any good or service is possible by combining the factors of production and directing them to production. Factors of production in the economy consist of resources that people use to produce goods and services. They are the most basic building blocks of the economy. Economists divide the factors of production into four categories. These are: land, labor, capital and entrepreneurship.

The field of entrepreneurship is defined as the scientific study of future goods and services by whom, how and with what (Shane and Venkataraman 2000: 218). Entrepreneurship is a process of creating value that consists of combining resources to seize an opportunity and evaluate it (Banger, 2013: 1). An entrepreneur is to create an innovative economic organization to earn and grow under risks and uncertainties, using scarce resources (Casson, 1982; Dollinger, 1995). Entrepreneurship creates a new business, growth, improves efficiency, provides efficient use of resources, creates jobs, and increases the level of social welfare, reduce regional disparities, unlocks your potential personal and social benefits. Entrepreneurs start their business with their own equity capital or near it they establish it with the funds of individuals (spouse, friend, family) (Christofidis and Debande, 2001: 6). Angel investors support the initiative at the initial stage. Venture capitalists, on the other hand, take part in the advanced stages of the venture. Apart from these methods, in the advanced stages of the initiative there are bank loans that are used very frequently (Er, Şahin and Mutlu, 2015: 33).

In order for an entrepreneur to be successful, his own abilities and competencies are not enough. There are factors that affect entrepreneurship. The entrepreneurial climate, economic stability, appropriate infrastructure, appropriate corporate structure, appropriate supports and similar factors affect the success of the entrepreneur. On the other hand, the OECD defines the elements that determine the framework of entrepreneurship in general as the entrepreneurial ecosystem (Cansız, 2013:16).

Entrepreneurship has a contribution to the individual, firm and country at the macro and micro levels. Entrepreneurship at the individual level provides contributions to success, development, income and satisfaction. It includes profit at the firm level, employment, the introduction of new resources and products into the economy, recognition/advertising contributions. Its contributions at the country level are new technology, products, services, increasing supply and demand, economic growth, income distribution, export growth and current account surplus (Arıkan, 2002: 42).

Financing of entrepreneurship is one of the most important points in entrepreneurship. Because it is an unfunded and commercial product initiatives and ideas that have not been transformed remain dormant, and these ideas have no economic value. The period when entrepreneurs most need financing and have

difficulty finding this financing is the early stage and the initial stage. When the financing methods of entrepreneurship are examined, the angel investment financing model, which is an alternative financing model, plays an effective role in providing the financing needed by early stage and startup entrepreneurs.

2.Angel Investment

The concept of angel was first introduced by stock traders on Broadway. High-risk investor for the continuation of Broadway shows it's a term they use to describe the wealthy. These rich people, called angels, to meet and spend time with the stage actors they admire at the shows.they would make this investment. Today's angel investors in many ways they resemble these angels. Wealthy people and families invest in business ideas with high risk and return potential that they like they do. Angels are also higher risk core or financially sophisticated private are investors (Benjamin and Margulis, 2000: 5).

Angel investment has not only grown its own sector, but has also become formalized and organized through the formation of angel groups and networks. Angel investors provide strategic and operational expertise for start-ups, as well as social capital and physical capital. Angel investors have managed to attract the attention of policy makers. Due to the nature of angel investment, it is not in a homogeneous structure. The level, complexity, area of interest and dynamics of the angel in the national angel market can vary greatly at the national and regional level. Therefore, policy makers should make decisions taking this into account. In fact, many countries, such as Canada and the United States, are planning and implementing angel policies at the regional level, not at the national level (OECD, 2011: 11). In addition, angel investments vary Decisively between countries in terms of volume and approach. Policies that are successful in one country may not necessarily be successful in another country. Angel networks and groups solve the problem of asymmetric information and information pollution.

Co-investment funds are implemented and supported in countries such as Scotland, New Zealand and the Netherlands. As a matter of fact, these models have attracted attention all over the world and have been studied and adapted by some countries. Both tax incentives and co-investment programs can have the side benefit of collecting additional data on angel investment in a country (OECD, 2011: 12).

Lourdes Moreno from the University of Deusto, in collaboration with EBAN, has researched the effects of angel investment on the performance of European startups. between the years 2004 and 2013, 3208 investments were analyzed in terms of their economic effects. Dec. According to the research that has been examined and finalized in three years: angel investments have tripled the use, revenues and company assets have increased by 150% (Braha, 2014).

The small firm financing market is developing rapidly. Angel investors are no longer working with a local focus. Legal regulations are trying to adapt to technological change. Women are increasingly represented among angel investors. As the financing methods of small firms develop, the size and structure of angel investments also change (DeGennaro and Dobson, 2015: 9-10). Angel investment, an important role in high-tech industries Technology giants such as Apple, Amazon, Facebook and Google have achieved success as a result of the contribution of business angels in the early growth stages (Werth, 2017: 75-90).

2.Pros and cons of angel investors

- Angel investors take more risks than banks or venture capitalists. Angel investors are not indebted to a bank or institution. Therefore, they can invest their money as they see fit. In fact, this means that the investment risks that traditional funders are afraid of may not worry angel investors.

- As an entrepreneur, angel investment has less risk compared to other financing alternatives. If the venture is unsuccessful, there will be no payback to the angel investor. This situation provides a less risky option for those who want to grow their company.

- Angel investors have a fairly wide range of business knowledge. Many people or companies wealthy enough to qualify as angel investors have made their money through entrepreneurship or have grown their companies.

- There are great risks for the entrepreneur at the beginning of the venture. A large share is usually given to the angel investor at the beginning of the business. And this means that the entrepreneur has less control over managing the enterprise.

- Angel investors and venture capitalists, which are close concepts, can sometimes be confused. The differences between these two concepts need to be revealed.

3.Venture capitalist

Venture capital may have difficulty attracting financing it has developed as an important intermediary in financial markets by providing capital to firms (Gompers and Lerner, 2001: 145).

Angel investment has not only grown its own sector, but has also become formalized and organized through the formation of angel groups and networks. Angel investors provide strategic and operational expertise for start-ups, as well as social capital and physical capital. Although venture capital first appeared in the USA in 1946, its growth accelerated in the USA in the 1970s, and in the 1980s it began to gain widespread application in Europe and Japan. The concept of angel investment has emerged in the USA and Europe in the last 20-30 years.

A venture capitalist is a person or institution that invests money in high-risk enterprises. The very rapid growth potential of the enterprise compensates for the possible risk of its failure. This balancing encourages venture capitalists to invest. After some time, the venture capitalist may, in the event of an initial public offering of his company, purchase a large number of shares in it.

4.Pros and cons of venture capitalists

- Venture capitalists provide large investment amounts for new companies. Large companies need a cash infusion to start a new investment. Venture capitalists can be a good financing option for these companies.

- Venture capitalists are quite low-risk for entrepreneurs. As with angel investors, venture capitalists are often not paid back if the venture fails.

-The knowledge and connections of venture capitalists are very wide. Like angel investors, venture capitalists have the experience and connections of other investors, industry leaders, and auxiliary third parties.

- Entrepreneurs have poor control over managing business. Venture capitalists often need a controlling interest in the enterprise, effectively distracting entrepreneurs from the leadership.

5.The differences between angel investors and venture capitalists

There are many similarities between angel investors and venture capitalists, which are one of the most common alternative financing options Dec Angel investors and venture capital firms are attracted to innovative start-up businesses, they tend to prefer companies related to technology and science. However, there are also some differences Dec venture capitalists and angel investors.

- Angel investors work alone, while venture capitalists are part of a company: Angel investors are defined as business angels who invest their finances in an enterprise. Angels are wealthy and influential people who invest in high-potential companies in exchange for a stock. Venture capital companies, on the other hand, consist of a group of professional investors. Their capital comes from individuals, companies, pension funds, banks and foundations. These investors are limited partners. General partners, on the other hand, are people who work closely with founders or entrepreneurs. They, on the other hand, are responsible for managing the funds and ensuring the healthy development of the company.

-Investment amounts are different: An accurate idea of what they can provide financially is needed when benchmarking a venture capitalist or an angel investor. Angels invest between US$25,000 and US$100,000 of their own money. If they become a group, the average can be more than $ 750,000. Although angel investors offer a quick

solution, they cannot finance all the capital requirements of an enterprise due to their limited financial capacity. Venture capitalists, on the other hand, can invest up to $ 7 million on average in a company.

- Both have different responsibilities and motivations: The primary job of angel investors is to provide financial support. They advise or contact important people if they are requested by entrepreneurs, although they do not have to do so. Participation rates depend on the demands of the company and themselves. A venture capitalist is looking for a new or different product or service that has a competitive advantage, a talented and dynamic management team, and a market with potential. If venture capitalists are convinced and invest, they will help create successful companies that add value. In addition, a venture capitalist creates the strategic focus of a company and appoints senior management to the post. They advise CEOs. All this is to help the company make more money and grow more.

- Angel investors invest only in early-stage companies: Angel investors are primarily experts in early stage businesses. They finance technical development and early entry into the market for those in the late stages. The funds provided by an angel investor can change many things in the creation and operation of a company. Venture capitalists, on the other hand, invest in early-stage companies and more advanced companies depending on the focus of the venture capital company. A venture capitalist will be willing to invest if an enterprise is convincing and has a lot of growth potential.

- They both differ in due diligence: The subject of due diligence is an area that is constantly discussed for angel investors. Some angels do not pay enough attention to this issue. However, angel investors are five times more likely to have a positive return if they do at least 20 hours of due diligence. Venture capitalists have a fiduciary responsibility to their limited partners. Therefore, they have to conduct further due diligence (Jang, 2022).

- Investment experience: Since venture capitalists have more experience, they are more active and the number of investments is greater. However, the experience of angel investors is relatively less.

- The difference in professionalism: Venture capitalists work professionally for the purpose of high returns they invest. Angel investors, on the other hand, usually do not invest for the purpose of return, they invest in an amateur spirit (Uçkun, 2009:127).

6.Tax Advantages Applied on Angel Investment in Some Countries

Germany: In the studies conducted for the German Business Angels market, it has been determined that there is an excessive demand for angel investment in Germany at an early stage (Kraemer-Heis and Schillo, 2011: 18). Investors in young, innovative companies, defined by the EU as "small businesses", receive a subsidy of 20% of their

investment amount from the federal government. The purpose of this subsidy is to increase the number of investors in young innovative companies and to increase the investment power of angels for the benefit of start-ups. The general conditions sought for the 20% grant are as follows (https://www.business-angels.de/en/investitionszuschuss-wagniskapital-2/):

-There must be real participation (in opportunities and risks) through a capital increase of between €10,000 and €500,000. Dec. However, the amount exceeding € 500,000 is not subsidized.

-The maximum grant per investor /is €100,000 per calendar year. If the investor is an investment company, the de minimis limit of € 200,000 also applies in the current and previous two financial years.

-The maximum subsidy amount per calendar year for all investors per company is € 600,000 and a maximum of € 3 million per year. the amount exceeding 3 million euros is not subsidized. In total, the company may have received no more than 15 million euros in venture capital, including subsidized participation.

-Must hold it for three years.

China: Angel investing in China, 20. it emerged at the end of the century with the spread of the Internet and the establishment of high-tech enterprises. In recent years, there has been an intensive transition from entrepreneurs, investors and professionals to angel investment. The standardization and institutionalization of angel investment in China has also gained momentum. Various angel associations, groups and networks have been established in cities such as Beijing, Shanghai and Guangzhou. Especially in local governments such as Jiangsu province, Hubei province, Ningbo, Wenzhou, Chengdu, Chongqing and Luoyang, a large number of legal regulations have been enacted that encourage angel investment (Jiani and Su, 2015: 139-150).

Malaysia: The Angel Tax Incentive has been introduced to encourage angel investment in Malaysia. This program directs qualified individual investors to early stage technology startups. Thus, the early stage investment gap will be closed. Angel Tax Incentive is managed by Angel Tax Incentive Office (ATIO), a unit under Cradle Fund Sdn Bhd (Cradle). The investments are approved by the Malaysian Ministry of Finance. Two (2) years after the start of the investment, angel investors report their personal income taxes through Lembaga Hasil Dalam Negeri (LHDN). This notification will then be taken into account in the income tax returns for tax exemption. Angel investors must keep the tax incentive approval of the Ministry of Finance as proof of investment. Angel Tax incentive that are supported by major investment areas include: advanced electronics and information technology, telecommunications, health services, equipment/instrumentation, automation and flexible manufacturing systems, electro-optics, nonlinear optics and optoelectronics, advanced materials, public transportation, value-added services, and emerging technologies. To apply for

accreditation, it is necessary to be a taxpayer. It is necessary to be a high-value person or a person with a high income. To be a high-value person, it is necessary to have a fortune of over RM 3 million. The accreditation period of the angel investor is two (2) years. But it can be renewed again. The person's gross income for the last twelve months must be RM 180,000, or if he or she has RM 250,000 together with his or her spouse, this person is considered to have a high income. An angel investor can invest in more than one company per year. The maximum annual investment approval is only five (5) units. The minimum amount per investment is RM 5,000 and in total up to a maximum of RM 500,000 can be invested annually (https://mban.com.my/angel-tax-incentive).

Singapore: The Singapore government wants to attract more angel investors who can offer added value to innovative start-ups through a tax incentive scheme.In Singapore, the government has introduced a special tax exemption scheme called the Angel Investors Tax Relief Scheme to encourage entrepreneurship and start-up activities. According to official data, there are more than 100 angel investors in Singapore who are known to invest between 30,000-500,000 S$ in promising startups. Although angel investing is widespread in Singapore, the participation rate is not yet as high as in the United States or Europe. The Angel Investors Tax Rebate Program (AITD Program) was introduced by the Singapore government in March 2010. The aim of this program is to attract qualified angel investors to the country and to increase these investment activities. An approved angel investor who has made the appropriate investment of S$100,000 is entitled to claim a tax deduction. At the end of the two-year holding period, the angel investor can benefit from a tax deduction for each Assessment Year (YA) over 50% of the investment amount. There is an upper limit on tax deductions of S$250,000 for each Assessment Year (YA). Tax deductions will be deducted from the total taxable income (https://www.guidemesingapore.com/business-guides/taxation-and-accounting/personal-tax/tax-deduction-scheme-for-angel-investors).

Russia: Certain elements of the angel investment infrastructure are non-profit financial support programs for innovative projects offered in the form of grants and selective loans. In Russia, these programs are funded by the state, mainly from the federal budget (Veselovsky, et al., 2015: 232).

Australia: Angel investing was introduced in Australia in the mid-1990s by Bob Beaumont, an Australian engineer and businessman. Beaumont, a venture capitalist and commercial banker, has returned to his country after an entrepreneurial career in the United States for many years. He has been closely involved with the developing angel investment practice in the USA and Europe.When Beaumont returned to Australia, he formed the first official angel group. This first angel group started in Melbourne, Victoria and continued for 15 years based on a five-year commitment cycle from its members (Green, 2015: 163-175).

UK: To encourage more investment in early-stage companies, the UK Government has introduced two important schemes that offer generous tax breaks to investors. These two plans, called SEIS and EIS, on the one hand reduce the cost of investment, and on the other hand increase the returns on successful investments. SEIS was introduced in 2012. Investors will receive up to 50% tax relief on investments up to £100,000. If they sell their shares after 3 years, any profit will be exempt from Capital Gains Tax. To qualify, the business must have been trading for less than 2 years and the company must be raising less than £150,000. The EIS offers a tax deduction of up to 30%. The purpose of this tax break is to encourage investors to invest more in small companies. The plan also offers a capital gains tax exemption after three years and further tax relief in the event of a loss. Under the EIS, each angel investor will be able to invest up to £ 1 million per year (https://www.angelsden.com/tax-relief/#:~:text=SEIS%20Tax%20Relief,EIS%20Tax%20Relief,the%20event%20of%20a%20loss).

Belgium: The seven angels network was established in Belgium in 1998-2001. They spread across Belgium, with four in Flanders, two in Wallonia and one in Brussels. At the beginning of 2004, four Flemish organizations merged under the non-profit name BAN Vlaaderen. in 2007, one of the Walloon networks merged with the one in Brussels to become a single organization, renamed Be Angels. As of April 2015, there are two networks in Belgium, one in Flanders and the other in the Walloon Region. These two networks represent about 400 angels and receive more than 750 projects a year. Approximately 200 of these projects turn into 35 investments. These investments have reached a total size of 8 million euros with 40-50 annual agreements. Both networks carry out educational activities for entrepreneurs and investors under the name of business angel days (Vossen and Munck, 2015: 177-186).

Spain: Angel investment, organized specifically through networks, is a new phenomenon in Spain. it experienced a slow take-off in the early 2000s. by 2013, more than 50 networks have been established and the number is expected to gradually increase. With the end of the economic crisis and the increase of publications about entrepreneurship in the media, angel investment has become attractive. Incubators, accelerators, crowdfunding platforms are sprouting up, offering opportunities to angel investors and increasing the flow of deals. It is expected that the popularity of angel investment will increase in Spain in the coming years (Roure and De San Jose, 2015: 187-194).

Finland: Angel investing in Finland is probably almost as old as trading. In Finland, people started supporting each other's businesses as soon as they built their first ships. However, the concept of angel investment is more recent. Although it is not named in Finland, the angel ecosystem, the application of which dates back centuries, has an important advantage. The tax regulations are clear, which will find potential angels and make it easier to grow networks. Tax information is clear and transparent for

everyone. By the end of the period, people know who sold a company and how much was earned (Oker-Blom, 2015: 281-283).

Ireland: Angel investment can replace bank financing or venture capital, which can be difficult to obtain at the founding stage of a company. The average initial investment of an angel investment is between 50 thousand euros and 250 thousand euros individually. Dec. If angel investors form a partnership, they can create investments up to 500 thousand euros and more. Ideal for those of angel investment should be: clean and solid commercial record, perfect credentials commercial, investment capacity, the ability to capture the commercial opportunities, it is time to start a new investment, new technologies are closely monitoring relevant industry established strong links and connections (https://www.enterprise-ireland.com/en/invest-in-emerging-companies/source-of-private-capital/business-angels-bes,-angel-networks-.html). The Revenue Employment Incentive and Investment Scheme provides income tax relief to angel investors. This facility applies to investments made in qualified companies certified by the Employment and Investment Incentive (EII) Scheme every tax year. But there are no tax advantages for the company that receives the EII. Thanks to the EII status, it can increase their ability to attract external funds (https://www.enterprise-ireland.com/en/invest-in-emerging-companies/source-of-private-capital/business-angels-bes,-angel-networks-.html).

USA: In the USA, income tax is collected by the federal government, state governments, and local governments. The rates of income taxes payable vary from state to state. There are two different types of income tax in the USA, Federal and State. The amount of federal taxes paid depends on how much income you have in total. Tax rates have been determined as a minimum of 10% and a maximum of 39.6% (https://www.taxback.com/blog/abdde-calisma-ve-vergi-sikca-sorulan-sorular/). The taxation of angel investment differs from state to state. Now, the tax advantages offered to angel investment in some states will be explained.

Tennessee: The credit is valid for tax years starting on or after January 1, 2017, a Hall income tax credit equal to 33% of the value of a direct or indirect investment made by an "angel investor" in an innovative small business is established. Angel investors who invest in companies located in the Tier 4 district are given the right to a loan at a rate of 50%. The investment must be at least $ 15,000 and represent no more than 40% of the company's capital at the time of investment. The credit is limited to $50,000 per angel investor in any tax year. The total amount of earned credits is capped at $3 million for tax years beginning January 1, 2017. The loan total is $4 million for tax years beginning January 1, 2018. For tax years beginning on or after January 1, 2019, it is $5 million. The unused Angel Investor Loan can be carried over for up to five years until it is fully used. Qualification certificates for the loan will be issued by Tennessee Technology Development Corporation ("Launch Tennessee") on a first-come, first-

served basis (https://www.tn.gov/revenue/taxes/hall-income-tax/angel-investor-tax-credit.html).

New Jersey: The New Jersey Angel Investor Tax Credit Program creates tax credits against corporate businesses or gross income taxes based on a qualified investment in emerging technology businesses, in order to encourage investment. The Economic Recovery Act, signed by Governor Murphy in January 2021, increased the annual program cap from a $25 million tax credit to $35 million. If the cumulative credits requested by the taxpayers exceed the amount available each year, the credits will be applied from the first day of the following calendar year when the Angel Investor Tax Credit does not exceed the available credit amount (https://www.njeda.com/angeltaxcredit/).

Connecticut: To encourage angel investment in promising startups that need capital to grow, the Connecticut Department of Economics and Community Development, the State of Connecticut, has created the Angel Investor Tax Credit Program. This program, administered through Connecticut Innovations, provides qualified investors with a 25% credit against Connecticut's state income tax when they invest at least $25,000 in qualified businesses. Connecticut Innovations administers the Angel Investor Tax Credit Program, which gives angel investors the opportunity to receive a tax credit by making a qualified investment (https://ctinnovations.com/investors/angel-investors/).

7.Tax Advantages Applied on Angel Investment in Turkey

In Turkey, the regulation regarding angel investment has entered the system under the name of Individual Participation Capital. The legal regulation regarding the Individual Participation Capital (BKS) system was made in June 2012. A very short time after this arrangement then, on February 15, 2013, the Regulation on Individual Participation Capital entered into force and the BKS system was put into operation. A total of 795 licenses have been issued since 2013. Approximately 372 of the licenses (including the dates 01.07.2017 – 24.06.2022) are active. In June 2013, the first investment was made through the Individual Participation Capital System. To date, a total of 21.36 million Turkish Lira (TL) capital has been transferred to 158 angel investments for 50 investments. 61.5% of BKS license applicants have high income or wealth, 38.5% are experienced people (HMB, 2022; 2-4).

With the said Regulation, a number of regulations have been made to encourage angel investing. Provisions have been made for angel investors to benefit from tax support if they meet the conditions set out in the Regulation. First of all, 325 of the Tax Procedure Code No. 213. the concept of venture capital fund has been regulated with an addition made to the article. According to the regulation made in the Corporate IncomeTax Law No. 5520, an amount not exceeding 10% of the declared income of corporate tax payers will be allocated as a venture capital fund. If this amount is, it will

be excluded from the income tax base. Also the full corporation income tax payers venture capital venture capital investment fund participation certificates, investment trusts are exempt from corporation income tax dividends on their shares.

In order for angel investors to benefit from the Individual Participation Investor discount;

1-Being a full taxpayer natural person,

2-Obtaining an Individual Participation Investor license from the Ministry before the acquisition of participation shares,

3- Keeping the participation shares of a fully liable joint stock company for two full years (730 days not disposing),

4-According to the Regulation on Individual Participation Capital, making investments in areas determined by the Ministry and finding this investment in compliance with the legislation by the Ministry required.

The amount that can be subject to deduction from the earnings and revenues subject to declaration within this scope cannot exceed 1,000,000 TL annually.

According to the regulation in the General Communiqué on Individual Participation Investor Discount; Acquired within the framework of the Regulation on Individual Participation Capital;

-75% of the purchase price of participation shares belonging to fully paid joint stock companies,

-Ministry of Industry and Technology, The Scientific and Technological Research Council of Turkey, Small and Medium Enterprises Development Organization of Turkey, as determined by research, development and innovation projects supported programs within the scope of Joint Stock Companies in the last five years of the partnership of 100% of the cost are tax deductible.

Turkey is the country that gives the highest tax incentive (75% - 100%) to angel investors in the world. This incentive amount is 20% in Germany, 30% in England, 25% in Portugal and 50% in Singapore.

The ecosystem is defined as the economic and social environment that surrounds and supports the entrepreneurial process. Entrepreneurship ecosystem has micro and macro conditions. Micro conditions: access to finance, human capital and market access. Macro conditions: facilitating policies, institutional supports and supportive culture (Harrison, 2016: 489-490). Although adequate legal regulations are made regarding angel investment in Turkey, the ecosystem culture remains weak.

Example 1: Angel investor KL's Income Taxable income for 2022 is 600.000 TL. In 2022, KL became a partner of 50% of the shares of X joint stock company with 900.000 TL. The income tax that KL will pay for 2022 after the tax support is calculated as follows:

Angel Investor tax deduction = 900.000 TL × 75% = 675.000 TL

Taxable income = 600.000 TL- 675.000 TL = - 75.000 TL

Angel investor KL will not pay income tax for 2022 and will be able to deduct the increased 75.000 TL from the tax base in the following years (provided that it increases at the revaluation rate).

Example 2: Angel investor KL's Income Taxable income for 2022 is 1.300.000 TL. In 2022, KL became a partner of 50% of the shares of X joint stock company with 1.500.000 TL. The income tax that KL will pay for 2022 after the tax support is calculated as follows:

Angel Investor tax deduction = 1.500.000 TL × 75% =1.125.000 TL

The taxable income of the angel investor 125.000 TL that exceeds the limit of 1.000.000 TL will not be used for the tax deduction amount.

Taxable income = 1.300.000 TL- 1.000.000 TL = 300.000 TL

Example 3: Angel investor KL's Income Taxable income for 2022 is 900.000 TL. Ministry of Industry and Technology, The Scientific and Technological Research Council of Turkey, Small and Medium Enterprises Development Organization of Turkey, as determined by research, development and innovation project funded under the programme in the last five years of the company subsidiaries owned 50% of the shares of 1,000,000 TL KL angel investor purchased. The income tax that KL will pay for 2022 after the tax support is calculated as follows:

Angel Investor tax deduction = 1.000.000 TL × 100% =1.000.000 TL

Taxable income = 900.000 TL - 1.000.000 TL = -100.000 TL

Angel investor KL will not pay income tax for 2022 and will be able to deduct the increased 100.000 TL from the tax base in the following years (provided that it increases at the revaluation rate).

8. Conclusion

Innovation is the combination of a creative and entrepreneurial process by designated stakeholders to create value (Hindle, 2009: 17). So if there is no entrepreneurship, everything is empty. Governments should support entrepreneurs who create and create new values by making sacrifices on both the expenditure and income side of the budget and who are the dynamo of innovation. Inspiration without perspiration will never create value.

States provide tax advantages such as tax incentives, tax reliefs, tax exemptions, tax deferrals to support certain individuals, regions, sectors or factors. Countries that lack capital and entrepreneurs have to use some tax benefits to increase production and employment. Angel investment has been offering both capital contributions to

entrepreneurs and mentoring them in recent years. Investing in new and risky ventures is drastically different from being a financial investor or starting a company in a particular industry. Therefore, investors will be able to benefit from the training and mentorship of the experienced angel involved in the process.

The angel investment market has developed significantly, especially in the last 10 years. Some countries seem to have played a role in policies that will encourage a greater number of angel investors. These policies usually include supply-side measures such as tax cuts and public incentives (OECD, 2011: 12).

An investor must take into account the taxes that apply in a country and the advantages over these taxes. Taxation plays a role in supporting or discouraging angel investments. Taxes on income, in the context of angel investments may result in lower dividend payouts. Gains or losses on the disposal of the investment are a potential angel investor's will affect investment appetite. Tax deductions, capital gains exemptions or loss reductions for early and innovative investments within the tax system will encourage angel investment. Tax incentives are part of a broad set of policy tools to support growing and innovative businesses. It has been proven by empirical studies that the incentives provided to these enterprises through the income or expenditure side of the state budget do not go to waste and contribute to economic growth and employment (EC, 2017: 3). There are 46 tax incentives designed to encourage angel investment and venture capital in the EU28 and selected OECD countries (EC, 2017: 4).

Angel investment emerged as an alternative financing tool in the economy in the 2000s, when the economy partially stabilized due to the economic crises experienced in Turkey, lack of savings, instability in the economy and the shallowness of the capital markets. The tax advantages provided to angel investments in Turkey are considerably higher than in other countries. A country with no savings, like Turkey, should not only offer more tax advantages than existing ones, but also make the investment ecosystem suitable to increase angel investment.

Tax incentive policies aimed to increase the number of angels. In some countries such as the UK long standing angel tax incentive positive effects such as economic growth and employment increase have been experienced with the programs (EC, 2017: 3). However, implementing tax incentives can have many challenges. Therefore, rigorous monitoring and evaluation is important. In addition, the issue of tax incentives is a hot political issue, especially in today's economic circles (OECD, 2011: 12).

Undoubtedly, the role of state policies is decisive in the development and effectiveness of entrepreneurs and thus angel investment (Jeng and Wells, 2000). The most important obstacle to entrepreneurship is the lack of an entrepreneurial culture in many countries. Any start-up will not actually exist without entrepreneurs. Change in society or changing a culture is difficult and requires a long-term effort. The tax

incentives provided as well as the introduction of entrepreneurship-related courses into the curriculum, meetings and promotions will play a key role in the development of angel entrepreneurship. A well-functioning entrepreneurial ecosystem is critical for an angel investment to be successful. Since entrepreneurship cannot operate in a vacuum, stakeholders such as governments, universities, lawmakers, non-governmental organizations, large companies play a role in the formation and continuation of the entrepreneurship ecosystem. Angel investment will work and develop more comfortably in a country with appropriate legal and tax frameworks.

Angel investments enable innovative startups to emerge, mature and become competitive and increases the job creation capabilities of enterprises. Having problems with unemployment, current account deficit, low economic growth, and low value-added production, Turkey can alleviate these problems through angel investments. Professionals with the potential to become business angels in the world are more are senior executives in companies. Any incentive system in Turkey that will encourage people with this potential to become business angels are not implemented and sufficient awareness trainings are not given on the subject.

Tax incentives for angel investment, which will be more widely included in the tax system, will provide Turkey with a tax advantage over other countries. As of now, angel investment supply in Turkey is very low due to structural problems. This supply cannot be solved by financial and tax incentive systems alone. Although adequate legal regulations are made regarding angel investment in Turkey, the ecosystem culture remains weak.

References

Arıkan, S. (2002). *Girişimcilik.* Ankara: Siyasal Kitabevi.

Banger, G. (2013). *Uygulamalı Girişimcilik Eğitimi.* 30(9), KOSGEB, Eskişehir: Eskişehir Sanayi Odası.

Benjamin, G.A. ve Margulis, J.B. (2000). *Angel Financing: How to Find and Invest in Private Equity.* New York: John Wiley & Sons.

Braha, M. (2014). *Research: The Economic Impact of Angel Investment.* 08.08.2022, http://capital-riesgo.es/en/articles/research-the-economic-impact-of-angel-investment/

Cansız, M. (2013). *Türkiye'nin Yenilikçi Girişimcileri Teknoloji Geliştirme Bölgeleri Örneği.* Ankara: Kalkınma Bakanlığı, Yayın No: 2850.

Casson, M. (1982). *The Entrepreneur: An Economic Theory.* Rowman & Littlefield,

Christofidis, C. and Debande, O. (2001). Financing Innovative Firms through Venture Capital, *European Investment Bank Sector Papers.* 08.08.2022, http://www.eib.org/attachments/pj/vencap.pdf

DeGennaro. R.P. and Dobson, E.L. (2015). *The Future of Angel Finance.* 09.08.2022, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3094329

Dollinger, M.J. (1995). *Entrepreneurship: Strategies and Resources.* Austen Press.

EC (2017). Effectiveness of *Tax İncentives for Venture Capital and Business Angels to Foster The Investment of Smes and Start-Ups.* Final Report TAXUD/2015/DE/330 FWC No. TAXUD/2015/CC/131 PricewaterhouseCoopers LLP (PwC): Project Leader Institute for Advanced Studies (IHS): Consortium Leader.

Er, B., Şahin, Y. ve Mutlu, M. (2015). Girişimciler İçin Alternatif Finansman Kaynakları: Mevcut Durum ve Öneriler. *Uluslararası Ekonomi ve Yenilik Dergisi.* C.1, S.1, 31-54.

Gompers, P. and Lerner, J. (2001). The Venture Capital Revolution. *Journal of Economic Perspectives*. V:15, N:2, 145- 168.

Green, J. (2015). Australia. *Angels Without Borders,* 163-175.

Harrison, R. T. (2016). Afterword. *Angel Financing in Asia Pacific*. Lo, J.Y. (Ed.), Emerald Group Publishing Limited, Bingley, 489-491, 10.08.2022, https://www.emerald.com/insight/content/doi/10.1108/978-1-78635-128-920161044/full/html?utm_source=TrendMD&utm_medium=cpc&utm_campaign=Angel_Financing_in_Asia_Pacific_TrendMD_1

Hindle, K. (2009). The relationship between innovation and entrepreneurship: easy definition, hard policy. *Correct Citation for this Paper.* 6th AGSE International Entrepreneurship Research Exchange. 3-6 February. Adelaide, South Australia, Australia, 1-21.

HMB (2022). *BKS Raporu Haziran 2022.* Ankara: T.C. Hazine ve Maliye Bakanlığı Finansal Piyasalar ve Kambiyo Genel Müdürlüğü Finansal Araçlar ve Analiz Dairesi.

Jang, W. (2022). *Differences Between an Angel Investor and a Venture Capitalist.* Access: 08.08.2022, https://www.business.com/articles/angel-investors-vs-venture-capitalists/

Jeng, L. A. and Wells, P. C. (2000). The determinants of venture capital funding: evidence across countries. *Journal of Corporate Finance.* 6(3), 241-289.

Jiani, W. and Su, C. (2015). China. *Angels Without Borders,* 139-150

Kraemer-Heis, H. and Schillo, M. (2011). *Business Angels in Germany: EIF's initiative to support the non-institutional financing market.* European Investment Fund, Luxembourg: Working Paper 2011/11 EIF Research & Market Analysis.

Oker-Blom, J.D. (2015). Finland. *Angels Without Borders.* 281-283.

OECD (2011). Executive Summary. *Financing High-Growth Firms: The Role of Angel Investors.* 08.08.2022, https://www.oecd.org/sti/ind/49310423.pdf

Roure, J. and De San Jose, A. (2015). Spain. *Angels Without Borders.* 187-194.

Shane, S. and Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review.* 25(1), 217–226.

Vossen, R. and Munck, C. (2015). Belgium. *Angels Without Borders.* 177-186.

Werth, J.C. (2017). Angel Investing. *The World Scientific Reference on Entrepreneurship.* V:2, Entrepreneurial Finance- Managerial and Policy Implications, Edt: Na Dai, 75-90.

https://www.angelsden.com

https://ctinnovations.com

https://www.enterprise-ireland.com

https://www.guidemesingapore.com

https://mban.com.my/angel-tax-incentive

https://www.tn.gov

The Role of Local Governments in Global Climate Change Policies and Green City Practices of Municipalities in Turkey

Hakkı M. Ay

Selçuk University, Turkey

Adnan Söylemez

Selçuk University, Turkey

Abstract

Global climate change threatens the whole world. Although international organizations and states are not sufficient to solve global warming or global climate change problems, they develop common policies. The alarming increase in the amount of greenhouse gases causes dangers such as drought, food safety hazard, decrease in biodiversity, air pollution and floods. The increase in the urban population brings with it many urbanization problems. Cities are responsible for the majority of greenhouse gas emissions. Therefore, the most important role in the fight against climate change belongs to local governments. Increasing construction in cities means shrinking green areas, agricultural lands and living spaces of living things. Due to the decreasing green areas, air pollution increases and rain water cannot hold. Increasing floods damage residential areas and infrastructure services. The Covid-19 epidemic, which shook the world deeply, is more effective in cities where air pollution is experienced. Municipalities that are aware of the sustainable environment are working hard to protect existing green areas and to create new green areas. In addition, municipal governments with environmental awareness will have won the hearts and loyalty of their voters. In this study, the applications of green city projects, which are included in global climate change policies, in Turkey are explained.

Keywords: Global Climate Change, Global Warming, Green Cities, Municipalities, Covid-19

1. Introduction

Environmental problems caused directly or indirectly by human beings are both diversifying and gaining different dimensions day by day. Climate change is one of the most serious environmental problems. Although climate change is perceived as a global problem, it is clear that its effects and consequences will not be felt equally in every country. As a result of examining social vulnerabilities and social dynamics in the context of climate change, it is predicted that developing countries will be more affected by the negative consequences of climate change. One of the places that will be directly or indirectly affected by climate change is the cities where the majority of the world's population lives. Considering the fact that two-thirds of the total population will live in cities in 2050, the most important responsibility and duty in the fight against climate change belongs to the cities. Considering Turkey, one of the cities that will be most negatively affected by the consequences of climate change is Istanbul, which hosts one fifth of the total population.

Serious handling of the problem of climate change by local governments; taking responsibility of both public institutions and the private sector in terms of city life and the services offered; individuals making their transportation, heating and housing choices by considering greenhouse gas emission rates; The ability of local governments to find funds and financial support for environmental regulations may facilitate action for larger-scale steps.

Most of the world's population lives in cities. In addition, many industries transportation and transportation activities also take place in cities. On the other hand, climate Cities are at the forefront of the places that are affected by global problems such as global change. In this context, especially in recent years, climate change, which is the subject of cities and citizens, ,t can be said that their work has increased. The starting point of these studies is the climate change of the citizens. determination of perceptions of change. Because citizens of cities the fact that their perceptions are known will be monitored by the decision-making authorities with the decisions taken. It gives preliminary information about the reactions of citizens to the policies. Social reactions direction and severity are taken into account by policy makers.

2.Global Climate Change and Green Cities

Regarding its level during the early 21st century, climatology can now definitely put forward that the global warming is taking place due to carbon dioxide and equivalent greenhouse gases emanating from human actions and particularly from fossil fuels used in energy generation. The use of fossil fuels, changes in land use, and agricultural activities are considered the most significant causes of the rise in greenhouse gas level. There are countless observations and researches demonstrating that air and ocean temperatures increase, masses of snow and glaciers widely melt and sea levels rise.

The societies maintaining their existing production-consumption patterns and habits are projected to lead to severe consequences for climate change, resulting in considerable environmental damages and potential mass mortalities as well as associated humanitarian catastrophes. From the industrial revolution, carbon dioxide emissions caused by human actions particularly due to fossil fuel consumption are proven to rise much more rapidly than the amount which oceans and forestlands can absorb. This threat, which is very explicitly put forward by climatology, urged the world to take action.

However, the Intergovernmental negotiations on climate change has a very slow progress, remaining too incapable and slow-paced to take steps revealed by science. Local governments in closer contact with societies have started to get increasingly more involved in this issue which is of particular concern to human life quality and health.

The green city stands for a way to increase the sustainability of urbanized areas. It is an urban planning concept based on the ecosystem services that green infrastructure can provide. In essence, this concept includes the characteristics of all previously defined urban concepts such as meeting the city with nature, restoring the values of the urban ecosystem, minimizing resource and energy consumption, and benefiting from the ecosystem services of blue-green. Cities are home to half the world's population and serve as global economic centers producing almost 80 percent of the world's GDP. With cities facing extreme weather events and rapid urban growth leading to overuse of natural resources and environmental degradation, urban centers around the world need to become more resilient to climate change and reduce their ecological footprints. Green Cities are concerned with how to design the entire city in a more sustainable, efficient, adaptable and flexible way. Green Cities recognize the links between different sectors and support development strategies such as urban ecosystems that fulfill multiple functions and create multiple benefits for society and society. In the context of urban water resource management, the Green City calls for holistic planning and management of water, wastewater and stormwater throughout the entire city to ensure the health of aquatic life while ensuring the population's resilience to climate change and extreme weather events (Brears, 2018).

Green cities have clean air and water. Clean Green cities with their streets and parks are natural disasters and against major epidemics of infectious diseases is resistant. Greening of cities includes some or all of the following (UNEP, 2011):

1-New technologies developed against diseases,

2-Reduction of chemical and physical hazards,

3-Develop high-quality urban environments for all,

4-Minimizing transfers to areas outside the city and reducing environmental costs,

5-Making progress towards sustainable consumption.

Is growth harming or helping the urban environment? The answer is simply "both". Rapid growth in Asia has resulted in ambient particle levels in at least twenty-five cities more than three times the WHO standard of 90 micrograms per cubic metre, and the garbage heaps surrounding Mexico City have become infamous worldwide. But in other parts of the world, many cities have returned to a stunning quality of life as they continue to grow (Kahn, 2006). In this respect, the enormous size of the city can also create an opportunity for the full protection of the environment and natural resources (ELCA, 2011).

3. Local Governments and Climate Change Policies

Although more than half of the world's population lives in cities for now; By 2050, 6.4 billion people are expected to live in cities (OECD, 2014). With the increase in the number of urban areas, the heat balance between the atmosphere and the earth is changing. While the natural areas are decreasing, the increase in the ratio of man-made environment leads to the accumulation of heat on the surface, which increases the impact of climate change. Climate change causes many problems such as increase in temperatures in cities, heat waves, floods, water scarcity and drought, and rise in sea level. Climate change poses a great danger to cities and people living in cities (Kaya, 2018).

Some of the risks arising from climate change in cities are as follows: shift of seasons, rise in sea level, increase in the number and severity of disasters, decrease and deterioration of biological diversity, increase in temperatures, drought, inability to meet the increasing water demand, deterioration of income distribution, poverty, famine and widespread migration (Özcan, 2018). Scientific models, data and statistics related to climate change must be taken into account while making city planning for the solution of the aforementioned problems. Today, many cities of the world have devoted a large part of their local service policies to climate change mitigation-prevention and have started to prepare action plans in this regard. The activities carried out in line with these policies shed light on the city administrations in order to create cleaner and livable settlements (Talu, 2019).

At the level of local governments, the issue of climate change is one of the most interesting issues in today's scientific world. There are two main reasons for this: the majority of the world's population lives in cities and 70% of the greenhouse gases that cause climate change occur within the city limits. Today, while the consumption of food and water increases in cities, parallel to this, energy use, waste amount and emissions increase at the same rate or even more. Many cities around the world are preparing action plans on a local scale, developing adaptation strategies and making some interventions in order to combat climate change. Approximately 600 local government units in Europe and 9400 local government units worldwide have

implemented greenhouse gas reduction and adaptation measures against climate change (Uncu, 2019).

Some cities have achieved success with their climate action plans. For example, many cities such as London, New York, Paris and Barcelona, which are members of the C40 Climate Leadership Group, have achieved their targeted reduction in carbon emissions despite their population growth. While the economic growth in these cities increased by 3% on average, there was an average annual decrease of 2% in greenhouse gases. Efforts to produce plans and policies in this regard by bringing the fight against climate change to the local level have been going on for a long time in many countries. Especially since the beginning of the 1990s, local governments in the world have been producing and implementing different strategies and policies, primarily greenhouse gas reduction activities, in the fight against climate change, within the scope of their authorities and responsibilities. The ones leading this process are the local governments of North American and European cities (Talu, 2019). It builds on experiences in the United States Covenant of Mayors on Climate Protection and the European Covenant of Mayors, and is inspired by the achievements of the Convention on Biological Diversity and the Rio+20 negotiations.

The recognition of local governments and international organizations in the Paris Agreement and the COP21 Decision has been achieved with the long-term efforts of local leaders and international networks (Yıldırım, 2018).The Local Governments Climate Roadmap announced at COP13 in 2007 is the first important step. With the aforementioned roadmap, attention was drawn to the recognition, strengthening and authorization of local and international organizations in the global climate regime.

