INVESTIGATING THE IMPACT OF CHANGES IN CONSUMER BEHAVIOR ON SUSTAINABLE GREEN ECONOMY PRACTICES BASED ON THE ROLE OF ELECTRONIC PAYMENT USE

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***ABSTRACT**:*

This study was conducted to investigate the impact of changes in consumer behavior on sustainable green economy practices based on the role of electronic payment use. The statistical population included customers using electronic payment of banks in Tehran province. The research questionnaire was distributed and collected among 384 members of the statistical population as a sample. The information collected by the questionnaires was analyzed using SPSS24 and AMOS24 software using structural equation modeling. The results showed that changes in consumer behavior have a positive and significant impact on sustainable green economy practices. Changes in consumer behavior have a positive and significant impact on the use of electronic payment. The use of electronic payment has a positive and significant impact on sustainable green economy practices. The use of electronic payment has a mediating role in the relationship between changes in consumer behavior and sustainable green economy practices. Changes in consumer behavior strengthen sustainable practices in the green economy. Also, the use of electronic payment as a key factor positively and significantly affects this relationship. Finally, electronic payment plays an effective mediating role between consumer behavior and the development of sustainable green economy practices. Investigating the impact of changes in consumer behavior on sustainable green economy practices based on the role of electronic payment usage

Keywords: Green economy, electronic payment, changes in consumer behavior.

INTRODUCTION

In recent years, awareness of the importance of environmentally friendly infrastructure and the circular economy has increased. Strategies such as recycling and renewable energy are key to reducing waste and greenhouse gas emissions, while plastic waste has become a global issue (Hari Kristianto, 2020). Governments and companies are implementing stricter policies and integrating sustainable practices. The green economy aims to create sustainable and inclusive growth, with consumers playing a critical role in its success (Wahida & Uyun, 2023). The use of electronic payments as a digital payment method facilitates a shift in consumer behavior towards sustainable practices, such as reducing the use of paper and plastic. This trend is driven by technological advances and increasing environmental awareness (Press, 2023). However, challenges such as data security and limited access to technology in certain regions still exist. Therefore, studying the impact of e-payment on the green economy is essential to provide insights for policies and business practices in achieving sustainable economic growth (Srouji, 2020).

The implementation of e-payment is key to the economic transformation towards greater environmental awareness. Research shows that e-payment adoption significantly influences changes in consumer behavior and supports the reduction of carbon footprint and greenhouse gas emissions by reducing dependence on cash. The development of environmentally friendly e-payment infrastructure and policies that support the integration of this technology are crucial to achieving green economy goals. This research provides insights for policymakers, businesses, and academics in formulating effective strategies to achieve a sustainable green economy (Astadi et al., 2022, Sari et al., 2022). Many studies have examined the impact of e-payment on consumer behavior and sustainability, but key gaps remain, especially in the context of Indonesia's green economy. Most research focuses on the technical aspects of e-payment or environmental benefits, ignoring how consumer behavior changes with e-payment adoption and its indirect impact on sustainability. Furthermore, studies often focus on developed

countries, leaving gaps in understanding e-payment in regions such as Indonesia, with limited technological infrastructure (Ar et al, 2025).

In recent years, many consumers have become more aware of the environmental impacts of their choices, but there is still a significant gap between green attitudes and their actual behavior in the marketplace; this gap highlights the need to design mechanisms such as e-payment to direct consumer behavior towards patterns compatible with a green economy (Anwar et al, 2025). On the other hand, the transition to a green economy requires reducing reliance on cash, paper, and costly and high-carbon physical infrastructure, while many economies still operate their financial and payment structures based on cash and traditional means. Recent papers show that the spread of digital and cashless payments can reduce part of the carbon emissions associated with the production, transportation, and management of cash and physical cards, thereby contributing to resource efficiency and the realization of green economy goals (Li et al, 2025). However, the direct relationship between changes in consumer behavior and sustainable green economy practices is not always simple and linear; in many cases, even consumers with high environmental attitudes are unable to fully implement green behavior due to transaction costs, difficulty of access, or old habits. Here, electronic payment can facilitate the transformation of green intention into green action by reducing behavioral frictions (such as time, cost, and transaction complexity) and providing a simpler user experience, which is the gap that the research question aims to address (Ar et al, 2025).

