



Original article

Impact of green finance and environmental tax on sustainable development: Evidence from Vietnam

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ABSTRACT

The worldwide need for environmental preservation and robust economic development has garnered significant interest from scholars and politicians. This study examines the influence of green finance and environmental protection tax on Vietnam's financial sustainability and the transition towards a green economy as an emerging economy. The study obtained data from the Central Bank of Vietnam and World Bank Indicators covering 2012 to 2022. The authors used the Ordinary Least Squares approach to examine the associations between the variables. The analysis and examination of the data used Stata 19 software. The findings show a favourable correlation between green finance and environmental tax on sustainable development goals with all control variables. These results have prompted authorities to focus on green finance and environmental issues in the progress towards the country's green economy and sustainable development.

KEY WORDS: environmental tax, green finance, sustainable development

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1. Introduction

Vietnam's economy has seen enormous expansion since the reform and openness, making it an important global economy that has significantly influenced the growth of the worldwide economy (NGUYEN ET AL., 2023). However, the ecological environment is deteriorating, the natural environment as well as air quality that humans depend on for their existence are worsening, and ecological issues like environmental degradation and energy depletion are increasing attention (MUHAMMAD ET AL., 2023). Vietnam has demonstrated a proactive approach in recent years toward fulfilling its global responsibilities to reduce greenhouse gas emissions and to mitigate the effects

of climate change. The country is steadfastly dedicated to advancing sustainable development, as specified in its strategic blueprint for implementing the 2030 Agenda for Green and Sustainable Development Goals of the United Nations in 2015 (NGUYEN, 2016).

Furthermore, Vietnam has endorsed the Paris Agreement on climate change and has pledged to achieve carbon neutrality by 2050. The government's reports at the COP26 Conference attest that Vietnam has demonstrated remarkable competence in conducting its obligations (UNITED NATIONS, 2022). The environmental issues have been resolved by establishing a policy framework for green growth, which encompasses adopting the National Strategy for Green Growth, the National Strategy on Climate

Change until 2050, and the implementation of the plan for the conclusions of the COP26 Conference. Vietnam implemented its Law on Environmental Protection, establishing a strong legal basis for using economic instruments to promote sustainable development. Vietnam's historical development experience has shown that relying only on stringent terminal governance is insufficient for consistently and efficiently enhancing environmental quality.

Adopting eco-friendly technology, prioritising sustainability aims, and creating procedures and regulations to safeguard natural resources are all parts of the green transformation. The significance of financial measures in achieving economic development, as well as maintaining the ecological equilibrium between the environment and sustainable development, cannot be disregarded (BUKHARI ET AL., 2021). State Bank of Vietnam has released the action plans for the banking sector to implement the National Strategy on Green Growth until 2050. These plans aim to establish an economic development paradigm that promotes ecological, low-carbon, and sustainable development. The aim is to motivate businesses to participate in the preservation of ecological environments proactively and to promote advancements in green technology actively. These have served as guiding principles for showing green banking in Vietnam, guaranteeing their applicability, and bolstering green growth (SBV, 2022). The central concept is to institutionalise and link the environmental performance of businesses with green finance policies. International academics were the first to suggest sustainable and environmental (finance, which is how green finance started. According to BARANNIK (2001), environmental finance refers to the innovation undertaken by the financial industry to follow environmental regulations. Financial institutions use environmental finance as a funding strategy to support environmental conservation. Financial organisations may be prevented from decreasing their financial help for pollution initiatives under the green credit policy. When green finance rules are implemented, significantly polluting businesses usually face more substantial financing limits, higher financing costs, and a consequent impact on their economic activity.

Despite being a recent subject, some scholarly works have examined the effects of green financing on transitioning to a green economy in Vietnam (QUY, 2017; TRAN ET AL., 2020; NGO ET AL., 2021). However, for this process to be meaningful, it needs to consider the economy's growth more positively.

This study examines the impact of the revenue from environmental protection tax and green credits on Vietnam's economic growth. The research incorporates control factors such as economic growth and per capita spending. The statistics were acquired from the Central Bank of Vietnam and World Bank, spanning 2012 to 2022. The study aims to reveal the practical nature of developing and supporting a stable green finance system, and thereby improving economic efficiency, and proposing policies for Vietnam and emerging countries.

