

UNRAVELING THE LINKS BETWEEN HAPPINESS, ECONOMIC GROWTH, AND ENVIRONMENTAL SUSTAINABILITY
MUTLULUK, EKONOMİK BÜYÜME VE ÇEVRESEL SÜRDÜRÜLEBİLİRLİK ARASINDAKİ İLİŞKİLERİN ÇÖZÜMLENMESİ

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ABSTRACT

ÖZ

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Happiness has historically been closely linked to economic income levels; however, this association has been challenged due to the emergence of alternative viewpoints. In recent years, environmental pollution has emerged as a substantial factor influencing happiness. This study investigates the impact of environmental pollution and economic growth on happiness levels across 15 European countries from 1996 to 2016. The findings from the Pedroni cointegration test indicate that all variables are cointegrated, suggesting a stable long-run relationship. According to the results of a panel autoregressive distributed lag (ARDL) test, economic growth has been demonstrated to exert a positive effect on happiness in both the short and long run. This suggests that an increase in economic activity tends to result in an enhancement of overall well-being. Conversely, environmental pollution has been shown to exert a negative impact on happiness, albeit this effect only turns out to be only in the long run. This finding suggests that although an increase in economic activity promotes happiness in the immediate short term, the harmful effects of environmental pollution accumulate over time, ultimately resulting in reduced overall happiness levels.

Mutluluk tarihsel olarak ekonomik gelir düzeyiyle yakından ilişkilendirilmiştir; ancak bu ilişki alternatif bakış açılarının ortaya çıkmasıyla sorgulanmaya başlanmıştır. Son yıllarda, çevre kirliliği mutluluğu etkileyen önemli bir faktör olarak ortaya çıkmıştır. Bu çalışma, 1996-2016 yılları arasında 15 Avrupa ülkesinde çevre kirliliği ve ekonomik büyümenin mutluluk düzeyleri üzerindeki etkisini araştırmaktadır. Pedroni eşbütünleşme testinden elde edilen bulgular, tüm değişkenlerin eşbütünleşik olduğunu ve istikrarlı bir uzun dönem ilişkisine işaret ettiğini göstermektedir. Panel otoregresif dağıtılmış gecikme (ARDL) testinin sonuçlarına göre, ekonomik büyümenin kısa ve uzun vadede mutluluk üzerinde pozitif etkisi olduğu gösterilmiştir. Bu da ekonomik faaliyetlerdeki artışın genel refahın artmasıyla sonuçlanma eğiliminde olduğunu göstermektedir. Buna karşılık, çevre kirliliğinin mutluluk üzerinde olumsuz bir etkisi olduğu görülmüştür, ancak bu etki sadece uzun vadede ortaya çıkmaktadır. Bu bulgu, ekonomik faaliyetteki bir artışın kısa vadede mutluluğu teşvik etmesine rağmen, çevre kirliliğinin zararlı etkilerinin zaman içinde biriktiğini ve sonuçta genel mutluluk seviyelerinin düştüğünü göstermektedir.

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Introduction

Happiness has emerged as a central focus across various academic disciplines due to its far-reaching implications. Researchers have extensively explored its origins, underlying determinants, and effects across different fields of study. The conceptual foundation of happiness can be traced back to both medieval and modern eras. Aristotle, a prominent philosopher of ancient Greece, asserted that true happiness is attained through the cultivation of moral virtues and intellectual excellence (Ivanova, 2023). Over time, scholars have increasingly sought to understand the factors influencing happiness, with socio-economic determinants gaining substantial attention as a dominant area of investigation. This shift has led to a more interdisciplinary approach, incorporating insights from psychology, economics, and environmental studies.

In the realm of economics, the relationship that exists among income, subjective well-being, and subjective happiness has been a fundamental subject of inquiry. The pioneering work of Easterlin (1974) established a fundamental link between economic growth and happiness, which came to be recognized as the 'Easterlin Paradox.' In the context of this paradox, the conventional assumption is being called into question that increasing wealth indefinitely leads to greater happiness, demonstrating that beyond a certain income threshold, additional economic gains contribute minimally to well-being. Building upon this foundation, Kahneman and Deaton (2010) further expanded the literature by identifying a specific income level—approximately \$75,000 per year—beyond which additional earnings have a negligible impact on overall happiness. The notion that happiness is not solely driven by income has since been supported by a growing body of research. Morawetz et al. (1977) conducted a study that examined the impact of income disparities on overall well-being, thereby adding complexity to the discourse and challenging the conventional focus on income itself. While economic expansion was traditionally regarded as the primary driver of happiness, contemporary perspectives advocate for a more holistic approach, emphasizing quality of life, social equity, and mental well-being over financial accumulation. Oswald (1997) reinforced this argument by asserting that economic resources are only meaningful to the extent that they enhance individual happiness.

