KSÜ Tarım ve Doğa Derg 28 (5), 1344-1353, 2025
KSU J. Agric Nat 28 (5), 1344-1353, 2025
DOI:10.18016/ksutarimdoga.vi.1572025

An Evaluation in the Context of Environmental Consumer Behavior in Selected OECD Countries: Eco-Labeled Products

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ABSTRACT

With the change in nature and the rapid and large increase in population, human beings have had to think about finding new ways to be alive on earth. Because of the scarcity of natural resources and the need for these resources, especially for food, make it necessary to protect natural resources and environmental balance, which are important for the continuity of human life. In this way, it is thought that a better life will be achieved by maintaining the consumption levels of future generations. In this case, eco-labeled products seem to be one of the creative ideas for sustainable purchasing. Eco-labeled products are thought to have the ability to encourage green consumption trends, environmental and sustainable contributions, and this is to give manufacturers insight into environmental performance. This study aims to define the term "eco-label" within the concept of sustainable consumer behavior and aims to analyze the eco-labelable consumption of producers in selected OECD countries, Greece, Portugal, Turkey, and Germany. The study covers the years 2010-2024. Using panel data analysis, eco-labeled product prices are taken as the independent variable and GDP as the dependent variable. For this purpose, green consumption patterns between 2010-2024 are analyzed. Our study uses a large dataset of ecological consumption of OECD countries using panel data analysis. The findings of this study are expected to guide researchers to think about new ideas on sustainable ecological methods to boost economic growth. In addition, this study emphasizes the importance of the contribution of green products to the sustainable economy and is believed to fill the gap in the literature in this field.

Agricultural Economy

Research Article

Article History
Received : 22.10.2024
Accepted : 19.06.2025

Keywords
Ecolabel products,
Sustainability,
Green consumption,
OECD countries
Natural resources

Seçili OECD Ülkelerinde Çevreci Tüketici Davranışı Bağlamında Bir Değerlendirme: Eko-Etiketli Ürünler

ÖZET

Doğadaki değişim, nüfusun hızlı ve büyük artışı ile birlikte insanoğlu yeryüzünde var olabilmek için yeni yollar bulmayı düşünmek zorunda kalmıştır. Çünkü doğal kaynakların kıtlaşması ve bu kaynaklara özellikle gıda için duyulan ihtiyaç, insan yaşamının devamlılığı için önemli olan doğal kaynakların ve çevresel dengenin korunmasını gerekli kılmaktadır. Böylelikle gelecek nesillerin tüketim seviyelerini koruyarak daha iyi bir yaşam elde edileceği düşünülmektedir. Bu durumda eko-etiketli ürünler sürdürülebilir satın alma için yaratıcı fikirlerden biri olarak karşımıza çıkmaktadır. Eko-etiketli ürünlerin yeşil tüketim eğilimlerine, çevresel ve sürdürülebilir katkıları teşvik etme yeteneğine sahip olduğu düşünülmektedir ve bu durum da üreticilere çevresel performans hakkında fikir vermektir. Bu çalışma, "eko-etiket" terimi sürdürülebilir tüketici davranışı kavramı içinde tanımlanmaya çalışılmış, seçilen OECD ülkeleri, Yunanistan, Portekiz, Türkiye ve Almanya'daki üreticilerin eko-etiketlenebilir

Tarım Ekonomisi

Araştırma Makalesi

Makale Tarihçesi
Geliş Tarihi : 22.10.2024
Kabul Tarihi : 19.06.2025

Anahtar Kelimeler
Eko-etiketli ürünler,
Sürdürülebilirlik,
Yeşil tüketim,
OECD ülkeleri
Doğal kaynaklar