2. Literature reviews

Green finance plays a vital role because it contributes to the connection between the economy, the environment and sustainable development (CHIEN ET AL., 2021). Issues related to green finance both directly and indirectly affect economic development; nonetheless, the importance of GDP and other financial indicators also plays a vital role in aiding countries in their transition to a green economy with sustainable values (NGO ET AL., 2021). The manufacturing sector's explosive rise has also shown the industry's major influence on environmentally sustainable economic expansion. On the other hand, foreign direct investments are also recognised as a substantial part of the macroeconomy and a leading part of green financing that supports the transformation of the economy. Expansion of financial institutions' assistance with green finance plays a crucial role in the government's efforts to protect natural resources. In particular, financial institutions will provide loans with preferential interest rates to businesses with environmentally friendly products or business activities that have little negative impact on the surrounding environment (TU ET AL., 2021).

Various green financing instruments will support necessary economic conditions for particular projects that are beneficial to the environment, thereby contributing to fostering the sustainable development of the economy (D'ADAMO ET AL., 2020; DOS & PATTARIN, 2024). Besides, sustainability as opportunity cost is characterised by seeing the responsibilities of business extending beyond the sheer search for profit within legal boundaries. This perception encourages enterprises in the economy to actively pursue projects that benefit society, leading to enhanced competitiveness and increased business and economic development profitability. Scholarly literature elucidates the importance of green credits

in fostering economic growth (CUI ET AL., 2018; LI ET AL., 2018; SADIQ ET AL., 2020; NGO ET AL., 2021). However, economic research repeatedly identifies some limitations, notably to the suitability of legal frameworks and regulatory measures. Analysing their preparedness and use is crucial because positive green credits foster economic development and environmental change. Certain economies having loans from wealthy nations and financial institutions, see green financing as costly (GEDDES, 2020). The economic expansion model and different investments connected to green credits are necessary for economic development. Despite the benefits of investments, setting up a green lending environment affects the transition to a more environmentally friendly economy.

Socially conscious nations mostly use environmental protection taxes to support economic development and the social environment (GAJJAR, 2020; NGUYEN ET AL., 2021). Green taxes will prevent multinational and national firms from using excessive resources and environmentally harmful industrial techniques. These added levies have significantly impacted the use of products like petrol and oil (SSEKIBAALA ET AL., 2022). The demand for a green tax policy has become crucial in the nation's socioeconomic growth. Over the years, several tax and charge policies on environmental preservation and green economic growth have been created and progressively enhanced (TRAN ET AL., 2020). Approval has been granted for the green bank development project, in conjunction with integrating the objective of enhancing the proportion of the green credit balance within the overall credit balance.

According to TRAN ET AL. (2020), Vietnam is one of the 38 emerging economies that has made great strides in advancing the finance sector towards sustainable development. The research is dominated by various crediting practices, significantly affecting emerging nations trying to achieve sustainable economic development. Besides, according to OTHMAN ET AL. (2020), SADIQ ET AL. (2020), and ZHUANG ET AL. (2021), international influence raises several issues, even if some alternative initiatives with green issues encourage favourable thoughts about organising a sustainable economy. Governments may promote long-term economic growth by implementing elements of a green tax (TOUAT & TEBANI, 2022). The component of green finance that focuses on the quality of financial contribution examines the predominant feature of green finance and its impact on economic development and growth (CHIEN ET

AL., 2021). The literature covered every potential side of economic development and highlighted the several components that are predominant in green finance for a given period (CUI ET AL., 2018; ABBAS, 2020; SETYAWAN ET AL., 2020). It depends on how the premise explains the green credits as a more complex variable in economic development. The study considers green finance a crucial part of the economy, with various effects on society and the economy (CUI ET AL., 2018; LI ET AL., 2018). A nation's productivity is often measured by its efficient use of green finance (BASSINO & VAN DER ENG, 2019). The population is split by the GDP, showing that it significantly affects economic growth (SHAIR ET AL., 2021). Due to the exceptionally favourable economic circumstances that societies and companies are experiencing, green finance offers solutions to help sustainable efforts and accelerate economic development. The populace supports beneficial contributions to green economic expansion (OZILI, 2022). However, many significant measures are brought up by empowering the populace via jobs and possibilities. Significantly, in addition to trade domination and other variables, boundaries between different nations also contribute to the economic development of their neighbours (SETYAWAN ET AL., 2020). Green finance is often characterised as incorporating enhanced criteria for investment strategies to foster sustainable economic development.