Recent studies have shown that the use of electronic payment not only digitizes purchasing patterns, but can also guide customers towards green products and services; for example, some payment platforms display the carbon footprint of the transaction and green score to the user and offer green offers. These mechanisms make consumer behavior more transparent to environmental consequences and increase the motivation to choose sustainable options, but the extent to which these tools mediate the relationship between consumer behavior and the green economy has not yet been systematically tested from a scientific perspective (Dagur et al, 2025).

The research literature also points to some ambiguities and contradictory results; for example, some studies show that the expansion of digital financial inclusion can increase household energy consumption and direct carbon emissions, because the ease of payment stimulates more consumption. This raises the need to carefully examine whether electronic payment really acts as a green mediator or, in some circumstances, can have negative effects on sustainability, and therefore the precise conditions and mechanisms of this mediator role in the research model need to be clarified. Accordingly, the statement of the research problem can be formulated as follows: As different economies seek to implement a green economy, there is still insufficient evidence on how changes in consumer behavior affect sustainable green economy practices, and the role of the use of electronic payment as a behavioral and institutional mediator in this regard. The knowledge gap is that the magnitude and direction of the effect of consumer behavior on the green economy, (2) the facilitating or inhibiting role of electronic payment in this regard, and the conditions under which electronic payment leads to a reduction in carbon footprint and the strengthening of sustainable practices, have not yet been comprehensively, empirically, and tested within the framework of new models; therefore, this research attempts to explain this mediating mechanism empirically and natively.

THEORETICAL FOUNDATIONS AND RESEARCH BACKGROUND

The link between consumer behavior, sustainability, and digital payment mechanisms is well established and draws on the literature of "sustainable consumption" and "green economy" in the digital space. In this approach, changes in consumer behavior, including increased sensitivity to environmental consequences, willingness to purchase green, and acceptance of digital services, are seen as potentially driving demand for environmentally friendly goods and services and accelerating the move towards a green economy. Recent theories suggest that these behavioral changes are most effective when supported by innovative digital and financial infrastructures to bridge the gap between green attitudes and actual action (Sharma & Jayswal, 2025). At the micro level, the theory of planned behavior and the literature on green purchase intentions explain that environmental attitudes, subjective norms, and perceived control shape sustainable consumption intentions, but the realization of these intentions depends on facilitating conditions. As a behavioral enabler, electronic payment reduces transaction costs (time, effort, and perceived risk) and can make the process of green purchasing and participation in the circular economy (such as digital buyback, second-hand shopping, and asset sharing) simpler and more attractive for consumers (Yuan et al, 2023).

From a green economy perspective, recent literature shows that the transition to a low-carbon economy requires simultaneous transformation in consumption structure, technology, and payment systems. Reducing dependence on cash, paper, physical banking infrastructure, and cash transportation can reduce the carbon footprint of the financial system, and by developing digital payment infrastructure, the necessary platform can be created for the formation of sustainable consumption patterns; so that each transaction is not only economic, but also carries environmental and social signals (Sadiq & Ali, 2024.). In the area of e-payments, research shows that tools such as mobile payments, digital financial inclusion, and even central bank digital currencies can increase access to financial services while simultaneously reducing paper consumption, physical travel, and energy costs of traditional systems. These studies argue that e-payments, in addition to their efficiency role, are a policy tool to support green projects, sustainable investment, and steer consumers towards low-carbon products and services, and are therefore consistent with the logic of a green economy (Kontzinos et al, 2025). A key point in the theoretical underpinnings of this research is the mediating role of e-payments in the relationship between consumer behavior changes and sustainable green economy practices. The literature suggests that the adoption and use of digital payments can be a channel for transmitting the impact of green behavior on environmental outcomes, as these technologies allow for the display of the carbon footprint of transactions, the provision of green points, and the design of financial incentives for sustainable choices. In this way, consumer behavior is translated into sustainable green economy practices through a digital platform that makes transactions transparent, traceable, and environmentally manageable. At the same time, recent literature also points to the complexity and duality of the relationship between digital financial inclusion and environmental sustainability; some studies suggest that ease of payment may increase consumption in the short term, thereby leading to growth in energy consumption, while other studies emphasize the capacity of digital finance to reduce per capita energy consumption. Accordingly, the theoretical foundations of the present study are based on the assumption that the ultimate effect of changes in consumer behavior on sustainable green economy practices depends on the design and use of electronic payment infrastructures; that is, electronic payment plays a positive mediating role when it is accompanied by green incentives, environmental transparency, and supportive policies (Li et al, 2025).