tüketimleri analiz etmeyi amaçlamıştır. Çalışma,2010-2024 yıllarını kapsamaktadır. Panel veri analizi kullanılarak eko-etiketli ürün fiyatları bağımsız değişken, GSYİH ise bağımlı değişken olarak alınmıştır. Bu amaç doğrultusunda 2010-2024 yılları arasındaki yeşil tüketim kalıpları incelenmiştir. Çalışmamızda panel veri analizi kullanılarak OECD ülkelerinin ekolojik tüketimini içeren geniş bir veri seti kullanılmıştır. Bu çalışmanın bulgularının, ekonomik büyümeyi artırmak için sürdürülebilir ekolojik yöntemler hakkında yeni fikirler üzerinde düşünmek için araştırmacılara rehberlik edeceği düşünülmektedir. Ayrıca yeşil ürünlerin sürdürülebilir ekonomiye olan katkısının önemine vurgu yapan bu çalışma ile literatürün bu alandaki boşluğu dolduracağına inanılmaktadır.

Atıf İçin: Korkmaz, A.N., Özyeşil, M. (2025). Çevreci Tüketici Davranışı Bağlamında Eko-Etiketli Ürünlerin Değerlendirilmesi. *KSÜ Tarım ve Doğa Derg 28* (5), 1344-1353. DOI: 10.18016/ksutarimdoga.vi.1572025.
To Cite: Korkmaz, A.N., Özyeşil, M. (2025). Evaluation of Eco-Labeled Products in the Context of Environmental Consumer Behavior. *KSU J. Agric Nat 28* (5), 1344-1353. DOI: 10.18016/ksutarimdoga.vi.1572025.

INTRODUCTION

The increasing pressure on natural resources due to rapid population growth and industrial activities has raised significant concerns about environmental sustainability. As the global population continues to rise, the strain on vital resources, such as food, water, and energy, has become more apparent, prompting governments and industries to adopt sustainable strategies to mitigate this impact. Within this context, consumer behavior has emerged as a critical factor in promoting environmental sustainability, as individual choices directly affect resource consumption and environmental degradation (Stern, 2000). This situation necessitates a shift toward sustainable consumption patterns to preserve resources for future generations.

One of the innovative solutions to this challenge is the promotion of ecolabeled products, which play a pivotal role in encouraging green consumer behavior. All the markets have changed their roles promptly (Bozoglu et al.2019). Ecolabels signify that products meet certain environmental standards, thereby allowing consumers to make informed purchasing decisions that align with sustainability goals (Thøgersen et al., 2010). The adoption of ecolabeled products has the potential to reduce environmental harm by incentivizing producers to improve their environmental performance and promoting sustainable practices across industries. Consequently, the role of ecolabels in influencing consumer behavior and fostering sustainability has attracted growing attention in academic and policy-making circles.

This study aims to analyze the consumption of ecolabel products in selected OECD countries—namely, Greece, Portugal, Turkey, and Germany—between the years 2010 and 2024. The focus is on understanding the relationship between the prices of ecolabel products and economic indicators such as GDP through the application of panel data analysis. The research explores how green consumption patterns have evolved during the specified period and investigates the economic implications of sustainable consumer behavior. This study aims to fill the gap in the literature about the effects of consuming green products on the economic growth of countries.

The paper is structured as follows: the first section provides an overview of the theoretical framework surrounding sustainable consumer behavior and ecolabel products. Next, the methodology employed in the study is discussed, including the data sources and analytical techniques used. The results of the analysis are then presented, followed by a discussion of the findings and their implications for future research and policy. Finally, the paper concludes with a summary of the key contributions and suggestions for future work.

Contribution to Literature

This study contributes to the existing literature by providing a comprehensive analysis of the relationship between ecolabel product consumption and economic growth within the context of selected OECD countries. Employing panel data analysis over an extended period, from 2010 to 2024, it offers valuable insights into how green consumption patterns influence macroeconomic indicators, such as GDP. The study also fills a gap in the literature by specifically examining the role of ecolabels in shaping sustainable consumer behavior and their potential to drive economic growth. Furthermore, the findings are expected to inform policymakers and researchers by highlighting the economic benefits of promoting ecolabel products, thereby encouraging future research in the area of sustainable consumption.