Countries should have reflected on their economic development in addition to green financing considerations. This issue's growth rate may be calculated by comparing it to the gross domestic product at the same time as the previous year. Improvements in green finance should be considered in tandem with economic expansion (KIM & KANG, 2021). Green financing considerations may adversely affect the economy and the transition to a green economy. Therefore, it is essential to consider these two factors. This research used a range of financial measures to investigate the significant impact of green financing on economic development, resulting in its prominent inclusion in financial indicators. Previous research has investigated the influence of green financing on the overall quality of economic growth using extensive, proactive variables (WEEKS ET AL., 2020; EHSANULLAH ET AL., 2021; XUEYING ET AL., 2021). Specific aspects of green finance show the importance of the financial requirements that different nations' economies need (NAWAZ ET AL., 2020). Prospects for financial growth include essential, relevant regulations for environmental

green financing. Various assessments evaluated the prominence of green finance to per capita spending, each driving economic development differently. Industrial development is often driven by the mainstreams of economic expansion, causing the prominence of green finance.

3. Research methods

3.1. Data, variables and hypothesis

The research constructed a research model consisting of the four factors of green credit (GC), revenue from environmental protection tax (EPT), gross domestic product (GDP), and per capita expenditures growth (PCE) affecting Vietnam's sustainable development goals index (SGD) from 2012 to 2022. The data was collected from the

Vietnam State Bank, the General Statistics Office of Vietnam, and the World Bank. Table 1 shows selected variables as well as the research hypotheses of the model.

Dependence variable. The United Nations established the Sustainable Development Goals (SDGs), alternatively called the Global Goals, intending to tackle worldwide issues, including eliminating poverty, preserving the environment, and guaranteeing universal peace and prosperity by 2030 (UNITED NATIONS, 2015). The interconnectivity of the seventeen Sustainable Development Goals (SDGs) is evident. Recognising the interdependence of numerous regions, the authors stress the importance of balancing environmental and social concerns during development. An aspect worthy of contemplation is the metric quantified as a percentage of SDG fulfilment.

Table 1. Research variables and hypothesis

Variable	Code	Description	Unit	Hyp.	Source
Dep. Varb.	SDG	Sustainable Development Goals Index	%		World Bank
Indep. Varb.	GC	Ratio of green credits to credits	%	+	Vietnam State Bank
	EPT	Revenue from environmental protection tax	Trillion VND	+	GSO
Ctrl. Varb.	GDP	Gross domestic production growth	%	+	World Bank
	PCE	Per capita expenditures growth	%	-	World Bank

Independence variables. Green credit (GC) is a total outstanding loan from commercial banks that provides individuals and organisations with activities that positively affect the environment. The government started a program incentivising various stakeholders to contribute to environmental preservation and sustainable practices (LI ET AL., 2018). Green Credit refers to the annual ratio of green credits to total credits. Green credit provides preferential capital with low interest rates for projects related to environmental protection, reducing greenhouse gas emissions and unusual climate fluctuations toward a green and growing economy. Therefore, green credit is one of the solutions that specialised finance can apply to support Vietnam's micro and social environments through vital financial tools (NAWAZ ET AL., 2020).

H1: Ratio of green credits to credits positively impacts the sustainable development goals index.

The imposition of an Environmental Protection Tax (EPT) is limited to particular commodities and products deemed detrimental to the environment.

The funds generated from this tax are subsequently allocated to support programs and initiatives aimed at environmental protection. The primary objective of an Environmental Protection Tax is to establish financial motivation for businesses and consumers to embrace more environmentally sustainable practices (LIAO & SHI, 2018). When the revenue from environmental protection tax increases, this economic tool allows the integration of environmental costs into market prices, encourages consumers not to consume products that damage the environment, fosters manufacturers not to use materials that pollute the environment, and promotes compliance with environmental laws. Tax is an economic instrument that influences the conduct of economic agents in a manner that is advantageous to the environment, either directly or indirectly (OTHMAN ET AL., 2020; TOUAT & TEBANI, 2022).

H2: Revenue from environmental protection tax positively impacts the sustainable development goals index.