In this process, documents such as Copenhagen World Catalogue of Local Climate Commitments, Mexico City Pact and Durban Adaptation Charter, which are the products of the attempts of local governments in parallel with the international process, were produced. Each of the documents shows the importance of cities and regions in actions to be taken on climate change. Local governments also held events before and during the COPs to highlight and demonstrate their commitment and dedication. These efforts of local governments have achieved tangible successes and decisions on local and subnational governments have been adopted in COP16, and decisions on the recognition and strengthening of local and subnational governments have been taken in COP19 and COP21 (ICLEI, 2016).

4.Turkey's Performance in Climate Change Policies

Turkey ranked 42nd among low-performing countries in the Climate Change Performance Index (CPI) in 2022 (Table 1). It ranked 36th in the greenhouse gas emissions category with a low performance. Turkey showed a high performance in the renewable energy category and ranked 12th. It performed very poorly in energy

consumption and ranked 53rd among 64 countries. Unfortunately, it performed very poorly in the climate policy category and was able to rank 50th.

Table 1: Climate Change Performance Index 2022 – Rating table

Rank	Rank change	Country	Score**	Rank	Rank change	Country	Score**
1*	-↓↔	-	-	34	7↑	Spain	54.71
2	-	-	-	35	-7↓	New Zealand	54.49
3	-	-	-	36	-1↓	Austria	52.80
4	2↑	Denmark	76.92	37	-4↓	China	52.66
5	-1↓	Sweden	74.46	38	-8↓	Romania	52.59
6	2↑	Norway	73.62	39	-2↓	South Africa	51.56
7	-2↓	United Kingdom	73.29	40	-9↓	Slovak Republic	50.90
8	-1↓	Morocco	71.64	41	41↑	Cyprus	50.89
9	0↔	Chile	69.66	42	0↔	Turkey	50.75
10	0↔	India	69.22	43	new	Viet Nam	49.35
11	4↑	Lithuania	65.06	44	0↔	Bulgaria	49.02
12	0↔	Malta	64.39	45	0↔	Japan	48.94
13	6↑	Germany	63.82	46	-7↓	Ireland	48.29
14	-3↓	Finland	62.74	47	-1↓	Argentina	47.50
15	-1↓	Switzerland	61.98	48	-12↓	Belarus	46.91
16	1↑	Portugal	61.45	49	-9↓	Belgium	46.27
17	6↑	France	61.33	50	1↑	Slovenia	43.73
18	3↑	Luxembourg	61.03	51	-4↓	Czech Republic	42.53
19	10↑	Netherlands	60.81	52	-4↓	Poland	41.01
20	0↔	Ukraine	60.52	53	-3↓	Hungary	40.71
21	1↑	Egypt	59.83	54	-11↓	Algeria	40.24
22	-6↓	European Union (27)	59.53	55	6↑	United States	37.90
23	new	Philippines	58.98	56	-4↓	Russian Federation	35.00
24	10↑	Greece	58.55	57	-1↓	Malaysia	34.37
25	new	Colombia	58.11	58	-4↓	Australia	30.41
26	-13↓	Latvia	58.06	59	-6↓	Korea	27.28
27	-3↓	Indonesia	57.39	60	-3↓	Chinese Taipei	27.11
28	-10↓	Croatia	56.26	61	-3↓	Canada	26.73
29	3↑	Mexico	56.19	62	-3↓	Islamic Republic of Iran	26.35
30	-3↓	Italy	55.70	63	-3↓	Saudi Arabia	24.45
31	-5↓	Thailand	55.28	64	-9↓	Kazakhstan	19.81
32	6↑	Estonia	55.25				
33	-8↓	Brazil	55.17				

(CCPI, 2022)

* None of the countries achieved positions one to three. No country is doing enough to prevent dangerous climate change. ** rounded Ranking: 1-3 Very High, 4-18 High, 19-33 Medium, 34-49 Low, 50-64 Very Low.

Turkey ratified the October 2016 Paris Climate Agreement in October 2021, exactly five years later. After this approval process, according to CCPI experts, there have been positive changes in climate policy in Turkey. It has risen significantly in the international climate policy category. Thus, Turkey has risen above the low-performing countries. Meanwhile, although Turkey announced its net zero emission target until 2053; experts are pushing for targets to achieve further reductions in less time. In the field of renewable energy, the country is at a high level. More support is provided to coal production by the government. Therefore, the potential of renewable energy sources is not yet fully utilized.

As a result of the rapid urbanization that developed with industrialization, we feel the effects of the climate crisis more today. And now, one of the most important problems of cities is that, together with the climate crisis, they have become uninhabitable places away from human scale and nature. On the other hand, nature shows its reaction to the destruction that humans have done to nature. With the effect of greenhouse gases, the temperature of the planet is gradually increasing. As a result of this, the fires we have been experiencing intensely for the last two years, our forests that provide oxygen are destroyed, fertile lands are carried away by floods and floods, our lands for agriculture are decreasing due to drought, and the aquatic ecosystem is destroyed by mucilage in the seas. alarms for us to act immediately. For this reason, every solution that respects the nature developed for cities is very important for the future of cities. Local governments, namely municipalities, are one of the actors that affect the future of cities and have an important role in reducing the effects of the climate crisis. Because local governments, as decision-making mechanisms, take part in the first step of the ecological struggle carried out all over the world. For this reason, district, provincial and metropolitan municipalities should take action as soon as possible, together with other actors, to reduce the effects of the climate crisis, within the limits of their responsibility (Kışınbay & Arslan, 2021).

5.Practices of Municipalities in Turkey

At the panel held on 21-24 February 2022, within the scope of Turkey's first Climate Council, local governments came together to share the effects of climate change on municipalities and methods of combating the crisis. The Metropolitan Municipalities of Muğla and Samsun, one of the pilot provinces of United Nations Development Programme's (UNDP) "Strengthening Action for Adaptation to Climate Change in Turkey" project, and the Union of Municipalities of Turkey participated in the event. It is important to understand the risks arising from climate change, to be prepared for these risks, to adapt to them and to take advantage of the opportunities that may arise.

UNDP aims to play a critical role both in engaging local stakeholders and in creating a multisectoral dialogue at national and local levels. Local climate change adaptation strategies and strategies for 4 pilot municipalities in Konya, Muğla, Sakarya and Samsun within the scope of Strengthening Climate Change Adaptation Action in Turkey, financed by the European Union and the Republic of Turkey and carried out in cooperation with the Ministry of Environment, Urbanization and Climate Change action plans are being prepared (UNDP, 2022).

The proportion of residents living in provincial and district centers was 93.2%. The proportion of people living in provincial and district centers in Turkey, which was 93% in 2020, was 93.2% in 2021. On the other hand, the proportion of people living in towns and villages decreased from 7% to 6.8%. While 110 people per square kilometer fell in Turkey, 3 thousand 49 people fell in Istanbul. "The number of people per square kilometer", defined as the population density, increased by 1 person compared to 2020 in Turkey and increased to 110 people. Istanbul has been the province with the highest population density with 3 thousand 49 people per square kilometer. After Istanbul, Kocaeli with 563 people and Izmir with 368 people are the provinces with the highest population density (https://data.tuik.gov.tr).

5.1.Legal Arrangements within the Scope of the Climate Change Struggle of Local Governments in Turkey

The 2872 Environmental Law, which was adopted in 1983 in the fight against climate change in Turkey, has assigned some duties to local governments.

In all kinds of activities in the fields of environmental protection, prevention of environmental degradation and removal of pollution; The Ministry and local governments cooperate with professional chambers, unions and non-governmental organizations when necessary (Article 3/b). The right to participate is essential in the formation of environmental policies. Ministry and local governments; Professional chambers, unions, non-governmental organizations and citizens are obliged to create an environment of participation in which they will exercise their right to environment (Article 3/e). It is essential to protect the biological diversity that makes up the natural environment and the ecosystem that hosts this diversity. The principles of protection and use of biological diversity are determined by taking the opinions of local administrations, universities, non-governmental organizations and other relevant organizations (Art. 9/a). Metropolitan municipalities and municipalities are obliged to establish, have them set up, operate or have them operated (Article 11). In the event that municipalities establish service unions for the purpose of establishing wastewater treatment, waste disposal and waste recovery facilities, technical and financial assistance is provided to these service unions by the Ministry for research, survey and project issues (Article 11). Incentives are applied by the Ministry to municipalities, special provincial administrations, institutions, organizations and businesses that establish and implement a zero waste management system for the purpose of separate

accumulation and collection of wastes at the source (Article 28). To submit to the Ministry within one year from the effective date of this Law, the municipalities that have not established a wastewater treatment and domestic solid waste disposal facility, and organized industrial zones that are currently in operation but have not established a wastewater treatment plant, other industrial establishments and settlements, must be put into operation within the periods specified below (Temporary Article 4).

The following provisions are also included in the Municipal Law No. 5393 adopted in 2005; Urban infrastructure such as zoning, water and sewerage, transportation; geographic and urban information systems; provides or has them do the environmental and environmental health, cleaning and solid waste services (Article 14). Without prejudice to the acquired rights; to provide drinking, domestic and industrial water; ensuring the removal of wastewater and rainwater; to establish, establish, operate and operate the necessary facilities for these; to operate or have spring waters operated (Article 15/e). To perform and have all services related to the collection, transportation, separation, recovery, elimination and storage of solid wastes be made (Article 15/g). To carry out the works related to the planning, design, construction, maintenance and repair of bicycle paths and lanes, bicycle and electric scooter parking and charging stations, pedestrian roads and noise barriers (Article 15/ş). Council; It makes the necessary disaster and emergency plans, prepares the team and equipment, taking into account the characteristics of the town, in order to be protected from fire, industrial accidents, earthquakes and other natural disasters or to reduce their damages (Article 53).

Another important law in the fight against climate change of local governments in Turkey is the Municipality Law No. 5216, which was adopted in 2014. The following provisions are included in this law: To ensure the protection of the environment, agricultural areas and water basins in accordance with the principle of sustainable development; afforestation; to gather unsanitary workplaces, entertainment venues, and other workplaces that have an impact on public health and the environment in certain parts of the city; determining construction materials, scrap storage areas and sales places, excavation soil, rubble, sand and gravel storage areas, wood and coal sales and storage areas, and taking measures that will not cause environmental pollution in their transportation; to make and have the metropolitan solid waste management plan made; to perform services related to the reuse, storage and disposal of solid wastes and excavations, except for the collection of solid wastes at the source and transportation to the transfer station, to establish facilities for this purpose, to have them installed, to operate or to have them operated; to carry out services related to industrial and medical wastes, to establish the necessary facilities for this, to have them installed, to operate or to have them operated; collecting, collecting, purifying the wastes of marine vehicles and making the necessary arrangements (Article 6/i).

To make plans and other preparations for natural disasters at the metropolitan scale in accordance with the plans made at the provincial level; providing tools, equipment and material support to other disaster areas when necessary; conducting fire and emergency services; to detect explosive and flammable material production and storage areas, to inspect residences, workplaces, entertainment venues, factories and industrial establishments and public institutions in terms of precautions to be taken against fire and other disasters, to issue permits and licenses required by the legislation in this regard (Article 6/u).

To carry out works related to the planning, design, construction, maintenance and repair of bicycle paths and lanes, bicycle and electric scooter parking and charging stations, pedestrian roads and noise barriers (Article 6/mm). For the dissemination of bicycle transportation in order to reduce emissions caused by transportation; It is essential to include bicycle transportation in the transportation master plans to be prepared within the scope of this Law or to prepare a bicycle transportation master plan. The Ministry may provide technical support to local administrations upon request. Administrative and technical procedures and principles regarding this paragraph are determined by the regulation issued by the Ministry of Environment, Urbanization and Climate Change (Article 9).

Article 8 of the Zoning Law No. 3194 includes the following provisions; Studies and projects of structures in villages and other rural settlements can be prepared by the architects and engineers of the relevant administration or the provincial organization of the Ministry. by the Ministry; Energy efficient, climate sensitive and ecological plans and projects can be prepared or have them prepared for the settlements within the scope of this Law. These qualified structures can be built or supported by long-term loans. In this case, local governments have an important responsibility in combating climate in the field of development. Within the framework of the principle of sustainability, municipalities ensure the protection of agricultural areas, water basins and the environment, plant afforestation, collect workplaces that are harmful to public health in a certain region of the city, determine important storage areas, take measures that do not cause environmental pollution in the transportation of construction materials, make a metropolitan solid waste management plan, It has been seen that it has undertaken important duties in the fight against climate change to carry out services related to industrial and medical waste activities, to collect the wastes of marine vehicles, to make plans for natural disasters, to create bicycle paths to reduce emissions from transportation and to popularize the use of bicycles. From a legal point of view, the most comprehensive duties to local governments in the fight against climate change have been given by the 2872 Environment Law and the Municipality Law No. 5216.

5.2.Applications of Some Municipalities

With the climate change of municipalities in Turkey the first steps towards the struggle took place in 2009 coordinated by REC-Turkey it was launched with the "Climate Friendly Cities Campaign". The campaign will be held in Alanya, Beyoğlu, Bodrum, Çankaya, Halkapınar, Kadıköy, Karadeniz Ereğli, Keçiören, Muğla, Nevşehir, Nilüfer, Sivas, Şişli, Yalova there were 14 municipalities participating, including municipalities. However, local governments in Turkey have lagged behind many countries in the fight against climate change. Municipalities that signed the campaign climate change to reflect the activities related to urban services he has made a statement of intent and in this context some projects have been realized. These studies are mostly waste management, energy efficiency and awareness raising it's been on him.

With the participation of all municipalities in Turkey, the struggle to be carried out locally was launched at the 'First Local Climate Action Summit'. Climate change action plan has been prepared only 14 of 30 metropolitan municipalities (iklimhaber.org). These are: Antalya, Istanbul, Bursa, Denizli, Gaziantep, Izmir, Kocaeli, Turkey, Kayseri, Mersin, Turkey, Şanlıurfa, Trabzon municipalities. In the process of preparing climate change action plans in Turkey, Environmental Protection and Waste Management Units have carried out the necessary work in general.

Municipalities in Turkey, especially in recent years, have produced important policies in vehicle changes and transformations that can be made to prevent air pollution related to transportation, improving air quality and water management. In Turkey, local governments can prepare different action plans in order to ensure sustainable cities, combat climate change and increase the resilience of cities (IIDEP, 2018).

Istanbul Metropolitan Municipality has done some work to transform Istanbul into a green city and to offer more active green space opportunities to its residents (İBB, 2021):

- Kemerburgaz City Forest, Sarıyer Atatürk City Forest and 11 parks in different districts of the city were opened for public use.
- A green area of over 4 million m2 has been developed and put into use.
- Green area projects of more than 10 million square meters in total, including 15 living valleys, which will improve the life quality of Istanbul residents, have been started.
- With the "Reduce Your Garbage Project", various online meetings and organizations were held throughout the year, informing citizens about the waste management, studies and the importance of recycling implemented in Istanbul, and a total of 4,784 people were reached.
- Training seminars on "Keep Our Seas Clean" were given to 10,176 students to raise awareness of prevention of marine pollution.

- Within the scope of the project titled "Beautiful When Our Seas Are Clean" jointly with NGOs, 20 garbage collectors were placed in different parts of the Bosphorus. With these devices, a total of 66 m3 of waste is separated; recycled, recycled

- Inappropriate wastes were sent to disposal facilities.

- In order to stay active in conditions suitable for social distance rules during the COVID-19 process, planning and project studies have been carried out to expand and increase the availability of bicycle transportation, which is an environmentally friendly mode of transportation. As of 2020, the existing bicycle path length in Istanbul is 314.04 km, and the bicycle transportation network is

- The project works of the 198.02 km additional bicycle path for the development of the project continue.

- A total of 24,960 people were reached by supporting the training and awareness activities for the development of environmental awareness, which could not be realized due to the pandemic.

"Climate Change Branch Directorate" was established in Denizli Metropolitan Municipality and the works to be carried out in this area in Denizli started to be followed thanks to this directorate. In addition, the integration of the Climate Action Plan with the Denizli Metropolitan Municipality Strategic Plan (2020-2024) has created an important indicator in terms of sustainability in this struggle. Denizli Metropolitan Municipality has also implemented the Carbon Footprint Calculation Module, which is open on the municipality's website, which will calculate the individual carbon footprints of the inhabitants of Denizli. He pointed out that the applications made so far are direct emissions from fuel and electricity consumption, and indirect emissions from the products they use (Şengün & Kalağan, 2022).

As Antalya Metropolitan Municipality, it first established the Climate Change Branch Directorate. In 2022, he established the Climate Change Department. He prepared the Sustainable Energy and Climate Action Plan and presented it to the people of Antalya (ABB, n.d.).

"Green Climate Green Municipality Project" is carried out by the Green Thought Association and Bornova Municipality, financed by the European Union and the beneficiary institution is the Ministry of Environment and Urbanization, within the framework of the Grant Program for Capacity Building in the Field of Climate Change in Turkey, co-financed by the Republic of Turkey and the European Union. being carried out. Within the scope of the project, it is aimed to increase the capacity of Bornova residents, entrepreneurs and local governments on climate change, climate adaptation and especially renewable energy production, to introduce pilot renewable energy applications and to introduce good practices to reduce greenhouse gas emissions (Yeşil İklim, Yeşil Belediye, 2022). Within the scope of Bornova

Municipality, with the support of İzmir Development Agency, a 300 kilowatt solar power plant was commissioned in 2014. Bornova Municipality Council unanimously decided to charge 25 percent discount on all municipal fees from buildings using renewable energy sources (Yeşil Düşünce Derneği, 2018).

6. Conclusion

The total population of Turkey increased 4 times between 1940-2010. The population living in cities has also increased 13 times. In 2019, the share of the population living in cities (provincial and district centers) in the total reached 93 percent. For this reason, the management of cities is a prominent issue in the fight against climate change. Cities in Turkey are managed by the central government and its provincial organization and local governments. Municipalities stand out among local governments. There are 1397 municipalities in Turkey, 30 of which are metropolitan municipalities. 78 percent of the country's population lives within the borders of metropolitan municipalities. There are important services that municipalities can undertake in mitigation and adaptation activities, which are two main headings to combat climate change and its effects. Reducing climate change by reducing greenhouse gas emissions that cause climate change through mitigation activities, particularly from the use of oil, coal and other fossil fuels; With adaptation activities, it is aimed to take measures against the negative effects of climate change that are currently observed and that are certain to increase. Municipalities should plan mitigation and adaptation activities with climate change, and this should be done by creating a Local Climate Change Action Plan.

Municipalities need to strengthen their administrative organization within the framework of the action plan. Metropolitan municipalities, emphasizing the right to establish a climate change department, were granted in 2020. Despite this, an independent climate change department has not been established in any of the 30 metropolitan municipalities. Even if not all metropolitan cities, it would be beneficial to establish these presidencies and increase the number of relevant personnel, especially in municipalities with high greenhouse gas emissions or climatic vulnerabilities.

If the Climate Action Plans of the municipalities are not integrated with their basic functions such as zoning and science jobs, the reduction and adaptation targets cannot be achieved. It will be the poor and disadvantaged sections of the city that will be most affected by the climate crisis. On the issue of climate justice, it will be necessary to positively discriminate against disadvantaged segments of society.

If cities become more resistant to the effects of climate change and better urban planning is ensured, sustainable socio-economic development at the local level will be supported, and it will also contribute to the formulation of policies on a national scale and to national development.

It is of great importance that the fight against climate should be made a part of local politics and that mayors and council members should make efforts to adopt and implement climate action plans. The importance of participation in the service and policy production of municipalities is gradually increasing. While dealing with a multidimensional problem such as climate change, it is necessary for sustainable climate policies that citizens participate in decision-making mechanisms, have knowledge of the municipality's climate actions, and be informed about the issues that they can support in the fight against climate through education and awareness campaigns.

Auxiliary Tables

Number of Municipalities

Number of Provinces:	8	Number of Metropolitan Municipality	30
Number of Districts:	922	Number of Provincial Municipality	51
Number of Neighborhoods	32173	Number of Metropolitan District Municipality	519
Number of Villages	18292	Number of District Municipalities	403
Number of Affiliates	23925	Number of Municipalities in the Town	388
Total Number of Municipalities		1391	

https://www.e-icisleri.gov.tr/Anasayfa/MulkiIdariBolumleri.aspx

The Ratio of the Municipal Population to the Total Municipal Population where Waste Services are Provided (%)

Adana	99	Bingöl	99	Gaziantep	100	Kırklareli	100	Rize	99
Adıyaman	99	Bitlis	100	Giresun	97	Kırşehir	100	Sakarya	99
Afyonkarahisar	99	Bolu	100	Gümüşhane	100	Kilis	100	Samsun	100
Ağrı	100	Burdur	100	Hakkari	100	Kocaeli	100	Siirt	99
Aksaray	99	Bursa	100	Hatay	99	Konya	99	Sinop	99
Amasya	100	Çanakkale	96	Iğdır	100	Kütahya	100	Sivas	100
Ankara	100	Çankırı	98	Isparta	100	Malatya	99	Şanlıurfa	97
Antalya	99	Çorum	99	İstanbul	100	Manisa	100	Şırnak	97
Ardahan	100	Denizli	99	İzmir	100	Mardin	91	Tekirdağ	100
Artvin	100	Diyarbakır	98	Kahramanmaraş	99	Mersin	99	Tokat	99
Aydın	98	Düzce	100	Karabük	100	Muğla	100	Trabzon	100
Balıkesir	99	Edirne	96	Karaman	100	Muş	99	Tunceli	97
Bartın	99	Elazığ	99	Kars	100	Nevşehir	100	Uşak	100
Batman	97	Erzincan	99	Kastamonu	100	Niğde	97	Van	99
Bayburt	100	Erzurum	91	Kayseri	100	Ordu	94	Yalova	100
Bilecik	100	Eskişehir	99	Kırıkkale	100	Osmaniye	100	Yozgat	99
Zonguldak	100								

https://cip.tuik.gov.tr/#

Proportion of the Population Provided Wastewater Treatment Services (%)

Adana	82,0	Bingöl	76,2	Gaziantep	89,1	Kırklareli	93,7	Rize	61,7
Adıyaman	60,2	Bitlis	40,5	Giresun	55,9	Kırşehir	90,9	Sakarya	80,0
Afyonkarahisar	77,9	Bolu	87,6	Gümüşhane	58,2	Kilis	81,6	Samsun	70,2
Ağrı	----	Burdur	81,5	Hakkari	----	Kocaeli	99,0	Siirt	65,8
Aksaray	11,1	Bursa	93,0	Hatay	48,9	Konya	74,8	Sinop	22,5
Amasya	65,5	Çanakkale	89,9	Iğdır	----	Kütahya	84,2	Sivas	83,6
Ankara	63,7	Çankırı	10,4	Isparta	82,7	Malatya	79,3	Şanlıurfa	44,1
Antalya	75,0	Çorum	83,6	İstanbul	99,7	Manisa	74,8	Şırnak	----
Ardahan	54,7	Denizli	90,0	İzmir	99,0	Mardin	59,2	Tekirdağ	93,0
Artvin	19,7	Diyarbakır	44,5	Kahramanmaraş	49,6	Mersin	76,0	Tokat	61,5

Aydın	89,0	Düzce	75,4	Karabük	88,5	Muğla	77,0	Trabzon	71,7
Balıkesir	71,5	Edirne	38,7	Karaman	90,7	Muş	1,2	Tunceli	59,0
Bartın	84,0	Elazığ	60,9	Kars	10,8	Nevşehir	72,5	Uşak	89,1
Batman	76,3	Erzincan	64,8	Kastamonu	22,3	Niğde	67,1	Van	50,6
Bayburt	81,1	Erzurum	77,7	Kayseri	79,8	Ordu	62,2	Yalova	94,8
Bilecik	15,0	Eskişehir	96,0	Kırıkkale	81,2	Osmaniye	72,9	Yozgat	46,3
Zonguldak	66,1								

https://cip.tuik.gov.tr/#

Daily Amount of Wastewater per Person (L/Person-Day)

Adana	156	Bingöl	127	Gaziantep	200	Kırklareli	155	Rize	142
Adıyaman	104	Bitlis	183	Giresun	113	Kırşehir	153	Sakarya	155
Afyonkarahisar	136	Bolu	267	Gümüşhane	123	Kilis	116	Samsun	207
Ağrı	136	Burdur	169	Hakkari	105	Kocaeli	223	Siirt	99
Aksaray	161	Bursa	149	Hatay	203	Konya	149	Sinop	153
Amasya	151	Çanakkale	172	Iğdır	73	Kütahya	178	Sivas	205
Ankara	151	Çankırı	99	Isparta	174	Malatya	196	Şanlıurfa	186
Antalya	318	Çorum	199	İstanbul	248	Manisa	138	Şırnak	130
Ardahan	169	Denizli	110	İzmir	174	Mardin	121	Tekirdağ	153
Artvin	129	Diyarbakır	120	Kahramanmaraş	178	Mersin	210	Tokat	135
Aydın	182	Düzce	145	Karabük	203	Muğla	243	Trabzon	305
Balıkesir	191	Edirne	166	Karaman	102	Muş	164	Tunceli	195
Bartın	173	Elazığ	222	Kars	191	Nevşehir	121	Uşak	127
Batman	145	Erzincan	205	Kastamonu	139	Niğde	144	Van	145
Bayburt	154	Erzurum	143	Kayseri	157	Ordu	208	Yalova	339
Bilecik	133	Eskişehir	161	Kırıkkale	127	Osmaniye	151	Yozgat	151
Zonguldak	121								

https://cip.tuik.gov.tr/#

Proportion of the Population Served by Sewerage (%)

Adana	95	Bingöl	98	Gaziantep	98	Kırklareli	98	Rize	81
Adıyaman	95	Bitlis	93	Giresun	85	Kırşehir	98	Sakarya	80
Afyonkarahisar	96	Bolu	98	Gümüşhane	96	Kilis	100	Samsun	78
Ağrı	93	Burdur	93	Hakkari	59	Kocaeli	99	Siirt	98
Aksaray	86	Bursa	98	Hatay	70	Konya	91	Sinop	92
Amasya	99	Çanakkale	97	Iğdır	90	Kütahya	97	Sivas	97
Ankara	98	Çankırı	97	Isparta	93	Malatya	92	Şanlıurfa	65
Antalya	75	Çorum	99	İstanbul	100	Manisa	89	Şırnak	93
Ardahan	86	Denizli	90	İzmir	100	Mardin	70	Tekirdağ	93
Artvin	92	Diyarbakır	80	Kahramanmaraş	71	Mersin	76	Tokat	96
Aydın	89	Düzce	91	Karabük	99	Muğla	77	Trabzon	89
Balıkesir	88	Edirne	98	Karaman	96	Muş	88	Tunceli	93
Bartın	96	Elazığ	97	Kars	95	Nevşehir	93	Uşak	98
Batman	93	Erzincan	82	Kastamonu	93	Niğde	87	Van	76
Bayburt	96	Erzurum	80	Kayseri	91	Ordu	73	Yalova	96
Bilecik	98	Eskişehir	96	Kırıkkale	96	Osmaniye	86	Yozgat	95
Zonguldak	91								

https://cip.tuik.gov.tr/#

Proportion of Population with Drinking Water Network (%)

Adana	100	Bingöl	97	Gaziantep	95	Kırklareli	100	Rize	94
Adıyaman	98	Bitlis	97	Giresun	93	Kırşehir	97	Sakarya	99
Afyonkarahisar	98	Bolu	99	Gümüşhane	98	Kilis	100	Samsun	99
Ağrı	96	Burdur	100	Hakkari	92	Kocaeli	100	Siirt	98
Aksaray	97	Bursa	100	Hatay	99	Konya	100	Sinop	99
Amasya	100	Çanakkale	97	Iğdır	92	Kütahya	99	Sivas	100

64

Ankara	99	Çankırı	100	Isparta	100	Malatya	100	Şanlıurfa	95
Antalya	100	Çorum	99	İstanbul	100	Manisa	97	Şırnak	98
Ardahan	99	Denizli	100	İzmir	100	Mardin	96	Tekirdağ	100
Artvin	98	Diyarbakır	95	Kahramanmaraş	95	Mersin	99	Tokat	97
Aydın	100	Düzce	100	Karabük	100	Muğla	98	Trabzon	89
Balıkesir	100	Edirne	98	Karaman	99	Muş	97	Tunceli	99
Bartın	98	Elazığ	100	Kars	98	Nevşehir	98	Uşak	96
Batman	98	Erzincan	100	Kastamonu	99	Niğde	99	Van	99
Bayburt	100	Erzurum	100	Kayseri	99	Ordu	97	Yalova	100
Bilecik	97	Eskişehir	100	Kırıkkale	97	Osmaniye	95	Yozgat	98
Zonguldak	99								

https://cip.tuik.gov.tr/#

Proportion of Population Provided Drinking Water Treatment Services (%)

Adana	81	Bingöl	---	Gaziantep	72	Kırklareli	30	Rize	58
Adıyaman	18	Bitlis	1	Giresun	3	Kırşehir	---	Sakarya	77
Afyonkarahisar	32	Bolu	78	Gümüşhane	26	Kilis	86	Samsun	78
Ağrı	60	Burdur	---	Hakkari	---	Kocaeli	89	Siirt	60
Aksaray	67	Bursa	46	Hatay	4	Konya	63	Sinop	40
Amasya	---	Çanakkale	53	Iğdır	---	Kütahya	1	Sivas	58
Ankara	98	Çankırı	62	Isparta	69	Malatya	---	Şanlıurfa	68
Antalya	---	Çorum	52	İstanbul	100	Manisa	27	Şırnak	30
Ardahan	2	Denizli	---	İzmir	72	Mardin	5	Tekirdağ	14
Artvin	50	Diyarbakır	88	Kahramanmaraş	16	Mersin	72	Tokat	1
Aydın	52	Düzce	86	Karabük	85	Muğla	24	Trabzon	83
Balıkesir	38	Edirne	66	Karaman	74	Muş	---	Tunceli	---
Bartın	77	Elazığ	1	Kars	46	Nevşehir	9	Uşak	39
Batman	---	Erzincan	1	Kastamonu	46	Niğde	12	Van	28
Bayburt	7	Erzurum	88	Kayseri	---	Ordu	76	Yalova	59
Bilecik	---	Eskişehir	91	Kırıkkale	75	Osmaniye	---	Yozgat	25
Zonguldak	56								

https://cip.tuik.gov.tr/#

Electricity Consumption per Person (kWh)

Adana	3275	Bingöl	1078	Gaziantep	4076	Kırklareli	6811	Rize	2165
Adıyaman	2060	Bitlis	1042	Giresun	1563	Kırşehir	2568	Sakarya	3524
Afyonkarahisar	2634	Bolu	4154	Gümüşhane	2496	Kilis	3512	Samsun	2477
Ağrı	927	Burdur	3267	Hakkari	1026	Kocaeli	7375	Siirt	1427
Aksaray	2781	Bursa	3985	Hatay	3984	Konya	3746	Sinop	1732
Amasya	2000	Çanakkale	7337	Iğdır	1026	Kütahya	3021	Sivas	1996
Ankara	2680	Çankırı	2722	Isparta	2891	Malatya	2031	Şanlıurfa	2618
Antalya	3025	Çorum	1635	İstanbul	2539	Manisa	3571	Şırnak	1217
Ardahan	1376	Denizli	3719	İzmir	4569	Mardin	2546	Tekirdağ	7037
Artvin	2607	Diyarbakır	1631	Kahramanmaraş	4343	Mersin	3095	Tokat	1491
Aydın	2500	Düzce	2699	Karabük	7185	Muğla	3197	Trabzon	1749
Balıkesir	3156	Edirne	2979	Karaman	3731	Muş	996	Tunceli	1529
Bartın	3513	Elazığ	2850	Kars	1139	Nevşehir	2546	Uşak	4565
Batman	1467	Erzincan	2737	Kastamonu	2812	Niğde	3470	Van	921
Bayburt	1263	Erzurum	1403	Kayseri	2751	Ordu	1700	Yalova	4508
Bilecik	9388	Eskişehir	3737	Kırıkkale	3027	Osmaniye	7413	Yozgat	1787
Zonguldak	5154								

https://cip.tuik.gov.tr/#

65

References

Antalya Büyükşehir Belediyesi (ABB). (n.d.). Retrieved October 11, 2022, from https://www.antalya.bel.tr/Haberler/HaberDetay/4961/buyuksehir-belediyesi-surdurulebilir-enerji-ve-iklim-eylem-planini-acikladi

Brears, R. C. (2018). *Blue and Green Cities: The Role of Blue-Green Infrastructure in Managing Urban Water Resources* (1st ed. 2018 ed.). Palgrave Macmillan.

CCPI (2022). *Climate Change Performance Index 2022 Results*. Germanwatch, NewClimate Institute & Climate Action Network.

European Landscape Contractors Association (ELCA) (2011). *Green City Europe – for a better life in European cities*. ELCA Research Workshop.

ICLEI (Local Governments for Sustainability), (2016). "The Paris Climate Package: A Basic Guide for Local and Subnational." http://elib.iclei.org/wp-content/uploads/2016/05/COP21-Report-web.pdf

IIDP (2018). *İstanbul İklim Değişikliği Eylem Planı İklim Senaryoları.* İstanbul: İstanbul Büyükşehir Belediyesi Çevre Koruma ve Kontrol Dairesi Başkanlığı Çevre Koruma Müdürlüğü.

ISTANBUL METROPOLITAN MUNICIPALITY (IBB), (2021). *İstanbul İklim Değişikliği Eylem Planı*, İstanbul.

Kaya, Y. (2018). İklim Değişikliğine Karşı Kentsel Kırılganlık: İstanbul İçin Bir Değerlendirme. International Journal of Social Inquiry, Cilt / Volume 11 Sayı / Issue 2 2018 ss./pp. 219-257.

Kışınbay, S., & Arslan, Z. (2021, September 22). *Yeşil Belediye Nedir? Nasıl Olunur?* İklim Haber. Retrieved September 3, 2022, from https://www.iklimhaber.org/yesil-belediye-nedir-nasil-olunur/

OECD (Organisation for Economic Cooperation and Development), (2014). Cities and Climate Change. OECD Polıcy Perspectıves.

Özcan, K. Y. (2018). İklim Değişikliği Konusunda Farkındalık Geliştirme Projesi Kapsamında Türkiye'deki İllerin Değerlendirilmesi: Bursa, Trabzon Ve Gaziantep Örnekleri. Trakya Üniversitesi Sosyal Bilimler Dergisi, 245-271. Paris Agreement (2015). Birleşmiş Milletler İklim Değişikliği Çerçeve Sözleşmesi'nin 21. Taraflar Konferansı-COP 21.

Şengün, E., & Kalağan, G. (2022). Yerel Yönetimlerin İklim Değişikliği Mücadele Sürecinde Karbon Ayak İzinin Düşürülmesi: Denizli Büyükşehir Belediyesi Örneği. *Uluslararası Yönetim Akademisi Dergisi*. https://doi.org/10.33712/mana.1065718

Talu, N. (2019). Yerel İklim Eylem Planlaması Ve Türkiye Pratikleri. Ankara: İklim Değişikliği Alanında Ortak Çabaların Desteklenmesi Projesi (iklimİN).

Uncu, B. A. (2019). *İklim İçin Kentler Yerel Yönetimlerde İklim Eylem Planı*. İstanbul:350.org

UNDP. (2022, February 28). *Belediye Başkanları İklim Şurası'nda yerel yönetimlerin iklim değişikliğiyle mücadeledeki rolünü görüştü/United Nations Development Programme*. https://www.undp.org/tr/turkiye/news/belediye-baskanlari-iklim-surasinda-yerel-yonetimlerin-iklim-degisikligiyle-mucadeledeki-rolunu-gorustu

UNEP. (2011). *Towards a GREEN economy: Pathways to Sustainable Development and Poverty Eradication*. A Synthesis for Policy Makers, pp.16.

Yeşil Düşünce Derneği. (2018). *Yeşil Ekonomi Yeşil Belediye Paydaş Toplantısı*. Retrieved October 11, 2022, from https://www.yesildusunce.org/wp-content/uploads/2021/06/Yesil_Ekonomi_Yesil_Belediye_Paydas_Toplantisi.pdf

Yeşil İklim, Yeşil Belediye. (2022, April 2). Anasayfa. Retrieved October 11, 2022, from https://www.yesildusunce.org/projeler/yesil-iklim-yesil-belediye/

Yıldırım, B. S. (2018). Yüksek Lisans Tezi. Yerel İklim Değişikliği Politikalarında Kentsel İklim Adaleti: Bursa, İzmir, Karşıyaka ve Nilüfer Örnekleri.

https://cip.tuik.gov.tr

https://data.tuik.gov.tr

https://www.e-icisleri.gov.tr

https://www.iklimhaber.org

Urban Agricultural Practices in Turkey: The Case of İstanbul Metropolitan Municipality

Adnan Söylemez

Selçuk University, Turkey

Hakkı M. Ay

Selçuk University, Turkey

Abstract

Cities require large tracts of land to feed their large populations and become dependent on large quantities of food. While these circumstances is enhancing tendency to urban agriculture in the world, it also forces the countries to produce new policies on urban agriculture. It is known that urban agriculture contributes to decreasing poverty, local economic development, productively reuse of urban waste and wastewater, food safety, sustaining biodiversity. Due to the problems in the food supply, agriculture has started to come to the fore again in the municipalities. The development will start from the local and the local municipalities should be the owner of this work. Municipalities should be responsible not only for infrastructure services but also for agriculture. The role of municipalities is important in conscious and environmentally friendly agricultural practices. In addition to agricultural practices, municipalities should be able to provide great support for the preservation and protection of seeds and the continuation of varieties. In this study, the activities of Istanbul Metropolitan Municipality for urban agriculture practices are discussed. Within the framework of the research, first of all, a literature review was made. Afterwards, the reports and statistical data of the Istanbul Metropolitan Municipality Agricultural Services Department were scanned. Finally, the proposal for urban agriculture was brought up for other local governments.

Keywords: urban agricultural, local governments, Turkey, İstanbul Metropolitan Municipality,

1. Introduction

Agriculture has always been associated with the imagination of the rural environment, and in fact, activities related to it have often been limited to this context. Based on this, it has long been thought that only rural plant production would be sufficient to feed the urban population. However, for many cities of the world's developing countries this turned out to be quite wrong, mainly as a result of scarce infrastructures (transports, roads, markets, etc.) and the low purchasing power of the poor population (Drescher 2004). Indeed, over time, the rise in poverty and high unemployment rates, along with the opportunities the city can offer – such as food demand and proximity to markets – have spurred the development of diversity, particularly in cities specializing in the production of fresh vegetables, milk, eggs and chickens, and the crop and food systems around them. The term urban agriculture has been coined to describe both the cultivation of plants and the raising of animals for household consumption and income generation in cities. Moreover, urban agriculture includes the production and sale of agricultural inputs and other interrelated activities such as post-harvest processing and marketing of agricultural products.

Urban agriculture (UA) has long been dismissed as an irrelevant ancillary activity in cities; however, its potential is beginning to be realized. In fact, UA is about food self-reliance: it involves job creation and is a response to food insecurity, especially for the poor. Contrary to what many believe, UA is found in every city, sometimes hidden, sometimes obvious. If you look carefully, there is very little unused space in a big city. Valuable vacant land is rarely left idle and is often formally or informally taken over and made productive. Urban agriculture is a well-established subsistence activity of all scales, from the small family market garden to the large farms located on the edge of a city. It provides food and income to those who farm the city. Above all, UA makes an important contribution to food security for those without easy access. In essence, UA is the fulfillment of the saying 'necessity is the mother of invention'.

With the decrease in raw material resources, the concept of circular economy is becoming increasingly important. circular economy; It is a system in which resources are recycled or reused and the waste material is returned to be used in production again. Today, a restructuring at all levels is required for industrial production to become cyclical, which can be seen as the most obvious reason for this resource consumption. Every step, from the sourcing and use of resources, to design and production processes, to logistics and distribution, must be shaped around circularity and sustainability. With the inevitability of urban areas to adapt to the cyclicity of the economy, producers, suppliers and consumers are also changing their behavior in this context. In addition to all these developments, the importance of nature and healthy life has increased once more with the current global epidemic of COVID-19. In order to revive the society, which has collapsed due to the epidemic, it is vital to ensure efficiency and sustainability in sectors based on education, agriculture and agriculture-

69

based production, as well as health, medicine and food supplements. In this context, the issue of 'urban agriculture' as a means of safe food production and access to safe food has taken its place on the city agenda in the world and in Turkey (Kayasü & Durmaz, 2022).

Today, more than half of the world's population lives in cities and it is estimated that another 2.5 billion people will live in cities in 2050. Again, 85% of the world's population lives within three hours of the city center, while 881 million people continue their lives in shantytowns on the outskirts of cities. Unemployment and poverty among the urban population and social injustice in access to basic services have reached serious dimensions. The urban population plays an important role in the creation of these problems as well as in the target of climate change and environmental problems. Although it covers 3% of the world's geography, the urban population is responsible for 70% of the worldwide CO_2 emissions; in addition, the urban population consumes two-thirds of the total energy. Urban population consumes 70% of the food produced. Despite this, injustices in access to food, malnutrition and nutritional disorders, overweight, obesity and related problems have become important public health problems (FAO, 2019).

In this study, the work carried out by the Istanbul Metropolitan Municipality on urban agriculture is discussed, and the benefits it will provide in the long term in terms of product supply for the city and the city are discussed.

2. Urban Agriculture

In 1999, the Food and Agriculture Organization of the United Nations (FAO) was formally mandated by its Members to include the UPA as an integral part of their agricultural production systems and to take particular note of the UPA's contributing role in feeding cities, providing employment and creating production. they come. FAO, in collaboration with global, national and local partners and stakeholders, supports the transformation of UPA into a recognized urban land use and economic activity integrated into national and local agricultural development strategies, food and nutrition programs and urban planning. In 2020, FAO launched the Green Cities Initiative to improve people's well-being and the environment by promoting sustainable and resilient agri-food systems and green spaces in urban and urban areas where UPA is critical to contributing to people's lives and, in general, urban sustainability and for durability (FAO, 2022).

The terms "urban agriculture" and "environmental agriculture" are both sometimes used interchangeably without clearly defining what each term means. An important question for quantitative research is where urban and urban areas begin and end. Drechsel and Keraita (2014) stated that the term "urban" refers to the administrative city boundary, while the expression "urban" is used for lands outside the IBBediate

periphery of the city; Because cities around the world are defined in different ways, emphasizing administrative considerations leads to definition problems.

The fourth World Urban Forum in 2006 highlighted the vital importance of UA in cities of the 21st century. During the forum, statistics were presented showing that by 2006 more than 50 percent of the world's population lived in urban areas. Also, projections show that by 2050, two-thirds of humanity is expected to live in urban areas. Thus, the Forum confronted the delegates with the challenges of such a rapid and historic change in human geography. The Forum was also notable for introducing UA during a major international event where its participants were mayors, government ministers, international organisations, researchers and members of civil society. Urban agriculture was the main topic at a number of networking events, product launches and booths in at least 20 corporate partners and eight cities. Nearly 1000 delegates participated in the networking events, especially in TC. The recognition of TC and its presence at such a large scale are indicative of the broad shifts that have taken place in policy regarding how cities are viewed and how the value of land – and food production – is perceived.