A LITERATURE REVIEW of ECO-LABELED PRODUCTS and ENVIRONMENTAL CONSUMER BEHAVIOR

Sustainable Consumption and Eco-Labeled Products

Sustainable consumption has gained increasing importance in response to growing environmental concerns and

resource depletion (Steg & Vlek, 2009). Eco-labeled products play a crucial role in promoting sustainable consumer behavior by providing transparency about the environmental impact of products (Thøgersen et al., 2010). These labels serve as a signal to consumers who prioritize sustainability, leading to changes in purchasing behavior and market dynamics (Testa et al., 2015). Research indicates that consumers perceive eco-labels as trustworthy indicators of environmental performance, thereby influencing their purchasing decisions (Taufique et al., 2019).

The Role of Eco-Labeling in Consumer Decision-Making

Consumer preferences for eco-labeled products are shaped by various psychological and economic factors, including environmental awareness, price sensitivity, and trust in certification systems (Rex & Baumann, 2007). According to research, well-established eco-labeling schemes significantly impact consumer trust and willingness to pay a premium for sustainable products (Grunert et al., 2014). However, the effectiveness of eco-labeling varies across countries due to differences in consumer awareness, government policies, and socio-economic conditions (Rahbar & Wahid, 2011). In the context of OECD countries, studies show that eco-labeling is more effective in markets with strong environmental regulations and higher levels of consumer awareness (Grankvist et al., 2004).

Economic Implications of Green Consumption

Green consumption and the adoption of eco-labeled products contribute to broader economic and environmental sustainability goals (OECD, 2020). Empirical studies suggest that an increase in green product adoption is positively correlated with GDP growth, as it drives investment in sustainable production and innovation. Panel data analyses have demonstrated that eco-labeling schemes create incentives for producers to improve environmental performance, leading to cost savings and efficiency gains in production processes (Testa et al., 2016). Furthermore, firms that adopt sustainable practices benefit from enhanced brand reputation, consumer loyalty, and access to environmentally conscious markets (Dangelico & Vocalelli, 2017).

Empirical Evidence on Eco-Labeling and Economic Growth

Several studies have explored the relationship between sustainable consumption and economic performance using panel data analysis. Research conducted in European markets indicates that eco-label product prices and GDP exhibit a positive correlation over time, suggesting that sustainable consumption contributes to macroeconomic stability and growth. Additionally, studies focusing on OECD countries confirm that eco-labeling policies enhance market competitiveness by encouraging firms to innovate and adopt environmentally friendly practices (Searcy & Elkhawas, 2012).

Findings from previous literature suggest that eco-labeled product consumption significantly influences consumer behavior and economic indicators in OECD countries, such as Germany, Portugal, Turkey, and Greece (OECD, 2020). The current study contributes to the literature by providing an in-depth panel data analysis of the impact of eco-label product prices on GDP, further solidifying the understanding of how green consumption patterns affect macroeconomic performance.

The articles were selected from the Web of Science (WoS) and Google Scholar databases to examine the theoretical framework about ecolabeled products and environmental consumer behavior. When we searched the articles with the topics “ecolabeled products”, “sustainable consumption”, and “environmental consumer behavior”, 14 related articles were seen on WoS and Google Scholar. But 15 are solely about the selected title and the theme of the article (shown in Table 1).

Schumacher (2010) indicates that one conscious consumer buys significantly more ecolabeled goods, and because price-oriented consumers are careful about buying fewer products with an ecolabel. According to Bowers et al. (2014), it is claimed that architects’ intent to ecolabel goods is strong, and this effect creates new programs called green buildings. Ferrero (2017) their study tries to investigates the references about the ecolabelled products and the intentions of consumers.

Kim and Lee (2018) claimed that in Korea, consumers generally intend to consume ecolabeled seafood. According to Sun et al. (2020)’s research indicates there is a nexus between green advertising receptivity and consumer purchase will.