Control variables. The Gross Domestic Product (GDP) refers to the yearly increase in the overall financial worth of a nation's output. It represents the combination of economic size and the financial wellness of an economy. GDP structure is a key criterion used to assess sustainable economic growth. Achieving sustainable growth relies on the proportion of GDP devoted to services and industries surpassing that of agriculture. However, the growth of the Gross Domestic Product comes with specific effects on the environment. However, the growth of the Gross Domestic Product may adversely affect the goal of sustainable development or economic growth associated with environmental factors (MALICK & RAHMAN, 2020).

H3: Gross Domestic Product negatively impacts the sustainable development goals index.

Government per capita expenditure (PCE) is the average amount of money a government spends on each person in a specific period, typically a year. It is calculated by dividing government spending by population size (ZHAO et al., 2015; QUY, 2017; MARJIT ET AL., 2020). This research measures PCE by the annual government per capita expenditure growth over the years. PCE will reflect the inflation or deflation occurring from one period to the next. Combining the deflator with the PCE index will give the extent of the periodic price changes. When the PCE index increases, it means inflation will cause people's real income to decrease. This problem makes achieving sustainable development goals more challenging (SETYAWAN ET AL., 2020; MALICK & RAHMAN, 2020).

H4: Government per capita expenditure positively impacts the sustainable development goals index.

3.2. Research method and model

This study evaluates the impact of green credit and environmental tax on Vietnam's economic growth. An analysis of Ordinary Least Squares (OLS) regression is used. The authors then conducted tests for autocorrelation and heteroskedasticity in the model to ensure it was suitable for the intended purpose. The research aimed to identify appropriate models for estimating the optimal outcomes in analysing the influence of green finance, environmental protection tax, and control factors on the rate of achieving sustainable development targets in Vietnam. Figure 1 shows the model diagram to assess the impact of green finance, environmental tax and control variables on sustainable development goals in Vietnam from 2012 to 2022.

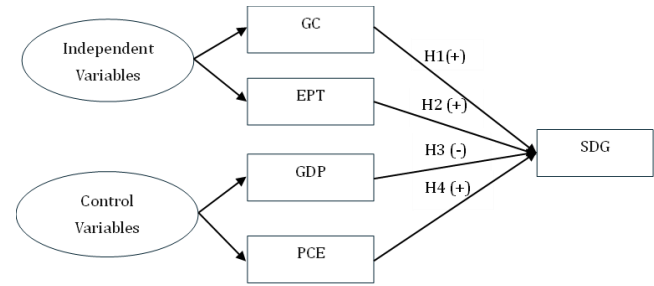


Fig. 1. Research model diagram

Model (1)

$$SDG_t = \beta_1 + \beta_2 GC_t + \beta_3 EPT_t + \beta_4 GDP_t + \beta_5 PCE_t + u_t \quad (1)$$

$$\widehat{SDG}_t = \hat{\beta}_1 + \hat{\beta}_2 GC_t + \hat{\beta}_3 EPT_t + \hat{\beta}_4 GDP_t + \hat{\beta}_5 PCE_t + e_t \quad (2)$$

Model (2)

$$\text{Log}(SDG_t) = \beta_1 + \beta_2 GC_t + \beta_3 \text{Log}(EPT_t) + \beta_4 GDP_t + \beta_5 PCE_t + u_t \quad (3)$$

$$\text{Log}(\widehat{SDG}_t) = \hat{\beta}_1 + \hat{\beta}_2 GC_t + \hat{\beta}_3 \text{Log}(EPT_t) + \hat{\beta}_4 GDP_t + \hat{\beta}_5 PCE_t + e_t \quad (4)$$

In which:

SGD : Vietnam's Sustainable Development Goals index

t : Research period from 2012 to 2022

GC : Green credit

EPT : Revenue from environmental protection tax

GDP : Gross domestic product

PCE : Per capita expenditure

4. Results and discussions

4.1. Descriptive statistics

The data shown in Table 2 provides information on the mean, median, standard deviation, minimum, and maximum values of the variables included in the model.