Although the views expressed by Easterlin have been widely embraced in academic discourse, they have also been subject to considerable critique, particularly in studies conducted by Veenhoven (1989, 1991). In contrast to the Easterlin Paradox, Veenhoven (1991) presented empirical evidence indicating a positive relationship between income and happiness. According to findings by Veenhoven and Vergunst (2014), economic and subjective well-being have both increased in the majority of countries, with the greatest improvements in happiness observed in nations experiencing the most significant economic growth. This relationship was further examined in a recent study by Kamilcelebi and Veenhoven (2024), which revealed a substantial correlation between changes in GDP per capita and changes in national average happiness. Veenhoven's view has been corroborated by additional studies, including those by Diener et al. (2013), as well as Sacks et al. (2012).

Another critical dimension of happiness research pertains to its interconnection with environmental factors. Recent studies have indicated a marked increase in environmental awareness, primarily attributable to the discernible effects of global warming on the planet's fragile ecosystem (Savas, 2025). The significance of environmental degradation has been extensively highlighted in numerous studies (Khan et al., 2022; Numan et al., 2023; Wang et al., 2016; Sarkodie & Strezov, 2019). Over time, the increasing severity of environmental degradation has accelerated, leading to profound and far-reaching consequences for human life. Additionally, these negative impacts extend beyond physical health and economic stability, significantly affecting human well-being. In this particular context, the Kuznets hypothesis, which was originally proposed by Kuznets in 1955, provides a theoretical framework that highlights an inverted U-shaped relationship between income inequality and economic development. In accordance with this theoretical framework, an initial exacerbation of income disparities is observed following an increase in economic growth. However, as a nation progresses toward elevated levels of development, a subsequent decline in these disparities becomes apparent. This theoretical framework has been expanded to encompass ecological considerations, giving rise to the Environmental Kuznets Curve (EKC), which posits an analogous inverted U-shaped relationship between economic development and environmental deterioration. The validity of the EKC has been extensively examined, with empirical support from studies such as Wang et al. (2016), Sarkodie and Strezov (2019), Balsalobre-Lorente et al. (2022), and Leitão et al. (2023). Additionally, Kartal et al. (2022), Kirikkaleli et al. (2022), and Erat et al. (2023) investigated the relationship between economic growth, environmental degradation, and sustainability, and confirmed the existence of significant linkages among these variables.

While economic prosperity has long been considered a key contributor to happiness, research suggests that environmental quality plays an equally significant role. This shift in focus has prompted scholars to investigate the ecological determinants of happiness, underscoring the necessity for a sustainable equilibrium that encompasses both economic growth and the preservation of the environment. The origins of this perspective can be traced back to the pioneering study conducted by Kellert and Wilson (1993), which examined the psychological interdependence between humans and their surrounding environment. The researchers' findings established the foundation for subsequent research, which delved into the multifaceted connection that exists between ecological well-being and human happiness.

In furtherance of this discussion, a considerable number of efforts have been made to quantitatively represent this phenomenon. For instance, Marks et al. (2006) introduced the Happy Planet Index, a metric designed to evaluate well-being by comparing the ratio of average happy life years (HLY) to a country's per capita ecological footprint. This index provides a novel approach to measuring happiness, shifting the focus from economic output to environmental sustainability and life satisfaction. The connection between environmental sustainability and happiness has been examined in existing literature, with significant empirical evidence supporting the relationship. Welsch (2009), Welsch and Kühling (2009) and Rehdanz & Maddison (2008) demonstrated that established strong correlations between environmental decline and declining happiness levels, reinforcing the argument that ecological health is a crucial determinant of overall life satisfaction.

The purpose of this study is to examine the influence of environmental degradation on happiness by employing the ecological footprint to measure environmental deterioration. While extensive research has been conducted in this field, this paper makes a valuable contribution by analyzing data from 15 countries spanning the period from 1996 to 2016, ensuring a comprehensive and rigorous evaluation. The application of panel data methodology enhances the reliability and generalizability of the findings. The present study endeavors to offer a nuanced exploration of the factors that contribute to happiness and their broader implications for sustainable development by incorporating environmental and economic dimensions into the analysis.

Moreover, this study makes two significant contributions to the extant literature. Firstly, it seeks to elucidate the intricate relationship between economic growth and subjective well-being, a subject that has garnered significant academic attention following the seminal contributions of scholars such as Easterlin and Veenhoven. Although prior research has examined this nexus, the present study seeks to offer a more nuanced understanding by considering recent trends and data. Secondly, the study addresses the mounting concern over environmental issues and investigates their impact on individual happiness levels. This initiative acknowledges the growing recognition that environmental quality has emerged as a pivotal factor in determining well-being, rivaling conventional economic indicators in this regard. The central aim of this research is to examine the ways in which economic growth and environmental factors influence happiness, thereby offering a more comprehensive understanding of the determinants of well-being. Furthermore, this study is distinctive in its application of a robust and sophisticated panel data methodology, which is employed across a comprehensive range of European countries. The incorporation of all available data from these nations is imperative for ensuring broader representativeness and enhancing the reliability of the findings.