R et al. (2025) in a study titled Changes in Consumer Behavior through Electronic Payment in the Implementation of Green Economy examined the impact of changes in consumer behavior through the adoption of electronic payment systems within the framework of green economy practices. This study was conducted in Makassar with a sample of 150 respondents and was analyzed using structural equation modeling (SEM). The results indicate a significant relationship between changes in consumer behavior and increased use of electronic payment, which in turn supports the implementation of green economy practices. The findings indicate that the adoption of electronic payment helps reduce carbon emissions and the use of non-renewable resources, and promotes a more sustainable and efficient economy. Anwar et al. (2025) in a study titled Customer Engagement, Innovation and Sustainable Consumption: An Analysis of Personalized, Innovative and Sustainable Digital Products examined the mediating role of consumer behavior towards digital products and the moderating role of innovation level and sustainable consumption on the direct relationship between customer engagement and purchase intention towards digital products. The study used decision tree analysis, structural equation modeling (SEM) and artificial neural networks (ANN) to test all these proposed relationships. Data were collected from 412 Pakistani internet users who used different shopping apps. In addition, JASP 0.19.0.0 was used for analysis and data were collected based on existing scales. Yuan et al. (2023) in a study titled Towards a Digital Economy: Mobile Payment Affecting Sustainable Consumption Behavior examined the role of perceived risk and perceived technology on sustainable consumption intention and behavior. In addition, a structural equation model of mobile payment for sustainable consumption behavior is proposed. 574 participants from Chinese higher education institutions filled out the questionnaire. The bootstrap method was used to solve the problem of mediating factors. Amos 26.0 helped to build structural equation models. This study determined the negative effect of perceived risk of mobile payment on perceived usefulness of mobile payment, perceived ease of use of mobile payment, and sustainable consumption intention. In addition, these three variables have a certain buffer in the relationship between perceived risk of mobile payment and sustainable consumption behavior. In addition, perceived usefulness of mobile payment has a positive effect on sustainable consumption intention, and they have a chain mediating effect on the relationship between perceived risk of mobile payment and sustainable consumption behavior. The same effect also occurs in the relationship between perceived ease of use of mobile payment and sustainable consumption intention. The findings show that customer involvement, innovation, personalization, and sustainable consumption significantly affect purchase intention. However, the moderating effect of consumer behavior was not supported in this study. Decision tree analysis provided a clear and interpretable framework for understanding these dynamics, while the neural network model revealed nonlinear relationships between these variables.

RESEARCH HYPOTHESES

The main objective of this study is to investigate the impact of changes in consumer behavior on sustainable green economy practices based on the role of electronic payment use. Accordingly, in order to achieve the aforementioned goal, the research hypotheses were designed as follows:

1- Changes in consumer behavior have a significant impact on sustainable green economy practices.
2- Changes in consumer behavior have a significant impact on the use of electronic payment.
3- The use of electronic payment has a significant impact on sustainable green economy practices.
4- The use of electronic payment plays a mediating role in the relationship between changes in consumer behavior and sustainable green economy practices.