The concept of agriculture, which is mostly associated with the rural context, has gained a new dimension with its urban character in recent years. Economic, environmental and social problems caused by rapid urbanization, migration from rural to urban areas, high unemployment and urban poverty have led to an increase in agricultural activities in the urban context. This new trend is called "Urban Agriculture". Urban agricultural activities; It is developing rapidly around the world due to its positive effects in economic, environmental and social areas. For this reason, it is used as a sustainable development strategy in many countries. Sustainable Development Goals associated with Urban Agriculture announced by the United Nations (Sachs et al., 2021):

Goal-01 To end all forms of poverty everywhere,

Goal-02 End hunger, ensure food security and achieve good nutrition and promote sustainable agriculture,

Goal-12 To provide sustainable consumption and production patterns,

Goal-15 can be listed as protecting, restoring and promoting sustainable use of terrestrial ecosystems, managing forests sustainably, combating desertification and halting and reversing land degradation and preventing biodiversity loss.

3. Importance of Urban Agriculture

The urban population plays an important role in the creation of these problems, as well as the target of the problems caused by climate change and various environmental problems, especially chemical pollution. Although it covers 3% of the world's

geography, the urban population is responsible for 70% of the worldwide CO_2 emissions; in addition, the urban population consumes two-thirds of the total energy. Similarly, it consumes 70% of the food produced. Despite this, injustices in access to food, malnutrition and nutritional disorders, overweight, obesity and related problems have become important public health problems (İBB, 2021).

At the heart of the urbanization phenomenon are changes in diets coupled with an increase in urban food demand and growing demands for a wider range of food types that serve emerging middle class markets. These changes are challenging food production, rural-urban connections, transportation and traditional market chains. Specialized urban and peri-urban farming systems are emerging, such as large-scale poultry production or high-input vegetable farming (Drechsel & Keraita, 2014).

By 2050, the world's population is expected to reach 9.7 billion, with 70 percent of them living in urban areas, particularly in low- and middle-income countries in Africa and Asia. At the same time, the current COVID-19 pandemic and the growing climate emergency are forcing us to rethink how we produce, process and distribute food. Since history recorded cities, urban and peri-urban agriculture (UPA) has played an important role in food production, and the effects of UPA have multiplied as cities expanded. Over the last few decades, UPA has grown in importance and is increasingly recognized as a key player in feeding the growing urban population, providing safe and nutritious food from diverse plants and animals, and contributing to all urban food systems. The role of the UPA is specific and complementary to the supply of food from rural areas as it helps meet local demand and contributes to short, efficient supply chains, thereby reducing food loss and waste. The UPA also provides a variety of benefits in the daily lives of billions of people, from social to educational and economic to environmental functions, ensuring that urban and peri-urban residents have prosperous livelihoods (FAO, 2022).

Urban agricultural activities have an increasing share in global food production. One reason for this is that urban agricultural activities offer the potential to offer solutions to many economic, social and spatial problems faced by settlements, especially environmental problems. Increasing production efficiency, reducing input costs, optimizing resource use, and providing uninterrupted consumer access are the main economic benefits that can be considered together with urban agriculture. While the activation of transportation and resource use are topics that can be directly related to environmental conditions, the food security and food security opportunities provided by urban agriculture systems to cities contribute to the development of settlements in environmental and social terms. Creating healthy communities related to nature and agricultural production is one of the most important contributions of urban agriculture (Ankara Development Agency, 2020).

4. The Case of Istanbul Metropolitan Municipality

With a population of 16 million, a geography extending to two continents, and hosting Turkey's largest trade, culture, art, science, education and historical assets, Istanbul has been included in the world's leading inter-city networks. Considering the population growth, urban space, infrastructure and transportation problems of Istanbul, the most populated city in Europe, and its vulnerability to global climate change, earthquake and similar natural disasters, the importance of the food system for an inclusive, safe, durable and nature-friendly city becomes even more important. is also gaining importance (IBB, 2021).

Rural areas of Istanbul, which can be considered under two main headings as natural areas, agricultural areas and villages, become areas where the distinction between city and countryside becomes blurred due to urban expansion, and agricultural production or rural landscape remains are encountered in the gaps of the urban texture. As a result of the increase in rent pressure on rural areas, forest, meadow, pasture and agricultural areas in Istanbul are decreasing at a much higher rate compared to the rest of the world. The construction-based growth model, which is one of the most important factors causing the destruction of rural areas, values these areas in terms of rent rather than their rural potential. While mega projects such as the 3rd Bridge, Northern Marmara Motorway, Kanal Istanbul and its affiliated New Istanbul cause a change in the rural landscape, they also threaten the rural settlements on which the projects are based. In addition to these, since the beginning of the 2000s, making rural settlements invisible with various legal regulations, and the abolition of the legal entities of the villages adversely affected agricultural production. Special emphasis should be given to producers and farmers, who are among the most fragile links of the food supply chain and shoulder the burden of production, and their social security should be provided. While all these are being done, the labor that women spend in production and care services should not be overlooked (IBB, 2021).

First of all, within the scope of the "National Agriculture Native Seed Project" of the Istanbul Metropolitan Municipality, 75 local and national varieties were planted in 258 decares of land, 42 different regions, in order to disseminate native seeds in Istanbul (Agricultural Services Department, 2019).

Turkiye has a great potential with its irrigated and non-irrigated agricultural lands. In this respect, it is important to irrigate the lands with the right methods. In this regard, İBB has carried out a total of 18 thousand 318 meters of pipe laying in its own ponds in Mahmutşevketpaşa, Paşamandıra, Cumhuriyet and Bozhane ponds to switch to the closed circuit irrigation system (İBB Agricultural Services Department, 2019).

"Metropolitan and district municipalities may engage in all kinds of activities and services to support agriculture and animal husbandry." Within the scope of the authority granted to metropolitan municipalities by the article of the İBB, the

agricultural data research, which started with Pendik Göçbeyli District in order to measure the current situation and potential in terms of agricultural and livestock activities, was completed with a 3-month field study carried out in 14 districts and 211 neighborhoods. . Within the scope of this study, one-on-one interviews with neighborhood headmen, chambers of agriculture, agricultural cooperatives, farmers and stakeholder public institutions were examined, and agricultural areas and livestock activities were examined on site. A database was created by collecting information such as existing agricultural areas, product patterns, production type, greenhouse activities, current status and capacity of livestock activities, marketing opportunities, irrigation resources, satellite images and field photos. In the light of the information obtained, it is planned to reveal the agriculture and livestock potential of Istanbul, to establish direct contact with the producers, to strengthen the cooperation with the stakeholders, and to use the data obtained in the research as a resource in the projects to be carried out in the neighborhoods (İBB Agricultural Services Department, 2019).

The greenhouse, which was established in the Solid Waste Site in Kemerburgaz Odayeri for the purpose of seasonal flower production in 2015 by the Istanbul Metropolitan Municipality (İBB), has been inactive since 2016 after operating for about 1 year. IBB, which has made the greenhouse, which has been idle for about 5 years, operational again, distributed 3.6 million seedlings. A full 16,380 tons of yield was obtained from the seedlings planted as crops on 2,287 decares of land (IBB Agricultural Services Department, 2021).

"Şile Beekeeping Center", which was established with the cooperation of Istanbul Metropolitan Municipality (İBB), Şile Municipality and Yeniköy, Çayırbaşı, Balibey, Doğancılı, Akçakese, Kömürlük, Alacalı Agricultural Development Cooperative, was put into operation. In this center, which will carry out studies in many areas from the production stage to the marketing of chestnut honey, which has been registered as the first geographically marked product of Istanbul, to the diversification of products, it is aimed to be with beekeepers in processing products such as pollen, propolis and bee bread, which are bee products (İBB Agricultural Services Department, 2021).

Istanbul Metropolitan Municipality (İBB) provides support for water buffalo breeders whose production costs have increased, especially for feed prices. Milk feed support for 3 water buffaloes is provided to producers engaged in buffalo breeding throughout Istanbul. IBB, which reduced the cost of the breeder, decided to distribute the produced milk to the children of Istanbul as Halk Sut (IBB Agricultural Services Department, 2021).

5. Conclusion

In the past, only humans met their endless needs by recklessly using the scarce resources in nature. Especially in the last few centuries, the damage to nature has

reached great proportions. The severity of the situation has increased when the climate change and global warming are added to the disasters experienced with the effect of this destruction. The effects and consequences of climate change have begun to affect our lives perceptibly, and consequences such as epidemics, drought, erosion, desertification, displacement of climate zones, increase in severe weather events, rise in sea level, damage to wildlife species as a result of deterioration of natural balance and deterioration of human health have emerged. out.

Finally, local governments have a role to play in adopting specific provisions to ensure that agricultural labor is available, particularly at critical points in the production process (FAO, 2020a). They can also promote sustainable production, such as hydroponic and vertical farming, as systems that use the limited space of cities and create incentives to adopt renewable energy generation to power urban farms. (FAO, 2020b).

Considering the complex structure of the agriculture and food sector and its close relationship with other sectors such as health, nature, energy, finance, labor, education and housing, it is clear that the change in the food system will require reforms not only in one sector but also in all basic systems that shape economic and social life. . An environmentally friendly and stable food system without ecological agriculture and alternative clean energy sources, food sovereignty without breaking the dominance of multinational monopolies and global finance, food security without re-establishing the functions of social welfare institutions, as well as rearranging housing, transportation and labor policies for the benefit of workers. it is impossible to ensure its safety (İBB, 2021).

Forest fires and floods are the biggest indicators of this. The climate crisis has now begun to occupy the agenda of countries more and more. We can say that the international decisions, protocols and contracts taken so far in the process have started to gain a more active direction in the epidemic process. Studies and practices for urban agriculture developed by local governments in our country are important for the right to live in a healthy environment. In recent years, more use of renewable energy sources and the continuation of agricultural production with domestic seeds provide gains both for the fight against the climate crisis and for the independence of our country.

When we evaluate the activities of İBB in the light of all these data and facts, we see that renewable water systems for urban agriculture, the creation of systems that will provide economic use and reuse of water, incentives, incentives and control through taxation and subsidies, improved food storage, processing. In the long run, by identifying products harmful to human health and taking precautions, by establishing transportation and distribution technologies and infrastructures that connect the urban periphery and nearby rural areas, supporting especially small-scale producers, women farmers and entrepreneurs socially and economically, and strengthening food control systems. and will ensure the continuity of healthy food supply.

References

Ankara Kalkınma Ajansı. (2020*). Kentsel Tarım Stratejisi Belgesi: Çankaya İlçesi Uygulama Örneği, Ankara*, Proje Ekibi: Serap Kayasü (Prof.Dr.), A.Burak Büyükcivelek (Dr.Öğr.Üy.), Büşra Durmaz (Ar.Gör.),Selen Karadoğan (Ar.Gör.), Pelin Akça (Öğrenci).

Drechsel, P., & Keraita, B. (2014). Irrigated urban vegetable production in Ghana: characteristics, benefits and risk mitigation. *Sri Lanka: International Water Management Institute (IWMI)*. https://doi.org/10.5337/2014.219

Drechsel, P., Adam-Bradford, A. & Raschid-Sally, L. (2014) Irrigated urban vegetable production in Ghana. In Irrigated urban vegetable production in Ghana: Characteristics, benefits and risks. Sri Lanka, International Water Management Institute.

FAO, Rikolto and RUAF. (2022) Urban and peri-urban agriculture sourcebook – From production to food systems. Rome, FAO and Rikolto. https://doi.org/10.4060/cb9722en

FAO. (2019). FAO Framework for the Urban Food Agenda. *FAO Framework for the Urban Food Agenda*. https://doi.org/10.4060/ca3151en

FAO. (2020a). COVID-19 and the role of local food production in building more resilient local food systems. *FAO*. https://doi.org/10.4060/cb1020en

FAO. (2020b). COVID-19 and the role of local food production in building more resilient local food systems. *FAO*. https://doi.org/10.4060/cb1020en

İBB Tarımsal Hizmetler Daire Başkanlığı. (2019). *Haberler - Tarımsal Hizmetler Dairesi Başkanlığı*. İBB. https://tarim.ibb.istanbul/tr/haberler/4554/deneme-ekimi-yapilan-bugday-cesitlerinin-hasadi-yapildi.html

İBB Tarımsal Hizmetler Dairesi Başkanlığı. (2019, June 18). *Haberler - Tarımsal Hizmetler Dairesi Başkanlığı*. Tarımsal Hizmetler Dairesi Başkanlığı. Retrieved August 31, 2022, from https://tarim.ibb.istanbul/tr/haberler/0/sp5.html

İBB Tarımsal Hizmetler Dairesi Başkanlığı. (2020, February 28). *Haberler - Tarımsal Hizmetler Dairesi Başkanlığı*. İBB. Retrieved August 31, 2022, from https://tarim.ibb.istanbul/tr/haberler/8622/ibbden-kirsal-mahallelerde-tarim-ve-hayvancilik-veri-arastirmasi.html

İBB Tarımsal Hizmetler Dairesi Başkanlığı. (2021, June 21). Haberler - Tarımsal Hizmetler Dairesi Başkanlığı. İBB. Retrieved August 31, 2022, from https://tarim.ibb.istanbul/tr/haberler/9687/yem-destegi-ibbden-halk-sut-ureticiden.html

İBB Tarımsal Hizmetler Dairesi Başkanlığı. (2021a, April 9). *Fide Üretim Merkezi hizmete açıldı*. İBB. Retrieved August 31, 2022, from

https://tarim.ibb.istanbul/tr/haberler/9677/fide-uretim-merkezi-hizmete-acildi.html

İBB Tarımsal Hizmetler Dairesi Başkanlığı. (2021b, June 10). *İş birliği meyvesini verdi, Şile Arıcılık Merkezi açıldı.* İBB. Retrieved August 31, 2022, from https://tarim.ibb.istanbul/tr/haberler/9756/is-birligi-meyvesini-verdi-sile-aricilik-merkezi-acildi.html

İstanbul Büyükşehir Belediyesi (İBB). (2021). *İstanbul Gıda Strateji Belgesi*, Eylül, İstanbul.

Kayasü, S., & Durmaz, B. (2022). Türkiye'de Kentsel Tarımın Yapısal ve Oluşumsal Çerçevesi. *İdealkent*. https://doi.org/10.31198/idealkent.957765

Sachs, J., Kroll, C., Lafortune, G., Fuller, G., & Woelm, F. (2021). *Sustainable Development Report 2021* (New ed.). Cambridge University Press.

The Causality Relationship between Wages, Labor Productivity and Economic Growth in Mediterranean Countries

Oya Korkmaz

Tarsus University, Turkey

Suna Korkmaz

Bandırma Onyedi Eylül University, Turkey

Abstract

Productivity of labor, which is one of the factors of production, and the amount of labor used are important in determining the level of production. As the productivity of labor increases, the amount of production will also increase. One of the most important elements determining the productivity of labor is wages. The level of wages determines the productivity and quantity of labor. The more wages increase, the more persons supply their labor on the market. Due to increased wages, persons want to work more. As those employed at the minimum wage level increase, the amount of production will also increase. It includes examining the relationship between wages, labor productivity and economic growth. Therefore, in this study, full-time workers according to the level of the minimum relative to average wages, labor productivity and economic growth the relationship between 2010-2020 period and annual data taken six Mediterranean Countries by applying for panel causality test were analyzed. As a result of the Granger Causality Test, a bidirectional causality relationship was found between labor productivity and economic growth, and a unidirectional causality relationship from minimum relative to average wages to economic growth. As the productivity of labor increases, production also increases. Economic growth occurs as a result of increased production. As production increases and economic growth is achieved, more people are employed. Minimum wages are also one of the factors determining economic growth. Since the majority of people are working with the minimum wage in the economy, the change in the minimum wage also affects economic growth.

Keywords: Wages, Labor Productivity, Economic Growth, Panel Causality Test.

1. Introduction

The concept of productivity has been one of the most important topics in economics and one of the most prominent topics with the feature of being one of the important topics. It is important which production factors will be used in the realization of a production and in which proportions they will be present in the composition. The more efficient and intensive the inputs are used at the production level, the higher the production level will be. The productivity of labor in production factors is assessed in partial productivity. Partial productivity is expressed by dividing the total production realized in a country by the amount of labor or the number of hours worked. The productivity of labor in the production process will ensure better quality and more realization of production. Adam Smith, one of the classical philosophers, emphasized that the specialization of the labor force and the division of labor between employees will increase labor productivity. This opinion still remains valid today.

One of the most important elements that increase labor productivity is wages. As wages increase, humans will supply their labor more and more. As wages increase, the productivity of labor will also increase. According to the New Keynesians view, firms do not want to reduce wages. Because they think that a decrease in wages will reduce the productivity of labor. In addition, they prefer those who work inside to those who work outside. They do not want to employ a new workforce that will work from outside with low wages. Because they know the business, they prefer to continue production with a trained internal workforce. The minimum wage is an important wage level that determines employment in the economy. Labor is employed at the minimum wage level, which is determined at a certain level according to the economic conditions of the countries. In the event of an increase in the minimum wage level, firms usually reduce the demand for labor. With the increase in minimum wages, employment in the economy will decrease. With the increase of the minimum wage, the level of production will decrease along with the decrease in employment.

Increasing the productivity of labor in the production process will ensure more production and contribute to the realization of economic growth. For this reason, the wages, which are effective in the productivity of labor and affect the motivation of the employees, should also be at a certain level. Our study, the relationship between minimum wage, labor productivity and economic growth in six Mediterranean countries that adopted the minimum wage level was investigated by panel causality test. According to the Granger causality test, which was conducted by taking annual data for the 2010-2020 period, a bidirectional causality relationship was found between labor productivity and economic growth, and a unidirectional causality relationship from minimum relative to average wages to economic growth.

In the introduction section of the article, the theoretical substructure among wages, labor productivity and economic growth has been explained. In the second section, studies on the subject have been included. In the third section, secondary data on the

subject have been analyzed for six Mediterranean Countries using the panel data method. In the last section, the results obtained have been interpreted and suggestions have been made about this topic.

2. Literature Review

2.1. The Relationship Between Labor Productivity and Wages

Strauss and Wohar (2004) showed that there was a bidirectional causality relationship between real wages and labor productivity as a result of the Granger causality test conducted for 459 US manufacturing industries with annual data for the period of 1956-1996. Reza and Reza (2007) proved that labor productivity had a positive effect on the real wage rate as a result of their ARDL model for Iran by taking annual data for the period of 1979-2002. Khoon (2009) found that labor productivity was positively related to real wages in the long run, as a result of his time series analysis for Malaysia with annual data for the period of 1970-2005. Tang (2012) found a bidirectional causality relationship between real wages and labor productivity as a result of the Granger causality test conducted for the Malaysian manufacturing sector with annual data for the period of 1980-2009. Islam et al (2015) found a unidirectional causality relationship from real wages to labor productivity as a result of the Granger causality test conducted for Tanzania with the data for the period of 1967-2010. Aras (2015) made a panel data analysis for 16 OECD countries using annual data for the period of 1995-2011. As a result of the analysis, it was determined that the minimum change in wages had a statistically significant effect on labor productivity. Dritsaki (2016) has found that wages have a huge impact on labor productivity and that there was a unidirectional causality relationship between real wages and labor productivity for Romania as a result of the Toda and Yamamoto causality test and ARDL cointegration test for Bulgaria and Romania by using annual data for the period 1991-2014. Katovich and Maia (2018) analyzed annual data for Brazil for the period of 1996-2014 and concluded that labor productivity was positively related to wage levels in all economic sectors. Nguyen (2019) found that labor productivity responded positively to the increasing minimum wage as a result of his regression analysis with annual data for the period of 2010-2015. Ozturk et al (2019) determined that there was a long-term relationship between labor productivity and labor wages, according to the Johansen cointegration test and vector error correction mechanism they conducted for the New Zealand construction industry, taking the period of 1983-2017. They also revealed that the labor productivity index had a positive effect on labor wages. Herman (2020) found that labor productivity in the manufacturing sector in Romania positively affected wages as a result of the correlation and regression analysis he made with the data for the period of 2008-2016. Vera and Vera (2021) detected that there was causality from real wages to labor productivity as a result of the causality test conducted with the annual data of the period of 1967-2013 and the quarterly data of the period of 1998Q1-

2013Q4. Trenovski et al (2021) found a strong and positive relationship between minimum wage and labor productivity for the countries of North Macedonia, Albania and Serbia and a weak and negative relationship for Bulgaria, Croatia and Romania as a result of the panel regression analysis for six countries with annual data for the period of 2004-2017.

2.2. The Relationship Between Labor Productivity and Economic Growth

Atesoglu and Smithin (2006), as a result of their analysis of annual data for the period 1960-2002 for the G7 countries, found that labor productivity was positively related to economic growth. Mahmud and Rashid (2006) have determined the unidirectional causality relationship between labor productivity and economic growth as a result of the causality test they conducted for Pakistan with annual data from 1972-73 to 2004-05. Alani (2012), as a result of his analysis for Uganda with data from the period 1971-2008, concluded that an increase in labor productivity leaded to a decrease in economic growth. Alam et al (2013) proved that unidirectional causality from labor productivity to economic growth in the short run; that there was a bidirectional causality relationship between labor productivity and economic growth in the long run, as a result of the causality test they conducted with the data of the period of 1980-2009. Auzina-Emsina (2014) found a weak relationship between labor productivity and economic growth in the pre-crisis and post-crisis phase and the increase in labor productivity after the crisis was an important driving force of the economy, as a result of the analysis he made for the European Union member countries with the pre-crisis and post-crisis data for the period of 2004-2008 and the post-crisis period of 2011. Korkmaz and Korkmaz (2017) found that unidirectional causality from economic growth to labor productivity as a result of the panel data causality analysis conducted for 7 OECD countries with annual data for the period 2008-2014. Ngutsav et al (2017) demonstrated that there was a positive but statistically insignificant relationship between labor productivity and economic growth in the short run as a result of their VAR analysis for Nigeria with annual data for the period 1970-2015. Kalkavan et al (2021) proved that there was a causal relationship from labor productivity to economic growth with annual data for the period 1970-2017 as a result of the Toda Yamamoto causality test for Turkey.

3. Research Methodology

3.1. Data Set and Method

This study tested the relationships between labor productivity per hour worked (LP), minimum relative to average wages of full-time workers (MW) and economic growth (GDP) among six selected Mediterranean countries (Spain, France, Greece, Israel, Slovenia and Turkey). We used yearly data in our analysis from 2010 to 2020. GDP per hour worked is a measure of labour productivity. This indicator is measured in USD (constant prices 2010 and PPPs) and indices. The logarithm of the LP variable is taken.

For GDP, the annual percentage growth rate was taken. GDP variables were taken from the World Bank's electronic database, LP variables were taken from the OECD electronic database and MW (median wage) were taken from the OECD electronic database.

3.2. Panel Unit Root Test

Performing unit root test in time series studies is becoming widespread among applied researchers and it becomes important for results to come out as significant in econometric analysis. In the literature relating to panel unit root tests various panel unit root tests have been developed such as Quah (1994), Harris and Tzavalis (1999), Im, Pesaran and Shin (2003), Maddala and Wu (1999), Choi (2001), Levin, Lin and Chu (2002), Harris and Sollis (2003) (Baltagi, Kao, 2000, p.2).

Apart from these, Bhargava, Franzini and Narendranathan, Boumahdi and Thomes, Breitung and Meyer and Puali proposed a new test in dynamic models with fixed effects. In their proposal, they proposed Durbin Watson statistics as a new modified form of test statistics based on fixed effect residuals and differentiated OLS residuals. They proposed their own DW statistics as N goes to infinity in micro panels. Other than these, Quah suggested that the N/T ratio is constant, the unit root test in the panel data model where the N and T values go to infinity and where they have no constant effects (Quah, 1994).

In our study, the stationarity of variables was determined by the stationarity tests developed by Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS), ADF and PP. of these tests, which are among the first generation stationarity tests, all tests showed the labor productivity (LP) and economic growth (GDP) series were stationary at the 1st difference, at the significance level of 5%, for LLC, IPS, ADF-Fisher, ADF and PP-Fisher tests. Median wage (MW) series were stationary at the 1st difference, at the significance level of 5%, for LLC, ADF-Fisher, ADF, PP-Fisher tests and at the significance level of 10% for IPS test. The stationarity tests of the series are given in Table 1.

Table 1. Panel unit root test results

Variables	Method	I(0) (w/constant)		I(1) (w/constant)	
		Statistic	Prob*	Statistic	Prob*
LLP	Levin, Lin and Chu t*	-2.466	0.006*	-4.304	0.000*
	Im, Pesaran and Shin W-stat	0.316	0.624	-2.355	0.009*
	ADF-Fisher Chi-square	21.341	0.045**	27.544	0.006*
	PP-Fisher Chi-square	42.969	0.000*	31.090	0.001*
GDP	Levin, Lin and Chu t*	2.594	0.995	-4.881	0.000*
	Im, Pesaran and Shin W-stat	0.912	0.819	-1.934	0.026**
	ADF-Fisher Chi-square	5.022	0.957	25.358	0.013*
	PP-Fisher Chi-square	5.978	0.917	28.301	0.005*
MW	Levin, Lin and Chu t*	1.438	0.924	-3.841	0.000*
	Im, Pesaran and Shin W-stat	1.167	0.878	-1.398	0.081***
	ADF-Fisher Chi-square	10.003	0.615	26.465	0.009*
	PP-Fisher Chi-square	10.335	0.586	31.037	0.001*

Source: Own calculations. *, **, *** indicates significance at the 1%, 5%, %10. Im, Pesaran and Shin; ADF-Fisher and PP-Fisher- Null Hypothesis: Unit root (Individual unit root process), Levin, Lin and Chu Test- Null Hypothesis: Unit root (Common unit root process). Automatic lag lenght selection based on Modified Schwarz Criteria and Bartlett Kernel.

3.3. Granger Causality Test

Panel causality test is based on the Granger (1969) method. Dumitrescu and Hurlin (2012) provide an extension designed to detect causality in panel data. The underlying regression are;

$$\Delta LLP_{1t} = \alpha_{11} + \sum_{l=1}^{p_1} \beta_{11l} \Delta LLP_{1t-l} + \sum_{l=1}^{p_1} \delta_{11l} \Delta GDP_{1t-l} + \sum_{l=1}^{p_1} \varphi_{11l} \Delta MW_{1t-l} + \varepsilon_{11t} \quad (1)$$

$$\Delta LLP_{Nt} = \alpha_{1N} + \sum_{l=1}^{p_1} \beta_{1Nl} \Delta LLP_{Nt-l} + \sum_{l=1}^{p_1} \delta_{1Nl} \Delta GDP_{Nt-l} + \sum_{l=1}^{p_1} \varphi_{1Nl} \Delta MW_{Nt-l} + \varepsilon_{1Nt}$$

$$\Delta GDP_{1t} = \alpha_{21} + \sum_{l=1}^{p_2} \beta_{21l} \Delta GDP_{1t-l} + \sum_{l=1}^{p_2} \delta_{21l} \Delta LLP_{1t-l} + \sum_{l=1}^{p_2} \varphi_{21l} \Delta MW_{1t-l} + \varepsilon_{21t} \quad (2)$$

$$\Delta GDP_{Nt} = \alpha_{2N} + \sum_{l=1}^{p_2} \beta_{2Nl} \Delta GDP_{Nt-l} + \sum_{l=1}^{p_2} \delta_{2Nl} \Delta LLP_{Nt-l} + \sum_{l=1}^{p_2} \varphi_{2Nl} \Delta MW_{Nt-l} + \varepsilon_{2Nt}$$

$$\Delta MW_{1t} = \alpha_{31} + \sum_{l=1}^{p_3} \beta_{31l} \Delta MW_{1t-l} + \sum_{l=1}^{p_3} \delta_{31l} \Delta GDP_{1t-l} + \sum_{l=1}^{p_3} \varphi_{31l} \Delta LLP_{1t-l} + \varepsilon_{31t} \quad (3)$$

$$\Delta MW_{Nt} = \alpha_{3N} + \sum_{l=1}^{p_3} \beta_{3Nl} \Delta MW_{Nt-l} + \sum_{l=1}^{p_3} \delta_{3Nl} \Delta GDP_{Nt-l} + \sum_{l=1}^{p_3} \varphi_{3Nl} \Delta LLP_{Nt-l} + \varepsilon_{3Nt}$$

In the above equations, "N" denotes the number of countries in the panel (i = 1,2,3,…, N), "t" the time period (t = 1,2,3,…, T) and "l" the length of the lag. The error terms.

$\varepsilon_{1Nt}, \varepsilon_{2Nt}, \varepsilon_{3Nt}$ are assumed to be white noise (they have zero mean and constant variance). Granger causality test results according to 1 lags are given in Table 2.

Table 2. Granger causality test results

Null hypothesis:	Obs	F-Statistic	Prob
ΔGDP does not Granger cause ΔLLP	54	3.402	0.071***
ΔLLP does not Granger cause ΔGDP		8.257	0.005*
ΔMW does not Granger cause ΔLLP	54	0.194	0.661
ΔLLP does not Granger cause ΔMW		0.290	0.592
ΔMW does not Granger cause ΔGDP	54	5.448	0.023**
ΔGDP does not Granger cause ΔMW		0.816	0.371

Source: Own calculations. *, **, *** indicates significance at the 1%, 5%, %10.

As can be seen from Table 2, economic growth is not the cause of labor productivity, and the null hypothesis has been statistically rejected at the 10% significance level. An alternative hypothesis has been adopted, according to which economic growth is the cause of labor productivity. The null hypothesis that labor productivity is not the cause of economic growth has also been statistically rejected at the 1% significance level. An alternative hypothesis has been adopted, according to which labor productivity is the cause of economic growth. The null hypothesis that minimum wages are not the cause of economic growth has been statistically rejected according to the 5% significance level. According to this conclusion, minimum wages are the cause of economic growth. According to the Granger causality test results in Table 2, a bidirectional causality relationship was found between economic growth and labor productivity. In addition, a unidirectional causality relationship has been found from wages to economic growth. Minimum wages increase the amount of labor employed, which leads to an increase in the level of production. The increase in labor productivity also has a positive effect on economic growth and increases the rate of economic growth. The increase in the economic growth rate also reflects positively on the increase in labor productivity.

4. Results

The problem of the research is whether there is a relationship between minimum wages and economic growth and between labor productivity and economic growth. The more minimum waged employees increase, the more production of goods and services will increase, which will increase economic growth. Increased labor productivity due to wages will be reflected in production, which will contribute to more production, which will increase economic growth. Focusing on the relationship between these three variables is vanishingly small and the number of the six

Mediterranean countries (Spain, France, Greece, Israel, Slovenia and Türkiye) for the problem of not working it was working makes it special. In this study, the relationship among minimum wage, labor productivity and economic growth in six Mediterranean countries that have adopted the minimum wage level has been investigated by panel causality test. According to the Granger causality test, which was conducted by taking annual data for the term of 2010-2020, a bidirectional causality relationship was found between labor productivity and economic growth, and a unidirectional causality relationship from minimum wage to economic growth. As can it can be seen from the results, it leads to an increase in the pace of economic growth by which the increase in labor productivity has a positive effect on economic growth. Economic growth also positively affects labor productivity. As employment increases at the minimum wage level, the level of production increases, which increases the pace of economic growth. It is necessary to determine the minimum wage level at a certain level in accordance with the economic conditions of the countries. Excessive increase in the level of wages can lead to a decrease in the level of production and a decrease in the rate of economic growth by reducing employment in the economy. In our analysis, it has been observed that the minimum wages determined in the six Mediterranean countries we examined that there is a relationship between the economic growth rate.

5. Discussion

In this study, the relationship between minimum wage, labor productivity and economic growth in six Mediterranean countries that have adopted the minimum wage level was investigated by panel causality test.

According to the Granger causality test conducted by taking annual data for the period of 2010-2020, a bidirectional causality relationship was found between labor productivity and economic growth, and a unidirectional causality relationship from minimum wage to economic growth. Because as wages increase, this increases the productivity of labor, and as the productivity of labor increases, more goods and services are produced. This, in turn, increases economic growth. The study of Dobija (2011, p. 780), one of the previous (bygone) studies on this subject, shows that labor productivity is one of the main factors that ensure the establishment of an appropriate minimum wage level. Croucher and Rizov (2012, p. 285), they noted that the minimum wage leads to increases in labor productivity in all low-wage sectors, and these increases are more pronounced in larger firms. Aras (2015, p. 1), on the other hand, examined the effect of minimum wage changes in 12 OECD countries on labor productivity by using the minimum wage and labor productivity data for the period 1995-2011, using panel data analysis method. Aras (2015, p. 1) as a result of his research, he found that changes in the minimum wage have a significant impact on labor productivity. On the other hand, Trenovski et al., (2021, p. 32) examined the relationship between minimum wage and labor productivity in countries with the

highest minimum wage (North Macedonia, Albania, Serbia, Bulgaria, Croatia and Romania) in Eastern European Countries that are members of the European Union and those that are not. In North Macedonia, Albania and Serbia, which are among the countries with the highest minimum wage increase, the relationship between minimum wage and labor productivity is strong and positive, on the other hand, in countries such as Bulgaria, Croatia and Romania, this relationship was found to be weak and negative.

Herscovici (2010, p. 269) In his study using Baumol's unbalanced growth models, he stated that economic growth depends on increasing labor productivity. Seyhan and Akyol (2021, p. 35) on the other hand, using VAR analysis, they investigated the relationship between labor productivity and economic growth in the manufacturing industry in Türkiye for the period of 2005-2017. As a result of the statistical analyzes, a bidirectional causality relationship was determined between the manufacturing industry labor productivity and economic growth both in the long run and the short run. It has been determined that the increase in labor productivity in the manufacturing industry causes growth in the country's economy and that economic growth causes an increase in labor productivity in the manufacturing industry.

When the literature studies on this subject were examined, it was determined that the results obtained from the study were similar to the results of previous studies. However, it is seen that there are no studies examining the relationship between these three variables for six Mediterranean countries.

6. Conclusions

Among the production factors used in the production processes, which component of the labor will be used in the production process and its efficiency are important. As the productivity of labor increases, this will be reflected in the production level and increase the amount of production. Specialization of labor in jobs will increase the productivity of labor and cause more production. One of the most important factors in increasing the productivity of labor and motivation of employees is wages. As wages increase, labor motivation increases. Therefore, firms do not reduce wages in order not to reduce the productivity of labor. In wage policies, the minimum wage is important. When the minimum wage rises, the costs of the firms will increase and they will be able to decrease the employees they employ. In this case, since the number of working people will decrease, there will be a decrease in the amount of production.

Labor productivity is affected by other factors besides wages. In order to increase labor productivity, employees can be provided with in-house training, and the communication between employees within the enterprise can be strengthened. Occupational safety should be ensured and accidents that may arise from work should be minimized. In order to increase the motivation of the employees, there should be a

reward system. Social conditions such as kindergarten services should be provided in enterprises with a large number of woman employees.

In practice, this study serves as a guide for decision makers (authority/authority holders) while determining the national minimum wage. This study shows that if the managers who desire economic growth determine the minimum wage appropriately, they can increase labor productivity and therefore they can achieve economic growth only in this way.

The inaccessibility of the data of some countries that are considered to be included in the scope of this study constitutes the limitation of this study. In the future, this study may be repeated for different countries using different methods.

References

Alam, A., Arshad, M. U., & Rajput, W. U. (2013). Relationship of labor productivity, foreign direct investment and economic growth: Evidence from OECD Countries. *Journal of Business and Management Sciences, 1*(6), 133-138. doi: 10.12691/jbms-1-6-3.

Alani, J. (2012). Effects of technological progress and productivity on economic growth in Uganda. *Procedia – Economics and Finance, 1*, 14-23. doi: 10.1016/S2212-5671(12)00004-4.

Aras, E. (2015). The effect of minimum wage level on labor efficency: An analysis on OECD Countries. *Journal of International Management, Educational and Economics Perspectives, 3* (2), 1-11.

Atesoglu, H. S., & Smithin, J. (2006). Real wages, productivity and economic growth in the G7, 1960–2002. *Review of Political Economy, 18* (2), 223-233. doi: 10.1080/09538250600571478.

Auzina-Emsina, A. (2014). Labour productivity, economic growth and global competitiveness in post-crisis period. *Procedia - Social and Behavioral Sciences, 156*, 317-321. doi: 10.1016/j.sbspro.2014.11.195.

Baltagi, B. H., & Kao, C. (2001). Nonstationary panels, cointegration in panels and dynamic panels: A survey. In B. H. Baltagi, T. B. Fomby & R. C. Hill (Eds.). *Nonstationary Panels, Panel Cointegration, and Dynamic Panels* (*Advances in Econometrics, Vol. 15*). Bingley: Emerald Group Publishing Limited, 7-51. doi: 10.1016/S0731-9053(00)15002-9.

Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance, 20*(2), 249-272. doi: 10.1016/S0261-5606(00)00048-6.

Croucher, R., & Rizov, M. (2012). The impact of the national minimum wage on labour productivity in Britain. *E-Journal of International and Comparative Labour Studies, 1*(3-4), 265-289.

Dritsaki, C. (2016). Real wages, inflation, and labor productivity: Evidences from Bulgaria and Romania. *Journal of Economic & Financial Studies, 4*(05), 24-36. doi: 10.35341/2314-5419.2020.17.3.

Dobija, M. (2011). Labor productivity vs. minimum wage level. *Modern Economy, 12*(2), 780-787. doi: 10.4236/me.2011.25086.

Dumitrescu, E-I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling, 29*(4), 1450-1460. doi: 10.1016/j.econmod.2012.02.014.

Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica, 37*(3), 424-438. doi: 10.2307/1912791.

Harris, R. D. F., & Tzavalis, E. (1999). Inference for unit roots in dynamic panels where the time dimension is fixed. *Journal of Econometrics*, *91*(2), 201-226. doi: 10.1016/S0304-4076(98)00076-1.

Harris, R., & Sollis, R. (2003). *Applied the time series modelling and forecasting*. England: Wiley.

Herman, E. (2020). Labour productivity and wages in the Romanian Manufacturing Sector. *Procedia Manufacturing, 46*, 313-321. doi: 10.1016/j.promfg.2020.03.046.

Herscovici, A. (2010). Economic growth, labor productivity and technical progress: The historical limits of Baumol's Unbalanced Growth Models. *The International Conference on Economics and Administration, Faculty of Business and Administration,* University of Bucharest, Romania ICEA – FAA Bucharest, 4-5th June 2010.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53-74. doi: 10.1016/S0304-4076(03)00092-7.

Islam, R., Kinyondo, A., & Nganga, J. (2015). Real wages and labour productivity in Tanzania: How do they link? *Journal of African Studies and Development, 7*(3), 81-98. doi: 10.5897/JASD2014.0311.

Kalkavan, H., Yüksel, S., & Dinçer, H. (2021). Identifying the relationship between labor productivity and economic development for Turkey. In M. K. Pal (Eds.). *Productivity growth in the manufacturing sector*. Bingley: Emerald Publishing Limited, 43-54.

Katovich, E. S., & Maia, A. G. (2018). The relation between labor productivity and wages in Brazil: A sectoral analysis. *Nova Economia, 28*(1), 7-38. doi: 10.1590/0103-6351/3943.

Khoon, G. S. (2009). *Is productivity linked to wages? An empirical investigation in Malaysia.* Malaysia: CenPRIS Working Paper Series.

Korkmaz, S., & Korkmaz, O. (2017). The relationship between labor productivity and economic growth in OECD Countries. *International Journal of Economics and Finance, 9*(5), 71-76. doi: 10.5539/ijef.v9n5p71.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, *108*(1), 1-24. doi: 10.1016/S0304-4076(01)00098-7.

Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, *61*(1), 631- 652. doi: 10.1111/1468-0084.0610s1631.

Mahmud, M. & Rashid, A. (2006). Labor productivity and economic growth, what causes what: An empirical analysis. *Journal of Management and Social Sciences, 2*(1), 69-81.

Ngutsav, A., Iorember, P. T., & Akighir, D. T. (2017). Education financing, labour productivity, and economic development in Nigeria. *International Journal of Advanced Studies in Economics and Public Sector Management, 5*(1), 22-39.

Nguyen, D. X. (2019). Minimum wages and firm productivity: Evidence from Vietnamese Manufacturing Firms. *International Economic Journal, 33*(3), 560-572. doi: 10.1080/10168737.2019.1624806.

Ozturk, M., Durdyev, S., Aras, O. N. & Banaitis, A. (2019). Productivity as a determinant of labour wage in New Zealand's Construction Sector. *Technological and Economic Development of Economy, 25*(5), 900-914. doi: 10.3846/tede.2019.10297

Reza, K. A. & Reza, M. A. (2007). The relationship between labor productivity and wage rates in The Industrial Sector of Iran. *Iranian Journal of Economic Research, 9*(31), 127-150.

Seyhan Akyol, E., & Ulu Metin, G. (2021). Türkiye'de imalat sanayinde işgücü verimliliği ve ekonomik büyüme ilişkisi. *Verimlilik Dergisi,* 1, 35-47. doi: 10.51551/verimlilik.614695.

Strauss, J., & Wohar, M. E. (2004). The linkage between prices, wages, and labor productivity: A panel study of manufacturing industries. *Southern Economic Journal, 70*(4), 920-941. doi: 10.2307/4135280.

Tang, C. F. (2012). The non-monotonic effect of real wages on labour productivity: New evidence from The Manufacturing Sector in Malaysia. *International Journal of Social Economics, 39*(6), 391–399. doi: 10.1108/03068291211224900.

Trenovski, B., Kozheski, K., Tashevska, B., & Peovski, F. (2021). The minimum wage impact on labour productivity: The case of selected see countries. *Management Research and Practice, 13*(3), 32-42.

Vera, L., & Vera, J. A. (2021). Labor productivity and real wage: Causal relationships in Venezuela. *Problemas del Desarrollo,* 52(205). doi: 10.22201/iiec.20078951e.2021.205.69620.

Quah, D. (1994). Exploiting cross section variation for unit root inference in dynamic data. *Economics Letters, 44*(1-2), 9-19. doi: 10.1016/0165-1765(93)00302-5.

Human Rights and Sustainable Development from Millenium Declatation to UN Agenda 2030: Principles, Norms, Change and Chalenges

Nezir Akyeşilmen

Selçuk University, Turkey

Abstract

This research aims to find out the link between human rights and sustainable development. It also tries to figure out the changes sustainable development has gone through in the first two decades of 21st century. For this purpose statistics related to sustainable development goals (SDG) including poverty eradication and clean environment will be used. PANEL Analysis which is based on a rights-based approach to development will be applied for case studies. A rights-based approach to sustainable development is a holistic approach that tries to construct a balance among social, economic and ecological consideration of development that is being guided by human rights principles, including freedom, equality and positive peace in the society. Both human rights and sustainable development are dynamic processes. Both have shown changes throughout time. Human rights norms that guide development processes paved the way for sustainable development by nature. Since human rights and SDGs interrelated and integrated in the way that more than 92% of SDGs are linked to internationally recognized human rights norms and principles. Researches show that the correlation between human rights and sustainable development is so strong that you cannot have one without the other.

Keywords: Sustainable development, human rights, millennium declaration, equality, sustainable development goals (SDGs).