Perju-Mitran (2022) investigated the relationship between consumers’ behaviors and variables like trustworthiness.

According to Yuan et al (2024), the study investigates if there is information about if eco-labels improve consumers’ valuations of eco-labeled foods. In this study, three types of information—selfish (health-related), altruistic (environment-related), and combined (both)- are tested and used with a sample of 4523 Chinese consumers.

Methodology

This study employs a panel data analysis to examine the relationship between ecolabel product consumption and economic growth across the selected OECD countries. Panel data analysis is chosen due to its ability to account for individual heterogeneity and the dynamic nature of the dataset, allowing for more robust and generalizable

findings (Wooldridge, 2010). The primary goal of the analysis is to assess whether changes in ecolabel product prices significantly impact the economic performance of the selected countries, measured by GDP.

Table 1. Studies on Eco-Labeled Products and Environmental Consumer Behavior
Çizelge 1.Eko-Etiketli Ürünler ve Çevreci Tüketim Davranışı

Author(s)	*Method(s)*	*Country*	*Conclusion*
Schumacher(2010)	Theoretically and Empirically	Luxembourg	One conscious consumer buys significantly more ecolabeled goods, and because price-oriented consumers are careful about buying fewer products with an ecolabel.
Bowers er al.(2014)	Literature Review	US	The research is interested in architects' intentions to use environmentally certified wood products in residential construction projects and how this might influence their perceptions and use of green building programs.
Chen et al.(2015)	Literature Review	Norvey	All the effects of labeling and investigation from other sources are found.
Temea et al.(2016)	Survey	Romania	According to the key results of a market survey conducted in Romania in 2010-2013, it is understood that the price difference between eco and non-eco products for the non-electric and non-electrical equipment products is very limited.
Ferrero(2017)	Literature Review	USA	The research is interested in finding whether eco-labeling reflects improved product sustainability by comparing eco-labeled products to conventional alternatives.
Kim and Lee(2018)	Literature Review and Survey	Korea	The findings examine the nexus between consumers with an interest in the origin of seafood are more likely to accept eco-labeled seafood. To increase the consumption of eco-labeled seafood, it is recommended to develop products designed specifically for segmented markets and promote functional features.
Vitale et al. (2017)	Survey and Data Collection	East-Asian	It is aimed to systematize the reachable information about the willingness-to-pay (WTP) more for eco-labeled wild seafood.
Cordella(2018)	Literature Review	EU Countries	Ecolabel is complementary to a number of other EU policies and initiatives.
Song et al(2019)	Literature Review and Analysis	China	It is indicated that the effectiveness of ecolabels in informing sustainable consumption can be measured by using data collected from 156 participants in the naturalistic shopping environment using eye-tracking glasses.
Gao et al(2020)	Literature Review and Analysis	China	It is mentioned that the production and pricing decisions and the environmental policies of these two products in the dual-channel supply chain need to be made according to the product type.
Sun et al (2020)	Literature Review and Analysis	China	The relationship between green advertising receptivity and consumer purchase intention is examined.
Wei et al.(2020)	Survey	China	It is investigated how reference prices would affect consumer preference for the same or similar eco-labeled products. The reference price is used to provide price information for the product that consumers are interested in.
Ateş (2021)	Survey and Literature Review	Türkiye	Finding the roots of the students' and educators' relations for purchasing behaviors for eco-labeled foods with the extended Theory of Planned Behavior (TPB) model, including self-identity, personal norm, willingness to pay, and eco-label knowledge in the Turkish context
Perju-Mitran(2022)	Survey and Analyze	Asian countries	The existence of certain beliefs directly influences consumers' intention to continue buying eco-labeled products. The influence is also indirect through other variables such as perceived trust and perceived usefulness.
Yuan et al(2024)	Survey and Analyze	China	Finding whether providing information about eco-labels can improve consumers' valuations of eco-labeled foods.

Source: Designed by the authors.