The structure of this paper is as follows: The initial section introduces the subject of research, delineating the significance in the study of happiness and its interdisciplinary nature. The second section provides a detailed review of pertinent literature, encompassing economic and environmental perspectives on happiness. The third part of the study presents the research methodology and the sources of the data collected. In this section, the reader will find a detailed description of the research framework and the analytical techniques used in this study. The following section is devoted to a discussion of the econometric results, with an emphasis on the insights they provide regarding the relationship that exists within the context of environmental factors and happiness. In the final section, the core findings are distilled and policy recommendations are proposed with the aim of promoting sustainable well-being.

Literature Review

The association between environmental degradation and subjective well-being has garnered mounting interest in academic researches. A growing body of literature suggests that deteriorating environmental conditions,

particularly pollution, play a significant role in shaping individuals' happiness levels. A variety of scholars have examined various aspects of this relationship, including air pollution, environmental attitudes, economic growth, and regional differences, to provide a multifaceted analysis of whether environmental factors have a significant impact on well-being.

Welsch (2006) conducted a seminal study that examined the association amongst pollution levels, self-reported happiness, across a sample of 10 European nations. By utilizing panel data from happiness surveys alongside economic indicators and air pollution levels, the study assessed how well-being varies based on both economic prosperity and environmental conditions. The findings indicated that air pollution functions as a substantively significant indicator of discrepancies in subjective well-being across countries across time. Building on this idea, MacKerron and Mourato (2009) explored both perceived and measured air pollution levels and their impact on life satisfaction. Their research confirmed that increased exposure to pollution negatively affects subjective well-being, even after controlling for diverse socio-economic and demographical variables.

Beyond objective environmental conditions, individual perceptions and attitudes toward environmental issues exert a significant influence on well-being. Ferrer-i-Carbonell and Gowdy's (2007) study examined the impact of subjective environmental concerns on happiness, utilizing an analytical approach to investigate the relationship between these two concepts. Their results indicated a complex relationship: Individuals who expressed concern about ozone pollution reported lower well-being, whereas those who were concerned about species extinction exhibited higher well-being. Expanding the scope of analysis to a broader dataset, Tiwari's (2011) study examined the nexus of happiness and environmental degradation in a sample of 21 countries over a 35-year period (1970–2005). Using a log-linear method, the study provided strong empirical evidence that increasing environmental degradation is associated with declining happiness. These findings underscore the global relevance of the issue, indicating that regardless of geographic location, worsening environmental conditions tend to have a universally adverse influence on subjective well-being. Further exploring the intersection of economic growth, environmental conditions, and happiness, Tiwari and Mutascu (2015) analyzed data from 23 countries covering the years 1961–2005. Their study examined the dynamic interactions between GDP, environmental degradation, and happiness. The findings suggested that in the short term, higher happiness levels are associated with lower GDP, challenging the conventional assumption that economic growth alone leads to improved well-being. Interestingly, the study found that while GDP and happiness are interrelated, their relationship with environmental degradation remains statistically insignificant. This implies that while economic prosperity may contribute to well-being in some cases, its role in mitigating or exacerbating the effects of environmental decline is more complex and requires further investigation. Guo et al. (2017) introduced an additional dimension to this discourse by examining the influence of environmental contamination on well-being and health. They employed multi-level analysis to evaluate data for the case of China. Their study provided a nuanced perspective by distinguishing between provincial-level and community-level pollution. The findings indicated that while pollutants at the provincial level were linked to enhanced health outcomes across the entire income spectrum, community-level industrial pollution exhibited a predominantly beneficial effect on health, particularly among individuals in the lower and middle income brackets. Additionally, Fotourehchi and Ebrahimpour's (2019) study examined the relationship between gross domestic product (GDP) per capita and subjective well-being, while controlling for the impact of air pollution across nations. The present study utilizes annual unbalanced panel data from 59 countries spanning from 2005 to 2015 to investigate the relationship between GDP per capita and happiness. The findings indicate that increases in GDP per capita may be associated with a decline in happiness when air pollution levels are high. Conversely, in contexts of low air pollution, economic growth is associated with increased happiness. These findings suggest that environmental conditions have the potential to reshape the relationship between economic growth and subjective well-being. In their study, Apergis and Majeed (2021) investigated the relationship between greenhouse gas emissions and subjective well-being across a sample of 95 countries from 1990 to 2015. They employed panel data analysis, a statistical approach that utilizes longitudinal data to examine the impact of specific factors over time. The results obtained from this study indicate that greenhouse gases, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and total greenhouse gases (GHG), exert a considerable negative influence on subjective well-being. Conversely, economic affluence has been shown to enhance subjective life satisfaction. Moreover, Li et al. (2023) examined the long-term and short-term dynamics among

CO₂ emissions, energy consumption, mortality rates, life expectancy, and GDP in the top five carbon-emitting nations from 1975 to 2015. The findings indicate a significant positive relationship between CO₂ emissions and energy consumption. However, health indicators such as mortality and life expectancy exhibit a weaker correlation, indicative of the impact of country-specific economic policies.