1. Introduction[1]

Human Rights and development relationships have been very controversial issues in literature and also has been attractive to scholars particularly but not limited to Political Science, International Relations and Law studies.[2] It has many interrelated aspects and differences between theory and practice has always been there. Human rights and development in generals, then human development in 1990s, human rights and sustainable development discussions gaining momentum day by day in different disciplines. Not only scholars but also international organizations such as different UN units, UNDP, OHCHR, World Bank etc. Several soft legal documents also have been issued by world leaders in the last decades including UN Declaration on the Rights to Development(1986)[3], Millenium Declaration (2000),[4] and UN Agenda 2030 (2015).[5]

The goal of all these theoretical and practical efforts is to create a world of peace and harmony. Particularly to increase participation in development, integrate human rights into development processes, to empower vulnerable groups and create a more democratic, free and equal world. It also targets poverty and hunger eradication, quality education and well-being, gender equality, clean water and clean energy, reduce inequalities, economic growth, peace, justice and democratization all over the world.[6]

2. Human Rights and Development: Reinforcing One Another?

The roots of human rights and development lay on different historical development with distinct theories and different discipline. Yet today both promise a world with a human face and a world of well-being and freedom.[7] Both concepts today reinforce

---

[1] This presentation is mostly based on the presenters previous relevant Works.

2 Sen, A., *Development as Freedom,* New York: Alfred A. Knopf, 2000,; Alston, P and Robinson, M., *Human Rights and Development: Towards Mutual Reinforcement,* Nev York: Oxfordf University Press, 2005; https://web.worldbank.org/archive/website01010/WEB/IMAGES/HUMAN_RI.PDF, Pogge, Thomas, "World Poverty and Human Rights", *Ethics ! International Affairs* 19, no. 1 (2005), https://eportfolios.macaulay.cuny.edu/menonfall16/files/2016/08/Pogge-World-Poverty-and-Human-Rights.pdf..

[3] Declaration on the Right to Development(1986), https://www.ohchr.org/en/instruments-mechanisms/instruments/declaration-right-development#:~:text=The%20right%20to%20development%20is%20an%20inalienable%20human%20right%20by,freedoms%20can%20be%20fully%20realized.

[4] UN Millenium Declaration (2000)., https://www.ohchr.org/en/instruments-mechanisms/instruments/united-nations-millennium-declaration

[5] UN Agenda 2030, (2015), https://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=CjwKCAjw7p6aBhBiEiwA83fGukZ3YWKay0LlftJ78vBHfNUUDfXpHJX_lJ6oapW4JYfJ1KzhL4i_ahoCTcQQAvD_BwE .

[6] İbid.

[7] Donnelly, J., "Human Rights, Democracy and Development" in *Human Rights Quarterly,* (1999), 21, p.632. See also, Fukuda-Par, S., "Human Rights and Human Development" Report on the Report of the Oslo Symposium, 2-3 October 1998, (Oslo : United Nations Development Office, 1998) Symposium .; Pollis, A., "

each other. They are interrelated and not separable most of the time. The countries that are able to merge to fields together have succeeded sustainable development in the last two decades. They have been associated not only in politics but also in legal documents developed by international organizations in recent decades. For instance, they have been associated in international human rights instruments and in the practices of United Nations development agencies in recent years. In that respect the Declaration on the Right to Development (UNDRD)[8] is a significant lead clearly expressing that development is a means to realize human rights, as human rights are means to realize development. Inversely, massive human rights violations hinder development.

The association of these two concepts led also to a consolidated democracy. They are also strongly related to democracy democratic participation and empowerment of citizens. The Vienna Declaration and Programme of Action(1993) claims that "Democracy, development and respect for human rights and fundamental freedoms are interdependent and mutually reinforcing.[9] And Declaration of Principles on Human Rights and the Environment (1994) puts forward that "human rights, an ecologically sound environment, sustainable development and peace are interdependent and indivisible".[10]

The maps below illustrates the correlaltion between human rights and development worldwide.

Development, Growth and Human rights: the Case of Turkey" in Forsythe, D. P., *Human Rights and Development: International Views*, (Basingstoke: Macmillian, 1989), p.237.

[8] The United Nations Declaration on the Right to Development (UNDRD), adopted by The UN General Assembly in 1986.

[9] (The Vienna Declaration and Programme of Action, 1993, https://www.ohchr.org/en/instruments-mechanisms/instruments/vienna-declaration-and-programme-action

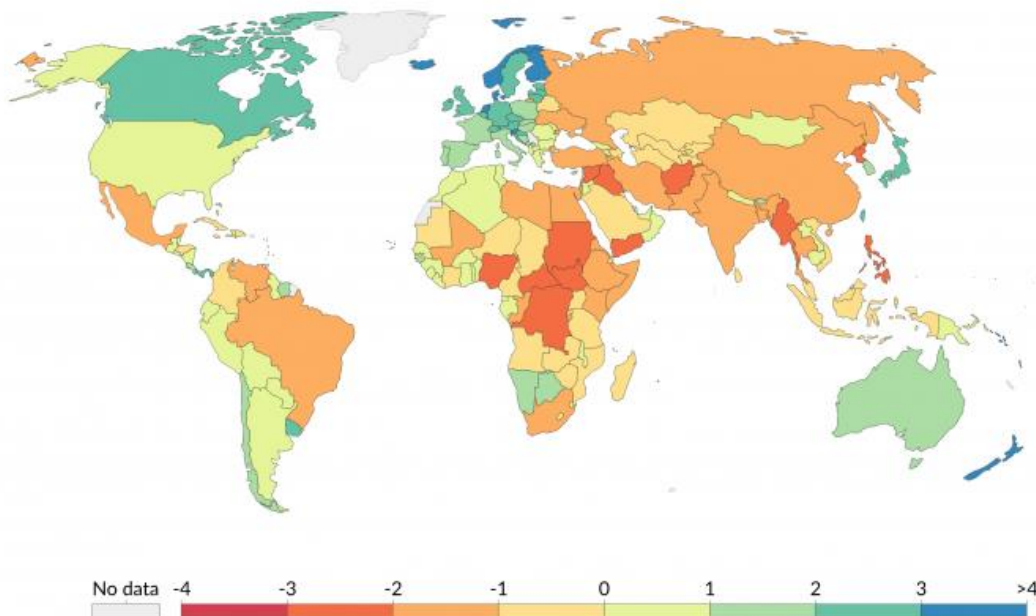[10] Declaration of Principles on Human Rights and the Environment, Geneva, 16 May 1994, principle 4, available on (visited July 8, 2022) http://www.fletcher.tufts.edu/multi/www/1994-decl.html.

Map-1: Human Development Index[11]
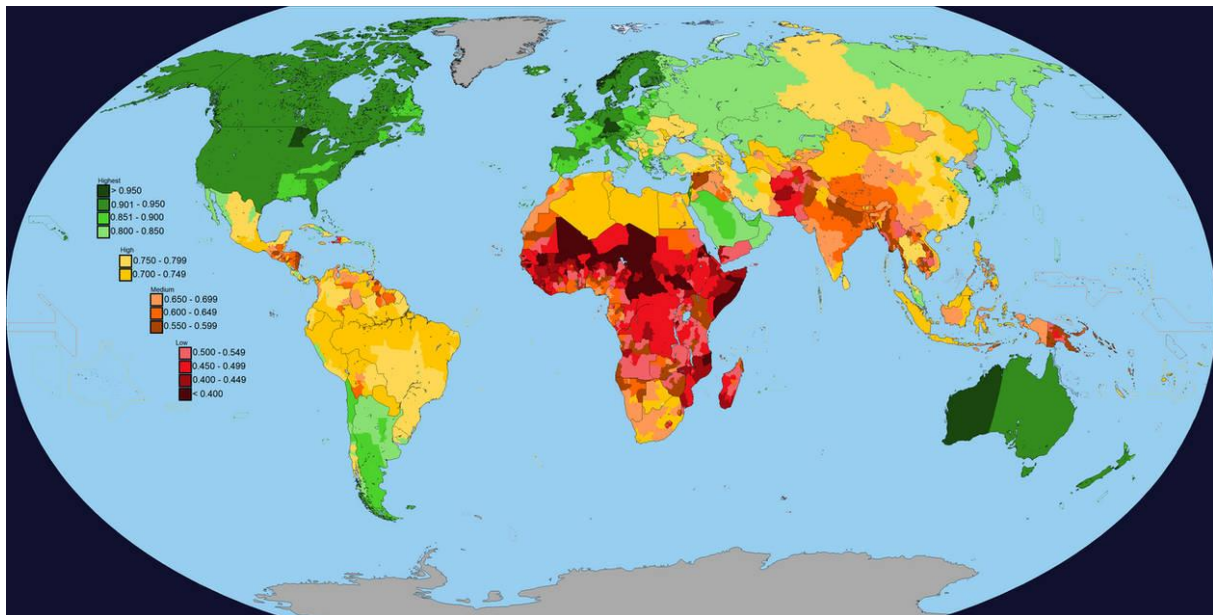
Map-2: Human Rights Score 2017[12]

[11] Human Development Index, 2019, https://www.deviantart.com/ardolon/art/Subnational-Human-Development-Index-world-map-2019-884537697
[12] https://landgeist.com/tag/human-rights/

The correlation between development and human rights is clear in the maps above. Therefore, it is not wrong to claim that human rights are requirements for a successful development strategy. Development here goes beyond a mere economic growth but economy with social, cultural and political dimensions. Development is a multidimensional process that encompass all aspects of life. The aspects that empower individuals in terms of human rights and political participation is much more vital here. Therefore, human rights should not be considered symply an "attachment" one adds to development, rather, they need to inform and guide development policies.[13] Or as Heusermann puts forward that human rights principles therefore provide an effective and globally recognized framework for development strategies.[14] Amartya Sen sees development as a process of expending the real freedoms, which is viewed, as both the primary end and principle means of development.[15] Human rights and development are two inseparable concepts as Chinsmanett.al have put it in words;

> *In recent times the issues of development and human rights have been thrust to the forefront of global discourse. There is now a general consensus that these issues are inseparable and need to be fully and properly addressed to ensure that humanity continues to survive in an enabling and equitable environment that guarantees a good quality of life, social justice and equity. This is not a mere coincidence. Evidence abounds to demonstrate that development without a human face is not sustainable.[16]*

3. Development as Human Rights and Sustainable Development

Development as a comprehensive and multidimensional process has been accepted as a human rights by the UN Declaration on Right To Development(UNDRD) in 1986.[17] UNDRD defines the right to development as "an inalienable human right by virtue of which every human person and all peoples are entitled to participate in, contribute to, and enjoy economic, social, cultural and political development, in which all human

---

[13] Mabusela, S., "Human Rights and Sustainable Human Development: How Development is a Necessary Means to Pro,ote and Protect Human Rights" Report of the Oslo Symposium, 2-3 October 1998, (Oslo : United Nations Development Office, 1998)

[14] Hausermann, J., A Human Rights Approach to Human Development" Report of the Oslo Symposium, 2-3 October 1998, (Oslo : United Nations Development Office, 1998)

[15] Sen, A., *Development as Freedom,* (New York: Alfred A. Knopf, 2000), p.36.

[16] Chinsman, B. et.al, "Conceptual Issues in Human Development and Human Rights" in Report of the Oslo Symposium, 2-3 October 1998, (Oslo : United Nations Development Office, 1998)

[17] Declaration on the Right to Development(1986), https://www.ohchr.org/en/instruments-mechanisms/instruments/declaration-right-development#:~:text=The%20right%20to%20development%20is%20an%20inalienable%20human%20right%20by,freedoms%20can%20be%20fully%20realized.

rights and fundamental freedoms can be fully realized."18 Right to development is related to all civil and political rights, economic, social and cultural rights and also solidarity rights. Indeed, development itself is considered as a solidarity rights in literature.[19]   the UN Working Group on the Right to Development (October 1995), stresses the link between human rights and development while defining the right to development :

> [M]ultidimensional, integrated, dynamic and progressive. Its realization involves the full observance of economic, social, cultural, civil and political rights. It further embraces the different concepts of development of all development sectors, namely sustainable development, human development and the concept of indivisibility, interdependence and universality of all human rights.[20]

Sustainable development emerged as a challenge to traditional understanding of development that considered development as economic growth and measured it with per capita income. Sustainable development does not ignore or omit economic growth, to the contrary it takes growth into account. But it also takes into account participation, equity, distribution of outcomes and protection of the environment Participation by individuals, particularly at the community level, is seen as an important means for achieving sustainable development and formulating development goals. The first article of Draft Declaration of Principles on Human Rights and Environment, "human rights, an ecologically sound environment, sustainable development and peace are interdependent and indivisible."21 It continues claiming in the article 4 that " All persons have the right to an environment adequate to meet equitably the needs of present generations and that does not impair the rights of future generations to meet equitably their needs."22 Sustainable development is one of the oldest alternative development understanding and continue to guide other newly emerging alternative approaches, including human development and rights – based development views.

---

[18] UNDRD, supra note 3. Art.1.
[19] Cornescu, A.V., "The Generations of Human Rights", Dny práva – 2009 – Days of Law: the Conference Proceedings, 1. edition. Brno : Masaryk University, 2009, ISBN 978-80-210-4990-1, https://www.law.muni.cz/sborniky/dny_prava_2009/files/prispevky/tvorba_prava/Cornescu_Adrian_Vasile.pdf.
[20] UNDP, Integrating Human Rights with Sustainable Human Development, (visited July 9, 2001) http://magnet.undp.org/Docs/policy5.html.
[21] Draft Declaration of Principles on Human Rights and the Environment, Geneva, 16 May 1994, principle 4, http://hrlibrary.umn.edu/instree/1994-dec.htm.
[22] Ibid.

4. Human Rights and Development in 21st century

With end of the Cold War and particularly with the start of the 21st Century international organizations and states started to combat poverty and develop policies for poverty eradication and other relevant issues in world politics. Two valuable steps regarding sustainable development have been *The UN Millennium Declaration (2000) and UN Agenda 2030 (2015).*

These two documents have comprehensive policy proposals and prescriptions for international society how to overcome poverty and related problems. How to realize sustainable development worldwide.

The Millenium Declaration roughly covers issues such as;

* Peace, security and disarmament

* Development and poverty eradication

* Protecting our common environment

* Human rights, democracy and good governance

* Protecting the vulnerable

* Meeting the special needs of Africa

* Strengthening the United Nations.

The UN Agenda 2030 also has developed similar but a wider agenda for world society. This Agenda is a plan of action for people, planet and prosperity. It also seeks to strengthen universal peace in larger freedom. It puts forward that the world leaders agreed to "eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development".[23] And also they are "determined to end poverty and hunger, in all their forms and dimensions, and to ensure that all human beings can fulfil their potential in dignity and equality and in a healthy environment".[24] More than 90% are linked to International human Rights. Both human rights and sustainable development are dynamic processes. Both have shown changes throughout time. Human rights norms that guide development processes paved the way for sustainable development by nature. Correlation between human rights and sustainable development is so strong that you cannot have one without the other.

---

[23] UNDP, "No Poverty", Agenda 2030, principle 1. https://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=CjwKCAjw7p6aBhBiEiwA83fGurRvBumbn4oiixaKSL7FsD-PV8f6WPBJGuET3RcHb6byH512Zv-IRRoCNqgQAvD_BwE#no-poverty
[24] UN Agenda 2030.

5. Conclusion

Inserting human rights into development processes emerged as a new or alternative understanding to development particularly in the last three decades. Right to development, human development and sustainable development are interrelated but with a lightly different component. Thus, in many studies they are all used side by side. Unique feature of sustainable development is linked to protection of environment. But it also encompasses all other social, cultural, political and economic dimensions of development processes that is in common with other alternative views. These links have also paved the way for global sustainable development policies and practices. The legal regulations at the global level also link all these concepts. For example, UN Declaration of the Right to Development, Draft Declaration of Principles on Human Rights and the Environment, the UN Millenium Declaration and the UN Agenda 2030 have similar contents or used similar concepts. All try to promote human rights, development and democratization. All try to create a world of peace, well-being and equality.

Inequalities as the Achilles Heel of Democracies

Önder Aytaç Afşar

Selçuk University, Turkey

Abstract

This study examines the relationship between democracy and inequality, which is understood as complex and multidimensional. It will be mentioned why inequality is corrosive to democracy. The study argues that inequality undermines the quality and flexibility of democratic governance. Inequality and social problems caused by inequality can increase social polarization and lead to the weakening of the moderate social segment. Inequality and exclusion, lack of representation, and equal opportunity deprive some segments of the society of their rights. This undermines confidence in democratic institutions and increases support for populism, extremism, or violent conflict, especially among young people. Therefore, if democracy is to be consolidated, it must address and correct inequality and exclusion. However, democracies cannot automatically combat such inequalities, and in fact, many of the built-in features of democracy can make it challenging to do so.

Why is inequality so corrosive to democracy? In answer to the question, the following can be said: inequalities are likely to lead to social cohesion, violence, and armed conflict, undermine the legitimacy of political institutions, disrupt the social supply chain, and undermine democratic principles such as political representation. So, inequality is a test of democracy. However, compared to other regimes, democracies have the means to combat inequality and exclusion. Inequality is complex and multidimensional. Economic inequality is possible because they relate to individuals or households. In addition, this concept includes inequality such as basic political and socio-economic rights and freedoms, and inequality of access and opportunity. This includes inequality and the distribution of resources, inequality in power distribution, and inequalities in social position in areas that require basic equality such as being healthy, educated, or socially integrated.

Therefore, inequality is as much a collective phenomenon as it is individual. In this respect, it is shaped by a dynamic process of interaction and struggle between the state and society about the distribution of power and resources. Using the World Inequality Report and other data, inequalities between and within countries will be demonstrated with empirical examples.

Keywords: democracy, inequality, development, democratization.

1. Introduction

This study examines the relationship between democracy and inequality, which is understood as complex and multidimensional. Why inequality harms democracies will be discussed. In particular, the study explains that economic inequalities distort the character of democracy and damage its basic arguments. Inequalities are socially cohesive and reduce the motivation to live together. If inequalities deepen, they can damage the social fabric and increase polarization. Inequalities are also detrimental to equality of opportunity. It can cause feelings of exclusion and destroy faith in democracy and the desire to live together. By moving away from the state of good governance, it can increase society's faith in the future and its turn to violence, especially on young people. In this context, it is essential for democracies to keep social inequality under control. Inequality is therefore an important test of democracy. Democracies that are sensitive to the demands of society have the means to combat inequality.

Inequality is complex and multidimensional. It covers economic, political and socio-rights and freedoms for individuals and the whole society, and situations such as inequality of opportunity. The inequalities that arise in the provision of public services in major areas such as economy, education and health and the unfair distribution of public resources are evaluated in this context in the context of social inequalities (Klasen, 2000). This situation is harmful for democracies and is a serious problem.

Inequality is not only individual. It also has a collective dimension that concerns groups and identities and is a social phenomenon. Inequality is shaped by the current interaction of the state, individuals and society. If the state, which is responsible for the equal distribution of power and resources, makes this organization good, this dynamic process will reflect positively on social peace and order. Inequality is the institutional structure of a particular social and political system that causes or reduces inequalities.

Horizontal inequalities are the discrimination and exclusion of certain social groups due to political, social, economic, cultural or common identities. Inequalities are perpetuated and reproduced through laws, economic structures, political and social institutions (Klasen, 2000; Stewart, 2010).

2. Inequality and Democracy at the Global Scale

Since the 1980s, there has been an increase in prosperity in the world. Progress has been made towards reducing global inequalities. Global inequalities between countries have declined over the past two decades. But at this time, inequalities within countries increased significantly. After the 1990s, most authoritarian regimes turned into democratic regimes, with many countries having formal democratic governance (The Economist Intelligence Unit EIU, 2019). In the process, significant progress has

been made in improving the well-being of those who need it most. For example, according to the World Bank's 2016 Poverty and Shared Prosperity report, nearly one billion people were lifted out of poverty between 1990 and 2015 (World Bank, 2016). Maternal mortality and deaths from diseases such as polio decreased (International IDEA, 2017). COVID-19 itself has made clear the weaknesses and flaws in political systems and the social contract that have emerged in the context of growing inequalities since at least the 2008 financial crisis. Although a transformation in the direction of democratization in the world has led to such positive results in the international arena; positive steps should be taken to eliminate inequalities for the country.

Global income inequality: Inequality within and between countries (Theil index), 1820-2020.
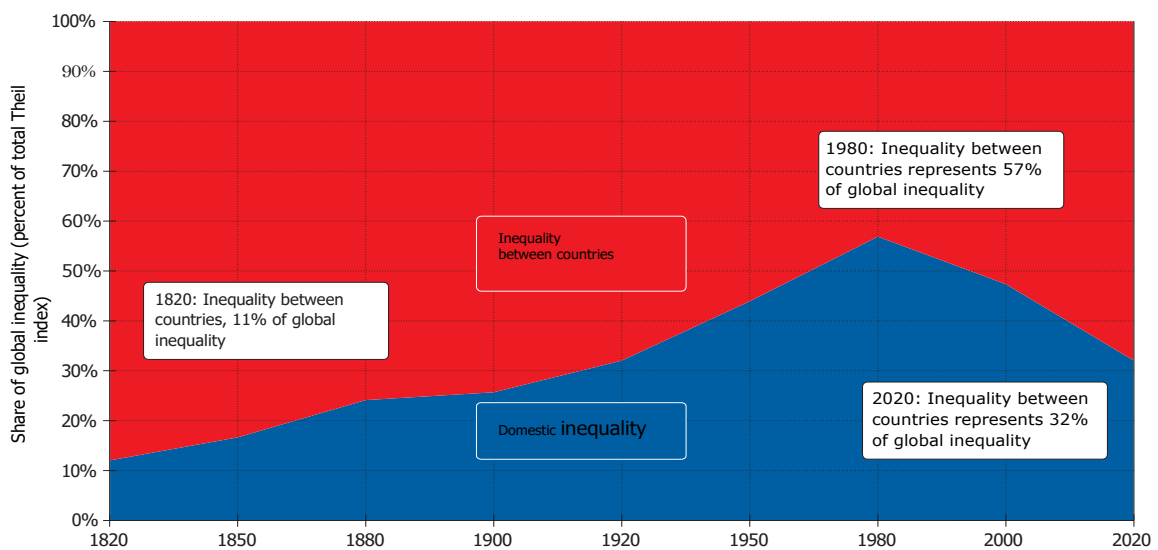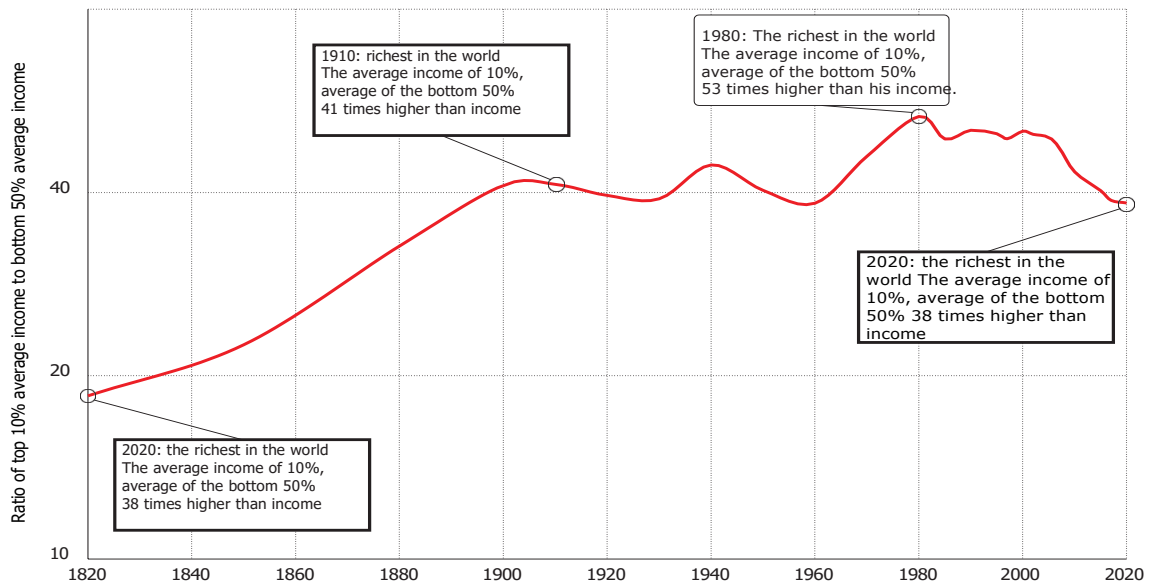

Sources and series wir2022.wid.world/methodology ve Chancel ve Piketty (2021).

Graph 1. Global Income Inequality

In the 1990s, many countries switched to democracy. In fact, this situation caused optimism in terms of the end of dictatorships on a global scale and the spread of peace and prosperity. With these developments, the positive effect of democracies on the economic growth of countries and their function in distributing the benefits arising from growth to society and their impact on poverty reduction have been frequently discussed (Knutsen 2020). Because democracies are ultimately based on popular power, they also provide a security mechanism for citizens, including in economic matters. Democracies are a form of regime that is expected to provide equal opportunities to society for the equal distribution of development and prosperity and the elimination of inequalities in general. In this sense, development is a basic concept in eliminating inequalities.

Global income inequality: T10/B50 ratio , 1820-2020

Sources and series: wir2022.wid.world/lmethodology ve Chancel ve Piketty (2021).

Graph 2. Global Income Inequality 1820-2020

Development can be defined as societies having better and livable living conditions and making progress in this direction. Economic growth, growth redistribution, and the redistribution of the benefits of growth are vital to democracies. In order to ensure economic growth and reduce inequality, it is important for development that this growth is reflected fairly in society. In this context, economic freedoms are important for civil and political freedoms. Therefore, democracy's mission to promote development should not be neglected. Democracies are better at recovering from economic crises than other repressive governments and are a less risky form of governance for citizens and investors (Knutsen, 2020: 4).

Democracies also function as a safety net as they guarantee to avoid the worst possible economic outcomes. According to Sen, the promotion of democracy is important for the development process for the following three reasons (Sen, 2000: 157-158): i) democracy is important in that it is a value in itself and has a direct interest in promoting basic capabilities that include social and political participation. ii) democracy enables people to express their claims to economic needs and to express them politically strongly by various means. iii) Democracy as a social being an important possibility of understanding and defining "needs". Democracies operate in conditions and contexts that offer opportunities but also impose significant constraints on this front. Among other things, democracies tend to distribute political economic power throughout society, not to concentrate it in specific hands. It is essential that public authorities are sensitive to all segments of society when conducting and implementing politics (World Bank, 2008).

103

Democracies offer the opportunity to promote human rights and freedoms. Certain fundamental freedoms related to freedom of expression, association and opposition freedoms are necessary for democracy. The checks and balances that democracies should have prevent the abuse of political power and arbitrariness, and guarantee the rights and entitlements of citizens. In the sense of the implementation of democracy at the lowest level, minimalist democracy briefly refers to an understanding of democracy in which governments come to power through elections and leave office through elections. However, a minimalist understanding of democracy is not exactly a quality democracy. Strong and proactive government action is needed on poverty alleviation and other important issues that go beyond just focusing on elections (Diamond 1996:23–24).

Democracies guarantee fundamental freedoms. However, this situation, which exists in theory, is not always sufficient for citizens to exercise these freedoms in practice. Democracies should function well with all their rules and institutions and should be qualified democracy (Afşar, 2017). In qualified democracies, citizens are expected to be sensitive to their economic demands. The quality of democracy and the institutional structure that varies according to whether inequality is high or low are shown in the table below.

Table 1. Institutions, democratization, and inequality

	Low inequality	High inequality
Low democracy	1. Economies with average institutions ratings: many Asian countries	2. Economies achieving low institutions ratings: Latin American and Sub- Saharan African countries, plus Ex-Soviet transition economies
High democracy	3. Economies with high institutions ratings: developed economies (OECD countries), and Central-Europe transition economies	4. No countries could settle in this category: it is unlikely to observe consolidated democracy and high inequality at the same time

Source: Savoia, at all., (2010:145).

Acemoğlu and Robinson (2019) argue that freedom and development proceed in a narrow corridor While there are despotic states that oppress people, on the other side there is the search for freedom and prosperity. Therefore, the corridor is narrow. Freedom and prosperity, therefore, are closely related to the existence of a strong state and a strongly mobilized society that can control violence and enforce laws while actually maintaining order in society. At this point, the state and society must balance each other. While China has a weak society, India is the opposite when it comes to poverty reduction and development. Since democracy provides control over public decisions in line with political equality, it is intended to be a redistributive political system by its very nature, and this constitutes the main threat of democracy to the elite (Acemoğlu and Robinson, 2014).

In this context, the reality of preventing inequality in democracies can be much more complicated. But democracies should not be expected to automatically reduce inequality. Officially recognized political equality may not in itself lead to equality in other areas. Politics is not only a technical process, but also a social-political process. Factors such as who is involved in decisions, how, where, and why the power is in whom, influence policies and practices. Therefore, a significant challenge in eliminating inequalities and promoting inclusive development requires cohesion and understanding among elites and wider social groups.

One of the main criticisms of the negative impact on development in democracies is that policies in democracies are often short-term. Politicians can neglect long-term social interests by being populist in order to be re-elected; the Urocracy can become politicized and this can hinder development in the long run. In many developing Asian, African and Latin American countries, the parties followed populist politics due to election competition for a long time. This is expressed as patronage. Patronage can impede the equitable distribution of resources, leading to fragmentation within the state and society.

The fact that democratic decision-making processes in democracies can involve a greater number of stakeholders and be more participatory does not automatically make them more effective in combating inequality and exclusion. Such efforts alone proved insufficient to transform the existing power structure and redefine it for a more inclusive democratic redefinition. Indeed, research on the long-term struggle for greater equality points to a number of limitations inherent in democratic politics.

3. Why Is Inequality Dangerous to Democracy?

As mentioned above, the ability of democratic systems to provide, both economically and socially, is controversial. While inequality between countries has decreased recently, inequality within countries has remained at a significant rate (World Bank, 2016). Especially according to the Gini index, inequality has increased significantly in Eastern Europe and in South and Central Asia.

However, a more equitable distribution of wealth to society affects the quality and resilience of democratic systems (Houle, 2009). When wealth and privilege are distributed relatively fairly, democracy is more easily preserved and more resilient. A fair distribution of social and economic resources and power softens distribution conflict, reduces polarization, and promotes moderation and tolerance (Bermeo, 2009; Karl, 2000; Levin-Waldman, 2016).

An egalitarian world that works on inequalities in the world", Oxfam's report emphasizes the following points: Economic inequality is worrying for democracies for many reasons. Inequality is first and foremost morally controversial. It has negative effects on economic growth and poverty alleviation, and can multiply social problems.

In most countries, economic inequality is alarming as it increases the influence of wealth holders in politics. Because wealth has an impact on the policy-making process of governments, it leads to the fact that laws and rules are set in a way that favors the rich and harms the rest of society. Democratic governance is eroding as the principle of social cohesion and equal opportunity for all disappears. In this case, Societies will not proceed in harmony. It will be more socially and economically segregated (Oxfam, 2013)

A number of proposals have been made to prevent the rapid increase in inequality. Some of these are: urgent tax reform should be carried out; greater investment in public services that can mitigate the ill effects of distorted wealth and income distribution in key areas such as health and education; there should be a greater focus on decent work and wages; governments must change the rules and systems that lead to inequality, and their primary goal should be to respond to the needs of their citizens. Economic power holders must be prevented from using this power in a way that undermines the democratic will of its citizens by obtaining political benefits (Oxfam, 2013).

4. Inequality, Social Cohesion and Distribution Inequality

When bonds of trust and reciprocity connect citizens and the state, democracies are more flexible and function better (Marc at all, 2013; World Bank, 2011). But inequality and exclusion undermine social cohesion and structure. As populism in countries and continents, including Asia, Europe, Latin America and the United States, and movements across the political spectrum leading up to its rise have shown, there is a growing resentment against an economic and political establishment perceived in favor of elites that have lost touch with people. (Gershman, 2016; The Economist, 2014). This weakening of the social fabric can reinforce polarization and movements of the far right and left.

Inequality and the multidimensional exclusion it creates distracts social work from those who need it most. This creates a huge distance between different social groups, resulting in fragmented social service systems where the poor and marginalized do not have access to reliable and adequate basic services, social protection and justice.

5. Legitimacy of Political Institutions, Political Representation and Inequality,

As a rule in democracies, all citizens have equal rights before the law. However, in a number of developing countries, privileged social groups emerge with inequalities that affect individuals and society at large. These elites have more influence over governments and political decisions. Through nepotism, corruption and bribery, etc., some people interpret the laws according to themselves, bend them in their favor,

influence politicians, and try to prevent democratic reforms against them (Levin-Waldman, 2016). These attempts to eliminate inequality for a more equitable distribution of resources make it difficult to reach political consensus on policies. An OXFAM survey of six countries – Brazil, India, South Africa, Spain, the UK and the US) shows that people believe that laws are being distorted in favour of the rich.

Trust in the state and existing democratic institutions is the main point in ensuring political stability (World Bank, 2011). Meanwhile, high rates of inequality adversely affect democratic governance (Stewart, 2010). The elimination of inequality is decisive for democratic support (Krieckhaus et al., 2014, p. 149) High inequality leads to a decrease in citizen support for democracy. Inequality leads to despair about democracy in the society of democracy. Negative thoughts develop that politics and the judiciary cannot be trusted. These institutions are the basic institutions of democracies. The idea that they are underrepresented makes democracy and the political structure fragile. This supports populist politics. Young people, in particular, may be disappointed by politics. They may feel discriminated against (UN, 2016).

6. Violence and Inequality

Inequalities and social exclusion are associated with violence. The forms of political, economic, and social inequality that perpetuate inequality lead to an increase in violence (Stewart, 2010).

Inequalities in society can create a deep conflict Those who feel discriminated against and cannot benefit equally from the country's resources are in anger and tension that can lead to illegality and violence. To prevent the escalation of tension and violence, it is necessary to fight for an equal distribution of resources socially, politically and economically. This is especially prevalent when inequality is identity-based (Stewart, 2010). Social groups that feel unequal and believe that they are more disadvantaged than the rest of society can take action against the existing political order and the state. Economic and social inequality causes instability and violence, especially among young people. As seen in countries in Latin America such as Colombia, the Democratic Republic of the Congo, Guatemala and South Africa, exclusion prepares the ground for inequality, low-income and unemployed people to join extremist groups (UN, 2016, p. 89). In Europe, it was also the threat of revolution and violent conflict that persuaded elites to renounce privileges and lay the foundations of the welfare state (Fukuyama, 2011).

7. Result

Inequalities pose significant threats and structural risks to the quality and long-term resilience of democracy. Inequality weakens social and political cohesion in a society and increases polarization. This undermines the state's process of providing equal

services to all. This weakens the legitimacy of governments seeking to consolidate their democracy.

If a democracy is to be sustainable, it must combat inequality and exclusion. But democracy alone does not automatically correct inequalities, and in fact it has some such difficulties. Addressing inequality is a political process involving negotiation and bargaining between various actors. It is important to address the tensions between inequality and democracy. In this sense, the factors that lead to the reduction of inequalities within the borders of democracy should be examined and adequately investigated.

Bibliography

Acemoglu D, Robinson J. (2019) The Narrow corridor: states, societies, and the fate of liberty. Penguin Press, New York.

Acemoglu, D. and Robinson, J. (2014), 'Democracy vs. inequality', Why Nations Fail [blog], 30 January, at http:// whynationsfail .com/ blog/ 2014/ 1/ 30/ democracy - vs -inequality .html Accessed 15.09. 2022.

Afshar, O. A. (2017). "Democratic Approaches from Quality Democracy to Democratic Consolidation", International Journal of Academic Value Studies, 3(12); pp:192-208.

Bermeo, N. (2009), 'Does electoral democracy boost economic inequality?', Journal of Democracy, 20(4), 21–35.

Chancel L. and Piketty. T. (2021). "Global inequality 1820-2020: The Persistence and Mutation of Extreme Inequality", Journal of the European Economic Association.

Department for International Development (DFID) (2005), Reducing Poverty by Tackling Exclusion, London: DFID.

Diamond L. (1996) Is the third wave over? J Democracy7(3):20–37.

Freedom House (2021) Freedom in the World 2021. Democracy under Siege. Freedomhouse.org. https:// freed omhou se. org/ report/ freedom- world/ 2021/ democ racy- under- siege. Accessed 14.09.2022.

Fukuyama, F. (2011), 'Dealing with inequality', Journal of Democracy, 22(3), 79–89.

Gershman, C. (2016), 'Democracy and democracies in crisis', World Affairs, accessed 12 April 2017 at https:// isnblog .ethz .ch/ politics/ democracy -and -democracies -in -crisis.

Houle, C. (2009), 'Inequality and democracy: why inequality harms consolidation but does not affect democratization', World Politics, 61(4), 589–622.

International Institute for Democracy and Electoral Assistance (International IDEA) (2017), The Global State of Democracy: Exploring Democracy's Resilience. Stockholm: International IDEA. https://www.idea.int/ Accessed:9/15/2022.

Klasen, T. L. (2000), 'Economic inequality and democratic instability', Journal of Democracy, 11(1), 149–56.

Knutsen CH (2020) The business case for democracy. Working paper series, 2020:111, The Varieties of Democracy Institute, University of Gothenburg

Krieckhaus, J., Son, B., Bellinger, M. and Wells, J. M. (2014), 'Economic inequality and democratic support', The Journal of Politics, 76(1), 139–51.

Levin-Waldman, O. (2016), 'How inequality undermines democracy', E-International Relations, 10 December, http:// www. e -ir .info/ 2016/ 12/ 10/ how -inequality - undermines-democracy/. Accessed.16.09.2022

Marc, A., Willman, A. and Aslam, G. et al. (2013), Societal Dynamics and Fragility: Engaging Societies in Responding to Fragile Situations, Washington, DC: World Bank.

OXFAM, (2013). Even it up Tıme to End Extreme Inequality, https://www.oxfam.org/en/research/time-end-extreme-inequality Accesed: 15.09.2022

Savoia, A. Easaw J. and A. McKay (2010). Inequality, Democracy, and Institutions: A Critical Review of Recent Research, World Development, 38/2, pp.142-154, https://doi.org/10.1016/j.worlddev.2009.10.009.

Sen A., (2000). Development as freedom. Anchor Books, New York.

Stewart, F. (2010), Horizontal inequalities as a cause for conflict: A review of CRISE findings, London: Centre for Research on Inequality, Human Security and Ethnicity (CRISE), UK Department for International Development (DFID).

The Economist Intelligence Unit (EIU) (2019), Democracy Index. London: EIU. https://www.eiu.com/topic/democracy-index/Accessed.16.09.2022

United Nations UN (2016). Youth Civic Engagement, New York: UN, http://youtheconomicopportunities .org/ sites/ default/ files/ uploads/ resource/ un world youth report youth_civic engagement.pdf. Accessed.16.09.2022.

World Bank (2008). Governance, Growth, and Development Decision-Making – Reflections by Douglass North, Daron Acemoglu, Francis Fukuyama, and Dani Rodrik, Washington, DC: World Bank.

World Bank (2011), World Development Report 2011: Conflict, Security and Development, Washington, DC: World Bank.

World Bank (2016), Poverty and Shared Prosperity 2016: Taking on Inequality, Washington, DC: World Bank.

World Inequality Report Wir (2022) Global inequality from 1820 to now: the persistence and mutation of extreme inequality https://wir2022.wid.world/category/chapter-2/ accesed, 25.09.2022.

Examining the Relationship between Economic Growth and Environmental Pollution in the Sustainable Development Process: the Case of G7 Countries

Mehmet Ali Polat
Bursa Uludağ University, Turkey

Oktay Kızılkaya
Malatya Turgut Özal University, Turkey

Adem Babacan
Sivas Cumhuriyet University, Turkey

Abstract

Today, one of the most important problems we face is the destruction of the environment. Putting environmental problems in the background in order to achieve economic growth has seriously caused the destruction of nature and the environment. Pollutant gases, the proportions of which are constantly increasing in the atmosphere, have begun to cause climate change, which is one of the most important problems of the world, and other environmental problems. Therefore, environmental pollution has begun to be of interest to many branches of science and has begun to be examined from different dimensions. With significant increase in environmental degradation, the concept of sustainable development, which states that a balance should be established between economy, society and environmental phenomena, has started to gain importance.

In the study, sustainable development is discussed conceptually, and then the development of sustainable development in the historical process is revealed. In this context, the relationship between economic growth and environmental pollution for the G7 countries was examined by panel data analysis using annual data for the period 1991-2018. According to the empirical results obtained, it has been determined that the effect of economic growth on environmental pollution is significant and positive. As a result of Granger causality analysis, it was determined that environmental pollution is a cause of economic growth.

Keywords: Sustainable Development, Economic Growth, Environmental Pollution, Panel Data Analysis, Granger Causality Analysis.

1. Introduction

Sustainable development; states that a balance should be established between the dimensions of economy, society and environment. With the increase of environmental problems such as environmental pollution, global warming, climate change, decrease in biodiversity and deforestation, the concept of sustainable development has become very important. The concept of sustainable development, which has been used more frequently since the quarter of the 20th century; It also started to give an idea in the future on how to solve problems such as poverty, increasing inequality, environmental destruction and deterioration of human health. Sustainable development; it refers to a long-term approach that aims at a balance between these three dimensions: economic, social and environmental. Sustainable development and its current extension, the green economy model; These are two basic concepts that have been put forward in order to maintain a safer life in the future in order to get out of the economic, social and ecological crisis that the world economy has fallen into (Paul, 2008).

The concept of sustainability, defined by the Bruntland Report, was discussed extensively at the United Nations Conference on Environment and Development. Therefore, it has been concluded that indicators such as gross national product, owned resources or pollution level, which are used as sustainability indicators, are insufficient. In this context, it was emphasized that sustainable development indicators that give importance to the relationship between different sectoral, environmental, demographic, social and developmental parameters should be developed in order to obtain more objective results in terms of sustainability (United Nations, 1992).

Since people are at the center of environmental problems, it is in his hands to ensure sustainable development. At this point, it is important to establish policies to minimize environmental problems. Therefore, it is imperative that environmental problems are correctly identified, evaluated and solutions are produced accordingly. In the study; a conceptual framework was created about the concept of sustainable development and the development of sustainable development in the historical process was explained. Then, for the G-7 countries, the effect of economic growth and renewable energy consumption on carbon dioxide emissions was examined using the static panel data analysis method, taking into account the annual periodical data of 1997-2019. It is thought that the study will contribute to the literature.

2. Sustainable Development

The concept of sustainability, which is one of the most frequently used concepts of the 21st century, is a participatory process that ensures the prudent use of the social, cultural, scientific and natural resources of the society and requires respect for this (Gladwin et al., 1995).

The concept of sustainable development, which emerged in the late 1980s, is a concept that will contribute to the development of countries in economic, social and environmental issues. As a result of the production-oriented work of the world's countries and large international companies, the increase in poverty and the injustices in income distribution in developing countries have led to the emergence of the concept of sustainable development. Even if the concept of sustainable development lacks an understandable expression, it is still a very common term used by politicians and other people all over the world (Soubbotina and Sheram, 2000; Cole, 2006).