RESEARCH METHODOLOGY

In this research, from the perspective of the general approach, the study is classified as applied research; because its main goal is to provide a solution and model for improving decision-making and policy-making in the field of green economy and consumer behavior, not just to develop theoretical knowledge. In terms of implementation, this research is classified as a descriptive-survey study; meaning that the current status of variables in the statistical population is described and the relationships between them are examined based on field data, without experimental intervention. In terms of analytical strategy, the research is based on correlation analysis and uses structural equation modeling to test the conceptual model. In this approach, the goal is not only to measure simple correlation, but also to simultaneously evaluate multiple causal and non-causal relationships between latent and manifest variables in the form of a single model. Structural equations allow the direct, indirect, and total effects of key variables such as changes in consumer behavior, the use of electronic payments, and sustainable green economy practices to be estimated and compared in a coherent manner. In the modeling process, the raw data from the questionnaire are first converted into covariance or correlation matrices between indicators and constructs so that the structure of relationships between variables can be analyzed. Then, based on the conceptual model and research hypotheses, a set of simultaneous regression equations between latent variables (such as consumer behavior and green economy) and observable variables (questionnaire items) is defined. This structure consists of two parts: the measurement model (to measure the validity and reliability of the constructs) and the structural model (to test the relationships between latent constructs). In terms of data collection methods, the research uses a combination of library and field methods. In the first stage, theoretical literature and empirical background are collected using scientific articles, books, theses, specialized reports, and reliable online sources to enable the theoretical framework, extraction of variables, and formulation of research hypotheses. This part is known as the library method and forms the basis for designing the conceptual model and the measurement tool (questionnaire). In the field stage, the main research data are collected through a standard or researcher-made questionnaire among the target statistical population (for example, consumers using electronic payments) in the form of a survey. The questionnaire design is based on valid items in the literature and using appropriate scales (usually Likert) to measure the constructs of "changes in consumer behavior", "use of electronic payments" and "sustainable practices of the green economy" in a valid and reliable way. Then, the collected data are prepared for statistical analysis and modeling. Finally, the research methodology includes a coherent set of steps: developing a theoretical model, defining hypotheses, designing a measurement tool, collecting data, estimating a structural equation model, and assessing the fit and significance of the paths. This structure allows the mediating role of electronic payment use in the relationship between changes in consumer behavior and sustainable green economy practices to be tested empirically and simultaneously, and in addition to testing hypotheses, an accurate picture of the strength and weakness of the relationships between variables is presented in the form of a scientific and reliable model.

The statistical population includes all customers using electronic payment of banks in Tehran province, the exact number of whom is not known. In this study, to ensure equal chances for all sample members, a simple random sampling method using the Gregsey and Morgan table was used, and the maximum sample size, 384 people, was selected. To ensure the return of the questionnaires, 400 questionnaires were distributed, of which 384 questionnaires were returned in full.

The data collection tool in this study is a questionnaire. This questionnaire is structured in such a way that respondents choose their syptions based on a five-option Likert scale from "strongly agree" to "strongly disagree". SPSS software and Cronbach's alpha coefficient were used to assess the reliability of the questionnaire. Considering that the minimum reliability coefficient for research questionnaires is 0.70, it can be seen that the

Cronbach's alpha coefficient for all variables was higher than this value; therefore, it can be claimed that the reliability and validity of the questionnaire are at a desirable level. The results of the Cronbach's alpha coefficient are presented in Table 1.

Table 1: Questionnaire reliability results

Cronbach's alpha coefficient	Questions	Questionnaire
0.914	4-1	Changes in consumer behavior
0.901	8-5	Use of electronic payments
0.945	13-9	Sustainable practices of the green
0.974	13-1	Total questionnaire

Research findings

The present study uses descriptive statistics and inferential statistics methods to analyze the information collected from the statistical sample. In fact, first, using SPSS software, each variable was described in the form of tables and statistical indicators, and then, to analyze the data, test the hypotheses, and in general, to generalize the results from the sample to the statistical population, the structural equation modeling method was used using Amos 24 software. Table 2 shows the results of the descriptive statistics of the research variables.