Taken together, these studies provide compelling evidence that environmental degradation, particularly air pollution, plays a critical role in shaping subjective well-being. While economic prosperity and individual environmental attitudes may mediate this relationship to some extent, the overarching trend indicates that deteriorating environmental conditions contribute to declining happiness. As such, improving environmental quality should be considered one of the key component in policies aimed at enhancing overall life satisfaction and well-being.

Methodology and Data

The methodological framework and data sets utilized in this study have been designed to comprehensively analyze the influence of environmental pollution and economic growth patterns on the overall happiness levels perceived by individuals. In this analysis, happiness is proxied by the share of people who report being either 'very satisfied' or 'fairly satisfied' with their lives. The primary source of happiness data is the Eurobarometer (2017), which has been further processed and made available by Our World in Data. To measure environmental pollution, data on the Ecological Footprint is derived from the Global Footprint Network. This measure includes six components: Built-up Land, which accounts for urban and infrastructure areas; Carbon Footprint, representing the forest area needed to absorb CO₂ emissions; Cropland for growing food and fiber; Fishing Grounds supporting aquatic resource consumption; Forest Products for timber and related goods; and Grazing Land used for livestock production. Meanwhile, the measurement of economic growth is derived from the real Gross Domestic Product (GDP), which is expressed in constant 2015 U.S. dollars. The dataset spans the period from 1996 to 2016, as this represents the most complete and consistently available time frame for the selected variables on a yearly basis. The dataset is limited to the period ending in 2016 due to the lack of available happiness data for the years thereafter, which consequently restricted the time span of the analysis. Additionally, the statistical software packages Stata and EViews were employed to conduct the econometric analyses, including data preparation, model estimation, and the interpretation of results relevant to the study.

Panel data analysis, particularly in the context of happiness studies, presents several methodological challenges, the foremost being the availability of data across time and country ranges. To ensure robustness and reliability, the analysis focuses on a panel dataset comprising fifteen European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom. The inclusion of the aforementioned nations is predicated on the existence of consistent and rigorous data sets for all three key variables across the designated time frame.

Table 1. Descriptive Statistics

	Happy	GDP	EF
Mean	4.402910	26.93519	1.844214
Median	4.464495	26.65852	1.781763
Maximum	4.587148	28.86430	2.849711
Minimum	3.477702	24.15829	1.317206
Standard Dev.	0.201724	1.158267	0.296521
Skewness	-2.157346	-0.026043	1.271701
Kurtosis	8.105379	2.293773	4.988201
Jarque Bera	586.4442	6.581793	136.7866

P-values	0.000000	0.037220	0.000000
Obs.	315	315	315

As illustrated in Table 1, the descriptive statistics offer a summary of three variables: happiness, GDP, and Ecological Footprint (EF) across 315 observations. The mean and median values indicate that the distributions are relatively balanced, though Happiness and EF show some skewness. The standard deviation suggests moderate variability, with EF exhibiting the highest dispersion. Skewness and kurtosis values reveal that Happiness is highly negatively skewed and peaked, while EF is positively skewed with a moderately peaked distribution. GDP appears more normally distributed. The Jarque-Bera test confirms that all three variables deviate from normality, particularly Happiness and EF.

Given this distribution, the econometric methodology adopted in this study follows a structured and rigorous approach to facilitate the validation and credibility of the estimated relationships. The empirical model employed is specified as follows:

$$LNHAPPY_{it} = \alpha_0 + \alpha_1 LNGDP_{it} + \alpha_2 LNEF + \varepsilon_{it}$$

In this equation, all variables are expressed in their natural logarithmic forms to account for potential non-linearity and to allow for more interpretable elasticities. The dependent variable, LNHAPPY, represents the log-transformed happiness index. The independent variables include LNGDP, which denotes the log-transformed real GDP, and LNEF, which represents the log-transformed Ecological Footprint. The error term is represented by ε_{it} .

The methodological framework implemented in this paper consists of several key steps to ensure robust estimation. The first step involves testing for cross-sectional dependency among the variables, as ignoring cross-sectional dependence with panel data estimations can result in biased and inconsistent estimates. Various cross-sectional dependency tests are carried out to ascertain the existence of such dependencies.

Following the cross-sectional dependency analysis, the next step involves testing the stationarity attributes of the variables. This is performed using CIPS test, as outlined by Pesaran (2007). The CIPS test is particularly well-suited for panel data that exhibits cross-sectional dependence, ensuring more reliable assessment of the integration properties of the variables.

An additional approach involves the application of the homogeneity test, as introduced by Pesaran and Yamagata (2008), to assess whether the variables are homogeneous. Subsequent to the implementation of the homogeneity and stationarity tests, the study proceeds with the examination of the connection between the variables over the long run through cointegration analysis. As introduced by Pedroni (1999, 2004), the Pedroni cointegration test is employed for this purpose. The aforementioned test is classified into two overarching categories, namely, panel and group panel cointegration statistics.