The concept of sustainable development began to be widely used after it was stated in the report "Our Common Future", also called the Brundlant Report, published by the UN Environment and Development Commission in 1987. This report is important because it is the starting point for sustainable development to come to the fore both scientifically and politically. In this report; Sustainability has been defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs (IULA-EMME, 1997; Al, 2019).

Sustainable development began to make sense on a global scale, with the Rio Conference held in 1992. One year after this conference, the UN Commission for Sustainable Development was established. Therefore, this concept has been included in the agenda of countries, never to be seen again. Following the adoption of sustainable development as the common goal of humanity for the 21st century, at the UN 1992 Rio Conference on Environment and Development, also known as the Earth Summit, an action plan was created that sets out the principles and areas for environmental and development problems in order to achieve this goal (Barlas, 2013).

After the Rio Conference, the Johannesburg World Sustainable Development Summit was held in 2002. The purpose of this summit is to implement the decisions taken in Rio and to find solutions to the difficulties encountered in realizing the determined goals. In this context, two important decisions came out of this summit. The first is the commitments made by governments and the issues to be implemented by governments as action plans. The other is that responsibilities do not only belong to governments, but that these responsibilities should be undertaken by all stakeholders. Aiming to achieve tangible action and results, the Johannesburg Summit recommends business organizations to foster dialogue between businesses, the communities in which they operate, and other stakeholders in order to make efforts to increase their environmental and social responsibility. In the Leaders' Summit held in Johannesburg in 2002, after evaluating the developments and targets on Agenda 21, in 2012 Rio+20 Summit in Brazil, it is necessary to maintain adherence to Agenda 21 principles and to emphasize the responsibilities of countries more strongly despite global economic problems. Consensus has been reached. Drawing attention to the increasing poverty, hunger and illiteracy as well as the deterioration in ecosystems, this action plan draws attention to the importance of global cooperation for improving the quality of life and

protecting ecosystems, while aiming to prepare our world against the threats of the new century. (Yalçın, 2016).

2. Literature Review

When the studies are examined in the literature, it can be seen that there is a relationship between CO_2 emissions and economic growth in general. In Table 1, the studies and the results obtained that deal with the relationship between CO_2 emissions and economic growth are given:

Table 1: Empirical Literature

Author(s)	Countries Period	Econometric Methods	Conclusions
Azomahou et al. (2005)	100 Countries 1960-1996	Non-Parametric Panel Approach	There is a positive relationship between economic growth and CO_2 emissions.
Dinda and Coonda (2006)	88 Countries 1960-1990	Panel Cointegration and Causality Analysis	There is a bi-directional causal relationship between economic growth and CO_2 emissions.
Ang (2007)	France 1960-2000	Cointegration and Causality Analysis	Causality relation exists from economic growth to CO_2 emission.
Jalil and Mahmud (2009)	China 1975-2005	ARDL, Cointegration and Causality Analysis	Causality relation exists from economic growth to CO_2 emission.
Halıcıoğlu (2009)	Türkiye 1960-2005	ARDL, Cointegration and Causality Analysis	There is a bi-directional causal relationship between economic growth and CO_2 emissions.
Chang (2010)	China 1981-2006	Cointegration Analysis	Causality relation exists from economic growth to CO_2 emission.
Arı and Zeren (2011)	Mediterranean Countries 2000-2005	Panel Regression Analysis	There is a positive relationship between economic growth and CO_2 emissions.

Tiwari (2011)	India 1971-2007	Causality Analysis	There is a positive relationship between economic growth and CO_2 emissions.
Wang et al. (2011)	China 1995-2007	Panel Cointegration Analysis	Causality relation exists from economic growth to CO_2 emission.
Saboori et al. (2012)	Malaysia 1980-2009	Cointegration and Causality Analysis	There is a positive relationship between economic growth and CO_2 emissions.
Altıntaş (2013)	Türkiye 1970-2008	ARDL, Cointegration and Causality Analysis	Causality relation exists from economic growth to CO_2 emission.
Burnett et al. (2013)	United States 1981-2003	Cointegration Analysis	There is a positive relationship between economic growth and CO_2 emissions.
Ergün and Polat (2015)	OECD 1980-2010	Panel Cointegration and Causality Analysis	Causality relation exists from economic growth to CO_2 emission.
Gülmez (2015)	OECD 2000-2012	Panel Cointegration and Panel Causality Analysis	There is a positive relationship between economic growth and CO_2 emissions.
Topallı (2016)	India, China, Brazil and South Africa Countries 1980-2010	Panel Cointegration and Panel Causality Analysis	There is a positive relationship between economic growth and CO_2 emissions.
Bayramoğlu and Yurtkur (2016)	Türkiye 1960-2010	Linear and Nonlinear Cointegration Analysis	There is nonlinear and positive relationship between economic growth and CO2 emissions.
Chen et al. (2019)	China 1980-2014	ARDL	There is a positive relationship between economic growth and CO_2 emissions.

115

| Shahbaz et al. (2021) | India 1980-2019 | Nonlinear ARDL | There is a positive relationship between economic growth and CO_2 emissions. |
| Ozturk et al. (2022) | Saudi Arabia 1968–2017 | Cointegration and Causality Analysis | There is a negative relationship between economic growth and CO_2 emissions. |

3. Data and Findings

This study investigates the effects of economic growth on environmental pollution in G-7 countries (Canada, France, Germany, Italy, Japan, United Kingdom, and United States). For this purpose, annual data for the period 1997-2019 are taken into account. The model to be used in the study is included in Equation (1):

$$CO_{2_{i,t}} = \alpha_0 + \beta_1 GDP_{i,t} + \beta_2 REN_{i,t} + \varepsilon_{i,t} \qquad (1)$$

In equation (1), CO_2 represents CO_2 emission (Million tonnes of carbon dioxide) as an indicator of environmental pollution, GDP presents per capita Gross Domestic Product (constant 2015 US\$) as an indicator of economic growth, REN is renewable energy consumption (% of total final energy consumption), α_0 is the constant term and $\varepsilon_{i,t}$ is the error term.

Static panel data analysis will be included in the study. In this context, Arellano, Froot and Rogers fixed effects and random effects methods, which take into account the problems of autocorrelation and heteroscedasticity, are used. Arellano (1987), Froot (1989) and Rogers (1993) produced robust standard errors in their studies. The estimation results of the Arellano, Froot and Rogers fixed effects and random effects model are given in Table 2 and Table 3, respectively.

Table 2. Arellano, Froot and Rogers Fixed Effects Model Results

	Coefficients	Robust Std. Errors	t-statistics	Prob.
GDP	0.296***	0.144	2.06	0.086
REN	-0.172*	0.021	-7.86	0.000
Constant	3.902**	1.497	2.61	0.040
F-statistics (Prob.)		Number of Observations		Number of Groups
37.22 (0.000)		161		7

Note: *, ** and *** represent the significance in %1, %5 and %10, respectively.

Table 2 presents the Arellano, Froot, and Rogers fixed effects model results. The findings in Table 2 indicate that the coefficient of the GDP is positive and statistically

significant. Accordingly, a 1% increase in the growth of G-7 countries increases CO_2 emissions by 0.30%. According to these results, the increases in the economic growth of the G-7 countries cause an increase in CO_2 emissions and therefore environmental pollution. However, the coefficient of the REN variable, which expresses renewable energy consumption, is negative and statistically significant. Accordingly, the increase in the renewable energy consumption of the G-7 countries causes a decrease in CO_2 emissions and thus environmental pollution.

Tablo 3. Arellano, Froot and Rogers Random Effects Model Results

	Coefficients	Robust Std. Errors	t-statistics	Prob.
GDP	0.300**	0.143	2.09	0.036
REN	-0.172*	0.021	-7.84	0.000
Constant	3.861**	1.546	2.50	0.013
F-statistics		**Number of Observations**		**Number of Groups**
73.73 (0.000)		161		7

Note: *, ** and *** represent the significance in %1, %5 and %10, respectively.

The results of the Arellano, Froot and Rogers random effects model given in Table 3 and the Arellano, Froot and Rogers fixed effects model results given in Table 2 are similar. The findings in Table 3 indicate that the coefficient of GDP is positive and statistically significant, while the coefficient of REN is negative and statistically significant. Accordingly, a 1% increase in the growth of G-7 countries increases CO_2 emissions by 0.30%. According to these results, the increases in the economic growth of the G-7 countries cause an increase in CO_2 emissions and therefore environmental pollution. In addition, the increase in the renewable energy consumption of the G-7 countries causes a decrease in CO_2 emissions.

4. Conclusion

This study investigates the effect of economic growth and renewable energy consumption on CO_2 emissions for the G-7 countries in 1997-2019 annual periods. Arellano, Froot and Rogers fixed effects and random effects models are used as econometric methods in the study. The findings reveal that economic growth has an increasing effect on environmental pollution in G-7 countries, while renewable energy has a reducing effect.

The burning of poor quality coal, which is used intensively, and the deforestation problem it brings are the most important reasons for the increase in environmental pollution. In this direction, it is thought that increasing investments in renewable energy resources in G-7 countries will be an effective policy tool in the fight against environmental pollution.

References

Al, İ. (2019). Sustainable Development and Green Economy: A Proposal of Index for Turkey. Hitit Journal of Social Sciences, 12(1), 112-124.

Altıntaş, H. (2013). "The Relationships Between Primary Energy Consumption, Carbon Dioxide Emission And Economic Growth in Turkey: An Analysis Of Cointegration And Causality", Eskişehir Osmangazi University Journal of Economics and Administrative Sciences, (8), 263-294.

Ang, J.B., (2007). CO2 Emissions, Energy Consumption, and Output in France, Energy Policy, 35(10), 4772-4778.

Arellano, M. (1987). Computing robust standard errors for within-groups estimators. Oxford bulletin of Economics and Statistics, 49(4), 431-434.

Arı, A., & Zeren, F. (2011). CO2 Emission and Economic Growth: A Panel Data Analysis, Journal of Management and Economics Manisa Celal Bayar University, 18(2), 37-47.

Azomahou, T., Laisney, F., & Van, P. N. (2006). Economic Development and CO2 Emissions: a Nonparametric Panel Approach.Journal of Public Economics, 90 (6), 1347-1363.

Barlas, N. (2013). Environmental Problems of Our Age from Global Crises to Sustainable Society. 1. Edition. İstanbul: Boğaziçi University Press.

Bayramoğlu, A. T., & Yurtkur, A. K. (2016). The Relationship between Economic Growth and Carbon Emissions in Turkey: An Analysis of Nonlinear Cointegration. Bolu Abant İzzet Baysal University Journal of Graduate School of Social Sciences, 16(4), 31-45.

Burnett, J. W., Bergstrom, J. C., & Wetzstein, M. E. (2013). Carbon Dioxide Emissions and Economic Growth in the US. Journal of Policy Modeling, 35(6), 1014-1028.

Chang, C.C. (2010). A multivariate causality test of carbon dioxide emissions, energy consumption and economic growth in China. Applied Energy 87, 3533-3537.

Chen, Y., Wang, Z., & Zhong, Z. (2019). CO2 emissions, economic growth, renewable and non-renewable energy production and foreign trade in China. Renewable energy, 131, 208-216.

Cole, M. A. (2006), "Economic growth and the environment", (Ed.) G. Atkinson, S. Dietz, & E. Neumayer, Handbook of Sustainable Development, Edward Elgar, Cheltenham, pp. 240- 53.

Dinda, S. & Coondoo, D. (2006). Income and Emission: A Panel Data-Based Cointegration Analysis. Ecological Economics, 57; 167–181.

Ergün, S., & Polat, M. A. (2015). The Relationship between CO2 Emission, Electricity Consumption and Economic Growth in OECD Countries. Erciyes University Journal of Faculty of Economics and Administrative Sciences, (45), 115-141.

Froot, K. A. (1989). Consistent covariance matrix estimation with cross-sectional dependence and heteroskedasticity in financial data. Journal of Financial and Quantitative Analysis, 24(3), 333-355.

Gladwin, T. N., Kennelly, J. J., & Krause, T. S. (1995). Shifting paradigms for sustainable development: Implications for management theory and research. Academy of management Review, 20(4), 874-907.

Gülmez, A. (2015). The Relationship between Economic Growth and Air Pollution in OECD Countries: A Panel Data Analysis. Kastamonu University Journal of Economics and Administrative Sciences Faculty, 9, 18-30.

Halıcıoglu, F. (2009). An Econometric Study of CO2 Emissions, Energy Consumption, Income and Foreign Trade in Turkey. Energy Policy, 37: 699-702.

IULA-EMME. (1997). Local Agenda 21, Development of Local Agenda 21in Turkey Project News Release, Issue 1, Istanbul.

Jalil, A. & Mahmud, S.F. (2009). Environment Kuznets Curve for CO2 Emissions: A Cointegration Analysis for China. Energy Policy, 37(12), 5167-5172.

Ozturk, I., Aslan, A., & Altinoz, B. (2022). Investigating the nexus between CO2 emissions, economic growth, energy consumption and pilgrimage tourism in Saudi Arabia. Economic Research-Ekonomska Istraživanja, 35(1), 3083-3098.

Paul, B. D. (2008). A history of the concept of sustainable development: literature review. The Annals of the University of Oradea, Economic Sciences Series, 17(2), 576-580.

Rogers, W. H. (1993) Regression Standard Errors in Clustered Samples, Stata Technical Bulletin 13: 19-23. In Stata Technical Bulletin Reprints, 3, 88-94, College Station, Tx: Stata Press.

Saboori, B., Sulaiman, J. & Mohd, S. (2012). Economic growth and CO2 emissions in Malaysia: A cointegration analysis of the Environmental Kuznets Curve. Energy policy 51, 184–191.

Shahbaz, M., Sharma, R., Sinha, A., & Jiao, Z. (2021). Analyzing nonlinear impact of economic growth drivers on CO2 emissions: Designing an SDG framework for India. Energy Policy, 148, 111965.

Soubbotina, T. P., & Sheram, K. (2000). Beyond economic growth: Meeting the challenges of global development. World Bank Publications.

Tiwari, A. K. (2011), "A structural VAR analysis of renewable energy consumption, real GDP and CO2 emissions: Evidence from India", Economics Bulletin 31, 1793-1806.

Topallı, N. (2016). The Relationship between CO2 Emission and Economic Growth: Panel Data Analysis for India, China, Brazil and South Africa. Çankırı Karatekin University Journal of the Faculty of Economics and Administrative Sciences. 6(1), 427-447.

Wang, S.S., Zhou, D.Q., Zhou, P. & Wang, Q.W. (2011). CO2 emissions, energy consumption and economic growth in China: A panel data analysis. Energy Policy 39, 4870-4875.

Yalcin, A.Z. (2016). Green economy thinking and financial policies for sustainable development, Çankırı Karatekin University Faculty of Economics and Administrative Sciences Journal. 6(1), 749-775.

Evaluation of Green Logistics and Green Supply Chain Management in the Sustainable Development Process: The Case of the Automotive Industry

Adem Babacan
Sivas Cumhuriyet University, Turkey

Mehmet Ali Polat
Bursa Uludağ University, Turkey

Oktay Kızılkaya
Malatya Turgut Özal University, Turkey

Abstract

The sustainability approach, which has become a very important issue recently is defined as a concept that can meet the demands of today's consumers, taking into account the needs of future generations. As a result of the disruption of ecological, the concept of green management has become a very important approach. In this context, the concept of green supply chain aims to achieve all logistics activities from producer to consumer in a sustainable way. Necessary environmental policies should be regulated in line with the expectations of the customers. At the same time, businesses should carry out their supply chain activities in a way that causes less harm to the environment. The concept of sustainability has three sub-dimensions: economic, environmental and social. The sub-dimensions were weighted with the Multi-Criteria Decision Making method. Then, supplier companies were selected using the TOPSIS method in terms of Green Logistics and Green Supply Chain Management concepts. The TOPSIS method is an effective method for evaluating the most appropriate activities in improving sustainable supply chain management performance. Considering the phenomenon of globalization, global competition is experienced not only between businesses but also between logistics and supply chain management. The concept of sustainability has been associated with the logistics and supply chain process. As a result, the phenomenon of green logistics and green supply chain management has emerged, which means that companies can control the environmental effects they cause in the logistics and supply processes, and achieve social benefits.

Keywords: Sustainable supply chain management, Performance improvement, MCDM, TOPSIS

1. Introduction

Concerns from the use of the temperature in the son, the environment and the climate; therefore, green supply chain management research has started to attract more attention. Green supply chain management has increased the ecological efficiency of organizations and reduced environmental risks. Thus, green supply chain management has become an important concept for achieving an organization's profit and market share goals; in order to minimize environmental impacts, manufacturers have begun to effectively include their environmental projects in their strategic planning programs. The concept of green supply chain management; assumes all environmental responsibility for the organization's products and services, from the procurement of raw materials to their final use and disposal (Koca and Behdioglu, 2019).

2. Conceptual Framework

Concepts such as global warming, environmental pollution, and social poverty are the most important issues for the future of our world. As a result of the rapid increase in the world population, the natural environment is in danger of extinction. Following these developments, sustainable development has been one of the most important concepts on the agenda of countries and companies since the second half of the 20th century (Engin and Akgoz, 2013).

2.1. Sustainable Development

The concept of sustainability, which is one of the most frequently used concepts of the 21st century, is a participatory process that ensures the prudent use of social, cultural, scientific and natural resources of the society and requires respect (Gladwin et al., 1995).

The environmental problems that emerged as a result of the increase in production and the rapid increase in the world population, which gained momentum with the industrial revolution, became a factor that the world economies did not take into account until the 1970s. The first international platform to deal with environmental issues was the United Nations Environment Conference, which was held in Stockholm in 1972. In the Human Environment Declaration adopted at the conference; The principles that draw attention to the carrying capacity of the environment, observe intergenerational justice in the use of natural resources, and establish the relationship between economic and social development and the environment have been the main pillars of the idea of sustainability. In particular, in the time period from World War II to the 1980s, the world's production of goods and services has increased significantly compared to the beginning of the 20th century. However, in this process, the increase in production was paralleled by the emergence of environmental and social problems such as exceeding the self-renewal capacity of natural resources, increasing poverty,

destruction of forests, reduction of biological diversity and global warming (Masca, 2009).

The concept of sustainable development, which emerged in the late 1980s, is a concept that will contribute to the development of countries in economic, social and environmental issues. As a result of the production-oriented work of the world's countries and large international companies, the increase in poverty and the injustices in income distribution in developing countries have led to the emergence of the concept of sustainable development. Even though the concept of sustainable development lacks an understandable expression, it is still a very common term used by politicians and other people all over the World (Soubbotina and Sheram, 2000; Cole, 2006).

The concept of sustainable development began to be widely used after it was stated in the report "Our Common Future", also called the Brundlant Report, published by the UN Environment and Development Commission in 1987. This report is important because it is the starting point for sustainable development to come to the fore both scientifically and politically. In this report; Sustainability has been defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs (IULA-EMME, 1997; Al, 2019).

In the Brundlant Report, sustainable development is defined as the ability of human beings to meet the needs of the present without compromising the ability of future generations to meet their own needs. The objectives of the environment and development policies created with this vision are to stimulate growth; improve the quality of growth; meet basic needs such as jobs, food, energy, water and public health; ensuring a sustainable population level; maintaining and improving the resource base; can be listed as combining environment and economy in decision making (Brundtland, 1987).

The sustainable development view in the Brundtland Report can be considered as a call for policies that take into account the need for economic growth and aim at maximum growth. In addition, two other important features of the concept can be stated as not jeopardizing the situation of the poor and disadvantaged, and making the natural resource available to future generations. This concept brought a different perspective to economic development and revealed that quality is at least as important as quantity (Soussan, 1992).

Sustainable development began to make sense on a global scale, with the Rio Conference held in 1992. One year after this conference, the UN Commission for Sustainable Development was established. Therefore, this concept has been included in the agenda of countries, never to be seen again. After the adoption of sustainable development as the common goal of humanity for the 21st century at the UN 1992 Rio Conference on Environment and Development, which is also known as the Earth

Summit, an action plan was created that sets out the principles and areas for environmental and development problems in order to achieve this goal (Barlas, 2013).

After the Rio Conference, the Johannesburg World Sustainable Development Summit was held in 2002. The purpose of this summit is to implement the decisions taken in Rio and to find solutions to the difficulties encountered in realizing the determined goals. In this context, two important decisions came out of this summit. The first is the commitments made by governments and the issues to be implemented by governments as action plans. The other is that responsibilities do not only belong to governments, but that these responsibilities should be undertaken by all stakeholders. Aiming to achieve tangible action and results, the Johannesburg Summit recommends business organizations to foster dialogue between businesses, the communities in which they operate, and other stakeholders in order to make efforts to increase their environmental and social responsibility. After evaluating the developments and targets on Agenda 21 at the Leaders' Summit held in Johannesburg in 2002, a consensus was reached at the Rio+20 Summit in Brazil in 2012 to maintain adherence to Agenda 21 principles despite global economic problems. Drawing attention to the increasing poverty, hunger and illiteracy as well as the deterioration in ecosystems, this action plan draws attention to the importance of global cooperation for improving the quality of life and protecting ecosystems, while aiming to prepare our world against the threats of the new century (Yalcin, 2016).

Despite all these developments, global trends towards sustainable development have slowed down considerably since the beginning of the 21st century. Sustainable development was considered to be only one of the obligations of states. In this context, a new way was needed because the measures taken by the governments on environment and development became insufficient. The concept that meets this need is the green economy.

2.2. Green Economy

Green growth is the protection of natural assets in order to ensure the continuation of resources and environmental services that increase people's well-being, and in this context, promoting economic growth and development (OECD, 2011). Green growth, which is defined as the efficiency in the use of natural resources, will both minimize pollution and its environmental effects, and create a flexible environment against environmental disasters by revealing the role of natural capital and environmental management in the prevention of physical disasters (World Bank, 2012). According to another definition, green growth is environmentally sustainable economic progress that increases social development and reduces emissions. As a matter of fact, green growth is a development model that maintains economic growth while at the same time ensuring climatic and environmental sustainability (Al, 2019).

The concept of green economy is basically based on the concept of sustainable development. Green growth refers to a growth process that can be applied according to the changing geographical and environmental conditions of countries, minimizes ecological risks, considers future generations without harming the environment, and includes a new economic growth paradigm for existing systems (Diniz ve Bermann, 2012; Yılmaz, 2018). The concept of green growth, which emerged thanks to the 5th Environment and Development Ministerial Conference convened in 2005; With the 2008 Global Crisis, which includes social, ecological and economic conflicts, it has become a phenomenon known all over the world. At this conference, it was agreed to go beyond the sustainable development discourse and follow the green growth path (Kararach et al., 2018).

In the 2011 report of the UN Environment Program, it is emphasized that the green economy has three main goals in the global sense. These are to contribute to the revival of the world economy, to increase employment and to protect the vulnerable in society; shaping the economy according to the sustainable growth model and contributing to the elimination of poverty; to reduce the carbon dependency of economies and slow the deterioration of ecosystems (UNEP, 2011). At the United Nations Conference on Sustainable Development Rio+20 held in 2012, it was confirmed that green growth is a strategy for achieving sustainable development (UNESCAP, 2012). In this context, it is agreed that the exit from the 2008 Global Crisis will be achieved with the green new order (Allen ve Clouth, 2012).

Green economy significantly reduces ecological problems and environmental risks, increases human well-being and social equality. In this context, in an environment where green economy prevails, income and employment increase, energy and resource efficiency increase with public and private sector investments. In addition, reductions in biodiversity and ecosystems are prevented, while carbon emissions and pollution rates are reduced (UNEP, 2011; Al, 2019). Green economy; It is an economy where growth in human welfare and employment increase thanks to social investments that prevent damage to biodiversity and ecosystem, ensure efficient use of energy and resources, and lead to reduction of emissions and environmental pollution (Schlor et al., 2017). The green economy, which is defined as the sustainable innovation process that ensures sustainable socioeconomic development, is an institutional factor against socioeconomic and environmental challenges in the globalizing economy.

The main purpose of the green economy, which establishes a very important link between the concepts of economic growth and environmental sustainability; It is possible to achieve increases in environmental quality and social inclusion with investment increases and the economic growth process. With the idea of green economy, it is aimed to correct the relations between negative externalities caused by

uncontrolled economic growth and environmental problems which are its natural consequences.

2.3. Automotive Industry

The automotive sector, which is seen as one of the most important branches of industry in terms of its size and area of influence; passenger cars, buses, minibuses, midibuses, tow trucks, trucks, tractors, etc. It is defined as an industry branch that manufactures road vehicles and the parts used in the production of these vehicles. In this context, in the last hundred years, automobile culture has spread all over the world, shaping the world economy and leading to significant changes in the life of the society. Automotive industry; It plays an important role in the development of countries due to the added value it creates, its contribution to employment and its pioneering technological development. This sector, which receives input from many sectors such as iron-steel, petro-chemistry, weaving, glass, paint, electricity and electronics; It has a driving feature in economies in the context of the large business volume it creates in marketing, repair, maintenance, spare parts sales, financing and insurance services (Chiaberge, 2011; Mitchell et al., 2010).

With the Global Crisis, a transition period was experienced in the sector from developed countries to developing countries, and then in 2017, more than half of automotive production was transferred to the Asian continent (OICA, 2018). In this context; While the production shares of the USA, Japan and Canada decreased, there was no change in Germany, and the shares of countries such as China and India increased (Piskin, 2017). The worldwide production and sales of the industry grew steadily between 2010 and 2017, and in 2017, production increased by 2.4% compared to the previous year to 97.3 million units, while sales increased by 3.1% to 94.7 million units (KPMG, 2019). In 2017, it is seen that more than half of the production was transferred to the Asian continent, and automotive demands, especially in developing countries with unsaturated domestic markets such as China, India, Brazil, Mexico and Turkey, are the driving force in terms of market and production Dynamics (Piskin, 2017). After 2017, there was a decline in the sector and in this context, total production and sales decreased by 2.7% in 2018 to 94.7 million units. In 2019, it is estimated that the production of the sector will decrease by 3.7% to 91.2 million units (OICA, 2018).

Intercontinental transitions in production in the last 10 years have also reflected on automotive sales, and the shares of America and Europe in total sales decreased from 33% and 32.2% in 2007 to 26.6% and 21.6% in 2017, respectively. Sales in Asian economies increased from 33% to 50.5% in the same period (KPMG, 2019).

The concept of Sustainable Supply Chain Management includes the management of material and information flow. However, in this process, it takes into account the three components of sustainable development, namely the economic, social and environmental components. There is an increasing scientific research interest in this

area. In this study, we will focus on the Green Supply Chain, which is considered in the environmental dimension, and evaluate the impact on the automotive industry, which is an important sector. The Green Supply Chain approach is an approach that increases the performance of the production process and the resulting products depending on environmental factors. It is also the concept that is taken into account in the selection of suppliers. MCDM methods are used in supplier selection. Gustavo (2022) conducted an integrative systematic literature review for Green Supply Chain Management. Sarkis (2003) and Chen et al. (2012) used the Analytical Network Process (ANP), Shen et al. (2013) used fuzzy TOPSIS in the evaluation of green suppliers. In this study, green supplier selection will be made for the automotive industry by using the SWARA-based TOPSIS method.

3. Method

In the study; green supply chain management criteria, Rostamzadeh et al. It was determined by using Koca and Behdioğlu (2019) with 2016. In the study; Analysis was made among 8 supplier companies. These criteria are weighted by the SWARA method. Then, the selection of suppliers was carried out with the TOPSIS method.

Table 1. Variables used in the study

Main Criterion	Sub-Criteria	Symbol
Green Design	Product design that reduces material/energy consumption	Y1
	Product design that provides reuse, recycle, and recovery of materials	Y2
	Designing products that reduce or avoid the use of harmful products and/or the production process	Y3
	Designing products that can be used easily in a way that will save the most energy	Y4
Green Purchasing	Selection of suppliers that take into account environmental criteria	Y6
	Purchasing environmentally-friendly raw materials	Y7
	Pressure on suppliers to take environmental measures	Y8
	Having a supplier environmental management system	Y9
Green Production	Remanufacturing and lean production	Y15
	Having clean production	Y16
	Reducing waste rate and increasing product quality	Y17

	More advanced capacity utilization	Y18
	Increasing the quantity of products delivered on time	Y19
Green Transport	Environmentally friendly transportation	Y20
	Using an eco-efficiency transport fleet	Y21
	Use of fuels with low emission content	Y22
	Providing support for the development of driving habits to reduce fuel consumption	Y23

3.1. SWARA Method

Conflict resolution methods economical, social, etc. In order to evaluate the solutions from different aspects, it is necessary to apply evaluation methods that can reveal the solutions according to more than one qualification/criteria. The use of multi-criteria methods will only make sense if the weight of one criterion is higher or lower than the other criterion. Therefore, criterion weights should be evaluated. While calculating the importance of the criteria in the rational decision-making process, Swara ensures that the opinions of experts or disputed parties are included in the solution. This method can be preferred especially in the practical applications of alternative dispute resolution (Keršulienė, 2010). In this study, the SWARA method was preferred because it is easy to implement and provides convenience in terms of making a criterion ranking first. SWARA has four main sets of regulations and procedures. In the first step, experts are asked to rank the criteria from the most important to the least important. In the next step, experts were asked to express the relative importance levels for each criterion as a percentage, starting from the second criterion. For this, J. with criterion (j-1). criteria are compared. This value is called the sj value, the percentage of importance of comparisons between criteria. The kj coefficient equation is formed as the factor that affects the determination of the result from the sj value, which is the percentage of importance between the criteria. By using the kj coefficient, qj recalculated weight is performed. As a last step, the relative weights of the criteria are calculated as in Table 2 (results rounded to two digits).

Table 2. SWARA Method Weighting Results According to Expert Opinions

Main Criterion	Main Criterion Weight	No	Sub-Criteria	Average	Sub-Criteria Weight
Green Design	0,329	1	Y1	0,234	0,077
		2	Y2	0,215	0,071
		3	Y3	0,199	0,065
		4	Y4	0,166	0,055
Green Purchasing	0,312	5	Y5	0,121	0,038
		6	Y6	0,109	0,034
		7	Y7	0,111	0,035
		8	Y8	0,119	0,037
Green Production	0,358	9	Y9	0,097	0,035
		10	Y10	0,129	0,046
		11	Y11	0,083	0,030
		12	Y12	0,131	0,047
		13	Y13	0,122	0,044
Green Transport	0,347	14	Y14	0,136	0,047
		15	Y15	0,123	0,043
		16	Y16	0,083	0,029
		17	Y17	0,112	0,039

(Numbers have been rounded)

3.2. TOPSIS Method

When choosing/ranking/indexing or deciding on available options, a decision maker often has to consider different aspects of available solutions in terms of both potential benefits and costs. In order to support decision makers, Multi criteria decision making (MCDM) techniques are used to select the best solution in many respects. There are many MCDM methods such as AHP, ELECTRE, PROMETHEE, VIKOR or TOPSIS. TOPSIS method was used in this study.

The TOPSIS method is based on the logic that the alternatives in the problem should have the smallest geometric distance from the positive ideal solution point and the non-ideal solution should have the largest distance by being at the bottom point. The ideal solution consists of all the best criterion values available, and the non-ideal solution consists of the worst of all achievable criterion values.

As in every MCDM method, a decision matrix is created between the alternatives and criteria in the TOPSIS method. In the second step, normalization is done. In the third step, a weighted decision matrix is created using criteria weights based on expert opinion or determined by another MCDM method or other methods.

Positive ideal solution using weighted decision matrix $V^* = \{V_1^*, V_2^*, V_3^*, \dots, V_N^*\}$ and negative ideal solution $V^- = \{V_1^-, V_2^-, V_3^-, \dots, V_N^-\}$ values are obtained. By calculating the n-dimensional Euclidean distance, the separation measurement values are calculated. In the last step, the ratio of the negative ideal solution deviation to the total deviation, the measure of closeness to the ideal solution, Ci*, is calculated. The relative closeness of an alternative Ai to the ideal solution A* is defined in the equation below.

$$C_i^* = \frac{S_i^-}{S_i^- + S_i^*}$$

$$0 \le C_i^* \le 1 \; ve \; i = \{1,2,3, \dots, m\}$$

It will happen if Ai=A* and Ai=A-. If the closeness measure is close to 1, it will be determined that Alternative Ai is close to the ideal solution, and if it is close to zero, it will be close to the negative ideal solution.

3.3. Findings

The 17 sub-criteria of the four main criteria were weighted as in Table 2 by taking expert opinion with the SWARA method. Using these results, the decision matrix created in the TOPSIS method was evaluated. The results are in Table 3. It is the best T8 supplier according to the results.

Tablo 3. TOPSIS Scores and Green Supplier Selection Ranks of Supplier Companies

Supplier	Scor	Order
T1	0,160002	7
T2	0,145055	8
T3	0,203178	3
T4	0,164175	6
T5	0,192026	5
T6	0,195227	4
T7	0,233771	2
T8	0,334042	1

4. Conclusion

The concepts of sustainability, sustainable development, green economy and automotive industry constitute the main research area of the study. The concept of sustainable development was first brought to the agenda at the 1972 Stockholm Conference and today it has become one of the most important issues of both the business world and the policies of the country. sustainable development; It refers to the use of existing scarce resources, taking into account future generations. Sustainable Development Model; justice refers to real progress in the context of reducing poverty, reducing resource use and incorporating economic, environmental and social issues in decision making. As a result of the meaning added by this concept, today businesses are not seen as institutions that make profit by producing and selling goods and services; They are also considered as beings sensitive to the problems of the society and producing solutions.

Green growth is an approach that invests in natural capital for environmental sustainability, which is one of the most important criteria of sustainable development, provides economic development and provides flexibility to the economy in terms of growth by protecting the environment. Today, it is seen that the concepts of sustainable development and green growth make sense when used together. Therefore, the concept of sustainable development is directly related to green growth. In this context, the aim of both concepts is to leave a more livable world to future generations.

In the study, the green production criterion was found to be more important than the other criteria with 0.358 in the selection of green suppliers. In the sub-criteria, the Y1 criterion (designing a product that reduces material/energy consumption) is the most important criterion. This criterion is not only a sub-criterion of the economy criterion, but indirectly affects both the social criterion and the environmental criterion. When we evaluate the TOPSIS results; Company T8 is at the forefront. Although there is a difference, its closest competitor is the T7. In the next tranche, T3, T5 and T7 enter the green supplier ranking. In order for this slice and beyond to be considered a green supplier, it is necessary to make serious corrections in its businesses. T2, on the other hand, is quite far from the green supplier view. According to these results; This model, which was created by using the SWARA method and TOPSIS method together for green supplier selection, gave us good results.

References

Al, İ. (2019). Sustainable development and green economy: An index proposal for Turkey, Hitit University Institute of Social Sciences Journal, 12(1), 112-124, doi: 10.17218/hititsosbil.473413.

Allen, C. & Clouth, S. (2012). Green Growth, and Low-Carbon Development history, definitions and a guide to recent publications. A guidebook to the Green Economy. Issue 1: Green Economy, UN Division for Sustainable Development, UNDESA ((UNDESA).

Barlas, N. (2013). Environmental Problems of Our Age from Global Crises to Sustainable Society. 1. Edition. Istanbul: Bogazici University Press.

Bruntland, Gro Harlem (ed.) (1987). Our common future: The World Commission on Environment and Development. Oxford University Press. Oxford. www.un-documents.net/our-common-future.pdf (21.06.2022).

Chen, Chiau-Ching; Shih, Hsu-Shih, Shyur; Huan-Jyh; Wu, Kun-Shan (2012). A Business Strategy Selection Of Green Supply Chain Management Via An Analytic Network Process. Computers & Mathematics with Applications, 64(8), 2544–2557.

Chiaberge, M. (2011). New Trends and Developments in Automotive Industry, InTech, https://www.intechopen.com/books/new-trends-and-developments-in-automotive-industry, (19.06.2022).

Cole, M. A. (2006). Economic growth and the environment. (Ed.) G. Atkinson, S. Dietz, & E. Neumayer, Handbook of Sustainable Development. Edward Elgar, Cheltenham, 240-253.

Endo, Gustavo & Lucion, Eric & Paschoalotto, Marco & Colares Santos, Lechan & Cruz, Érika. (2022). Green Supply Chain Management: an integrative systematic literature review. Revista de Gestão dos Países de Língua Portuguesa. 20. 61-84. 10.12660/rgplp.v20n2.2021.82851.

Engin, E. & Akgöz, B. (2013). Evaluation of the Concept of Corporate Social Responsibility in the Framework of Sustainable Development and Corporate Sustainability. Selçuk İletişim, 8 (1), 85-94 .

Gladwin T. N., Kennelly, J. J. & Krause, T. S. (1995). Shifting Paradigms For Sustainable Development: Implications For Management Theory and Research, Academy of Management Review, Vol. 3, Sayı 3, 874-907

IULA-EMME. (1997). Yerel Gündem 21. Türkiye'de Yerel Gündem 21'lerin Geliştirilmesi Projesi Haber Bülteni, 1, İstanbul.

Kararach, G., Nhamo, G., Mubila, M., Nhamo, S. Nhamechena, C., & Babu, S. (2018). Reflections on the green growth index for developing countries: a focus of selected African countries. Development Policy Review, 36, 432-454.

Keršulienė, V. and Turskis, Z. (2011). Integrated fuzzy multiple criteria decision making model for architect selection, *Technological and Economic Development of Economy*, 17(4), 645-666.

Koca, G. and Behdioglu, S. (2019). Multi-Criteria Decision Making in Green Supply Chain Management: Automotive Main Industry Example. Eskişehir Osmangazi University İ.İ.B.F. Journal, 14 (3), 675-698.

KPMG Automotive (2019). Sectoral Overview. https://assets.kpmg/content/dam/kpmg/tr/pdf/2019/04/sektorel-bakis-2019-otomotiv.pdf, (29.07.2019).

Masca, M. (2009). Sustainable Development: Seeking Balance Between Development and Nature, 2.National Davraz Congress, SDU İİBF Isparta, 195-206.

Mitchell, W. J., Borroni-Bird, C. E. & Burns, L. D. (2010). Reinventing the Automobile Personal Urban Mobility for the 21st Century, The MIT Press, USA.

OECD (2011). OECD Multilingual Towards Green Growth Summary in Turkish. www.oecd.org/greengrowth/48060835.pdf (14.05.2022).

OICA (World Motor Vehicle Production by Manufacturer World Ranking) (2018). http://www.oica.net/htdocs/Main.htm (17.03.2022).

Piskin, S. (2017). 2020 Domestic Market Expectations in the Perspective of Competitiveness and Demand Dynamics of the Turkish Automotive Industry. Automotive Industry Report.

Sarkis, J. (2003). A Strategic Decision Framework For Green Supply Chain Management. Journal of Cleaner Production, 11(4), 397-409.

Schlor, H., Venghaus, S. & Hake, J. F. (2017). Green economy innovation index (GEII) -a normative innovation approach for Germany & its FEW nexus, Energy Procedia. 142, 2310-2316.

Shen, Lixin; Olfat, Laya; Govindan, Kannan; Khodaverdi, Roohollah; Diabat, Ali (2013), "A fuzzy multi criteria approach for evaluating green supplier's performance in green supply chain with linguistic preferences", Resources, Conservation and Recycling, C. *74*, s.170-179.

Soubbotina T. P. & Sheram, K. A. (2000). Beyond Economic Growth: Meeting The Challenges of Global Development. Wasington, USA: World Bank.

Soussan, J.G. (1992). Sustainable Development: Environmental Issues in the 1990's. Essex: John Wiley Sons Publication.

UNEP (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty   Eradication. http://www.unep.org/greeneconomy/portals/88/documents/ger/GreenEcon omyReport.pdf (Accessed 27.08.2015).

UNESCAP (2012). Green growth, resources and resilience, environmentally sustainable in Asia and the Pacific. United Nations and Asian Development Bank Publication, Bangkok.

World Bank (2012). Inclusive Green Growth, The Path way to Sustainable Development. Washington D.C.

Yalcin, A.Z. (2016). Green economy thinking and financial policies for sustainable development, Çankırı Karatekin University Faculty of Economics and Administrative Sciences Journal. 6(1), 749-775.

Frequency-Based Return Connectedness between Crude Oil and Agricultural Commodity Spot Prices

Remzi Gök

Dicle University, Turkey

Eray Gemici

Gaziantep University, Turkey

Abstract

We study the return connectedness between the crude oil and eight agricultural commodity spot prices—including coffee, corn, cotton, oats, rapeseed, soybeans, sugar, and wheat—spanning from October 2, 2003 to August 12, 2022 by employing the time and frequency connectedness frameworks. The results show that the returns connectedness across series is not constant but time-varying and the major events exhibit significant impacts on the existence and magnitude of connectedness, while the proportion of short-term dynamics is stronger than the long-term dynamics. The empirical analysis shows that the intensity and direction of connectedness increases considerably over time and exhibits two highest peaks between 2008 and 2013, coinciding with the recent financial crisis in the U.S., the debt crisis in Eurozone, and Arab Spring protests. Although a subsequent decline starts in early 2013, coinciding with the FED's tapering, the level of return connectedness surge up again with the annexation of Crimea and the oil price shocks in 2014. Afterwards, we notice moderately high market spillovers, driven largely by FED's rate hike, Brexit leave note, the trade war between the US and China, the onset of pandemic, oil price war of Russia and Saudi Arabia, and the invasion of Ukraine by Russia. However, the degree of connectedness start declining with the changes of monetary policy regimes, in which, major central banks increases their policy rates to struggle the historically high inflation rates. The results show that corn, soybeans, and wheat are the net transmitter of shocks, whereas the receiving role of others strengthens during the periods of crisis. Notably, the oil market is both dominant factors on and driven by others, largely by the short-term dynamics.

Keywords: Time-frequency dynamics, return spillovers, agricultural commodities, crude oil.

1. Introduction

In the last decade, examining the linkages between the oil market and agricultural commodities has become much popular for investors and other economic agents, given the potential for diversification and other benefits such as asset allocation, hedging strategy, risk management process (Sun et al., 2021; Yip et al., 2020).

The hikes in oil prices leads to an increase in the cost of essential agricultural inputs such as fertilizers and thereby the production costs of agricultural commodities also boosts (Dahl et al., 2020;Shahzad et al., 2018;Umar et al., 2021). For example, spot price of WTI crude oil surged from $25.56 per barrel in January 1986 to a record high of about $138.68 in July 2008 before falling below $38.95/barrel by the end of December 2008 (Ji et al, 2018; Nazlioglu et al., 2013). Notably, in the mid of 2008, at which oil prices peaked, the prices of essential agricultural commodities such as corn, soybean and wheat reached record levels and turned back to the level of the beginning of 2007 (Fasanya and Akinbowale, 2019). In addition, with the COVID-19 crisis, agricultural commodity prices have been significantly affected factors such as global crude oil demand, production and transportation restrictions (Hung, 2021). Finally, the heightened geopolitical risk after the military operations between Russia and Ukraine, two major producers and exporters of commodities such as crude oil, natural, wheat and aluminum, on February 24, 2022 strengthened the impact on these commodity prices (Wang et al., 2022). Notably, since late 2021, prices of commodities such as grains and vegetable oils have risen further with the Russian invasion of Ukraine, surpassing those in the global food crisis (Glauben et al., 2022).