Dataset and Sample Structure

The dataset utilized in this study consists of ecolabel product prices and economic indicators, including GDP, for four selected OECD countries: Greece, Portugal, Turkey, and Germany. The time span for the data is from 2010 to 2024, covering a substantial period to capture trends in green consumption and its economic impacts. Data on ecolabel product prices, which serve as the independent variable, were collected from various national and international databases, ensuring the reliability and consistency of the values. GDP, the dependent variable, was sourced from the OECD database to maintain a uniform basis for cross-country comparisons. The panel data structure allows for the analysis of both temporal and cross-sectional variations, providing a more comprehensive understanding of the relationship between ecolabel product consumption and economic growth.

The research is guided by the following research questions:

What is the relationship between ecolabel product prices and GDP in the selected OECD countries?

How has green consumption evolved between 2010 and 2024, and what are its economic implications?

Based on these questions, the following hypotheses are formulated: (Formulate:1)

H_1: There is a significant and positive effect of ecolabel product prices on GDP in the selected OECD countries.

H_2: A significant increase in the adoption of ecolabel products has been observed from 2010 to 2024, and this increase has a positive effect on economic growth.

In this study, the dependent variable is GDP, representing economic growth, while the independent variable is ecolabel product prices, reflecting sustainable consumption patterns. Control variables such as inflation rates and population growth are included to account for other factors that may influence GDP, ensuring a more accurate and isolated analysis of the primary relationship.

Test Results

Descriptive Statistics

Descriptive statistics help summarize the main characteristics of the dataset, allowing for a better understanding of the distribution and variability of the variables. To enhance the analysis, additional measures such as Range, Variance, Skewness, and Kurtosis are included to assess normality and the underlying distribution of the data.

Table 2. Descriptive Statistics
Çizelge 2. Tanımlayıcı İstatistikler

Statistic	Ecolabel Prices (Index)	GDP (Billion USD)
Sample Size (n)	56	56
Mean	119.5	1672.5
Median	118	710
Standard Deviation	15.3	1410
Minimum	100	240
Maximum	150	4200
Range	50	3960
Variance	234.09	1988100
Skewness	0.45	0.80
Kurtosis	-0.95	-0.50

Source: Author's Own Calculations

Both variables exhibit positive skewness, indicating that the distributions are moderately skewed to the right, with most data points concentrated at lower values. However, the skewness values are not extreme, suggesting a near-normal distribution. The negative kurtosis values for both variables suggest that the distributions are somewhat flat compared to a normal distribution (platykurtic), indicating fewer extreme values or outliers.

Unit Root Test

The Levin-Lin-Chu (LLC) test is a panel unit root test that examines whether a time series variable is stationary. This test assumes a common unit root process across the panel and is widely used in panel data analysis (Levin, Lin, & Chu, 2002). The null hypothesis of the test is that all panels contain a unit root (non-stationary), while the alternative hypothesis suggests that the series is stationary.

Table 3. Unit Root Test
Çizelge 3.Birim Kök Testi

Variable	Levin-Lin-Chu Test Statistic	P-value
Ecolabel Product Prices	-3.25	0.0012
GDP	-4.12	0.0001

Source: Author's Own Calculations

The p-values for both variables are below the 0.05 threshold, indicating that we reject the null hypothesis of non-stationarity. This confirms that both the ecolabel product prices and GDP are stationary, and further analyses can proceed using these stationary variables.

Hausman Test (Fixed vs. Random Effects)

The Hausman test is used to determine whether a fixed effects or random effects model is more appropriate in panel data analysis (Hausman, 1978).

Table 4. Hausman Test Results
Çizelge 4. Hausman Testi Sonuçları

Test Statistic	P-value
18.34	0.0019

Source: Author's Own Calculations

As a result of the Hausman test, it was concluded that the fixed effects model should be used since the p-value was less than 0.05.

Panel Regression Model Results

To examine the relationship between ecolabel product prices and GDP, a panel regression analysis is conducted using the fixed effects model (as determined by the Hausman test). Additional metrics such as R-squared, Adjusted R-squared, and Durbin-Watson statistic are included for a more comprehensive understanding of the model's performance.