This study showed that the average SGD index of Vietnam from 2012 to 2022 was 70.87%. This result represents Vietnam's gains of about 70.87% sustainable development goal basing international commitments to the environment and sustainable development goals. Besides, the average green credit

ratio in total credit is 2.77%, which accounts for a small rate of the total credit of commercial banks. Therefore, the Vietnamese government, authorities, and commercial banks can consider increasing green loans and decreasing interest rates for green loans to support the sustainability of the economy in the long term. In addition, the average green revenue from environmental protection tax in Vietnam was 42.025 trillion dongs, and the revenue trend has been increasing through the years to ensure the limited effect on the environment of business activities. The average GDP growth was 6.69%, and the per capita expenditure on average was 5.30%.

Table 2. Descriptive statistics

	SDG	GC	EPT	GDP	PCE
Mean	70.77	2.75	43.012	6.03	4.59
Median	70.87	2.77	42.025	6.69	5.30
Maximum	73.32	5.10	80.535	8.02	6.50
Minimum	68.29	1.20	11.149	2.56	1.70
Std. Dev.	1.56	1.45	25.248	1.81	1.79

4.2. Correlation test

A correlation higher than 0.80 shows the presence of multicollinearity in the model. However, Table 3 shows no correlation values in the model's independent variables of the research model and explained variables of more than 0.80. These findings prove that multicollinearity issues do not exist in this model.

Table 3. Correlation test

Variables	Correlation coefficient	Correlation results
GC	0.60946	There is no existence of multicollinearity
EPT	0.55036	There is no existence of multicollinearity
GDP	-0.48332	There is no existence of multicollinearity
PCE	-0.38413	There is no existence of multicollinearity

first-order autocorrelation, and yields normally distributed residuals. However, the independent variables in the model (1) are not statistically significant. On the other hand, model (2) presents better results in terms of R-squared ($0.5347 > 0.5217$), and all the independent variables of this model are statistically significant at 5%. Therefore, model (2) can be considered the model with the better result of the two models.

Table 4. Regression results

Variables	Model (1) SDG	Model (2) Log (SDG)
C	67.5199	4.1723
GC	0.0289	0.0027**
EPT	0.0576	0.0212**
GDP	0.1334	-0.0028**
PCE	-0.0249	0.0023**
R-squared	0.5217	0.5347
Adj R-squared	0.4695	0.4911
P-value (F-statistic)	0.0018	0.0011

Note: *, **, *** are statistically significant at 10%, 5%, 1%.

4.3. Model results and discussions

4.3.1. Model results

Table 4 demonstrates the suitability of model (1) and model (2). The proposed model exhibits accuracy and linearity, demonstrates homoscedasticity, lacks

4.3.2. Model test

The data in Table 5 indicate that the P-value of 0.8009 exceeds the predetermined significance level of 0.05. However, this finding does not provide adequate support to reject the null hypothesis

(H0). The autocorrelation phenomenon is absent in the original model. Based on the p-value of 0.5203 reported in Table 6, the significance level of 0.05 has been surpassed, suggesting inadequate evidence to reject the null hypothesis (H0). The original model has been accurately determined linearly. The data in Table 7 shows that the P-value of 0.3466 is statistically significant at a significance level of 0.05. However, this value is insufficient to reject the null hypothesis (H0). Homoscedasticity is present in the original model.

Table 5. Breusch Godfrey test

Breusch-Godfrey Serial Correlation LM test			
F-statistic	0.0707	Probability	0.8009

$$\text{Log}(\text{SGD}_t) = 4.1723 + 0.0027\text{GC}_t + 0.0212\text{Log}(\text{EPT}_t) + 0.0028\text{GDP}_t - 0.0027\text{PCE}_t + e_t$$

The meaning of the coefficients:

$\hat{\beta}_1$: When the GC, EPT, GDP, and PCE variables are zero, the average SGD productivity of Vietnam is 4.1723% SGD.

$\hat{\beta}_2$: When the other independent variables do not change, if the GC grows 1 percent, there would be a 0.0027 percent increase in SDG.

$\hat{\beta}_3$: When the other independent variables do not change, if the EPT grows 1 percent, there would be a 0.0212 percent increase in SDG.

$\hat{\beta}_4$: When the other independent variables do not change, if the GDP grows by 1 percent, there will be a 0.0028 percent decrease in SDG.

$\hat{\beta}_5$: When the other independent variables do not change, if the PCE grows 1 percent, there would be a 0.0023 percent increase in SDG.