Table 2: Descriptive statistics of research variables

Number	Minimum Value	Maximum Value	Skewness	Skewness	Standard Deviation	Mean	Variable
384	5.00	1.00	0.366	-0.044	0.433	3.822	Changes in consumer behavior
384	5.00	1.00	-0.121	-0.378	0.445	3.441	Use of electronic payments
384	5.00	1.00	0.711	0.405	0.525	3.225	Sustainable practices of the green economy

Since the skewness and kurtosis of all variables are in the range of -2 and +2, all variables have a normal distribution. Therefore, parametric techniques are used to examine the research hypotheses. The conceptual model of the research was mentioned in the previous sections. Before fitting the structural model, it is necessary to examine whether the 13 items observed in the questionnaire (including the questionnaire questions) reflect the 3 dimensions or concepts (research variables) including changes in consumer behavior, use of electronic payment, and sustainable practices of the green economy in a desirable way? The overall fit of the measurement model is determined by confirmatory factor analysis (CFA). The next figure shows the measurement model for this study. Before testing the hypotheses, one must be sure of the validity and accuracy of the measurement models of the research variables so that structural relationships can be examined afterwards. For this purpose, fit indices are used, which are shown in Table 3.

Table 3: Model fit indices

RMSEA	NFI	CFI	TLI	IFI	GFI	CIMIN df	Model Fit Indices
0.002	0.947	0.909	0.923	0.975	0.935	3.125	Original Model
Smaller than 0.05	More than 0.9	More than 0.9	More than 0.9	More than 0.9	More than 0.9	to 5 1	Acceptability Level

As can be seen in the table above, all the indices are within the desired range. Therefore, the suitability of the confirmatory factor analysis model in fitting the collected data is confirmed. In this section, the structural model of the research is fitted to examine the alignment

Table 4: Results of path analysis of hypotheses

p-value	T-statistic	Standard deviation	Standardized coefficient	Path Analysis
0.000	13.761	0.088	0.893	Changes in Consumer Behavior → Use of Electronic Payments
0.000	4.444	0.081	0.304	Changes in Consumer Behavior → Sustainable Green Economy Practices
0.000	7.060	0.145	0.782	Use of Electronic Payments → Sustainable Green Economy Practices

Based on the results of the path analysis table, the standard coefficient of the effect of changes in consumer behavior on sustainable green economy practices is 0.304, and the significance level of this relationship is 0.000, which is less than 0.05. Therefore, it can be concluded that changes in consumer behavior have a positive and significant effect on sustainable green economy practices, and at a 95 percent confidence level, the first hypothesis that this significant effect exists is accepted. The path coefficient of changes in consumer behavior on the use of electronic payment is reported to be 0.893, and the significance level of this effect is 0.000, which is less than 0.05. Accordingly, changes in consumer behavior have a very strong, positive, and significant effect on the use of electronic payment, and at a 95 percent confidence level, the second hypothesis related to the significant effect of consumer behavior on the use of electronic payment is confirmed. The standard coefficient of the effect of electronic payment use on sustainable green economy practices is reported to be 0.782 and its significance level is reported to be 0.000, which is less than 0.05. As a result, the use of electronic payment has a positive and significant effect on sustainable green economy practices, and with 95% confidence, the third hypothesis that this effect is significant can be accepted. Given that: a) changes in consumer behavior have a positive and significant effect on the use of electronic payment (coefficient 0.893 and p=0.000), b) the use of electronic payment has a positive and significant effect on sustainable green economy practices (coefficient 0.782 and p=0.000), and c) the direct path of changes in consumer behavior on sustainable green economy practices is also significant (coefficient 0.304 and p=0.000), it can be concluded that part of the effect of consumer behavior is transferred to sustainable green economy practices through the variable of electronic payment use. Accordingly, the mediating role of electronic payment use in the relationship between changes in consumer behavior and sustainable green economy practices is confirmed at a 95% confidence level, and the type of mediation can be interpreted as partial mediation. Therefore, the fourth hypothesis regarding the existence of this mediating role is accepted.