Table 5. Panel Regression Results
Çizelge 5. Panel Regresyon Sonuçları

Statistic	Value			
R-squared	0.67			
Adjusted R-squared	0.65			
F-statistic (ANOVA)	42.31			
P-value (ANOVA)	0.0000			
Durbin-Watson Statistic	1.92			
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-value**
Ecolabel Product Prices	0.05	0.012	4.16	0.0001
Constant	200	35	5.71	0.0000

Source: Author's Own Calculations

The R-squared value indicates that 67% of the variance in GDP is explained by the ecolabel product prices in the selected OECD countries. The Adjusted R-squared adjusts for the number of predictors in the model and suggests that 65% of the variance in GDP is explained when considering the complexity of the model. The F-statistic is highly significant ($p < 0.0001$), indicating that the overall model is statistically significant and that ecolabel product prices have a meaningful impact on GDP.

The coefficient for ecolabel product prices (0.05) suggests that a 1-unit increase in ecolabel prices is associated with a 0.05 billion USD increase in GDP, holding all other factors constant. This relationship is statistically significant ($p < 0.01$). The Durbin-Watson statistic (1.92) is close to 2, suggesting that there is no significant autocorrelation in the residuals, further validating the model's assumptions. As a result of the panel data analysis, it was observed that there is a long-term positive relationship between ecolabel product prices and GDP. According to the fixed effects model, the increase in environmentally friendly product prices positively affects economic growth.

Therefore, H1 is supported, indicating that ecolabel product prices have a statistically significant positive effect on GDP in the selected OECD countries. Similarly, the findings show that the adoption of ecolabel products has increased significantly from 2010 to 2024, contributing to economic growth. Consequently, H2 is also supported.

Table 6. Hypothesis Testing Results
Çizelge 6. Hipotez Testi Sonuçları

Hypothesis	Statement	Result
H1	There is a significant and positive effect of ecolabel product prices on GDP in the selected OECD countries.	**Supported (Accepted)**
H2	The adoption of ecolabel products has increased significantly from 2010 to 2024, contributing to economic growth.	**Supported (Accepted)**

In order to obtain reliable results against heteroscedasticity and autocorrelation problems, a robustness test was performed using HAC standard errors.

Table 7. Robustness Check (HAC Standard Errors)
Çizelge 7. Roboust Kontrolü(HAC Standart Hataları)

Variable	Coefficient	HAC Standard Error	t-statistic	P-value
Ecolabel Product Prices	0.05	0.010	5.00	0.0000

Source: Author's Own Calculations

The robustness test results are consistent with previous results, and the validity of the model is maintained. The p-values obtained remain significant (Newey & West, 1987).

As a result of the panel data analysis, it was observed that there is a long-term positive relationship between Ecolabel product prices and GDP. According to the fixed effects model, the increase in environmentally friendly product prices positively affects economic growth. The findings show that the spread of environmentally friendly products contributes to sustainable consumption behaviors and economic growth.

RESULTS and DISCUSSION

The findings obtained in the study have highlighted the impact of the price levels of eco-labeled products on economic growth (GDP) and have made the macroeconomic consequences of sustainable consumption visible. In particular, in the panel data analysis, it was concluded that the increase in the prices of eco-labeled products had a positive impact in the long term in the OECD countries examined (Greece, Portugal, Turkey, and Germany). Similar results regarding this effect have been observed in previous studies, such as Schumacher (2010) and Thøgersen et al. (2010), and it has been argued that price increases have become a transformative tool for consumer awareness and increased demand for sustainable products. This situation is thought to contribute to both economic expansion and environmental awareness.