Finally, this study employs the Panel Autoregressive Distributed Lag (Panel ARDL) model with PMG estimator so as to estimate both short-run and long-run coefficients. This estimation technique is particularly advantageous as it allows for the differentiation between short-term dynamics and long-term equilibrium relationships while accommodating cross-sectional heterogeneity. The Panel ARDL approach is used to assess the extent to which economic growth and environmental pollution impact happiness levels in both the short run and the long run, providing deeper insights into the dynamic interplay between these factors.

Overall, this methodological framework provides a comprehensive and structured approach to examining the connections between happiness, economic growth, and environmental pollution. Consequently, it offers a more profound insight into the factors influencing subjective well-being across European countries during the period under study.

Econometric Estimation Results and Analysis

In this section, the econometric estimation results are presented in a systematic manner, following a structured and detailed approach to ensure a comprehensive understanding of the findings. The initial step in the analysis involves determining the presence of cross-sectional dependency among the variables, which is a critical aspect

in panel data analysis. To achieve this, multiple cross-sectional dependency tests are employed as it was outlined in table 2. The results obtained from these tests consistently indicate that all variables exhibit significant cross-sectional dependency. Given the presence of cross-sectional dependence, the subsequent pivotal stage in the process entails ascertaining the stationarity properties of the variables, as stationarity is a fundamental requirement for reliable econometric estimation.

Table 2. Cross-Section Dependency Tests

Variables	Breusch Pagan LM	Pesaran scaled LM	Bias corrected scaled LM	Pesaran CD
Happy	573.207***	32.309***	31.934***	7.838***
GDP	1687.539***	109.205***	108.830***	40.101***
EF	994.209***	61.361***	60.986***	29.276***

Given the finding that all variables are cross-sectionally dependent, the CIPS test is employed to ascertain the stationarity of the variables while the identified cross-sectional dependence is being accounted for. The outcomes of this stationarity assessment, as delineated in Table 2, uncover that, at their level form, the variables representing Happiness and GDP are stationary. However, the Ecological Footprint does not exhibit stationarity in its level form, which implies that it follows a non-stationary process initially. To address this issue, the first differencing method is applied to the Ecological Footprint variable, after which it becomes stationary.

Table 3. CIPS Test

	Level	Difference
Happy	-2.966**	--
GDP	-2.941**	--
EF	-2.701*	-3.220***

Furthermore, to evaluate the homogeneity of the series employed in the research, the Pesaran and Yamagata homogeneity test is conducted. The results from this test reveal that the variables are not homogeneous across the panel, indicating that their relationships vary across different cross-sections. This suggests that the effects of economic growth, environmental degradation, and happiness may differ depending on country-specific characteristics, institutional frameworks, or socio-economic conditions.

Table 4. Slope Heterogeneity Test

	Delta	Prob.
Adj.	-2.673	0.008
	-3.114	0.002

The Pedroni cointegration test is employed to ascertain the presence of a long-run relationship between the variables. The outcomes presented in Table 3 demonstrate that throughout all sub-statistics, the variables exhibit significant cointegration. This finding provides robust evidence supporting the existence of a stable long-run equilibrium relating the variables under consideration, despite their different integration orders. The

establishment of cointegration suggests that the variables utilized in the cointegration test exhibit long-run relations.

Table 5. Pedroni Residual Cointegration Test

Statistic	<u>Statistic</u>	<u>Prob.</u>
Panel v Stat.	2.377	0.008
Panel rho Stat.	-4.968	0.000
Panel PP Stat.	-9.337	0.000
Panel ADF Stat.	-9.663	0.000
Group rho Stat.	-3.310	0.000
Group PP Stat.	-10.279	0.000
Group ADF Stat.	-10.415	0.000

Following the validation of cointegration, the subsequent step involves estimating the coefficient relationships in both the short-run and long-run contexts to determine how the variables influence each other over different time horizons with Panel ARDL. The Schwarz Information Criterion (SIC) is employed to specify the optimal panel lag structure, leading to the selection of the panel (1,1,0) model. The results of the short-run estimation indicate that the Error Correction Model (ECM) term is negative and statistically significant, with an estimated coefficient of -0.550. This negative ECM coefficient indicate that the system exhibits mean-reverting behavior, meaning that any short-term deviations from the long-run equilibrium will gradually correct themselves over time.

In the short-run analysis, a significant relationship is observed between Happiness and GDP, with GDP exerting a positive impact on Happiness. This finding aligns with existing economic theories suggesting that higher levels of income contribute to improved well-being of individuals. However, an interesting observation is that Environmental Pollution, as measured by the Ecological Footprint, does not exhibit a statistically significant short-term relationship with Happiness. This suggests that while economic growth plays an immediate and tangible role in shaping happiness levels, environmental degradation may not have an immediate impact on well-being. Instead, its effects may manifest gradually, influencing happiness over a longer time horizon rather than exerting an abrupt and direct influence in the short run.