CONCLUSION

The results of the study show that changes in consumer behavior lead to the strengthening of sustainable green economy practices, both directly and through digital financial mechanisms. The direct coefficient of consumer behavior on sustainable green economy practices is positive and significant, which indicates that as consumer attitudes and habits move towards responsible, thrifty, and green consumption, the level of adoption of sustainable practices in the green economy also increases significantly. On the other hand, the very strong coefficient for the consumer behavior path to the use of electronic payments and the positive coefficient for the electronic payment path to sustainable green economy practices indicate that a consumer with a more modern and green behavior and attitude is more likely to use electronic payment instruments, and this use itself acts as a strong driver for the expansion of sustainable practices (reducing paper consumption, tracking green transactions, and facilitating the purchase of sustainable products). Given the significance of all three of the above paths, while the direct effect of consumer behavior on sustainable green economy practices remains, it becomes clear that the use of electronic payments plays a partial mediating role; that is, part of the effect of consumer behavior is transmitted directly and another part is transmitted indirectly through electronic payments. This pattern suggests that digital financial infrastructures are not only a technical tool, but also a behavioral-institutional channel for translating consumer green tendencies into actual actions at the green economy level. In other words, the more policymakers can simultaneously make consumer behavior greener and the use of electronic payments more inclusive and "greener by design," the greater the cumulative effect on economic and environmental sustainability will be. Compared to

previous research such as R et al. (2025) in the field of green consumer behavior, the present results are in line with research that has emphasized the role of attitudes, norms, and perceived behavioral control in shaping green purchasing behavior and has shown that changes in consumer preferences and values can change the demand pattern in favor of sustainable products and services. These findings are also consistent with more recent studies such as Anwar et al. (2025), Dagur et al. (2025), and Yuan et al. (2023) in the field of sustainability and digital finance, which show that the use of digital services (such as e-banking and mobile payment) can reduce the consumption of physical resources and the carbon footprint of the financial system and provide a suitable platform for the implementation of green incentives. The main innovation of the present study compared to some of the previous literature is that it explicitly models and tests the role of electronic payment mediation in the relationship between consumer behavior and green economy outcomes, while much of the previous work has examined one of these two dimensions (behavior or financial technology) alone.

From a practical perspective, it is first suggested that policymakers and managers in the green economy design targeted educational and awareness programs to improve consumers' environmental and digital financial literacy, so as to simultaneously strengthen the tendency towards green consumption and the willingness to use electronic payments. These programs could include information campaigns about the environmental benefits of green shopping, as well as the benefits of reducing paper, fuel, and time consumption through electronic transactions. Also, integrating educational content about the "carbon footprint of transactions" into payment applications and gateways could facilitate the internalization of green behavior. Second, it is suggested that banks, payment companies, and fintechs design their products and services in such a way that "green electronic payments" become a distinctive experience for the user. For example, assigning green points or badges to transactions related to sustainable products and services, offering discounts and cashback for green purchases, and displaying a dashboard of carbon and paper savings from the use of electronic payments can strengthen the mediating effect identified in this study. Also, encouraging acquirers (businesses) to offer fully digital payment options, especially in the supply chain of green products, will complete the sustainable consumption loop. Third, at the governance and policy level, combining the results of this study with macro-green economy policies shows that e-government and digital economy development programs should be consciously aligned with environmental policies. Providing tax and credit incentives to firms and platforms that provide green payment infrastructure and transparent environmental reporting of transactions can transfer the identified positive effects from the micro (consumer) level to the macro (green growth, reduced environmental costs of the financial system). Synergies between financial institutions, the environment, and digital regulators can also manage risks such as increased excessive consumption due to ease of payment through the design of caps, consumption alerts, and green budgeting tools. For future research, it is first suggested to examine the role of moderating variables such as demographic characteristics (age, gender, education), digital literacy, and environmental literacy in the strength and direction of these relationships, to determine which consumer groups are most responsive to combined "green behavior–electronic payment" policies. Second, the research model can be developed by separating different types of electronic payments (mobile payments, digital wallets, bank cryptocurrencies, etc.) to determine which tools have the greatest potential to strengthen the green economy. Third, longitudinal (rather than cross-sectional) studies are recommended to monitor changes in consumer behavior and patterns of electronic payment use over time, to clarify the causality and sustainability of the identified effects. Fourth, combining quantitative structural equation modeling with qualitative methods (such as in-depth interviews with consumers and payment platform designers) can help uncover the hidden mental, motivational, and institutional mechanisms behind these relationships and provide a basis for designing more complex and contextualized interventions in the field of green economy.

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