On the empirical front, a number of studies have documented the intensification of connectedness between crude oil and agricultural commodities during turbulence periods (Dahl et al., 2020; Hung, 2021;Kang et al., 2019;Naaem et al., 2022;Nazlioglu et al., 2013; Pal and Mitra, 2020; Tiwari et al., 2022; Umar et al., 2021; Wang et al., 2020;Wang et al., 2022;Yahya et al., 2019).

In this study, we prefer using the frequency connectedness approach proposed by Baruník and Křehlík (2018) to analyze the dynamic linkages among WTI crude oil and eight agricultural commodity prices in the time-frequency space. In fact, this method takes into account periods in which return and volatility dependence can occur at high frequencies. Thus, examining the heterogeneous effects among frequencies will provide important information about the propagation of shocks between different frequencies. For example, if connectedness occurs at high frequencies, shocks are transmitted with short-term movements and have a temporary effect on the receiving volatility, but at low frequencies, the transmission of shocks to other market is long-term and persistent.

136

The rest of the paper is organized in three sections. The dataset and methodology are described in Section 2. The results are presented and discussed in Section 3. Finally, Section 4. concludes the paper with some policy implications.

2. Data and Methodology

In this section, we first describe the dataset and then outline the econometric approaches applied.

2.1. Data

The dataset is daily spot prices of WTI crude oil and eight agricultural commodity prices—coffee, corn, cotton, oats, rapeseed, soybeans, sugar, and wheat—for the sample period extending from October 2, 2003 to August 12, 2022, with a total of 4842 daily observations. All daily closing prices measured in US Dollar are taken from the U.S. Energy Information Administration (EIA) and the websites of Business Insider and Macrotrends. The continuous returns are calculated as logarithmic first difference of two consecutive closing prices and are plotted in Figure 1.
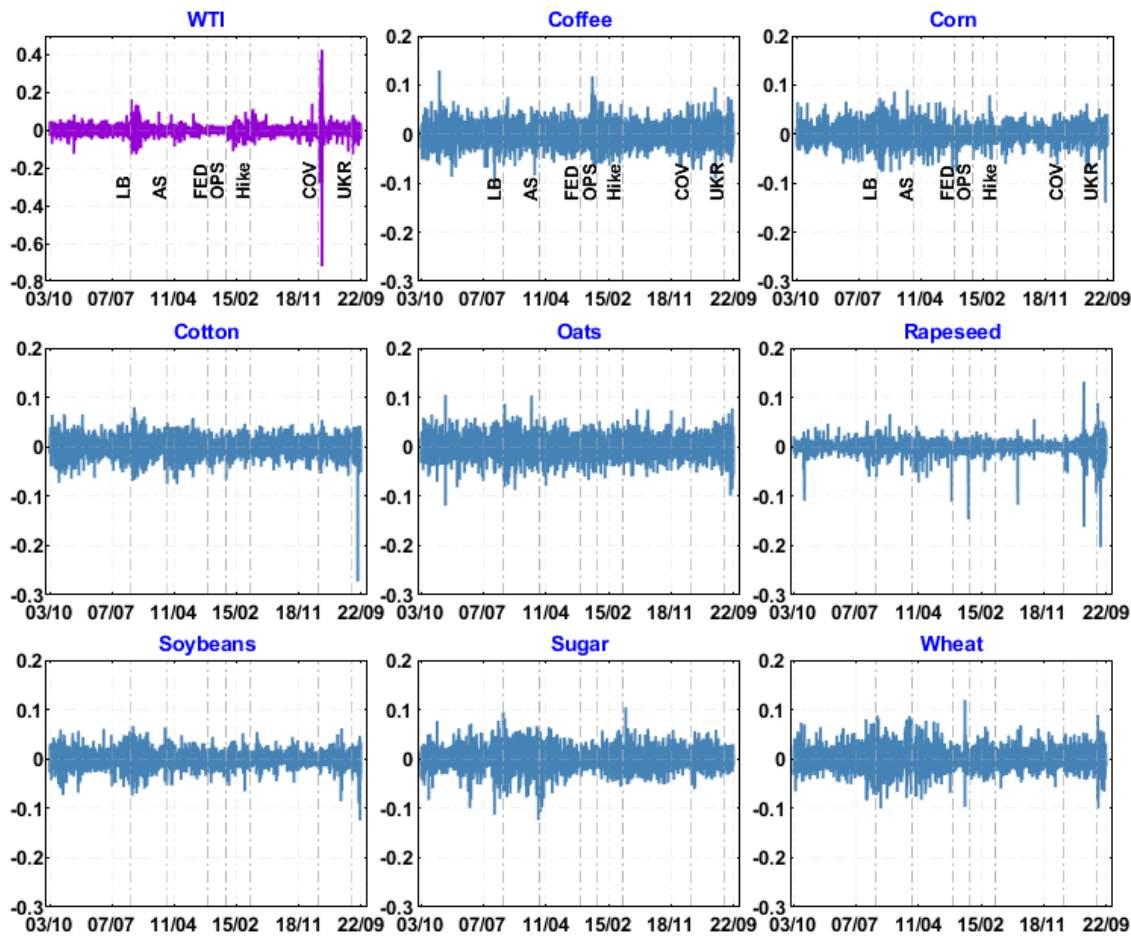

Figure 1. *Returns Series of WTI Oil and Agricultural Commodity Prices*

Notes: LB: The Collapse of Lehman Brothers (September 2008); AS: Arab Spring (2010 December); FED: FED Tampering (May 2013) OPS: Oil Price Shocks (June 2014); Hike: FED's rate hike (December 2015); COV: The first case reported for COVID19 death (January 2020), and UKR: The invasion of Ukraine by Russia.

2.2. Methodology

We study the return connectedness among crude oil and eight agricultural commodity markets in both time and frequency domains over the sample period from October 2003 to August 2022, utilizing the connectedness frameworks of the Diebold and Yilmaz (2012) and Baruník and Křehlík (2018). Given that the dynamics of frequency spillover may vary intensely across various investment horizons or shocks to a financial asset may provide an impact on other variables at different frequencies with varying degrees, we view the frequency domain as a natural place for investigating the return spillover across financial assets/markets (Baruník and Křehlík, 2018).

2.2.1. Return spillover in the time domain

To quantify return spillover among oil and commodity markets at both time and frequency domains, we implement the standard connectedness approach of Diebold and Yilmaz (2012) and the frequency connectedness approach of Baruník and Křehlík (2018), respectively. In particular, the former approach is an extension of the latter approach and both are built from generalized forecast error variance decomposition (GFEVD), which is completely invariant to variable ordering, from an estimated VAR model. Including the spectral representation of variance decompositions allows not only estimating unconditional connectedness relations in the frequency domain but also measuring the magnitude and direction of spillovers over time and across various frequencies simultaneously. That is, Baruník and Křehlík method allows us to decompose aggregate connectedness into different frequency domains and therefore identify the contribution of each frequency band—the dispersion of shocks over different time horizons, such as short-, medium-, and long-term—on the total connectedness of a system and this emerges as the distinctive feature of the framework.

To measure return connectedness in the time domain, we first estimate a simple vector autoregression—with n variables and p lags—which can be outlined as follows:

$$X_t = \Phi(L)X_t + \epsilon_t = X_t \sum_h \Phi_h L^h + \epsilon_t \tag{1}$$

where X_t is a $n \times 1$ vector of endogenous variables, $\Phi(L)$ stands for a $n \times n$ p-th order lag polynomial matrix of coefficients, L and ϵ_t represent, respectively, the lag operator and a white noise error vector with zero mean and covariance matrix $\sum$.

Let X_t be a covariance stationary vector of endogenous variables and its moving average representation takes the following form

$$X_t = \psi(L)\epsilon_t = \sum_{i=1}^{\infty} \psi_i \, \epsilon_{t-i} + \epsilon_t \tag{2}$$

where $\psi(L)$ is a $n \times n$ matrix of infinite lag polynomials. Then, the generalized forecast error variance decomposition (FEVD) is given as follows:

$$(\Theta_H)_{j,k} = \frac{\sigma_{kk}^{-1} \sum_{h=0}^{H} \left((\psi_h \Sigma)_{j,k} \right)^2}{\sum_{h=0}^{H} (\psi_h \Sigma \psi_h')_{j,j}} \tag{3}$$

where $(\Theta_H)_{j,k}$ indicates the contribution of the kth variable of the system to the variance of forecast error of the element j, at horizon h, and ψ_h represents a $n \times n$ a matrix of moving average coefficients at lag h. Given that the rows of $(\Theta_H)_{j,k}$ do not necessarily sum up to one, we need to normalize each entry of the variance decomposition matrix by the row sum as

$$\left(\tilde{\Theta}_H \right)_{j,k} = \frac{(\Theta_H)_{j,k}}{\sum_{k=1}^{N} (\Theta_H)_{j,k}} \tag{4}$$

where $\left(\tilde{\Theta}_H \right)_{j,k}$ denotes a measure of pairwise (return) spillover from k to h at horizon H in the time domain. By construction, the $\sum_{j=1}^{N} \left(\tilde{\Theta}_H \right)_{j,k} = 1$ and the sum of all elements in $\tilde{\Theta}_H$ is equal to N. Note that, to obtain the total (return) spillover, we must sum up the pairwise connectedness.

Following the definition in Diebold and Yilmaz (2012), we can describe the total spillover index as

$$C_H = 100 \cdot \frac{\sum_{j \neq k} \left(\tilde{\Theta}_H \right)_{j,k}}{\sum \tilde{\Theta}_H} = 100 \cdot \left(1 - \frac{Tr\{\tilde{\Theta}_H\}}{\sum \tilde{\Theta}_H} \right) \tag{5}$$

where $Tr\{\cdot\}$ denotes the trace operator and the denominator, $\sum \tilde{\Theta}_H$, represents the sum of all elements of the $\tilde{\Theta}_H$ matrix. Therefore, the connectedness can be defined as the relative contribution to the forecast variances from the other variables in the system.

2.2.2. Return spillover in the frequency domain

After introducing the connectedness measures in the time domain, we now discuss briefly the frequency connectedness measure of Baruník and Křehlík (2018). Note that, our goal here is to understand how the return of an asset is impacted by the returns of other assets within a portfolio over a certain period, say, within a day, a week, or a month (Hassan et al., 2020). To do so, we first consider the spectral representation of the variance decomposition based on frequency responses to shocks instead of impulse response to shocks. In the case of the Fourier transform of the coefficients of the matrix ψ_h, we can achieve the following frequency response function: $\psi(e^{-i\omega}) = \sum_h e^{-i\omega h} \psi_h$, where $i = \sqrt{-1}$ and ω denotes the frequency. In turn, the spectral density of X_t at frequency ω can be described as a Fourier transform a MA(∞)-filtered series, which is given by

$$S_X(\omega) = \sum_{h=-\infty}^{\infty} E(X_t X'_{t-h}) e^{-i\omega h} = \psi(e^{-i\omega}) \Sigma \psi'(e^{i\omega}) \tag{6}$$

Using the spectral representation for the covariance, the generalized forecast error variance decomposition at frequency ω can be achieved as:

$$(\mathfrak{f}(\omega))_{j,k} = \frac{\sigma_{kk}^{-1} \left| (\psi(e^{-i\omega}) \Sigma)_{j,k} \right|^2}{(\psi(e^{-i\omega}) \Sigma \psi'(e^{i\omega}))_{j,j}} \tag{7}$$

where $\psi(e^{-i\omega}) = \sum_h e^{-i\omega} \psi_h$ represents the Fourier transform of the impulse response ψ_h and $(\mathfrak{f}(\omega))_{j,k}$ is the portion of the spectrum of the jth variable at a particular frequency ω due to shocks in the kth variable. Further, the weighting function is given by

$$\mathfrak{M}_j(\omega) = \frac{(\psi(e^{-i\omega}) \Sigma \psi'(e^{i\omega}))_{j,j}}{\frac{1}{2\pi} \int_{-\pi}^{\pi} (\psi(e^{-i\lambda}) \Sigma \psi'(e^{i\lambda}))_{j,j} d\lambda} \tag{8}$$

which is used to weight the $(\mathfrak{f}(\omega))_{j,k}$ by the frequency share of the variance of the jth variable and thus obtain a natural decomposition of variance decompositions to frequencies. It is worth note that $\mathfrak{M}_j(\omega)$ denotes the power of jth variable at given frequency and sums through frequencies to a constant value of 2π.

In fact, it would be more beneficial for investors or researchers to evaluate return connectedness in various investment horizons, that is, in the short, medium, or long term, rather than at a particular single frequency ω. To do so, we aggregate all frequencies within a specific range, $d = (a, b) : a, b \in (-\pi, \pi), a < b$. In turn, the generalized variance decomposition on frequency band, d, is given by

$$(\Theta_d)_{j,k} = \frac{1}{2\pi} \int_d \mathfrak{M}_j(\omega) (\mathfrak{f}(\omega))_{j,k} d\omega \tag{9}$$

From here, it is possible to calculate a variety of connectedness measures over frequency band d: "within connectedness" and "frequency connectedness". The former connectedness measure quantifies the return spillover that occurs within the frequency bands and is weighted solely by the power of the series on the particular frequency band. The within connectedness on the frequency band d is given by

$$C_d^\omega = 100 \cdot \left(1 - \frac{Tr\{\tilde{\Theta}_d\}}{\sum \tilde{\Theta}_d} \right) \tag{10}$$

The latter connectedness measure, however, breaks the overall spillovers into different parts, such as short-, medium, and long-term spillovers, and gives the overall connectedness when summed, which can be defined as follows

$$C_d^{\mathcal{F}} = 100 \cdot \left(\frac{\sum \tilde{\Theta}_d}{\sum \tilde{\Theta}_\infty} - \frac{Tr\{\tilde{\Theta}_d\}}{\sum \tilde{\Theta}_\infty} \right) = C_d^\omega \cdot \frac{\sum \tilde{\Theta}_d}{\sum \tilde{\Theta}_\infty} \tag{11}$$

where $Tr\{\cdot\}$ and the denominator $\sum \tilde{\Theta}_d$ denotes, respectively, the trace operator and the sum of all elements of the $\tilde{\Theta}_d$ matrix as in Equation 5.

Since the framework of Baruník and Křehlík (2018) enables us to identify the direction of spillovers, it is straightforward to compute the directional frequency connectedness received by variable j from all other variables k, "FROM" connectedness, as

$$\left(C_d^{\mathcal{F}} \right)_{j \leftarrow \cdot} = 100 \cdot \left(\sum_{j \neq k, k} (\tilde{\Theta}_d)_{j,k} \right) \frac{\Sigma(\tilde{\Theta}_d)_{j,k}}{\Sigma(\tilde{\Theta}_\infty)_{j,k}} \tag{12}$$

Then, we have the "TO" connectedness which indicates the directional frequency connectedness transmitted from j to all other variables k and is calculated as

$$\left(C_d^{\mathcal{F}} \right)_{j \rightarrow \cdot} = 100 \cdot \left(\sum_{j \neq k, k} (\tilde{\Theta}_d)_{j,k} \right) \frac{\Sigma(\tilde{\Theta}_d)_{j,k}}{\Sigma(\tilde{\Theta}_\infty)_{j,k}} \tag{13}$$

Furthermore, the frequency "NET" connectedness can then be outlined as the difference between the variance transmitted ("TO") and received (""FROM) by a given variable

$$\left(C_d^{\mathcal{F}} \right)_{j,net} = 100 \cdot \left(\sum_{j \neq k, k} (\tilde{\Theta}_d)_{j,k} \right) \frac{\Sigma(\tilde{\Theta}_d)_{j,k}}{\Sigma(\tilde{\Theta}_\infty)_{j,k}} - 100 \cdot \left(\sum_{j \neq k, k} (\tilde{\Theta}_d)_{j,k} \right) \frac{\Sigma(\tilde{\Theta}_d)_{j,k}}{\Sigma(\tilde{\Theta}_\infty)_{j,k}} \tag{14}$$
$$= \left(C_d^{\mathcal{F}} \right)_{j \rightarrow \cdot} - \left(C_d^{\mathcal{F}} \right)_{j \leftarrow \cdot}$$

This equation indicates that if $\left(C_d^{\mathcal{F}} \right)_{j,net}$ is higher (lower) than zero, then we conclude that the variable j transmits more (less) information than it receives from the all others variables k, that is, the variable j can be considered as a net transmitter (receiver) of shocks.

It is also of interest to examine the net pairwise return spillovers between the variable j and variable i, which is simply the difference between the gross return shocks transmitted from the variable j to market i and those transmitted from i to j (Diebold and Yilmaz, 2012).

It should be noted that we arbitrarily have chosen two frequency bands, indicating short-term and long-term dynamics and ranging from 1 to 5 days (business week), $d_1 = (\pi/5, \pi)$, and from 6 days to infinite days, $d_2 = (0, \pi/5)$.

3. Empirical Findings

We first present the results of preliminary tests in the first subsection, and then turn to return spillover measures in the time and frequency domains through utilizing the

connectedness measures of Diebold and Yilmaz (2012) and Baruník and Křehlík (2018). By combining those approaches, we can quantify the contribution of each frequency bands on the connectedness measures and identify whether its dynamicity change or not at the different time horizons.

3.1. Preliminary test results

The summary statistics for (Panel A) and the correlation estimations (Panel B) among the returns series are provided in Table 1. The results in Panel A reveal that coffee shows the highest daily average return (0.026%) followed by WTI (0.024%) and oats (0.023%), while the returns of cotton is the lowest. The variance for WTI, however, is more than the returns of agricultural prices, indicating that oil market is more volatile than agricultural commodity market. All returns series (i) are significantly and positively (right) skewed—with exceptions for rapeseed and sugar with having a larger mean than the median—and (ii) leptokurtic distributed, and (iii) deviate from the normal distribution at the 1% level of significance. The results of ERS unit root test of Elliott et al. (1996) show that all returns are stationary in level over the entire period while the Ljung-Box Q statistics reveal the existence of autocorrelation in the residuals of seven out of nine variables and squared residuals of all series up to 20 lags. The returns of oil prices are significantly and positively correlated with all commodity returns, in which the highest (lowest) correlation estimation is with the soybeans (oats) returns over the sample period. All agricultural returns show significantly positive correlations, albeit at different magnitudes, ranging from 0.627 to 0.131 and indicating strong and moderate comovement in the commodity market. The biggest correlation coefficients are observed between corn and wheat, soybeans, and oats, with a positive value of 62.7%, 61.6%, and 48.9%, respectively.

Table 1

Descriptive Statistics and Pearson correlation

Panel A: Descriptive Statistics

	WTI	Coffee	Corn	Cotton	Oats	Rapeseed	Soybeans	Sugar	Wheat
Mean	0.00024	0.00026	0.00022	0.00011	0.00023	0.00020	0.00018	0.00022	0.00020
Variance	0.00088	0.00039	0.00016	0.00032	0.00031	0.00040	0.00023	0.00040	0.00039
Skewness	-2.286***	0.159***	-0.189***	-0.915***	-0.135***	-2.342***	-0.456***	-0.156***	0.110***
Kurtosis	95.981***	2.031***	2.900***	12.481***	1.922***	34.551***	3.479***	2.403***	2.073***
JB	1868211.6***	855.1***	1730.9***	32196.3***	762.4***	245983.8***	2616.8***	1187.5***	879. ***
ERS	-16.688***	-21.054***	-16.406***	-14.787***	-14.083***	-20.797***	-7.214***	-16.070***	-12.268***
Q(20)	135.569***	13.966	29.480***	55.690***	41.387***	45.699***	21.269***	18.964**	9.659
Q²(20)	977.504***	204.719***	468.598***	100.686***	316.396***	279.313***	651.199***	447.953***	959.758***

Panel B: Pearson Correlation Estimations

	WTI	Coffee	Corn	Cotton	Oats	Rapeseed	Soybeans	Sugar	Wheat
WTI	1								
Coffee	0.172***	1							
Corn	0.212***	0.183***	1						
Cotton	0.180***	0.178***	0.253***	1					
Oats	0.135***	0.175***	0.489***	0.192***	1				
Rapeseed	0.177***	0.131***	0.303***	0.172***	0.217***	1			
Soybeans	0.229***	0.192***	0.616***	0.257***	0.392***	0.406***	1		
Sugar	0.216***	0.252***	0.227***	0.199***	0.157***	0.143***	0.210***	1	
Wheat	0.161***	0.175***	0.627***	0.220***	0.432***	0.279***	0.448***	0.203***	1

Notes: The sample period spans from October 2, 2003 to August 12, 2022, yielding a total of 4842 daily observations. *** and ** denote significance at 1% and 5% significance levels for the results of skewness, kurtosis, normality, Elliott et al. (1996) unit root with constant, weighted portmanteau, and Pearson's correlation estimations. JB (Jarque–Bera), ERS (Elliott, Rothenberg, and Stock unit root test, ERS hereafter), Q20 (the Ljung-Box Q-test for the residuals of volatility series i), and Q220 (the Ljung-Box Q-test for the squared residuals of volatility series i).

3.2. Return connectedness measures

3.2.1. Time domain analysis for static return spillovers

Following the methodology outlined in Section 3, a VAR model consisting of nine variables is first estimated, in which we select optimal lag length of 1 following minimum value of Schwarz information criterion (BIC). To construct the average connectedness measures, we use a 100-period ahead forecasting horizon (H) for variance decomposition and results are presented in Table 2 and 3 adopting the approaches of Diebold and Yilmaz (2012) and Baruník and Křehlík (2018), respectively. The results given in both tables measure the extent the assets returns are integrated within the system, or, namely, how the shocks to one asset return affect the returns of others in the time or frequency domain. The main diagonal shows own-variance shares of shocks, represented by gray-shaded area, whereas off-diagonal elements indicate the connections among across returns. In other words, the off-diagonal column sums (contributions to others, expressed as "TO") and row sums (contributions from others, expressed as "FROM") indicates the directional return spillovers.

The results in the time domain, given in Table 2, show a moderate connection across the returns of nine spot prices, which confirmed by the correlation matrix. Explicitly, the value of total aggregate return spillover (TCI) among oil and eight agricultural commodity prices is 36.61%, indicating the existence of diversification opportunities, albeit moderately, for investors. The highest own-variance share spillovers occur in the case of the WTI crude oil returns, (78.27%), followed by the returns of coffee (78.21%) and sugar (75.04%). Conversely, the lowest own-variance share spillovers take place in the case of the corn returns, (43.46%), followed by the returns of soybeans (47.62%) and wheat (49.74%), indicating that they are highly vulnerable to the shocks stemming from the others. In turn, investigating "NET" findings, allows for the distinction between net transmitters and net receivers of shocks within the system. It appears that corn, soybeans, and wheat emerge as, respectively, the most three influential variables in terms of contribution "TO" (72.46%, 61.98%, and 54.25%) and "FROM" (56.54%, 52.39%, and 50.26%) other markets, indicating that they are the only net transmitter of return spillover shocks and this is largely in line with Hung (2021), who finds that the corn, copper, and oat markets are the largest contributors to other markets over both pre- and COVID19 periods. Accordingly, the returns of corn spot prices appear to be the strongest transmitter to the other series over the sample period. Likewise, the other remaining variables play the net receiving role over the entire period as they are driven by those three variables more than being influencing them. The returns of rapeseed is the most sensitive (-7.40%), whereas the oats is the least sensitive market (-3.56%) to innovation in other spot returns. The results also reveal that all commodities are mainly influenced by their own returns rather than the spillover shocks from the oil market. The returns of corn arise as the most influential factor on the forecast error variance of wheat, soybeans, and oats; while the effects of those variables on the forecast error variance of corn are the same ranking but at a

weaker magnitude. Last but not least, the return of sugar is the largest contributor (4.95%) of shocks on the coffee returns (complementary goods).

Table 2

Returns spillover results in time domain (Diebold and Yilmaz, 2012)

	WTI	Coffee	Corn	Cotton	Oats	Rapeseed	Soybeans	Sugar	Wheat	FROM
WTI	78.27	2.38	3.45	2.48	1.42	2.47	3.96	3.6	1.97	21.73
Coffee	2.34	78.21	2.71	2.47	2.53	1.26	2.97	4.95	2.56	21.79
Corn	1.94	1.5	43.46	2.8	10.46	4.06	16.49	2.21	17.08	56.54
Cotton	2.38	2.31	4.69	74.38	2.71	2.15	4.82	2.94	3.6	25.60
Oats	1.03	1.95	13.75	2.11	57.32	2.72	8.87	1.52	10.74	42.69
Rapeseed	2.11	1.07	6.34	2.07	3.34	66.51	11.54	1.35	5.67	33.49
Soybeans	2.47	1.75	18.08	3.15	7.42	7.91	47.62	2.08	9.53	52.39
Sugar	3.48	4.77	3.86	3	1.85	1.54	3.36	75.04	3.1	24.96
Wheat	1.3	1.55	19.58	2.4	9.4	3.98	9.97	2.08	49.74	50.26
TO others	17.05	17.28	72.46	20.48	39.13	26.09	61.98	20.73	54.25	TCI
NET	-4.68	-4.51	15.92	-5.12	-3.56	-7.4	9.59	-4.23	3.99	36.61

Note: Results following Diebold and Yilmaz (2012) are based on a VAR model with a 200 days rolling-window size, a lag length of order one (BIC), and a 100-step-ahead generalized forecast error variance decomposition. "TCI", "FROM", "TO others", and "NET" denote, respectively, the total connectedness index, the contributions FROM others, the contributions TO others, and the net contribution of the series on the return connectedness within the system. The figures in the gray-shaded cells show the own-variance contribution of the underlying series. The results are expressed as percentages.

3.2.2. Frequency domain analysis for static return spillovers

To understand the effect of short (high_freq) and long-term (low_freq) dynamics on the connectedness measure, we decompose the return spillover, utilizing the framework of Baruník and Křehlík (2018), and present the findings in Table 3. Results in "Panel A" reveal that return spillover from the short-term frequency contributes more to the aggregate connectedness measure, i.e. 28.94% vs. 7.67%, indicating that the return spillover within the nine variables quickly transmits in the short-run, corresponding to a business week. By confirming the time domain results, corn is the main contributors (TO connectedness at 57.77% and 14.7%) and receivers (FROM connectedness at 45.24% and 11.31%) of short- and long-lived return shocks in the system in the short-run, with the largest numbers in both directions, followed by soybeans, wheat, and oats. In line with the previous results in Table 2, the role of underlying variables remains the same in the short- and long-term and the large portion of return variance are caused by the short-term dynamics, that is, the lower frequency (1–5 days) drives the Diebold and Yilmaz (2012) net return spillovers results within the system for all variables. For instance, out of 19.58% variance from the wheat returns, 15.85% are caused by short-term spillovers while 3.72% originates from the long-term spillovers. Overall, the results imply that the short-term dynamics dominate (drive) the average connectedness measure in the time domain.

Table 3

Returns spillover results in frequency domain

	WTI	Coffee	Corn	Cotton	Oats	Rapeseed	Soybeans	Sugar	Wheat	FROM
Panel A: Short-term spillover (1–5 days) [high_freq]										
WTI	65.83	1.81	2.89	1.99	1.21	1.99	3.17	2.97	1.66	17.69
Coffee	1.95	63.95	2.03	1.87	1.84	0.97	2.22	3.94	1.88	16.7
Corn	1.65	1.13	34.52	2.12	8.47	3.2	13.2	1.73	13.74	45.24
Cotton	2	1.77	3.69	57.76	1.97	1.63	3.87	2.3	2.73	19.96
Oats	0.86	1.35	10.95	1.52	44.55	2.12	7.09	1.07	8.7	33.66
Rapeseed	1.67	0.82	4.79	1.45	2.42	52.29	8.44	1.04	4.08	24.71
Soybeans	2.11	1.4	14.63	2.42	6.08	6.19	38.21	1.66	7.73	42.22
Sugar	2.84	3.74	2.94	2.33	1.45	1.17	2.52	60.48	2.46	19.45
Wheat	1.14	1.22	15.85	1.88	7.74	3.14	8.22	1.6	40.36	40.79
TO others	14.22	13.24	57.77	15.58	31.18	20.41	48.73	16.31	42.98	TCI
NET	-3.47	-3.46	12.53	-4.38	-2.48	-4.3	6.51	-3.14	2.19	28.94
Panel B: Long-term spillover (longer than 5 days) [low_freq]										
WTI	12.45	0.57	0.56	0.5	0.21	0.47	0.78	0.64	0.31	4.03
Coffee	0.38	14.25	0.68	0.61	0.68	0.29	0.75	1.02	0.68	5.09
Corn	0.29	0.37	8.94	0.68	2	0.86	3.29	0.48	3.34	11.31
Cotton	0.38	0.54	1.01	16.63	0.74	0.52	0.95	0.65	0.87	5.66
Oats	0.17	0.6	2.8	0.58	12.76	0.59	1.78	0.45	2.04	9.02
Rapeseed	0.44	0.24	1.56	0.62	0.91	14.22	3.11	0.31	1.59	8.79
Soybeans	0.36	0.35	3.45	0.73	1.34	1.72	9.41	0.42	1.8	10.16
Sugar	0.64	1.03	0.92	0.68	0.39	0.37	0.84	14.56	0.64	5.5
Wheat	0.16	0.33	3.72	0.51	1.66	0.84	1.75	0.48	9.38	9.46
TO others	2.82	4.03	14.70	4.91	7.93	5.66	13.25	4.45	11.27	TCI
NET	-1.22	-1.06	3.39	-0.75	-1.08	-3.12	3.08	-1.06	1.82	7.67

Note: Results following Baruník and Křehlík (2018) are based on a VAR model with a 200 days rolling-window size, a lag length of order one (BIC), and a 100-step-ahead generalized forecast error variance decomposition. "TCI", "FROM", "TO others", and "NET" denote, respectively, the total connectedness index, the contributions FROM others, the contributions TO others, and the net contribution of the series on the return connectedness within the system at a given frequency. The figures in the gray-shaded cells show the own-variance contribution of the underlying series at a given frequency. The results are expressed as percentages.

3.2.3. Time-varying connectedness measure in both time and frequency domains

In this section, we conduct a rolling-window method to capture the time-frequency dynamics of return connectedness across oil and commodity markets considering both normal and turbulent periods. To do so, we use a window size of 300 days and keep the forecast horizon equal to 100. The total (violet-shaded area) and decomposed (green- and yellow-shaded areas) return spillover results, computed based on the Diebold and Yilmaz (2012) and Baruník and Křehlík (2018) frameworks, respectively, are given in Figure 2.
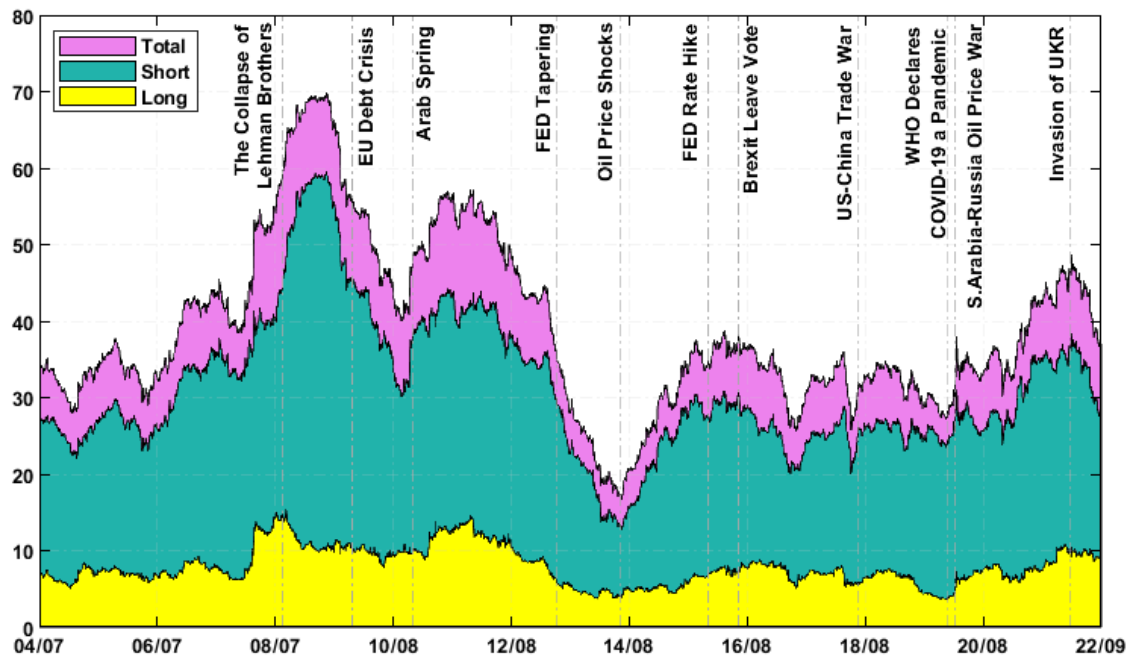
146

Figure 2. *Overall, short-term, and long-term dynamic total connectedness*

Notes: LB: The Collapse of Lehman Brothers (September 2008); AS: Arab Spring (2010 December); FED: FED Tapering (May 2013) OPS: Oil Price Shocks (June 2014); Hike: FED's rate hike (December 2015); COV: The first case reported for COVID19 death (January 2020), and UKR: The invasion of Ukraine by Russia.

Results are based on a VAR model with a 200 days rolling-window size, a lag length of order one (BIC), and a 100-step-ahead generalized forecast error variance decomposition. The violet-shaded area represents the time dynamic connectedness values (based on the framework of Diebold and Yilmaz (2012)) while the green- and yellow-shaded areas (calculated based on the Baruník and Křehlík (2018) framework) demonstrate the short and long-term results, respectively. The frequency connectedness at the short-term horizon captures connectedness at horizon [1,5] days (representing a business week) and long-term horizon captures connectedness at horizons greater than 5 days. at d1 ⊚ [1,5]

From the figure, we see several peaks and troughs, coinciding with the financial, political, and pandemic events. In other words, as expected and in common with the recent literature (Pal and Mitra, 2020; Umar et al., 2021; among many others), the dynamic total connectedness is heterogeneous over time and driven mainly by the crisis periods of economic/financial or the COVID19. By confirming the average connectedness measures given in the previous table, the proportion of short-term dynamics in total return spillover is larger than the long-term over the entire period. For example, we observe substantially low market spillovers until September 2009. Afterwards, all TCIs start to increase. That is, they surge up with the collapse of Lehman Brothers and reach the peak of around 68% during the financial (a.k.a. subprime mortgage) crisis of 2007–2009. A subsequent decline can be observed at the end of mortgage crisis and just before the beginning of Eurozone sovereign debt crisis. However, the fallen market risk starts to rise again with political protests, also called Arab Spring, in North Africa. The subsequent sudden drop led to the lowest TCIs value in May 2014 just before the 2014 oil price shocks start. Furthermore, we see that the occurrence of rate hike by FED, Brexit leave vote, the outbreak of pandemic as well as the war in Ukraine has significant and intensifying impacts on the spillover of

shocks. With the acceleration of global recession concerns and rising inflation rates in both advanced and emerging countries (that is, when the central banks of these countries, especially the FED, has to sharply increases policy rates), we see that the market risk, that is, the interconnection between the oil and commodity markets has started to decrease at the end of sample period. The results of intensified connectedness at high_freq suggest less diversification opportunities for investors in the short term but a more effective diversification role for commodities in the long-term.
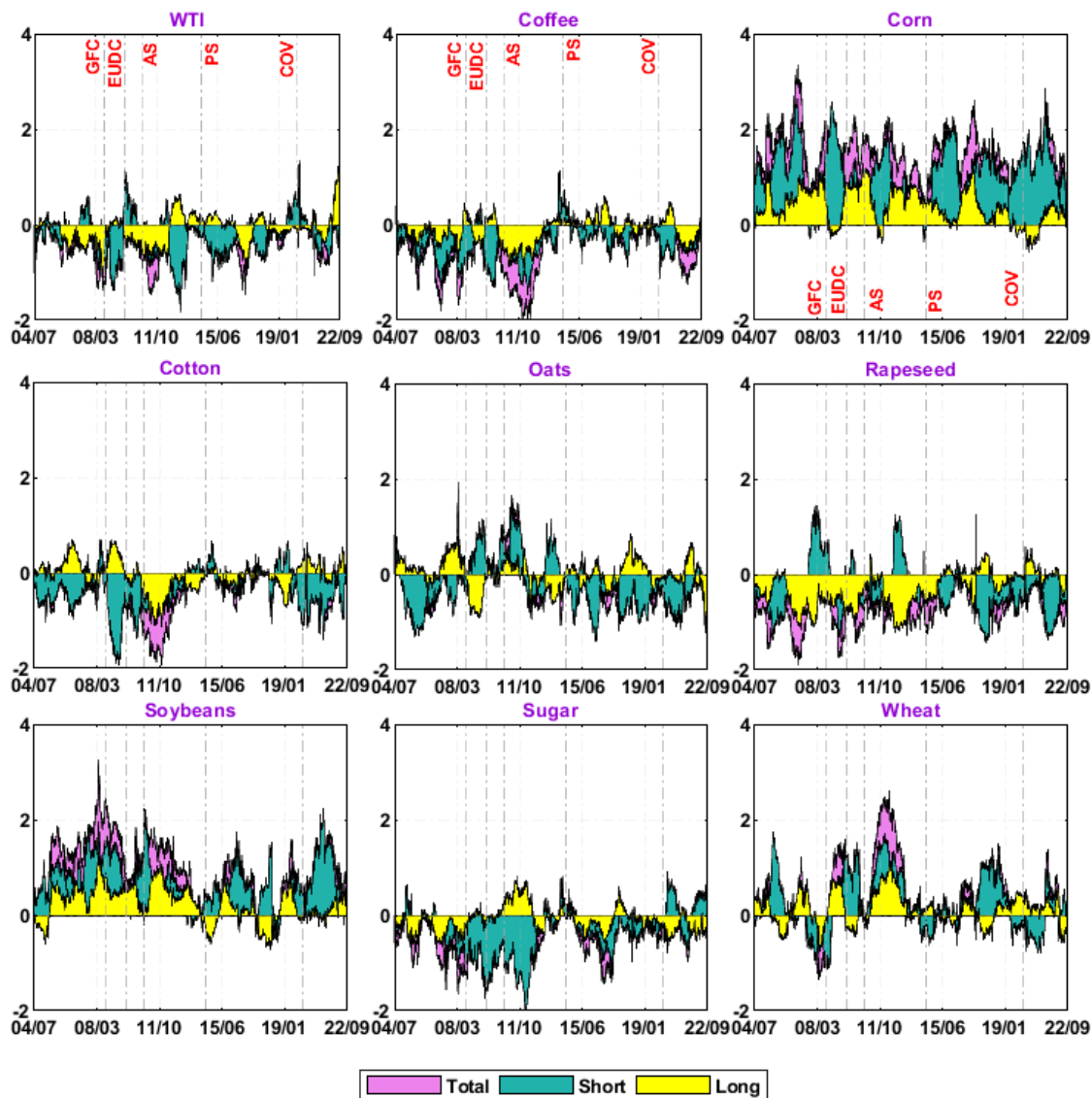
Figure 3. *Overall, short-term, and long-term net total directional connectedness*

Notes: See notes to Figure 2.

Next, we consider the net transmission power of each series within the system, and the time-varying return spillover shocks at different frequencies are depicted in Figure 3. A visual inspection suggests that both short and long term dynamics are responsible for all return series of being a net recipient or contributor of spillover shocks at varying magnitudes during the underlying period. As was the case in Figure 3, the level of net

total directional connectedness across the financial markets is not static but significantly evolves, coinciding with major financial conditions and events. Being different from the previous results given in 3, the connectedness measure takes negative or positive values. Namely, positive values correspond to net contributor of shocks whereas negative values represent the role of being net receivers of shocks into the system.

The results reveal that the returns of corn, soybeans, and wheat assume a persistent net transmitting role regardless of whether there is a normal or turbulent period, while the others are the net receivers of return spillover shocks to other markets in the system throughout the period of time. Quite similar results are reported by Hung (2021), in whom the author reveals that the markets of corn, oats, soybean, and wheat are the net contributors of return spillovers, whereas the sugar is the net receiver of return spillover with being their magnitudes is larger in the pandemic compared to the before the outbreak. Looking at the returns of coffee, for example, we observe that its total connectedness reaches a historic peak during the Arab Spring protests and it is a net transmitter of shocks with both short- and long-run dynamics over the entire period. During the financial and pandemic events, the transmitting role is mostly caused by the short-term dynamics, which strengthens the net transmission power of the series. In the case of the rapeseed returns, however, a visual inspection suggests that the long-term dynamics are rather constant over time (that is, the net receiving role virtually does not change), while the short-term dynamics exhibit different roles to play, either being a net transmitter or receiver of shocks. It also plays both roles simultaneously during the financial crisis of 2007–2009 and between 2012 and 2013, with being a net transmitter by the short-term and a net receiver by the long-term dynamics.
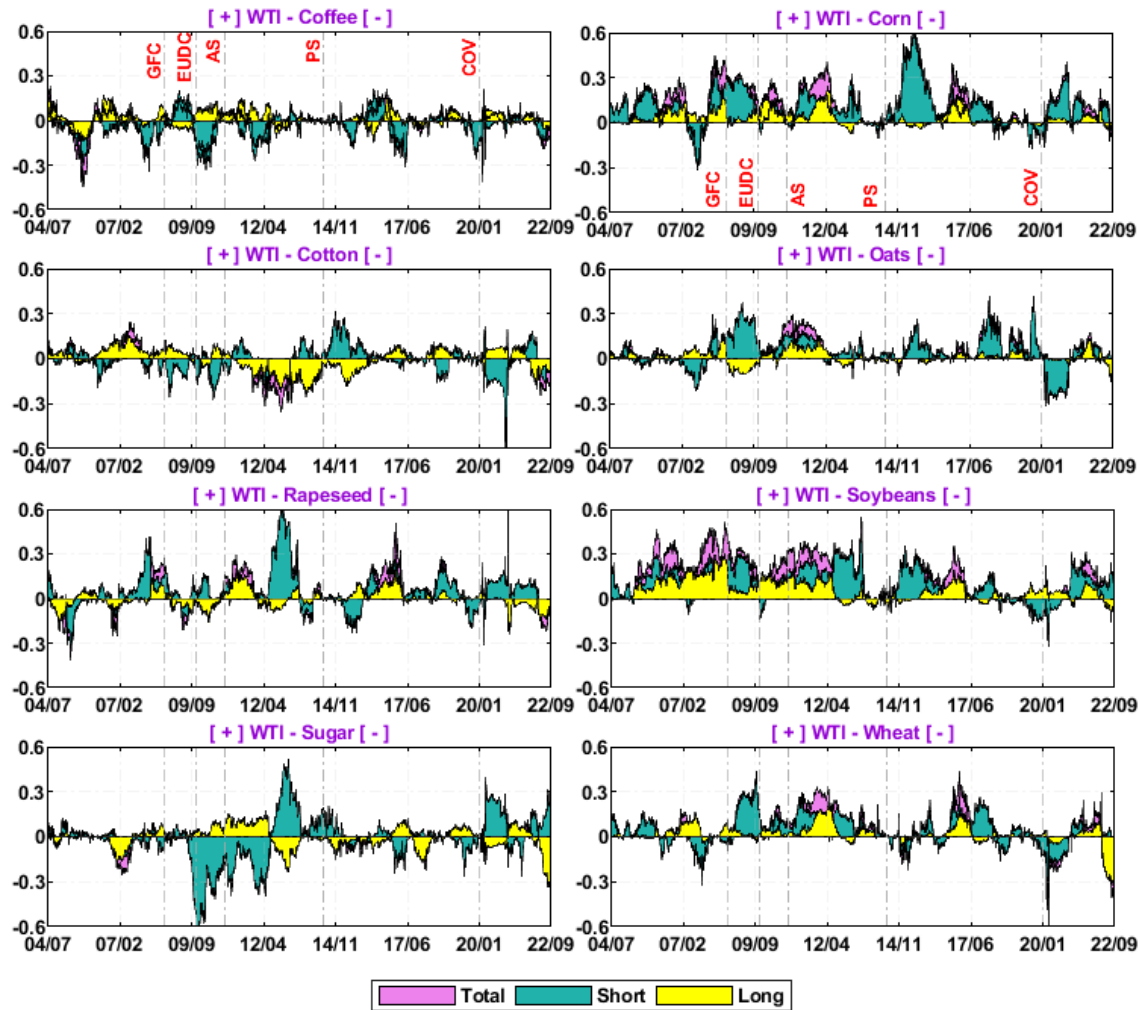
Figure 4. *Overall, short-term, and long-term net pairwise directional connectedness between WTI and commodity returns*

Notes: See notes to Figure 2. Positive (negative) values represent the net transmitter (receiver) and dominant role of the first (second) variable on second (first) one.