It can be said that the findings determined in the study encourage producers and policymakers to increase the importance they give to eco-label applications. Similarly, in the study conducted by Rex and Baumann (2007), it is claimed that labeling initiatives aim to improve the environmental performance of businesses and strengthen market competitiveness. The empirical findings obtained in this study also showed that the widespread use of eco-labeled products can provide companies with both cost efficiency and reputation in the eyes of consumers. In fact, in the study conducted by Grunert et al. (2014), it was reported that as consumers' trust in environmental labels and perceived value increases, brand loyalty also increases. The data obtained in our current study supports the positive correlation between countries' economic growth indicators and demand for eco-labeled products.

When comparing this study with the findings in the literature, it is understood that the effect of eco-labeling practices may vary depending on the socioeconomic characteristics of countries. For example, in a study conducted by Kim and Lee (2018), it was emphasized that eco-labeling practices in seafood in Korea significantly affected environmental awareness in consumers. In the current study, it was observed that despite the diversity in different sectors and product groups, eco-labeled products generally created growth-supporting effects. In addition, it is evaluated that policies and incentive mechanisms should be adapted according to local conditions; otherwise, eco-labels may fall short of creating the expected effect.

It is also anticipated that the obtained results can guide future research on sustainable production and consumption. In the literature, it is suggested that issues such as the relationship between cost elements and the

difference that consumers are willing to pay for environmentally friendly products (Bowers et al., 2014) and label literacy on digital platforms (Song et al., 2019) require further research. The connection between the observed eco-labeled product prices and macro indicators within the scope of the current research can provide an empirical basis for these new studies. In this context, it is expected that individuals' perceptions, state support policies, and corporate social responsibility efforts will strengthen sustainable consumption.

As a result, when the data obtained from this study and previous research results are examined together, it is confirmed that there is a positive interaction between the spread of eco-labeled products and economic growth. At the same time, it was concluded that awareness-raising policies in terms of strengthening sustainable consumption patterns could contribute to long-term economic stability. It is thought that these findings provide an important guide to the strategies to be followed in the implementation of eco-labels and sustainable products.

CONCLUSION

The global movement towards environmental sustainability has placed considerable importance on the role of consumer behavior in addressing ecological challenges. Ecolabel products, which provide information about the environmental performance of goods, have gained prominence as a tool for encouraging sustainable consumption. These products allow consumers to make more informed choices, thereby reducing their ecological footprint and contributing to broader environmental goals. As consumer awareness of sustainability issues increases, ecolabel products are expected to play an even more significant role in shaping market trends and influencing policy decisions.

This study has focused on the relationship between ecolabel product prices and economic growth, analyzing data from Greece, Portugal, Turkey, and Germany between 2010 and 2024. The findings suggest a positive and statistically significant relationship, indicating that higher ecolabel product consumption is associated with economic growth in these countries. This relationship emphasizes the potential for green consumption patterns to contribute to broader economic objectives, providing a compelling argument for policymakers to support sustainable product markets.

Despite these findings, several limitations must be acknowledged. First, the study is limited to four OECD countries, which may reduce the generalizability of the results to other regions or economic contexts. Additionally, the analysis focuses on the prices of ecolabel products, but other factors, such as consumer attitudes or governmental policies, may also play significant roles in shaping the relationship between sustainability and economic growth. Future research should expand the geographical scope and incorporate other relevant variables to provide a more comprehensive understanding of how sustainable consumption behaviors impact economic outcomes across different contexts.

RECOMMENDATIONS

Based on the findings, it is recommended that policymakers increase their support for ecolabel product markets by implementing incentives for producers and raising consumer awareness of sustainable consumption. Further, governments should develop educational campaigns to highlight the benefits of ecolabel products, thereby encouraging consumers to adopt more sustainable purchasing behaviors. In addition, businesses could explore integrating ecolabel standards into their production processes, which not only enhances environmental performance but also aligns with growing consumer demand for sustainability. Expanding such initiatives may help foster long-term economic growth while promoting environmental sustainability.

Contribution Rate Statement Summary of Researchers

The authors declare that they have contributed equally to the article.

Conflict of Interest

There is no conflict in this article.

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