When examining the long-run relationships, it is observed that GDP continues to have a positive and significant impact on Happiness, reinforcing the notion that sustained economic prosperity contributes to long-term improvements in well-being. Conversely, the Ecological Footprint exhibits a negative impact on Happiness in the long run, implying that an increase in environmental pollution and ecological degradation detrimentally affects overall well-being. This finding underscores a fundamental trade-off between economic growth and environmental sustainability. While economic progress enhances happiness, environmental degradation counteracts this effect, leading to a decline in overall well-being over time. The long-run negative relationship between ecological footprint and happiness highlights the importance of sustainable development policies that balance economic growth with environmental preservation.

Table 6. Panel ARDL Results

Variables	Coefficient	Std. Error	t-Statistic	Probability
Long Run Coefficients				
GDP	0.216	0.020	10.453	0.000
EF	-0.040	0.018	-2.137	0.033

Short Run Coefficients				
COINTEQ	-0.550	0.072	-7.638	0.000
GDP	0.624	0.307	2.028	0.043
C	-0.788	0.122	-6.441	0.000

Overall, the econometric analysis provides noteworthy insights into the complex interactions between economic prosperity, environmental sustainability, and societal well-being. The results of the study emphasize taking into account both economic and environmental factors when the determinants of happiness are to be evaluated. While economic growth positively influences happiness in both the short and long run, environmental degradation poses a significant long-term threat on societal well-being. This highlights the need for a balanced approach that fosters economic development while measures to mitigate environmental harm are simultaneously implemented.

Conclusion

The determinants of happiness have been a significant area of inquiry in the field of economics and social sciences. Initially, the relationship between income growth and happiness was considered a primary focus; however, as pioneered by Easterlin (1974), income alone has been recognized as an incomplete explanation. Consequently, scholars have extensively investigated other determinants of happiness to provide a more comprehensive understanding of the factors influencing well-being.

In addition to this, both academic discourse and policy discussions at national and international levels have increasingly emphasized environmental pollution as one of the most pressing issues of our time. Environmental degradation, as a crucial aspect of sustainability, is now acknowledged as a potential determinant of happiness. Given this context, the present study aims to examine both traditional economic factors—such as income growth—and environmental factors—specifically, pollution—on the overall happiness levels of countries. The analysis covers the period from 1996 to 2016, utilizing available data for selected countries.

The findings derived from econometric estimations provide robust evidence regarding these relationships. The Pedroni cointegration test confirms that the variables in the study exhibit a long-term equilibrium relationship, indicating that happiness, income growth, and environmental pollution are cointegrated. Furthermore, the results of the Panel Autoregressive Distributed Lag (ARDL) model reveal both short-term and long-term dynamics between these variables. Specifically, GDP growth demonstrates a significant positive effect on happiness in both the short and long run, supporting the widely held notion that higher income levels contribute to greater national well-being. This finding lends support to the perspectives outlined by Veenhoven (1989), Veenhoven (1991), Veenhoven & Vergunst (2014), Kamilçelebi & Veenhoven (2024).

However, the study also finds that an increase in ecological footprint—used as a proxy for environmental degradation—has a long-term negative impact on happiness levels. This suggests that while economic growth enhances happiness, rising environmental pollution diminishes well-being over time. These findings align with previous research in the literature, including MacKerron and Mourato (2009), Ferrer-i-Carbonell and Gowdy (2007), and Tiwari (2011), which similarly highlight the adverse effects of environmental pollution on happiness.

These findings highlight the complex interplay between economic growth and environmental factors in shaping happiness. While the positive effect of GDP growth on well-being is evident across both short and long terms, this relationship persists even in high-income regions such as Europe, suggesting that economic progress continues to contribute to happiness regardless of wealth levels. However, the negative impact of the ecological footprint on happiness underscores the cost of environmental degradation, revealing that unchecked pollution and resource overuse can erode the gains in well-being achieved through economic development. This dual dynamic calls for a balanced policy approach: fostering economic growth remains crucial for enhancing happiness, but without simultaneous efforts to reduce environmental harm, long-term well-being may be compromised. Consequently, implementing sustainable development strategies that prioritize ecological conservation alongside economic objectives is essential for ensuring lasting improvements in quality of life and

environmental stability. Future research could build on these insights by examining regional differences in how environmental pressures affect happiness and exploring the role of income inequality in moderating the relationships between growth, environment, and well-being. In this context, further econometric analyses incorporating the subcomponents of the Ecological Footprint, as well as policy-oriented variables such as green infrastructure investments, ecological taxation systems, and environmental education initiatives, may offer deeper insights into the mechanisms through which sustainability-oriented policies influence well-being and economic outcomes. Such approaches would enrich the understanding of how multidimensional environmental strategies contribute to both ecological balance and societal welfare. Additionally, evaluating the impact of targeted sustainability policies on happiness outcomes would provide practical guidance for policymakers aiming to promote both prosperity and ecological health.