Next, we turn our attention to Figure 4, in which we plot the bilateral (pairwise) connectedness measure results between oil and the eight commodity returns that given at different frequencies. First, the bilateral net directional connectedness measures fluctuate relatively, though mostly positive, but characterized by large negative and short-run swings, particularly for the pairs of WTI-sugar and WTI-oats markets, coinciding with the sovereign debt crisis in Europe and the COVID19. WTI simultaneously and constantly dominates the others and dominated by the others, caused either by short- (high_freq) or by long-run (low_freq) dynamics. While the oil returns dominate the returns of corn, oats, rapeseed, soybeans, sugar, and wheat, for example, with its short-run dynamics, its returns shock is largely driven by the effects of short-term dynamics of coffee and sugar (particularly from September 2009 to mid-2012) and of long-term dynamics of cotton from 2011 through 2016. This result is in line with Tiwari et al. (2022), who report that oil market is a net receiver of volatility shocks from, particularly, cotton, coffee, and sugar. Further, the findings from Pal and Mitra (2020) confirm our results in that the crude oil is found to be the net transmitter

150

of return spillover shock on the corn and soybeans markets at different frequencies from 2005 to 2018. With the outbreak of the pandemic crisis started in January 2020, we observe significant return spillover shocks from the oil market to several commodity spot returns, including corn, cotton, oats, soybeans, and wheat, while this market is exposed to shocks stemming from coffee, rapeseed, and sugar markets. These results suggest that neither oil market nor the commodity markets are immune from return based spillover shocks stemming from each other during the pandemic. It also should be noted that both developed and emerging markets have witnessed the highest rates of inflation—driven largely by expansionary monetary practices that last longer than necessary—and thus they had to change their monetary policy regimes, that is, from expansionary to contractionary monetary policies. Further, the unfolding crisis in Ukraine has triggered particularly severe disruptions to global markets for critical raw materials and threatens global food security. We can clearly observe the effect of war in Ukraine started February 2022 and the tightening monetary policy practices initiated by the FED on commodity and oil markets. With the removal of the blockage on cereal exports from Ukraine, we observe that most of commodities persistently dominate the oil market, driven by mostly long-run (low_freq) dynamics. This evidence is somewhat consistent with the empirical results of Wang et al. (2022), who report the net contribution role of crude oil and net recipient role of soybean and wheat during the war in Ukraine.

The time-varying pairwise net directional connectedness among agricultural commodities in time and frequency domains are given in Figure 5. The visual observation clearly manifests that the corn market is a major receiver of return shocks and consistently dominated by all other commodities over time, in which the short-term dynamics largely drives the Diebold and Yilmaz (2012) net pairwise return spillovers within the system. We notice that coffee is a net transmitter of returns shocks from all agricultural markets in general, but in some cases, the role played changes and it receives shocks from others, in which the long-term dynamics is the key drivers of connectedness measure. Soybeans market appears to be net transmitters of shocks and dominated by cotton, oats, sugar, wheat, and particularly rapeseed.
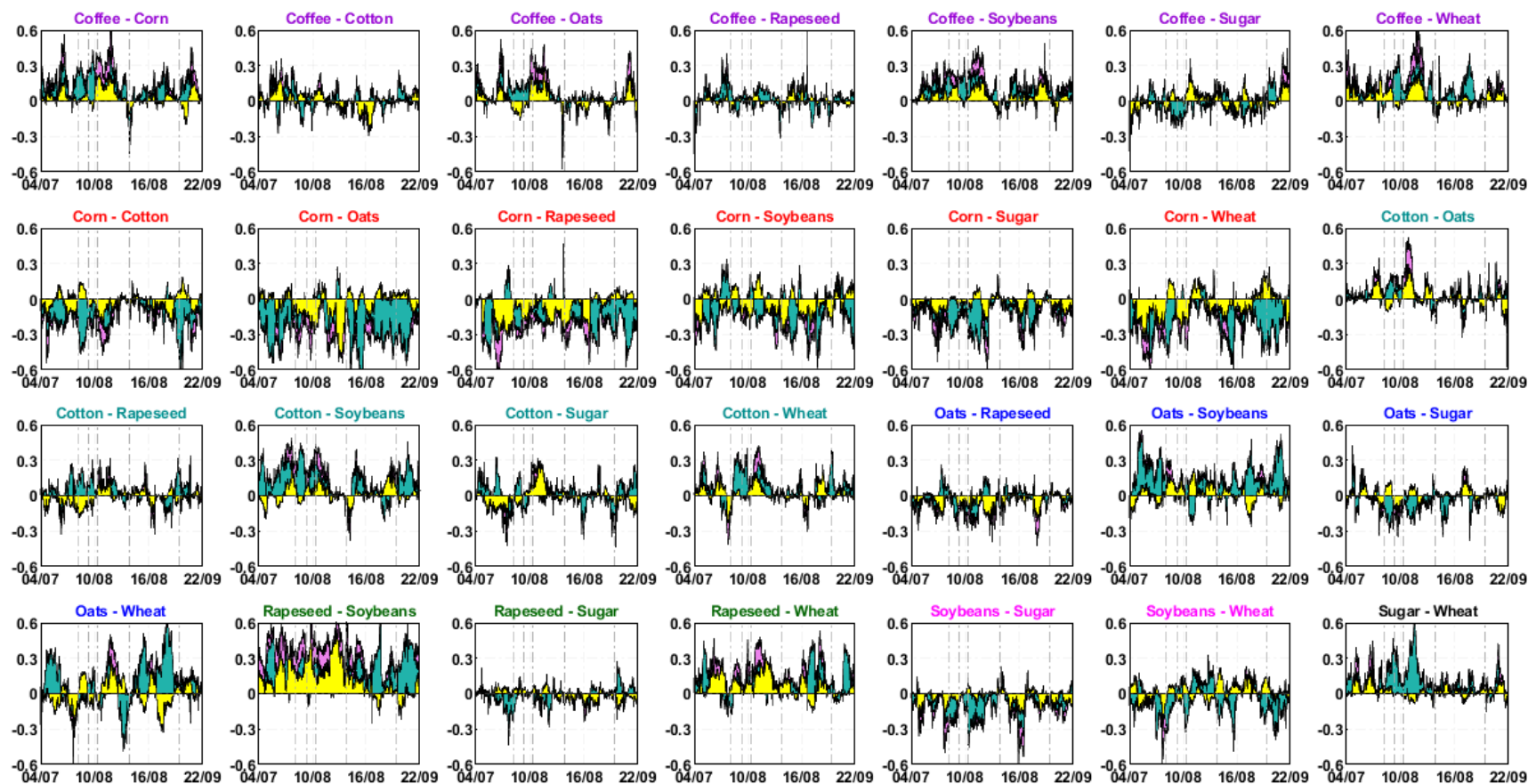
Figure 5. *Overall, short-term, and long-term net pairwise directional connectedness among commodity returns*

Notes: See notes to Figure 2. Positive (negative) values represent the net transmitter (receiver) and dominant role of the first (second) variable on second (first) one.

4. Conclusions

In this paper, we study the return connectedness among crude oil and eight agricultural commodity markets in both time and frequency domains over the sample period from October 2003 to August 2022, utilizing the connectedness frameworks of the Diebold and Yilmaz (2012) and Baruník and Křehlík (2018). Our static based results show a moderate return connectedness within the system over the entire period and the contribution of the short-term dynamics is larger than the long-term dynamics. Further, own return spillovers are highest for crude oil, coffee, and sugar, whereas the lowest own-variance share spillovers arise in the case of corn, soybeans, and wheat. Besides, the returns of oil, coffee, cotton, oats, rapeseed, and sugar are the net receivers of return shocks, while the remaining markets are the net transmitter of shocks within the system. Considering the effect of financial events, that take place during the sample period, on the connectedness, we also focus on the time-varying analysis. The results show that the return connectedness is not homogenous and is significantly driven by and reaches the peak during the financial, pandemic, and geopolitical events, confirming spillovers' intensity during periods of turmoil (Pal and Mitra, 2020; Hung, 2021; Umar et al., 2021; Wang et al., 2022). However, we notice that the level of connectedness weakens during the oil price shocks and the changes of monetary policy regimes around the world. Our net total direction connectedness results highlight the net transmitting role of corn, soybeans, and wheat while the net recipient role of oil, coffee, cotton, oats, rapeseed, and sugar becomes evident, albeit the direction of connectedness switches to positive and strengthens (weakens) during the turbulent (normal) periods. The oil returns not only dominate but also dominated by the short-term dynamics of several commodity markets, given that the returns of corn, oats, rapeseed, soybeans, sugar, and wheat are the net receivers of shocks while the coffee and sugar is, in general, the net transmitter of shocks on the oil prices. Besides, the returns corn (coffee) is a major receiver (transmitter) of spillover shocks, generally driven by the long-term dynamics, among the agricultural markets.

Our results provide important implications for policymakers, investors as well as the producers/farmers. The moderate and strengthened event-dependent connectedness between oil and agricultural commodity markets underline the potential of moderate and lower diversification opportunities mostly in the short-term for investors during the normal and turbulent periods. The fact that both markets are highly influenced by each other reveals that a comprehensive roadmap, favoring producers/farmers and consumers, should be drawn by policymaker in order to minimize or control the spillover effects across markets. Considering the effects of return/volatility spillover effects at different market conditions and measures the impacts of risk factors—such as the geopolitical risks, risk aversion index, economic uncertainty index—on the connectedness warrants future studies.

References

Baruník, J., & Křehlík, T. (2018). Measuring the frequency dynamics of financial connectedness and systemic risk. *Journal of Financial Econometrics*, *16*(2), 271-296.

Dahl, R. E., Oglend, A., & Yahya, M. (2020). Dynamics of volatility spillover in commodity markets: Linking crude oil to agriculture. *Journal of Commodity Markets*, *20*, 100111.

Diebold, F. X., & Yilmaz, K. (2012). Better to give than to receive: Predictive directional measurement of volatility spillovers. *International Journal of forecasting*, *28*(1), 57-66.

Elliott, G., Rothenberg, T. J., & Stock, J. H. (1992). Efficient tests for an autoregressive unit root. Econometrica, 64 (4) (1996), pp. 813-836

Fasanya, I., & Akinbowale, S. (2019). Modelling the return and volatility spillovers of crude oil and food prices in Nigeria. *Energy*, *169*, 186-205.

Glauben, T., Svanidze, M., Götz, L. J., Prehn, S., Jaghdani, T. J., Djuric, I., & Kuhn, L. (2022). *The war in Ukraine exposes supply tensions on global agricultural markets: Openness to global trade is needed to cope with the crisis* (No. 44e). IAMO Policy Brief.

Hassan, K., Hoque, A., Wali, M., & Gasbarro, D. (2020). Islamic stocks, conventional stocks, and crude oil: directional volatility spillover analysis in BRICS. *Energy Economics*, *92*, 104985.

Hung, N. T. (2021). Oil prices and agricultural commodity markets: Evidence from pre and during COVID-19 outbreak. *Resources policy*, *73*, 102236.

Jarque, C. M., & Bera, A. K. (1980). Efficient tests for normality, homoscedasticity and serial

independence of regression residuals. Economics Letters, 6(3), 255–259.

Ji, Q., Bouri, E., Roubaud, D., & Shahzad, S. J. H. (2018). Risk spillover between energy and agricultural commodity markets: A dependence-switching CoVaR-copula model. *Energy Economics*, *75*, 14-27.

Kang, S. H., Tiwari, A. K., Albulescu, C. T., & Yoon, S. M. (2019). Exploring the time-frequency connectedness and network among crude oil and agriculture commodities V1. *Energy Economics*, *84*, 104543.

Ljung, G. M., & Box, G. E. P. (1978). On a measure of a lack of fit in time series models. Biometrika, 65, 297–303.

Naeem, M. A., Karim, S., Hasan, M., Lucey, B. M., & Kang, S. H. (2022). Nexus between oil shocks and agriculture commodities: Evidence from time and frequency domain. *Energy Economics*, *112*, 106148.

Nazlioglu, S., Erdem, C., & Soytas, U. (2013). Volatility spillover between oil and agricultural commodity markets. *Energy Economics*, *36*, 658-665.

Pal, D., & Mitra, S. K. (2020). Time-frequency dynamics of return spillover from crude oil to agricultural commodities. *Applied Economics*, *52*(49), 5426-5445.

Shahzad, S. J. H., Hernandez, J. A., Al-Yahyaee, K. H., & Jammazi, R. (2018). Asymmetric risk spillovers between oil and agricultural commodities. *Energy Policy*, *118*, 182-198.

Sun, Y., Mirza, N., Qadeer, A., & Hsueh, H. P. (2021). Connectedness between oil and agricultural commodity prices during tranquil and volatile period. Is crude oil a victim indeed?. *Resources Policy*, *72*, 102131.

Tiwari, A. K., Abakah, E. J. A., Adewuyi, A. O., & Lee, C. C. (2022). Quantile risk spillovers between energy and agricultural commodity markets: Evidence from pre and during COVID-19 outbreak. *Energy Economics*, *113*, 106235.

Umar, Z., Jareño, F., & Escribano, A. (2021). Agricultural commodity markets and oil prices: An analysis of the dynamic return and volatility connectedness. *Resources Policy*, *73*, 102147.

Wang, Y., Bouri, E., Fareed, Z., & Dai, Y. (2022). Geopolitical risk and the systemic risk in the commodity markets under the war in Ukraine. *Finance Research Letters*, *49*, 103066.

Wang, Y., Zhang, Z., Li, X., Chen, X., & Wei, Y. (2020). Dynamic return connectedness across global commodity futures markets: Evidence from time and frequency domains. *Physica A: Statistical Mechanics and its Applications*, *542*, 123464.

Yahya, M., Oglend, A., & Dahl, R. E. (2019). Temporal and spectral dependence between crude oil and agricultural commodities: A wavelet-based copula approach. *Energy Economics*, *80*, 277-296.

Yip, P. S., Brooks, R., Do, H. X., & Nguyen, D. K. (2020). Dynamic volatility spillover effects between oil and agricultural products. *International Review of Financial Analysis*, *69*, 101465.

Improving the Standard of Living through Better Budget Transparency in the Balkan Region

Kristina Velichkovska

International Balkan University-Skopje, North Macedonia

Bojan Georgievski

Wittenborg University of Applied Sciences, Netherlands
Tilburg University, Netherlands,

Abstract

Budgetary transparency, which encourages public access to information about budgets, government programs, and financial operations of governments in order to make them available to citizens, has piqued the interest of international organizations, funders, and scholars in the last two decades. Social reformers advocate for a high open budget index score as the primary motivator for governments to implement policies that dependably maximize public finances. This paper uses a Pooled Least Squares technique on a panel data (during 2008, 2010, 2012, 2015, 2017, 2019) examining the links between budgetary transparency, as measured by Open Budget Index (OBI), and standard of living, as measured by the Human Development Index (HDI). Additionally, a second regression is done for the same years with budget transparency represented by OBI as the independent variable and economic performance (representing a significant part in the standard of living) measured by GDP per capita (current $US) as the dependent variable. The independent variable OBI which is a representative of the budget transparency in the selected countries from the Balkan region has a positive and significant effect on the standard of living in both cases. The empirical study's fundamental premise is that high budget transparency ratings benefit government policies while also providing important information to the general public.

Keywords: budget transparency, human development index, GDP per capita, Balkan countries

1. Introduction

Budget transparency has become a key principle for the management of economic performance, particularly in times of recession. Citizens have a right to know how governments manage public resources, this being stated and known for a very long time.

Transparency in government activities is seen as a necessary requirement for a long-term economy, effective governance, and fiscal responsibility (Kopits and Craig, 1998). The underlying idea that emerges from previous research is that there are occasions in which a country's government holds economic, financial, or political knowledge but chooses not to share it with the public. For example, if supplied economic data indicates that the government's action is inadequate, the government would not publish this information (or at least would "soften" the data). In other cases, it might be a case of "neglect," in which information is not necessarily withheld, but the gathering and transmission of information is given a low priority, resulting in the same outcome: the public is unable to make economic judgments owing to a lack of knowledge (or misleading makes the existing information of very poor quality) (Cimpoeru & Cimpoeru, 2015).

Another thing is that information on government activities makes it easier for citizens to exert influence over policymakers, which improves government accountability. Because modern economies' budgets are very complex, the actual budget balance can be hidden, and policymakers can avoid certain tax burdens: overgrowth spending and government debt, information availability is extremely important for the fight against corruption and for the efficiency of public services (Cimpoeru, 2015) . Budgets that are simple, straightforward, and transparent are not necessarily appealing to politicians (Benito and Bastida, 2009). Governments should, nevertheless, aim to improve budgetary transparency so that citizens and financial markets can analyze governments' financial circumstances and offer recommendations to improve the decision-making process in public institutions (Badun, 2009).

All of this only contributes to the point that budget decisions have a significant influence on the interests and living conditions of many people and groups in a society. Therefore, the main focus of this study is the influence of budget transparency on the standard of living. The open budget index (OBI) will be used as representation of the budget transparency, while the human development index (HDI), as well as the GDP per capita as a component of the HDI, will be used as measurements of the standard of living.

2. Literature Review

Studies in the literature on transparency have a long history (Hood, 2006, quoted by Heald, 2012). Despite the fact that there are critical examinations of the idea of financial transparency in the literature (Prat, 2005, Gavazza and Lizzeri 2009), the demands for

openness are clear since it is difficult to find a counterbalance for the social functions of ignorance. The benefits of fiscal openness on performance and government have been documented in the literature (Bellver and Kaufmann 2005; Hameed, 2005; Islam, 2003).

Center on Budget and Policy Priorities (CBPP) researchers have established a positive correlation between the OBI score and GDP per capita and stated that richer countries have better results than other countries in OBI.

The findings of a research done by Alt et al. (2012) suggest that implementing fiscal restrictions might be detrimental in terms of decreasing financial openness. The authorities are enticed to use budgetary "tricks" (to distort rather than fix fiscal policy reporting) because they are unable to supervise behavior and fiscal restrictions. These incentives are reduced or eliminated by institutions that represent greater openness in the budgetary process. The electoral calendar has similar effects, according to their research: in democratic systems, even advanced ones, the temptation for politicians to engage scammers increases when elections intervene, but the transparency of the budgeting process mitigates this problem, and temptations to manipulate are stronger during times of economic stress. Reduced transparency exacerbates this consequence of the global crisis, allowing politicians to "escape" via budgetary machinations. The budgeting laws simply do not operate in non-transparent environments, according to the authors (Alt et al., 2012). Lack of budget transparency is a barrier to economic progress, according to research concentrating on underdeveloped nations.

The importance of human capital in a country's economic development cannot be overstated. Human capital has been identified as one of the most essential aspects in the growth process in several studies based on panel, cross-sectional, and time series data. The majority of such surveys have been conducted in recent decades (Wilson and Briscoe, 2004) due to the availability of substantial cross-country data that enables researchers to experimentally evaluate models based on various hypotheses (Qadri and Waheed, 2014). Many empirical research (e.g., Svensson (2005), Asiedu and Freeman, 2009, Neanidis and Haque, 2009) have shown that corruption may affect economic development, investments, and budgetary transparency since Mauro (1995).

3. Methodology and Data

The literature deals with various types of indicators to assess the level of budget transparency and standard of living, however this study analyzes the impact of the Open Budget Index – OBI as independent variable on the Human Development Index – HDI, as the dependent variable. The HDI is taken into consideration since it looks beyond the gross domestic product, it encompasses life expectancy and progress in the education of the citizens - all these are fundamental for our lives, but absent in the GDP. The progress must be defined and measured in a manner which will count for the broader picture of human development and its context.

The Human Development Index (HDI) is a composite measure of health, education, and income that has surpassed GDP as a more commonly recognized option for assessing a country's growth. The HDI scale ranges from 0 (low development) to 1 (high development), and it is used to divide countries into four categories: very high human development, high human development, medium human development, and low human development.

The Open Budget Index (OBI) is a tool that tracks budget transparency throughout the world, offering important data that can be utilized for both research and decision-making processes. Since 2006, OBI has been calculated every two years, providing intriguing comparative data regarding the information that governments make accessible to the public on how they handle public finances (Renzio and Masud, 2011). This tool is based on a thorough questionnaire that was designed to collect comparative data on public access of budget and other budgetary accounting methods for 85 countries in 2008, 94 countries in 2010, 100 countries in 2012, and so on.

Following is the hypothesis that this study investigates: The standard of living in X country is positively correlated with budget transparency (as evaluated at the country's macroeconomic level).

4. Descriptive Analysis

In STATA, a descriptive study of the 7 (seven) selected Balkan countries is conducted, covering the years 2008-2019. The study first seeks for indicators linked to broad distributions of features in the descriptive analysis: minimum value, maximum value, amplitude, arithmetic mean, standard deviation, coefficient of asymmetry (skewness), and flattening coefficient (Kurtosis).

For example, to observe the symmetry of the distribution from which the data series is derived, we will examine the estimated value for Skewness, a statistical parameter that measures the lack of symmetry, with a value close to 0 indicating the presence of a normal distribution for the data series under consideration, and values significantly different from 0 (positive or negative) indicating the degree of deviation from the normal distribution. The Kurtosis indicator, on the other hand, determines whether the components of a series are close together or far off from the normal distribution. A high number shows a noticeable peak versus average in the data series.

The study statistically analyzes the OBI data series and shows the following: maximum value: 74, minimum value: 33, mean: 52.07, standard deviation: 12,63. The asymmetry coefficient value is near to 0, suggesting that the data series under consideration have normal distributions (0,15). The Kurtosis indicator has a lower value than 3 (1,79), indicating that the distribution is platycurtotic (having a lower peak than a normal distribution) (Figure 1).
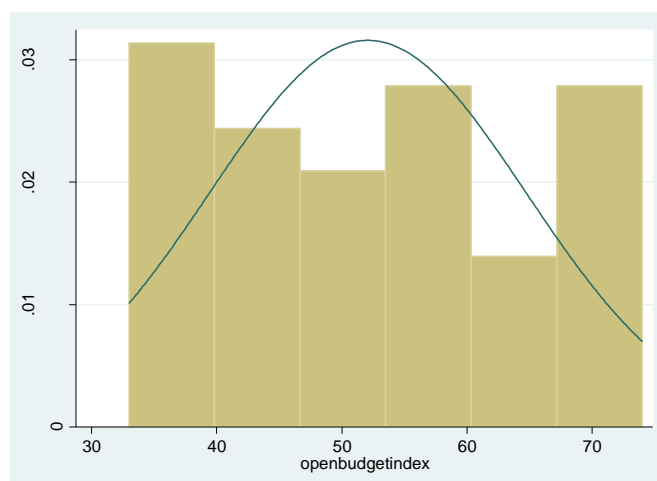
Figure 1. Histogram of OBI data series (2008-2019)

Analyzing the OBI scores, it can be seen that only 2 from the 7 selected Balkan countries have scores over 60% and can be characterized as countries that offer to their citizens' sufficient budgetary data to allow a comprehensive analysis of them. A score of less than 60% hampers the citizens' attempts to make the government accountable for the management of public resources.

The OBI score divides countries into five categories: the first group includes countries with an OBI score of 81 to 100 (these countries publish extensive information about their budgets); the second category concerns the countries which have a score of approximately 61 - 80 (they publish important information about their budgets); the third category includes countries which have an OBI score 41 – 60 (countries that publish some information about their budgets); the fourth category is made up of countries that have an OBI score between 21 - 40 (countries that publish minimum information about their budgets); and the fifth category concerns countries which have an OBI score between 0-20 (these countries publish truncated information, if any, about their budgets).

In our selected countries, only Slovenia is in the second category (61-80 score), Serbia, Bulgaria, Croatia and North Macedonia are in the third category (41-60), Albania in the fourth category (21-40), while Bosnia started out in the third category but then dropped down to the fourth category since 2016 and continues to decrease.

Next, we observe the trends of the OBI in the selected Balkan countries over the period of study (2008 – 2019). Slovenia is expectedly on the top, however gradually losing that first position through the years. Next in line are Bulgaria and Croatia, both of which are showing major improvements in the budget transparency levels, catching up with Slovenia and even overpassing it. Albania is also witnessing an improving trend of budget transparency, while Serbia and Bosnia and Herzegovina are both with a decreasing trend. North Macedonia started from a good position of budget transparency in 2008, then gradually worsening its level to reaching the lowest point in 2012, from where things are starting to go back to normal again. Nevertheless, the

country still provides the public with minimal budget information. The only country in a worse position is Bosnia and Herzegovina reaching their lowest point in 2019.
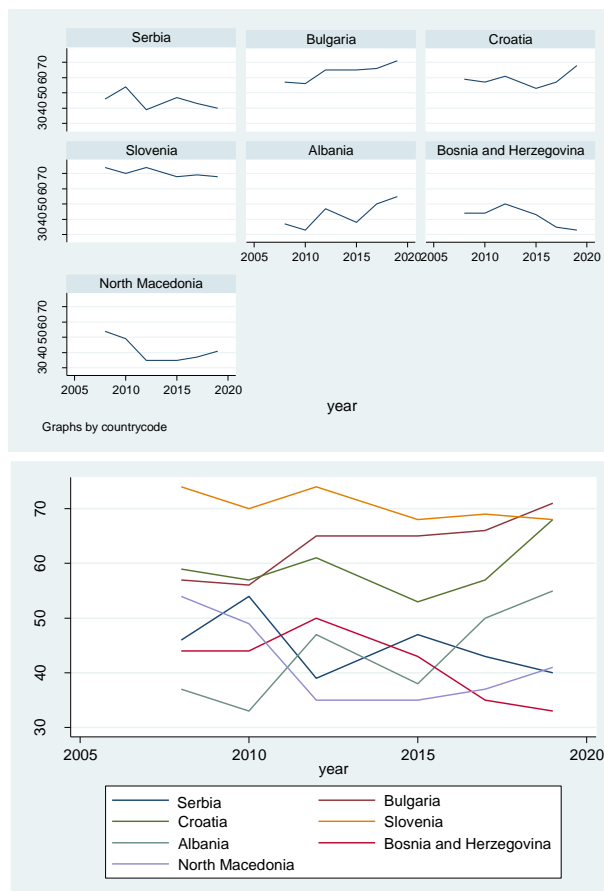
Figure 2 and Figure 3: Trends of the Open Budget Indices in the selected Balkan countries

If we take a look at the mean values of the OBIs during the observed period of time, the results will be the same. Slovenia at the top, followed by Bulgaria and Croatia, then Serbia and Albania in the middle, and on the drop of the list are North Macedonia and Bosnia and Herzegovina.
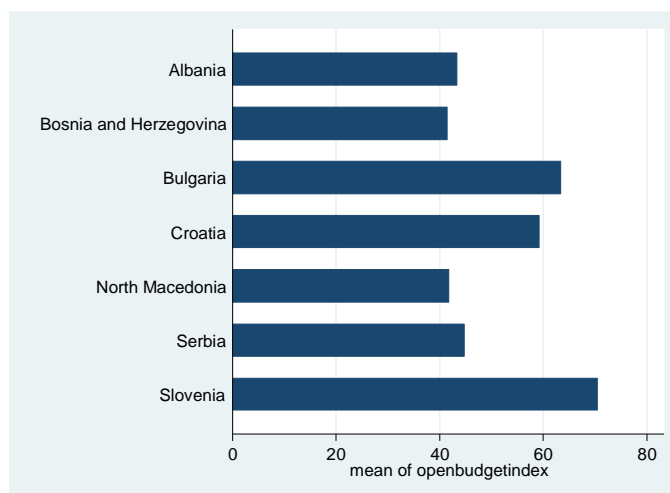
Figure 4: Mean values of OBIs of the selected Balkan countries (2008-2019)

Following the study performs a descriptive analysis on the dependent variable, i.e. the Human Development Index (HDI). The findings are the following: maximum value: 0.917, minimum value: 0.721, mean: 0.799, standard deviation: 0.05. The asymmetry coefficient value is near to 0, suggesting that the data series under consideration have normal distributions (0,767). The Kurtosis indicator, although close to the limit, still is lower than 3 (2.8), indicating that the distribution has a lower peak than a normal distribution) (Figure 5).
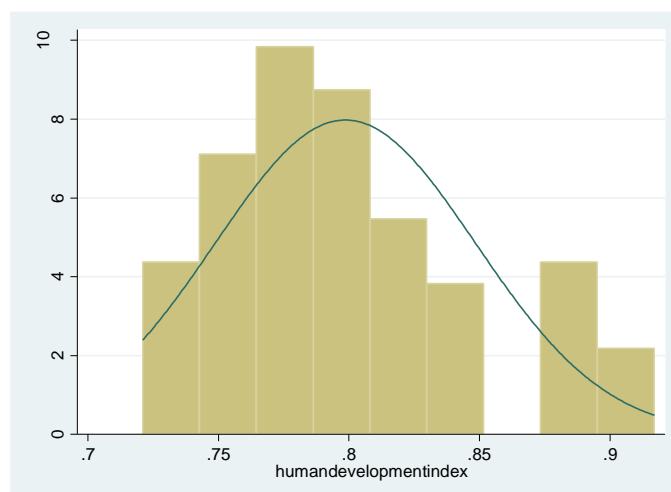
Figure 5. Histogram of HDI data series (2008-2019)

We then observe the trends of the HDI in the selected Balkan countries over same observation period of study (2008 – 2019). Here the results show that all selected countries show some improvement in their levels of the HDIs. Slovenia is at the top, followed by Croatia and Bulgaria, while Bosnia and Herzegovina are at the bottom of the list. The most significant improvement in the human development level is noticed in Albania, especially in the period 2010 – 2012. (Figure 6) (Figure 7).
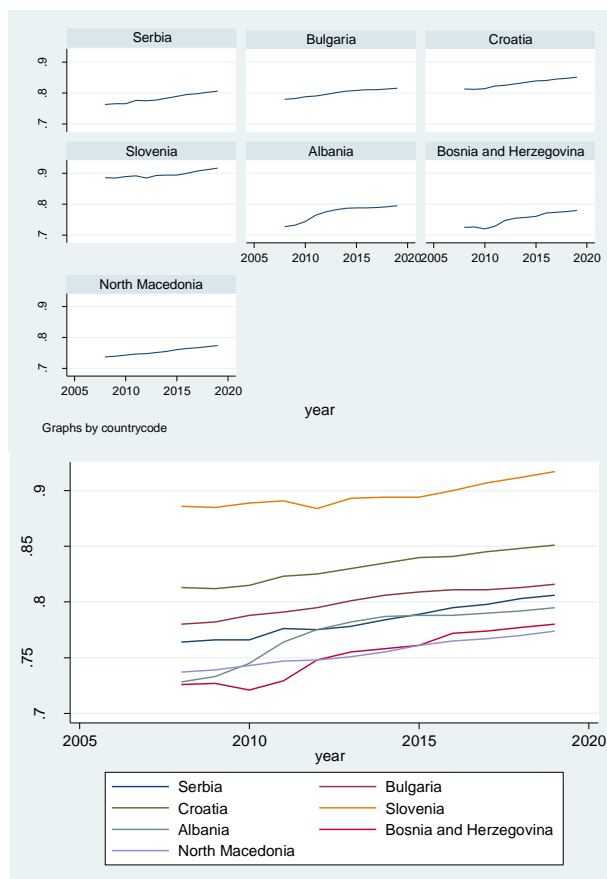
Figure 6 and Figure 7: Trends of the Human Development Indices in the selected Balkan countries

Before the mean values for HDI are observed, just for comparison, the study will show the trends of the GDP per capita for the same countries and the same observation period. Here the situation shows the more drastic difference between Slovenia and the rest of the panel of countries. Croatia is second with a high position as well in GDP per capita. In this graph Bulgaria is only slightly better than the rest of the countries. Then comes Serbia, followed by Bosnia and Herzegovina and North Macedonia following almost the identical trend of GDP per capita and at the bottom now is Albania (Figure 8) (Figure 9).
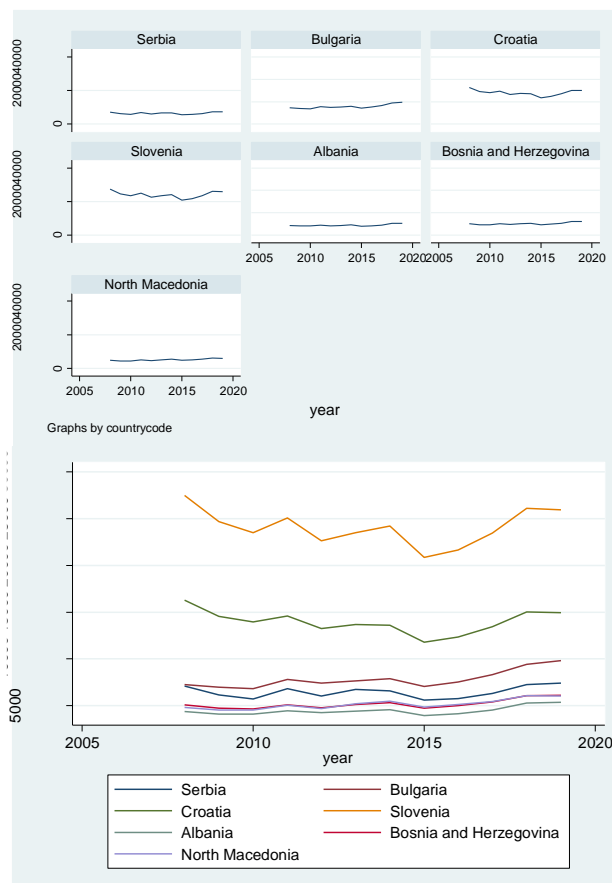
Figure 8 and Figure 9: Trends of the GDP per capita ($US) in the selected Balkan countries

Lastly, the mean values of the HDI and the GDP per capita are showed one next to another to make a comparison since GDP per capita is one of the three components of the HDI. From the bar graphs, it is easily noticeable that they do not correspond one to another. This supports the purpose of this study to use two models and investigate the relationship of each of them as independent variables with the budget transparency as dependent variable since both of them are indicators of the standard of living, yet show different results (Figure 10) (Figure 11).
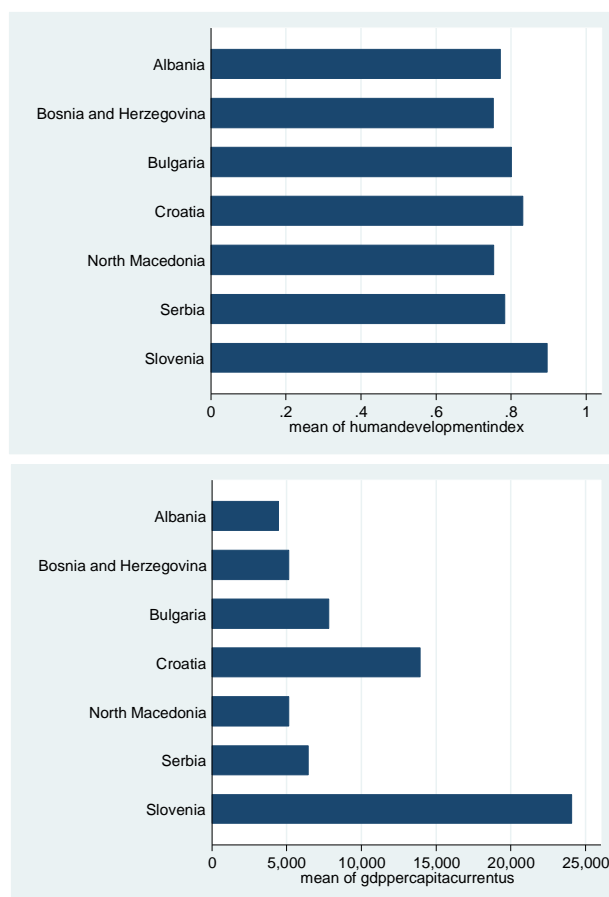
Figure 10 and 11: Mean values of HDIs and GDP per capita of the selected Balkan countries (2008-2019)

5. Empirical Results

As concluded from the descriptive analysis, the study needs to investigate two models:

(1) one where the standard of living is represented by the Human Development Index composed of all three components: life expectancy, education and per capita income

(2) the other where the standard of living is represented by the GDP per capita as the most frequently used indicator of the standard of living of the people within a country

The first model study estimates the parameters by the method of least squares aggregated (Pooled Least Squares) for the proposed model, which quantifies the correlation between the dependent variable (HDI) and independent (OBI). The following form for the regression equation is obtained:

$$HDI = 0.6379 + 0.0031*OBI \dots\dots\dots\dots\dots\dots (1)$$

```
    Source |    SS      df     MS          Number of obs =    42
-------------+----------------------------        F( 1,   40) =  55.10
      Model |  .062021729    1  .062021729        Prob > F    = 0.0000
   Residual |   .04502675   40  .001125669        R-squared   = 0.5794
-------------+----------------------------        Adj R-squared = 0.5689
      Total |  .107048479   41  .002610939        Root MSE    = .03355



--------------------------------------------------------------------------------
humandevelopm~x |    Coef.  Std. Err.     t   P>|t|    [95% Conf. Interval]
----------------+---------------------------------------------------------------
openbudgetindex |   .0030784   .0004147    7.42   0.000    .0022402   .0039166
          _cons |   .6378941   .0222071   28.72   0.000    .5930119   .6827763
```

Figure 12: Results from the Pooled Least Squares (HDI and OBI)

The method of Pooled Least Squares is used in preference to the Hausman method because our dataset has missing values for the years when the Open Budget Index is not calculated and published. The results of this model show that for every point of increase in the Open Budget Index, the country's Human Development Index increases by 0.0031 (increase by 0.31%). Overall this model is a good fit as it is able to explain 57.94% of the variability in HDI. The relationship between OBI and HDI is positive and significant, as would be expected.

Even though the Human Development Index paints a more holistic picture of the standard of living of a country, not often only one of the components of this index (GDP per capita) is closely observed when the dimension of standard of living is measured. The increase in GDP per capita as the total production of a country within a year, translates to a higher standard of living, while diminishing GDP per capita causes the standard of living to decline.

The method Pooled Least Squares is applied for this second model as well, since OBI which is published every two years, is once again the independent variable with missing values. The difference is in the dependent variable representing the standard of living and this variable is the GDP per capita. The following form for the regression equation is obtained:

GDP per capita = -11747.59 + 408.535*OBI ………………….. (2)

```
    Source |       SS        df       MS              Number of obs =    42
-------------+------------------------------          F( 1,   40) =  54.37
      Model |  1.0923e+09    1  1.0923e+09            Prob > F    = 0.0000
   Residual |   803592363   40  20089809.1            R-squared   = 0.5761
-------------+------------------------------          Adj R-squared = 0.5656
      Total |  1.8959e+09   41  46242013.2            Root MSE    = 4482.2


-------------------------------------------------------------------------------
gdppercapitac~s |     Coef.  Std. Err.    t   P>|t|    [95% Conf. Interval]
----------------+--------------------------------------------------------------
openbudgetindex |    408.535   55.40388   7.37  0.000    296.5596   520.5104
          _cons |  -11747.59  2966.702   -3.96  0.000   -17743.51  -5751.658
```

Figure 13: Results from the Pooled Least Squares (HDI and OBI)

As was expected, the value of the obtained Open Budget Index is statistically significant and result in a positive impact that an increase of 1 unit of it leads to an increase of 408.535 US dollars of the GDP per capita. Overall this model has a same goodness of fit as the previous model since it is able to explain 57.61% of the variability in GDP per capita. The relationship between OBI and GDP per capita is positive and significant, as would be expected.

The determination coefficients of both models shows that the influence of the independent variable over the dependent variables (HDI and GDP per capita) are about 60%. The adjusted values of the determination coefficients (expressing the quality of the variables included in the model) suggest that the relevance of the information of independent variable in describing the dynamics of the respective dependent variable is quite high (60%).

6. Results and Discussions

The results confirm the hypothesis set out in this research that budget transparency positively affects the living standard and we interpret the regression equations like this: as expected, the OBI indicator has a positive impact and indicates that an increase of one unit in OBI leads to an increase of 0.0031 in the Human Development index of the respective countries; also, the OBI has a positive and significant impact on the GDP per capita and indicates that an increase of one unit in OBI results in increase of 408.5 US dollars increase in the GDP per capita. Both of our models confirm the alternative hypothesis that there is a positive and significant relationship between budget transparency and the standard of living.

The validity of this model is sustained on account of low probability values (all variables are significant at a threshold over 99%), the value of the standard error, as well as on the basis of the determined report which lies at 60%.

7. Conclusion

This study tried to bring a contribution to the literature on the standard of living and budget transparency. In other words, the proposed models show if and to which extent does budget transparency affect the GDP per capita and the overall human development. This empirical analysis was based on a panel regression model for seven countries from the Balkan region, from different stages of human development (high human development, medium human development, low human development) and whose data are from the period of 2008 – 2019.

The research supports that countries facing increasing transparency shall ensure for themselves an increase in the level of human development, an improvement in the quality of government's policies as well as providing vital information to the public. These should keep increasing budget transparency in order to encourage economic growth. By being more transparent, countries will see improvements in all aspects of human development - life expectancy, education, and per capita income.

The results of the research can be used as a guideline for investigating the effects of the adopted strategies for human development and to improve national budgetary policies through a direct contribution to budgetary transparency in all countries, regardless of their level of development. As a result, human development should take precedence in government initiatives, particularly in developing nations, as well as in organizations that may successfully assist these countries in achieving long-term growth through the globalization process.