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Statements of Publication Ethics

I hereby declare that the study has not unethical issues and that research and publication ethics have been observed carefully.

Researchers' Contribution Rate

The study was conducted and reported by a researcher.

Ethics Committee Approval Information

Ethics committee approval was not obtained for this study because I declare as the responsible author that this study is one of the studies that does not require ethics committee approval.

AI Disclosures Statement

In the preparation of this paper, AI-based tools (DeepL and ChatGPT) were utilized for proofreading purposes. The AI tools were employed solely as supportive instruments to enhance linguistic clarity and coherence. The ideas, analyses, and arguments presented in the chapter remain entirely the responsibility of the author.

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GENİŞLETİLMİŞ ÖZET

Son yıllarda, mutluluk kavramı çeşitli akademik disiplinlerce artan bir ilgiyle ele alınmaktadır. Bu artan akademik ilginin temelinde, genellikle öznel iyi oluş (subjective well-being) olarak kavramsallaştırılan mutluluğun, hem toplumsal ilerlemenin hem de bireysel yaşam kalitesinin önemli bir göstergesi olduğu yönündeki farkındalık yatmaktadır. Geleneksel ekonomik göstergeler –örneğin gelir düzeyi ve gayri safi yurtiçi hasıla (GSYİH)– her ne kadar bilgi verici olsa da, insan refahını anlamada sınırlı bir çerçeveye sunmaktadır. Bu nedenle, araştırmacılar mutluluğun çok boyutlu belirleyicilerini daha derinlemesine incelemeye yönelmiş; maddi refahın, duygusal ya da psikolojik tatmini garanti etmediğini kabul eden bütüncül bir bakış açısını benimsemeye başlamışlardır. Bu paradigma değişimi, sosyal ve ekonomik etkenlerin yanı sıra giderek artan biçimde çevresel boyutları da içeren bir iyi oluş analizinin önünü açmıştır. Ekonomi disiplini özelinde, erken dönem araştırmalar, mutluluk ile gelir düzeyi arasındaki ilişkiye odaklanmış ve artan servetin yaşam memnuniyetini artırdığı varsayımıyla hareket etmiştir. Özellikle temel ihtiyaçların karşılanmadığı düşük gelirli gruplarda bu varsayımı destekleyen ampirik bulgular elde edilmiş olsa da, sonraki çalışmalar gelir düzeyinin belirli bir eşik değerini aşmasının ardından mutluluk üzerindeki marjinal etkisinin azaldığını ortaya koymuştur. "Easterlin Paradoksu" olarak adlandırılan bu olgu, mutluluğun alternatif belirleyicilerinin araştırılmasını teşvik etmiştir. Bu bağlamda, çevresel kalite giderek daha fazla önem kazanan ancak yeterince takdir edilmeyen bir faktör olarak öne çıkmıştır. Artan sayıda kanıt, doğal çevrenin durumunun bireylerin öznel iyi oluşlarını biçimlendirmede önemli bir rol oynadığını ortaya koyarak, mutluluğun başlıca belirleyicisi olarak ekonomik göstergelere verilen önceliği sorgulamaktadır. Bu alandaki giderek genişleyen literatür, çevresel bozulmanın –özellikle kirlilik ve ekolojik kaynakların aşırı tüketimi biçiminde– insan refahı üzerinde derin olumsuz etkiler yaratabileceği yönündeki önemli bir endişeye işaret etmektedir. İklim değişikliği ve çevresel sürdürülebilirlik konularına yönelik farkındalığın artmasıyla birlikte, araştırmalar ekolojik koşulların psikolojik ve duygusal sağlıkla nasıl kesiştiğini incelemeye yönelmiştir. Hava ve su kirliliği, karbon emisyonları ve doğaya yönelik kamuoyu tutumları gibi çeşitli çevresel göstergeleri temel alan çok sayıda çalışma, bu unsurların yaşam memnuniyeti üzerindeki etkilerini değerlendirmektedir. Bu çalışmalar farklı bölge ve demografik grupları kapsayarak, çevresel stres faktörlerinin bireysel ve toplumsal mutluluğu nasıl etkilediğine dair ayrıntılı bir anlayış sunmaktadır. Örneğin, kirlilik düzeyleri, ekonomik kalkınma düzeyi ve çevreye yönelik kültürel yaklaşımlardaki bölgesel farklılıkların, ekolojik kalite ile iyi oluş arasındaki ilişkiyi belirlediği ve bu nedenle bağlama özgü analizlerin gerekliliğini ortaya koyduğu saptanmıştır.