References

Alt, J. E. and Lowry R.C., 2010, "Transparency and Accountability: Empirical Results for US States", Journal of Theoretical Politics, 22(4), 379-406

Asiedu, E. & Freeman, J. (2009) "The effect of corruption on investment growth: evidence from firms in Latin America, Sub-Saharan Africa, and Transition Countries", Rev. Dev. Econ., vol. 13: 200–214

Badun, M. (2009) „Budget Transparency", Financial Theory and Practice: 481-483

Bellver, A. and Kaufmann, D., 2005, "Transparency: Initial empirics and policy implications" Unpublished manuscript

Cimpoeru, M. V. (2015) "Increasing Budget Transparency and Control of Corruption – Strategy to Increase Human Development", International Journal of Business, Humanities and Technology, Vol. 5, No. 4

Faisal Sultan Qadri and Abdul Waheed, 2014, "Human capital and economic growth: A macroeconomic model for Pakistan" Economic Modelling, 42, 66–76

Gavazza, A. and A. Lizzeri, 2009, "Transparency and Economic Policy", Review of Economic Studies 76(3), 1023-1048

Hameed, F. , 2005, "Fiscal transparency and economic outcomes", IMF Working Paper, WP/225 Washington, DC: International Monetary Fund

Haque, M.E. & Neanidis, C.K. (2009) "Fiscal Transparency and Corruption Centre for Growth and Business Cycle Research", Economic Studies, vol. 114: 1-7

Heald, D. (2012) "Why is transparency about public expenditure so elusive?", International Review of Administrative Sciences, vol. 78(1): 30–49

Islam, R., 2003, "Do more transparent governments govern better?" World Bank Policy Research Working Paper, 3077, Washington, DC: World Bank

Kopits, G. & Craig, J. (1998) "Transparency in government operations", IMF occasional paper: 158

Mauro P. (1995) „Corruption and growth", Q. J. Econ, vol. 110(3): 681–712 Benito and Bastida, 2009

Prat, A. (2006) "The wrong kind of transparency", Am. Econ. Rev., vol. 95 (3): 862–877

Renzio, P. & Masud, H. (2011) "Measuring and Promoting Budget Transparency: The Open Budget Index as a Research and Advocacy Tool", An International Journal of Policy, Administration, and Institutions, vol. 24(3): 607–616

Svensson, J. (2005), "Eight questions about corruption", J. Econ. Perspect, vol. 19 (3): 19–42

Wilson, R. A. and Briscoe, G. (2004) "The impact of human capital on economic growth: a review"

www.openbudgetindex.org

http://data.worldbank.org/indicator/GDP per capit

https://countryeconomy.com/hdi/macedonia

Determination of Brand Personality Characteristics in Healthcare Services

Emre Çolakoğlu

Kilis 7 Aralık University, Turkey

Feride Bal

Gaziantep University, Turkey

Abstract

Increasing competition and the unique characteristics of the health sector necessitate private hospitals to differentiate their products and services from their competitors in order to maintain their existence and make a profit. However, this differentiation has made it almost impossible to differentiate based on these features, as the ease of access to information and technology transfer make the functional features of products and services easy to imitate. For this reason, differentiation is about establishing emotional and symbolic bonds with customers. The best way to do this is to create brands with distinctive personalities. Brand personality is the set of human characteristics associated with a brand. Consumers prefer brands not only because they are suitable for their needs, but also because they are compatible with their original or ideal personality traits. Therefore, a well-formed brand personality is an important brand component that contributes to the preference of that brand by influencing consumers' attitudes and future behavior.

The aim of this study is to determine the brand personality specific to private hospitals operating in the health services sector. In this context, data were collected by applying face-to-face questionnaires to people who receive health services from private hospitals operating in Gaziantep. The convenience sampling method, which is one of the non-random methods, was used in the selection of the participants. To measure brand personality, a 42-item scale consisting of sincerity, excitement, competence, sophistication and ruggedness dimensions, previously used in many different industries, was used. The structure formed as a result of the factor analysis reveals the brand personality dimensions of private hospitals. Although brand personality studies have been carried out in many areas before, there are very few studies in the health services sector. For this reason, it is thought that the results of this research will contribute to both the academic field and the field of practice.

Keywords: Brand Personality, healthcare

1. Introduction

The proportion of private hospitals in healthcare services in Turkey has increased rapidly since the 2000s (Çetin, 2022). With the increase in health awareness, socio-economic developments and the easy accessibility of private health services, the number of private hospitals has increased. This increase has led to an intense competitive environment (Zengin & Sağlam, 2022). The health services sector has different and complex characteristics from other service sectors. The intangibility of the service provided makes it difficult to predict the results of the service in advance. The determination of the needs of patients who are in the position of service recipients, the determination of the scope, cost and time of meeting the needs by experts or hospitals in the position of service providers causes a great information asymmetry between the parties (Bilgili & Ecevit, 2008). This situation may cause concerns and mistrust about the quality of hospitals providing health services, the accuracy of diagnosis and treatment, and the protection of personal health data (Chang et al. 2013). The fact that the need for health services other than chronic diseases is random, non-substitutable and non-postponable creates uncertainty for service providers as well as service recipients (Karaçor & Arkan, 2014).

Increasing competition and the unique characteristics of the health sector require private hospitals to differentiate their products and services from their competitors in order to survive and make a profit. However, this differentiation has become almost impossible due to the ease of access to information and technology transfer, which makes the functional features of products and services easily imitable. Therefore, differentiation is based on establishing emotional and symbolic bonds with customers (Guiry & Guanajuato, 2013). Due to all these characteristics, it is more difficult for private hospitals to increase customer trust, reduce the high perception of pre-purchase risk and eliminate the difficulties in assessing quality than firms in other sectors, and the best way to overcome these challenges is to create distinctive brands (Kemp et al. 2014).

Creating consistent and memorable brands in the healthcare sector is an important marketing tool to differentiate the service from competitors (Piaralal & Mei, 2015). At the same time, brands are a communication tool that enables market segmentation by communicating different messages to different customer groups through personalization of services (Aguerrebere et al. 2015). As a set of promises about services, brands help to create characteristics associated with the organization in the minds of customers and to establish positive emotional and symbolic bonds. Brand personality is one of the important concepts to create a differentiated brand identity by positively strengthening consumers' attitudes and behaviors about the brand (Özçelik & Torlak, 2011). Although many studies have been conducted to examine the personality traits and dimensions of brands in various sectors, there is almost no research examining the brand personality traits and dimensions of private hospitals in

172

the field of health services. Therefore, the purpose of this study is to examine the brand personality traits of private hospitals.

2. Conceptual Framework and Literature

In addition to the tendency to have expectations about a brand's specific features, performance and functional benefits, consumers also create symbolic meanings about brands in their minds. This symbolic meaning is felt through the perception of a unique brand personality by associating human characteristics with the identity of that brand (Kim & Lehto, 2013; Sharifsamet et al., 2018). Brand personality is a type of brand association that explains symbolic consumption and the emotional ties consumers have with a brand (Aaker et al. 2004). Brand personality is a metaphor for the implicit idea that a consumer feels affinity for brands based on their own personality (Bairrada et al. 2019). Anthropomorphizing is a behavioral tendency defined as the human tendency to attribute human characteristics to inanimate objects (Aggarwal & McGill, 2012; Letheren et al. 2017). Consumers prefer brands not only because they fit their needs but also because they are compatible with their actual or ideal personality traits (Bekk et al. 2015). Therefore, a well-formed brand personality is an important brand component that contributes to the preference and ownership of a brand by influencing consumers' attitudes and future behaviors (Dickinger & Lalicic, 2016). A brand's personality is used as a means for consumers to express themselves or to differentiate themselves from other people by using the brand's prominent personality trait (Phau & Lau, 2001).

According to Aaker (1997), brand personality is the set of human characteristics associated with a brand and consumers use brand personalities to compare products in various categories. Aaker's (1997) study was the first to create a robust, reliable and valid scale to measure brand personality (George & Anandkumar, 2018). The scale, theoretically conceptualized within the framework of the Big Five human personality, consists of five dimensions (sincerity, sophistication, ruggedness, excitement and competence) composed of 42 statements. Although it has been criticized in many ways, it is the most widely used scale in the literature to measure brand personality (Saeed et al. 2021).

Although brand personality is a concept that has been extensively researched in many different product and service sectors, it is a subject that has hardly been researched in the health services sector, especially in hospitals. In one of these studies, Guiry and Guanajuato (2013) analyzed the website of Bumburgand Hospital in Thailand through content analysis based on Aaker's brand personality scale. As a result, he stated that the most prominent personality traits of the hospital are sincerity and competence. In another study, Aji and Muslichah (2022) examined the brand personality of Islamic hospitals in Malaysia. They concluded that halal brand personality, which consists of the dimensions of purity, excitement, safety, sophistication and righteousness, is

influenced by self-expression value, and halal brand personality has a significant effect on brand loyalty.

3. Method

This study was conducted to determine the brand personalities of private hospitals. For this purpose, a face-to-face survey was conducted with patients and patient relatives who receive services in the outpatient clinic department of five hospitals operating in Gaziantep. As a sampling method, quota sampling method, which is one of the non-random methods, was used to take an equal number of samples from five hospitals. The hospitals included in the study were selected based on the criteria of being in service for at least five years, similar in terms of technical and medical expertise, medical department and bed capacity, and having an agreement with the social security institution. The questionnaire form used to collect data from the participants consists of two parts. The first part includes demographic questions about gender, marital status, age, education and income of the participants. In the second part, Aker's (1997) brand personality scale, which consists of 42 statements and five dimensions, was used as a five-point Likert scale to determine brand personality characteristics specific to private hospitals. PLS structural equation modeling method was used to analyze the data.

4. Results

According to the gender distribution of the individuals participating in the study, 283 (56.6%) were female and 217 (43.6%) were male; according to their marital status, 341 (68%) were married and 159 (31.8%) were single. In terms of age groups, the largest group is between the ages of 21-39 with 178 (35.6%) participants and the smallest group is between the ages of 56-74 with 90 (18%) participants. Regarding educational status, the largest group consists of 167 (33.4%) associate degree graduates and the smallest group consists of 27 (5.4%) postgraduate graduates. In terms of income distribution, the largest group consists of 234 (46.8%) participants with an income of 5500 TL and below, and the smallest group consists of 32 (6.4%) participants with an income of 11501 TL and above. Detailed information on the demographic characteristics of the participants is shown in Table 1.

Table 1: Demographic Data of Participants

Variable	f	%
Gender		
Woman	283	56.6
Male	217	43.4
Total	500	100
Marital Status		
Married	341	68.2
Single	159	31.8
Total	500	100
Age		
$20 \leq$	129	25.8
21-39	178	35.6
40-55	103	20.6
56-74	90	18
Total	500	100
Education Level		
Primary education	79	15.8
High school	73	14.6
Associate degree	167	33.4
Bachelor's degree	154	30.8
Postgraduate degree	27	5.4
Total	500	100
Income Status (TL)		
$5500 \leq$	92	18.4
5501- 7500	234	46.8
7051- 9500	99	19.8
9501- 11500	43	8.6
$11501 \geq$	32	6.4
Total	500	100

While evaluating the measurement model, factor loadings of the statements for item reliability, Cronbach's alpha (CA) and Composite Reliability (CR) for internal reliability, Variance Inflation Factor (VIF) to check the linear connection problem, Average Variance Explained (AVE) for convergent validity, cross-loadings table, Fornell and Larcker criterion and Heterotrait-Monotrait (HTMT) ratios for discriminant validity were examined. Items that did not meet these criteria were removed and the analyses were repeated. After removing 24 statements under various dimensions, 18 statements were grouped under five dimensions in accordance with the original scale.

As a result of the analysis; item reliability since the loadings of the items constituting the variables are above 0.50 and statistically significant (p< 0.05) (Hulland, 1999); internal consistency (reliability) as the CA and CR values of the variables are greater than 0.70 (Bagozzi & Yi, 1988), multicollinearity problem as VIF values are less than 5 (Wong, 2013) and as AVE values are greater than 0.5 (Hair et al. 2019) convergent validity criteria were met. Detailed information about these values is shown in Table 2.

Tablo 2: Measurement Model

Factor	Loading	VIF	CA	CR	AVE
Sincerity			0.609	0.783	0.547
Friendly	0.792	1.102			
Original	0.712	1.364			
Family-oriented	0.712	1.364			
Excitement			0.663	0.812	0.591
Exciting	0.720	1.517			
Spirited	0.834	1.564			
Contemporary	0.747	1.139			
Competence			0.760	0.836	0.509
Reliable	0.661	1.474			
Hard working	0.707	1.994			
Secure	0.663	1.300			
Technical	0.871	2.472			
Successful	0.641	1.213			
Sophistication			0.576	0.777	0.540
Glamorous	0.775	1.258			
Good looking	0.809	1.217			
Smooth	0.605	1.115			
Ruggedness			0.786	0.851	0.589
Masculine	0.809	1.355			
Western	0.674	1.573			
Tough	0.842	2.630			
Rugged	0.734	2.127			

The discriminant validity of the measurement model was examined with three different methods and it was found that discriminant validity was achieved with each of these three methods. The first method is the examination of the cross loadings table. In this method, when each of the items loads on the variable to which it belongs at a higher rate than the other variables, it means that discriminant validity is achieved (Hair et al. 2011). When Table 3 is examined, it is seen that each of the statements in the model loads on the variable they belong to at a higher rate than the others.

Table 3: Cross Loading

	Sincerity	Excitement	Competence	Sophistication	Ruggedness
Friendly	**(0.792)**	0.265	0.364	-0.015	0.042
Original	**(0.712)**	-0.005	0.104	-0.008	-0.007
Family-oriented	**(0.712)**	-0.005	0.104	-0.008	-0.007
Exciting	0.105	**(0.720)**	0.487	-0.011	0.064
spirited	0.124	**(0.834)**	0.564	-0.010	0.370
Contemporary	0.124	**(0.747)**	0.475	-0.010	0.077
Reliable	0.155	0.508	**(0.661)**	-0.008	0.098
Hard working	0.105	0.356	**(0.707)**	-0.011	0.064
Secure	0.124	0.413	**(0.663)**	0.122	0.303
Technical	0.155	0.508	**(0.871)**	-0.008	0.098
Successful	0.482	0.575	**(0.641)**	-0.011	0.064
Glamorouss	-0.009	-0.008	0.074	**(0.775)**	0.277
Good looking	-0.011	-0.009	-0.009	**(0.809)**	0.062
Smooth	-0.014	-0.013	-0.013	**(0.605)**	0.248
Masculine	-0.012	0.093	0.047	0.337	**(0.809)**
Western	-0.010	0.123	0.065	0.137	**(0.674)**
Tough	0.083	0.408	0.398	0.123	**(0.842)**
Rugged	-0.010	0.123	-0.008	0.034	**(0.734)**

The second method used to determine the discriminant validity is the Fornell and Larcker criterion. In this method, the fact that the square root of the AVE values of each variable is greater than the correlation coefficient between them and other variables indicates that the discriminant validity is ensured (Fornell & Larcker, 1981). When Table 4 is examined, it is seen that the square root of the AVE values of each variable is greater than the correlation coefficients between them and other variables.

Table 4: Fornell and Larcker Criterion

	Competence	Excitement	Ruggedness	Sincerity	Sophistication
Competence	**0.713**				
Excitement	0.661	**0.768**			
Ruggedness	0.175	0.244	**0.768**		
Sincerity	0.294	0.155	0.020	**0.740**	
Sophistication	0.024	-0.013	0.244	-0.015	**0.735**

The third method used to see whether the discriminant validity is ensured is to examine the HTMT ratios. HTMT is the ratio of the arithmetic mean of the correlations of the items of all variables in the model (heterotrait heteromethod correlation) to the geometric mean of the correlations of the items of the same variable (monotrait

heteromethod correlation) (Henseler et al. 2014). When the HTMT ratios are below 0.85 or 0.90, it means that the discriminant validity of the model is ensured (Hair et al. 2017). When Table 5 is examined, since it is seen that the HTMT ratios are lower than 0.85, it is determined that the discriminant validity of the model is ensured with this method.

Table 5: HTMT Ratios

	Competence	Excitement	Ruggedness	Sincerity	Sophistication
Competence					
Excitement	0.924				
Ruggedness	0.229	0.315			
Sincerity	0.371	0.191	0.046		
Sophistication	0.074	0.022	0.346	0.024	

5. Conclusion

This study was conducted to determine the brand personality characteristics of private hospitals. A face-to-face survey was conducted with 500 people receiving services from five private hospitals in Gaziantep city. The data collected using Aaker's brand personality scale were analyzed by factor analysis. As a result of the analysis, 24 out of 42 statements were excluded from the analysis because they did not meet the validity and reliability criteria. In the final situation, 18 statements in the Aaker scale were grouped under five dimensions in accordance with the original. The resulting dimensions and their constituent statements are shown in Figure 1.
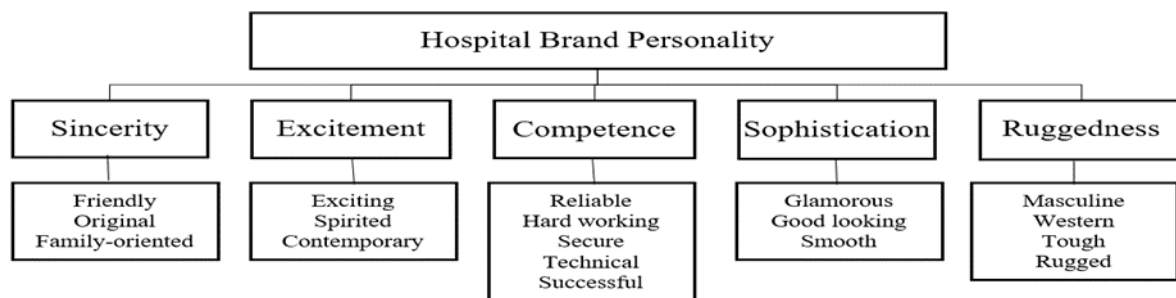
Figure 1: Hospital Brand Personality

Although the concept of brand personality has been and continues to be extensively examined in many sectors and product categories, there are almost no studies examining the brand personality of hospitals operating in the field of health services. This study is thought to help fill the gap in the academic literature in terms of showing that hospitals can have distinctive and distinctive brand personality characteristics as in other sectors and that the brand personality concept put forward by Aaker (1997) may also be valid for health services. It is also thought to provide important contributions in terms of professional practices operating in health services. Especially in markets like Turkey where there is intense competition in the field of healthcare services, it has become inevitable for hospitals to create strong brand images in order

to differentiate themselves from their competitors and increase their preferability by establishing emotional and symbolic bonds. It is important for marketing managers of hospitals to utilize the unique personality traits specific to their own brands in addition to the basic personality traits revealed in this study in their image development efforts.

The study has some limitations. The first one is that only five hospitals in Gaziantep were included in the study. The second one is that it is limited to Aaker's (1997) brand personality traits while examining the personality traits of hospitals. In future studies, collecting data from hospitals in different cities and examining hospital-specific personality traits in addition to generic brand personality traits may contribute to the generalization of the findings obtained in this study and the emergence of a hospital-specific brand personality scale.

References

Aaker, J. L. (1997). Dimensions of brand personality. Journal of Marketing Research, 34(3), 347-356.

Aaker, J. L., Fournier, S. & Brasel, S. A. (2004). When good brands do bad. Journal of Consumer Research, 31(1), 1-16.

Aggarwal, P. & McGill, A. L. (2012). When brands seem human, do humans act like brands? Automatic behavioral priming effects of brand anthropomorphism. Journal of Consumer Research, 39(2), 307-323.

Aguerrebere, P. M., Gazol, P. B. & Heath, R. L. (2015). Brand dissemination in Canadian hospitals through facebook. The International Journal of Communacation and Health (7), 27-39.

Aji, H. M. & Muslichah, I. (2022). Is halal universal? The impact of self-expressive value on halal brand personality, brand tribalism, and loyalty: Case of Islamic hospitals. Journal of Islamic Marketing. https://doi.org/10.1108/JIMA-10-2021-0327

Bagozzi, R. P. & Yi, Y. (1988). On the evaluation of structural equation models. Journal of the Academy of Marketing Science, 16(1), 74-94.

Bairrada, C. M., Coelho, A. & Lizanets, V. (2019). The impact of brand personality on consumer behavior: The role of brand love. Journal of Fashion Marketing and Management, 23(1), 30-47.

Bekk, M., Spörrle, M. & Kruse, J. (2015). The benefits of similarity between tourist and destination personality. Journal of Travel Research, 55(8), 1008-1021.

Bilgili, E. & Ecevit E. (2008) Sağlık hizmetleri piyasasında asimetrik bilgiye bağlı problemler ve çözüm önerileri. Hacettepe Sağlık İdaresi Dergisi 11(2), 200-228.

Chang C. S., Chen S. Y. & Lan Y. T. (2013). Service quality, trust, and patient satisfaction in ınterpersonal-based medical service encounters. BMC Health Services Research, 13(1). https://doi.org/10.1186/1472-6963-13-22

Çetin, B. (2022). Özel zincir hastanelerin marka konumlarının algılama haritaları yardımıyla incelenmesi. Gazi İktisat ve İşletme Dergisi, 8(2), 281-298.

Dickinger, A. & Lalicic, L. (2016). An analysis of destination brand personality and emotions: A comparison study. Information Technology & Tourism, 15(4), 317-340.

Fornell, C. & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18(1), 39-50.

George, J. & Anandkumar, V. (2018). Dimensions of product brand personality. Vision, 22(4), 377-386.

Guiry, M. & Guanajuato, S. (2013) Bumrungrad International Hospital's brand personality: A content analysis of medical tourists' online patient testimonials. Int. J. Leisure and Tourism Marketing 3(4), 328-343.

Hair, J. F., Hult, G. T. M., Ringle, C. M. & Sarstedt, M. (2017). A primer on partial least squares structural equation modeling (PLS-SEM) (2nd ed.). SAGE Publications.

Hair, J. F., Ringle, C. M. & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. The Journal of Marketing Theory and Practice, 19(2), 139–152.

Hair, J. F., Risher, J. J., Sarstedt, M. & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM article information. European Business Review, 31(1), 2-24.

Henseler, J., Ringle, C. M. & Sarstedt, M. (2014). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115-135.

Hulland, J. S. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. Strategic Management Journal, 20(4), 195-204.

Karaçor, S. & Arkan, A. (2014). Sağlık kuruluşlarında pazarlama: Sağlık pazarlama karması unsurlarının hasta/müşterı̇ açısından önemı̇. Selçuk İletişim 8(2), 90-118.

Kemp E., Jillapalli R. & Becerra E. (2014). Healthcare branding: Developing emotionally based consumer brand relationships. Journal of Services Marketing, 28(2), 126-137.

Kim, S. & Lehto, X. Y. (2013). Projected and perceived destination brand personalities: The case of South Korea. Journal of Travel Research, 52(1), 117-130.

Letheren, K., Martin, B. A. S. & Jin, H. S. (2017). Effects of personification and anthropomorphic tendency on destination attitude and travel intentions. Tourism Management, 62, 65-75.

Özçelik, D. G. & Torlak, Ö. (2011). Marka kişiliği algısı ile etnosentrik eğilimler arasındaki ilişki: Levis ve Mavi Jeans üzerine bir uygulama. Ege Akademik Bakış, 11(3), 361-377.

Phau, I. & Lau, K.C. (2001). Brand personality and consumer self-expression: Single or dual carriageway? Journal of Brand Management, 8(6), 428-444.

Piaralal, S. & Mei, T. M. (2015) Determinants of brand equity in private healthcare facilities in Klang Valley, Malaysia. American Journal of Economics, 5(2), 177-182.

Saeed, M. R., Burki, U., Ali, R., Dahlstrom, R. & Zameer, H. (2021). The antecedents and consequences of brand personality: A systematic review. EuroMed Journal of Business. https://doi.org/10.1108/EMJB-12-2020-0136

Sharifsamet, S., Jin, H. S. & Martin, B. (2018). Marketing destinations: The impact of destination personality on consumer attitude. Journal of Strategic Marketing. https://doi.org/10.1080/0965254X.2018.1485726

Wong, K. K.-K. (2013). Partial Least Squares Structural Equation Modelling (PLS-SEM) techniques using SmartPLS. Marketing Bulletin, 24, 1-36.

Zengin, A. Y. & Sağlam, Ş. (2022). Özel hastanelerde müşteri memnuniyeti unsurları ve sadakatin büyükşehir-şehir kıyaslaması. Süleyman Demirel Üniversitesi Vizyoner Dergisi, 13(33), 122-142.

Does Income Distribution Affect Environmental Quality

Elif Koçak

Gaziantep University, Turkey

Mehmet Akif Destek

Gaziantep University, Turkey

Abstract

This study aims to investigate the impact of income distribution on environmental quality in Turkey. For this purpose, the effects of Gini coefficient, income per capita, energy consumption per capita and trade openness on carbon emissions are analyzed with ARDL bound test approach for the period from 1990 to 2019. According to the findings, it is found that income per capita does not have any significant effect on environmental degradation. However, increasing energy consumption increases carbon emissions. Furthermore, we found the evidence that increasing Gini coefficient and trade openness reduces environmental degradation.

Keywords: Gini coefficient, Energy Consumption, Carbon Emissions

1.Introduction

Researchers have been interested in the connection between economic growth and income inequality for almost a century. It is crucial for policymakers to comprehend this relationship in order to determine how the increase in output should be distributed across the diverse components of an economy and what impact this distribution may have on future growth. It is also a contentious topic since empirical research on it has usually produced conflicting results and it is challenging to combine many hypotheses (Garca-Pealosa, 2010).

The Kuznets Curve Hypothesis, which was created by Kuznets in 1955, forms the cornerstone of theories on how income disparity affects the environment. This theory states that income disparity grows in the early phases of economic growth, then declines after a specific income level is achieved. The relationship between economic inequality and environmental quality is explained by a variety of explanations. The political economics approach (PEA), which looks at how classes relate to political power, is the first of these hypotheses. The PEA theory contends that individuals with economic and political power—the "winners" group—are also those who pollute the environment, while others who miss out on the benefits of economic activity belong to the "losers" group (Boyce, 1994). The marginal propensity to emitt (MPE) approach, the second method, contends that low-income households have a larger marginal propensity to consume (MPC) than high-income households do. The convergence in the income distribution between the segments will result in a higher marginal emission trend, or MPE, in this case because the low-income segment will consume more energy on the route to the high-income level (Hailemariam et al., 2019). The Veblen method, which is the third strategy, postulates that people in a particular social class have a propensity to compare themselves to persons in the immediately superior social class and emulate their purchasing habits in countries with increased income disparity (Veblen, 1934; Grunewald et al., 2017).

This study aims to investigate the connection between environmental degradation and income inequality in Turkey. For this, a data set spanning the years 1990–2019 is used to analyze the impacts of the Gini coefficient, real GDP, energy consumption, and trade liberalization on carbon emissions.

2. Empirical Model and Data

In order to observe the impact of income distribution on environmental degradation, we construct an empirical model as follows:

$$co_t = a_0 + a_1 y_t + a_2 ec_t + a_3 gini_t + a_4 tr_t + u_t$$

where co, y, ec, gini and tr indicate the carbon emissions per capita which is used as a proxy of enviromental pollution, y is gross domestic product (GDP) per capita that is used as proxy of economic growth, ec means energy consumption per capita, gini is

the gini index as a proxy of income inequality and tr is the share of total trade in gross domestic product as a proxy of trade openness.

As for datasets for the mentioned variables, the data of co, y, ec and tr is obtained from World Development Indicators of World Bank. Furthermore, the data of gini coefficients are downloaded from SWIID Version 9.3 of Solt (2020). During empirical analysis, the annual data from 1990 to 2019 is analyzed.

We utilized with ARDL bound test procedure to check the short and the long run impact of explanatory variables on environmental pollution. The most important reason for using this method in the study is that it allows us to examine the relationship between integrated variables at different levels.

3. Empirical Findings

In empirical procedure, we first observe the stationary properties of variables using with ADF unit root test. According to the results, it seems that the null of unit root is accepted for all variables excluding Gini coefficient at level form of variables. In first differenced-form, all variables are stationary. After this step, we used ARDL bound test approach to observe the existence of cointegration process and the findings are presented at Table 1. It can be seen that the computed F-statistic is bigger than critical values at 10 and 5 percent level, respectively. This situation means there is long-run relationship between variables in the model and they are cointegrated.

Table 1. Results of the ARDL Bound Test

Model	Lags	F-statistics
co=f(y,ec,gini,tr)	(1,0,0,1,1)	4.618**
Critical Values	Lower Bound	Upper Bound
10%	2.680	3.530
5%	3.050	3.970
1%	3.810	4.920

Note: ** indicates statistical significance at 5 percent level.

After determining the cointegration relationship between variables, we check the short and long run impacts of explanatory variables on carbon emission using with ARDL estimation. The results shown in Table 2 reveal that real GDP and trade openness do not have statistically significant effect on carbon emission in the short run. However, increasing energy consumption increases environmental pollution and increasing income inequality reduces the pollution.

Table 2. Results of the Short and Long Run Coefficients

Variables	Coefficient	p-values
Short Run		
$\Delta co(-1)$	0.201*	0.084
Δy	0.178	0.282
Δec	0.756***	0.000
$\Delta gini$	-0.092***	0.006
Δtr	0.008	0.853
ECT(-1)	-0.945***	0.000
Long Run		
y	0.133	0.379
ec	0.686***	0.000
gini	-0.487***	0.001
tr	-0.125*	0.060

Note: *, ** and *** indicate statistical significance at 10, 5 and 1 percent level, respectively.

In the long-run, similar to the short-run results, the coefficient of economic growth is not significant. Increasing energy consumption increases the emission level. However, increasing income inequality and increasing trade liberalization reduces environmental pollution.

4. Conclusions

This study mainly investigates the impact of income inequality on environmental pollution in Turkey. Based on this, we used annual data of 1990-2019 using with ARDL bound test procedure. According to the bound test, the cointegration relationship between variables are validated. In addition, we found that real GDP and trade openness do not have statistically significant effect on carbon emission in the short run. However, increasing energy consumption increases environmental pollution and increasing income inequality reduces the pollution. Furthermore, the coefficient of economic growth is not significant. Increasing energy consumption increases the

emission level in the long-run. However, increasing income inequality and increasing trade liberalization reduces environmental pollution.

These finding reveal that increasing income inequality increases environmental quality in Turkey. Based on this finding, it can be said that in case of an increase in the income level of the low-income segment, this segment allocates the increased income for relatively energy-intensive or pollution-intensive products.

References

Boyce, J. K. (1994). Inequality as a cause of environmental degradation. *Ecological economics*, *11*(3), 169-178.

García-Peñalosa, C. (2010). Income distribution, economic growth and European integration. *The Journal of Economic Inequality*, *8*(3), 277-292.

Grunewald, N., Klasen, S., Martínez-Zarzoso, I., & Muris, C. (2017). The trade-off between income inequality and carbon dioxide emissions. *Ecological Economics*, *142*, 249-256.

Hailemariam, A., Dzhumashev, R., & Shahbaz, M. (2020). Carbon emissions, income inequality and economic development. *Empirical Economics*, *59*(3), 1139-1159.

Kuznets, S. (2019). Economic growth and income inequality. In *The gap between rich and poor* (pp. 25-37). Routledge. Macmillan, New York, U.S.

Solt, F. (2020). "Measuring Income Inequality Across Countries and Over Time: The Standardized World Income Inequality Database." Social Science Quarterly 101(3):1183-1199. SWIID Version 9.3, June 2022.

Veblen, T., (1899). The Theory of the Leisure Class: an Economic Study of Institutions.

Time-Varying Relationship between Oil Price and Unemployment in Turkey

Mehmet Akif Destek

Gaziantep University, Turkey

Abstract

The purpose of this research is to look into the relationship between crude oil prices and unemployment rates in Turkey which is an oil-importer country. For this purpose, the period from 2005m1 to 2021m8 is taken into account, and the time-varying causality method based on parameter instability is employed. In addition, for periods when causality from oil prices to unemployment is valid, the time-varying coefficient estimator is employed to determine how unemployment rates are affected by oil prices. The results of the research primarily indicate to parameter instability. Furthermore, in the sub-periods 2008m3-2008m8, 2012m2-2012m5, and 2020m4-2020m9, the positive sign causation from oil prices to unemployment rates is valid. When the above-mentioned periods are examined, it is clear that these sub-periods correspond to times when global oil prices see sharp increases. Positive causality from unemployment rates to oil prices, on the other hand, is observed in the sub-periods 2008m5-2008m9 and 2019m7-2019m8.

Keywords: Crude oil price, unemployment, parameter instability, time-varying

1.Introduction

In terms of both effects and causes, unemployment rates are recognized as a key indication of a nation's economic progress. Numerous research on the factors that affect unemployment are done in this field. The link between oil prices and unemployment has been studied recently due to the great volatility in oil prices and the fact that oil is closely tied to the production structures and volumes of nations. The impacts of oil prices on unemployment appear through a variety of avenues, notably for oil importing nations, despite the fact that it is commonly acknowledged that rises and declines in oil prices depend on whether the countries are oil exporters or oil importers.

The classical supply side impact is the name of the initial route for the link between oil prices and unemployment. This channel claims that rising oil prices result in less basic input being available for production, a slower pace of growth, and lower productivity, which raises unemployment (Brown and Yucel, 2002). The wealth transfer effect is the name of the second channel. This channel claims that wealth transfers in the form of oil payments to oil exporting nations lower global demand and raise unemployment in oil importing nations (Ahmad, 2013). Real balance effect is a different channel. This channel claims that rising oil prices lead to an increase in the demand for money, and that if the monetary authorities can't keep up with the demand, interest rate increases would limit GDP (Dogrul and Soytas, 2010). The fifth and final channel is known as the sector adjustment effect, and according to this channel, due to an increase in production costs because of rising oil prices, which results in the churning of the economy (Tang et al., 2009). Since skills cannot be acquired over a short period of time and finding a new job takes time, unemployment ultimately ensues (Beaudreau, 2005).

In light of this knowledge, the goal of this study is to investigate the connection between the price of oil and unemployment for Turkey, a nation that imports oil. For this reason, an asymmetric time-varying causality test is used to look at the connection between oil prices and unemployment in Turkey.

2. Empirical Strategy

In order to observe the asymmetric and nonlinear relationship between oil price and unemployment, we observed the monthly period from 2005m01 to 2021m08 for crude oil price (OP) and unemployment rate (UNE) of Turkey. The data of real crude oil price as a proxy for OP is obtained from US Energy Information Administration and the unemployment rate (UNE) is obtained from OECD Database. In regard with methodology, the stationary properties of variables are checked with the unit root test of Narayan and Popp (2010) which allows structural breaks with the null hypothesis of unit root. Furthermore, the possible cointegration among variables are searched with the time-varying cointegration test of Bierens and Martins (2010) and Martins (2018) with the null of time invariant cointegration. After this step, we utilized with

189

the combination of two procedures, first we separated the series to with the positive and negative shocks following the asymmetric causality procedure of Hatemi J (2012) and checked the time-varying relationship between variables with bootstrap rolling window estimation of Balcılar (2010).

3. Empirical Findings

Now we see time-varying causality test results from negative shocks of oil prices to negative shocks of unemployment. The red line here represents the 10% statistical significance level and the blue line represents the probability values obtained for each period. Therefore, we can say that causality is valid in periods when the blue line is below the red line. Now we see time-varying causality results from negative shocks of oil prices to negative shocks of unemployment. The red line here represents the 10% statistical significance level and the blue line represents the probability values obtained for each period. Therefore, we can say that causality is valid in periods when the blue line is below the red line. Interpretations usually ignore causality of several periods, so we see in this graph that causality is valid in 2 sub-periods. The first sub-period is the period 2015m5 and 2016m2, and the second period is the period between 2018m8 and 2018m12.
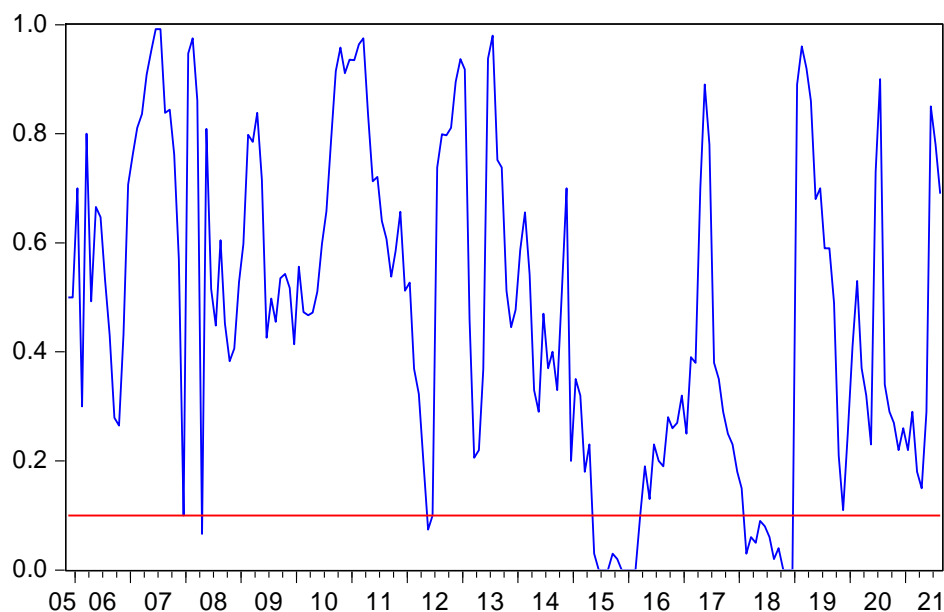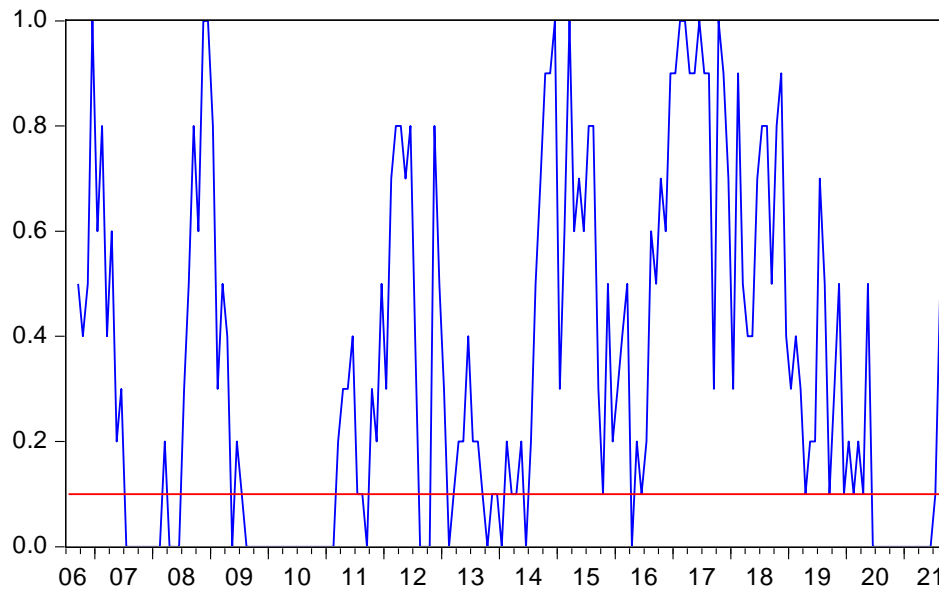

Fig 1. Rolling window causality from OP- to UNE-

Fig 2. Rolling window causality from OP+ to UNE+

In these graphs, we can observe the time-varying causality from oil price positive shocks to unemployment positive shocks. The first thing that draws attention here is that the number of sub-periods in which causality is valid is much higher. When we focus on the periods in which meaningful causality lasts longer, 3 sub-periods stand out. The first period is the sub-period 2007m7-2008m6, which coincides with the global financial crisis. The second sub-period is the period 2009m8-2011m2 and the third sub-period is the period 2020m7-2021m6.

When we evaluate our findings on the oil prices graph, we see that oil prices have decreased significantly for 2 sub-periods in which causality was detected between negative shocks. On the other hand, when we look at unemployment rates, we see that unemployment has not decreased enough in Turkey. For example, unemployment rates fell from 10.2 percent to 10.1 percent in the first sub-period.

In these charts, we see oil price changes in sub-periods where the causality between positive shocks is valid. There is a significant increase in oil prices in these sub-periods, but unlike the first chart, we see that unemployment has also increased significantly. For example, the unemployment rate increased from 9.1 percent to 10.2 in the first period.

4. Conclusions

In this study, we investigated the relationship between oil price and unemployment in Turkey using with asymmetric time-varying causality test. Our findings can be summarized as follows: i) There are very few sub-periods in which negative shocks in oil prices cause negative shocks in unemployment. ii) It is observed that the decrease in unemployment is at low levels in these sub-periods. iii) There are many sub-periods in which positive shocks in oil prices cause positive shocks in unemployment. iv) In

these sub-periods, the increase in unemployment was serious. v) The ineffectiveness of negative oil price shocks is evident against the obvious effects of oil price positive shocks. vi) This is largely due to the fact that oil exporting countries such as Iraq, Iran, Russia, Saudi Arabia, Libya and Algeria are among Turkey's important trade partners. Based on these findings, the following policies should be implemented: i) Countries that are dependent on foreign energy such as Turkey should take measures to reduce this dependency against the negative effects of the increase in oil prices. ii) For this, projects that increase the effective use of energy and the use of renewable energy should be encouraged. iii) Tax exemptions and subsidies should be provided to exporting firms if they undertake the renewable energy transition. iv) Market research should be conducted for new foreign trade partners who are not oil exporters.

References

Ahmad, F. (2013). The effect of oil prices on unemployment: Evidence from Pakistan. *Business and Economics research journal*, *4*(1), 43.

Balcilar, M., Ozdemir, Z. A., & Arslanturk, Y. (2010). Economic growth and energy consumption causal nexus viewed through a bootstrap rolling window. *Energy Economics*, *32*(6), 1398-1410.

Beaudreau, B. C. (2005). Engineering and economic growth. *Structural Change and Economic Dynamics*, *16*(2), 211-220.

Bierens, H. J., & Martins, L. F. (2010). Time-varying cointegration. *Econometric Theory*, *26*(5), 1453-1490.

Brown, S. P., & Yücel, M. K. (2002). Energy prices and aggregate economic activity: an interpretative survey. *The Quarterly Review of Economics and Finance*, *42*(2), 193-208.

Doğrul, H. G., & Soytas, U. (2010). Relationship between oil prices, interest rate, and unemployment: Evidence from an emerging market. *Energy Economics*, *32*(6), 1523-1528.

Hatemi-j, A. (2012). Asymmetric causality tests with an application. *Empirical economics*, *43*(1), 447-456.

Narayan, P. K., & Popp, S. (2010). A new unit root test with two structural breaks in level and slope at unknown time. *Journal of Applied Statistics*, *37*(9), 1425-1438.

Tang, W., Wu, L., & Zhang, Z. (2010). Oil price shocks and their short-and long-term effects on the Chinese economy. *Energy Economics*, *32*, S3-S14.