Bu çalışma, çevresel bozulmanın mutluluk üzerindeki etkisini ekolojik ayak izi göstergesi aracılığıyla ampirik olarak inceleyerek mevcut literatüre katkı sağlamaktadır. Daha önce benzer temalar araştırılmış olmakla birlikte, bu çalışma, 1996–2016 dönemini kapsayan ve 15 Avrupa ülkesine ait dengeli panel verisinden yararlanması bakımından özgün bir katkı sunmaktadır. Zaman ve ülke düzeyinde çok boyutlu bir çerçeve sunması, analiz sonuçlarının genellenebilirliğini ve sağlamlığını artırmaktadır. Ayrıca panel veri yöntemlerine dayalı gelişmiş ekonometrik tekniklerin uygulanması, bulguların güvenilirliğini pekiştirmektedir. Bu çalışmada öznel iyi oluş, Eurobarometer (2017) anketine dayalı olarak yaşamından "çok memnun" ya da "oldukça memnun" olduğunu belirten bireylerin oranı ile temsil edilmektedir. Çevresel bozulma, Global Footprint Network tarafından sağlanan ekolojik ayak izi göstergesi aracılığıyla ölçülürken, ekonomik refah ise sabit 2015 ABD doları cinsinden ifade edilen reel GSYİH verisiyle temsil edilmektedir. Söz konusu değişkenlerin seçimi, hem kuramsal hem de ampirik gerekçelere dayalı olarak, veri erişilebilirliği ile analitik titizlik arasında bir denge kurulması amacıyla yapılmıştır. Analize dahil edilen ülkeler şunlardır: Avusturya, Belçika, Danimarka, Finlandiya, Fransa, Almanya, Yunanistan, İrlanda, İtalya, Lüksemburg, Hollanda, Portekiz, İspanya, İsveç ve Birleşik Krallık. Bu ülkeler, Avrupa'daki farklı ekonomik ve çevresel bağlamları yansıtan temsili bir örneklem sunmaktadır. Metodolojik çerçevede, sonuçların geçerliliğini ve güvenilirliğini sağlamak amacıyla çeşitli ekonometrik prosedürler uygulanmıştır. İlk aşamada, panel birimler arasındaki bağımlılığı test etmek üzere Çapraz Kesit Bağımlılığı (CSD) Testleri gerçekleştirilmiş; ardından değişkenlerin durağanlık düzeylerini belirlemek için CIPS birim kök testi uygulanmıştır. Bulgular, mutluluk ve ekonomik büyümenin seviyede durağan, ekolojik ayak izinin ise birinci farkta durağan olduğunu göstermektedir. Ülkeler arasında eğitim katsayılarının heterojenliğini dikkate almak amacıyla Pesaran ve Yamagata testi ile eğitim homojenliği test edilmiştir. Test sonuçları, değişkenler arasındaki ilişkinin ülkeler genelinde tekdüze olmadığını ortaya koyarak eğitim heterojenliğini doğrulamıştır. Ardından, değişkenler arasında uzun dönemli eşbütünleşme ilişkisini test etmek amacıyla Pedroni Artık Eşbütünleşme Testi uygulanmıştır. Eşbütünleşmenin varlığı doğrulandıktan sonra, kısa ve uzun dönemli dinamikleri incelemek amacıyla Panel Otoregresif Dağıtılmış Gecikmeli (ARDL) model kullanılmıştır.

Ampirik bulgular, ekonomik büyümenin mutluluk üzerinde anlamlı ve kısa vadeli bir etkiye sahip olduğunu ortaya koyarak, maddi refahın öznel iyi oluş üzerindeki olumlu etkisine dair geleneksel görüşü teyit etmektedir. Öte yandan, çevresel bozulmanın (ekolojik ayak iziyle ölçülen) kısa vadede mutluluk üzerinde doğrudan bir etkisinin gözlenmediği görülmektedir. Bu durum, bireylerin çevresel bozulmanın olumsuz etkilerini hemen fark edememeleri ya da bu etkilere zamanla uyum sağlamaları ile açıklanabilir. Ancak uzun vadede, ekolojik ayak izi ile mutluluk arasında istatistiksel olarak anlamlı ve negatif bir ilişki tespit edilmiştir. Bu bulgu, doğal kaynakların aşırı kullanımı ve kirlilik yoluyla süregelen çevresel tahribatın yaşam kalitesini zamanla aşındırarak öznel iyi oluşu azalttığını göstermektedir. Sonuç olarak, bu çalışma ekonomik ve çevresel etkenlerin mutluluğun oluşumunda oynadığı ikili rolü ortaya koymaktadır. Ekonomik büyüme, iyi oluşun önemli bir belirleyicisi olmaya devam etse de, çevresel bozulmanın uzun vadeli olumsuz etkileri bu kazanımları gölgeleyebilir. Bu nedenle, politika yapıcıların ekonomik hedefler ile çevresel sürdürülebilirlik arasında denge kuran daha bütüncül bir kalkınma yaklaşımını benimsemeleri, uzun vadeli mutluluğun ve toplumsal direncin sağlanması açısından elzemdir.