4.3.3. Results and discussions

From the results presented in Table 4, model (2) is more appropriate than model (1) because it does not miss variables, has the residuals customarily distributed, there is no high linear multi-additive phenomenon affecting the model, no autocorrelation phenomenon, and the model is homoscedastic. The coefficient R² is 0.5347, meaning that the independent variables can explain 53.47% of the change in SDG. Other elements not accounted for in the model contribute to the remaining 46.53%. In the sample data, the estimated findings indicate the presence of a positive correlation between the green transformation of the economy and the expansion of green financing.

Table 6. Ramsey test

Ramsey test			
F-statistic	0.4775	Probability	0.5203

Table 7. White test

White's test			
Chi-square	8.9492	Probability	0.3466

From all the above results, the selected model is model (2), and regression results for the impact of Green Finance, Environmental Protection Tax, and control variables on Vietnam's sustainable development are as follows:

Based on statistical analysis, the relationship between the green credit ratio and environment protection tax significantly impacts Vietnam's sustainable development goals index. This conclusion is supported by a P-value of 5%, indicating that the available data and the OLS model provided convincing evidence for this relationship. Thus, this research offers valuable insights for authorities to develop targeted green financing policies in specific timeframes and locations, therefore enhancing the effectiveness of these policies in curbing the activities of highly polluting firms and promoting their green innovation in business operations. The government might include various funding channels in its policy oversight to enhance the effectiveness of green financial policies in achieving pollution reduction and green development goals. Economic development considers the close connection between green financing and economic growth. Economic growth is favourably affected by green finance, and in a green economy, the availability of green loans is prevalent and plays a significant role (XU & LI, 2020; YUAN ET AL., 2020). The results from the study proved that there is a close link between green finance and economic growth, as well as the sustainable development of the economy. Green credit elements support sensible initiatives and successful policies that support economic expansion.

Sustainable economic development requires a stable annual growth rate of gross domestic product. The green transformation of the economy must go hand in hand with economic development. Only then will the transformation be maximally

effective, significantly helping the economy. However, the study's findings have shown that Vietnam's gross domestic product and sustainable development goals index have a negative relationship, which shows that the GDP growth rate and green transformation of the economy negatively affect each other. This finding can be explained in association with the general activities of the enterprises related to environmental factors. As the results of the research of DOS & PATTARIN (2024) show, imposing environmental taxes causes businesses to pay more costs related to the environment, thereby leading to a decrease in business profits. As a result, the GDP of the overall economy decreases. In addition, there is a reality in Vietnam, in general, when implementing green projects. Although enterprises have to invest more in technology to protect the environment, businesses do not receive any support regarding interest rates or preferential policies for industries that benefit the environment. This issue makes these businesses more costly than other traditional business activities. This result may also be the reason that the total GDP of the economy has a negative impact on sustainable development goals. However, it may only be the first stage of the process of greening the economy in the direction of sustainability because besides green credit and environmental taxes, gross domestic product growth or government expenditure, the sustainable development goals of Vietnam, in particular, and developing countries in general, are also affected by many other factors. Our study also shows that the government's green policies are inevitable towards the green transformation of the economy, but corporations and businesses need more time to adapt to recent changes. Besides, the findings also show that the higher the GDP per capita, the higher the goals towards a more sustainable economy.

5. Conclusions and recommendations

This research investigated the favourable transformations seen in Vietnam's economy within the framework of the shared objective established by nations to effectively govern the environment, society, and the global economy. Research showed that green finance and various financial factors have influenced Vietnam's sustainable economic development. The research considered green finance as a green credit, economic factors, environmental protection taxes, GDP growth, and per capita

expenditure towards sustainable development goals. Examining growth rates and accelerating movements towards environmentally friendly paths had significant empirical importance for economists. Findings showed that when per capita expenditure increases, it will assist countries in achieving their goals towards a more sustainable economy. The implementation of a comprehensive environmental protection tax system has the potential to enhance economic development. This research has proposed that regulators have focussed on green financing to enhance the country's economic transition towards sustainability.

The Vietnamese government and authorities can consider an initiative-taking approach to promoting green investment by formulating policies that facilitate, incentivise, and foster green investment for businesses through green loans. This issue should be complemented by investment priorities and government expenditures in sectors that promote environmental sustainability, thereby attracting private-sector investment in the green economy. Investments should be directed towards fostering the advancement and use of novel energy sources, renewable energy sources, fresh raw materials, fuels, and materials that can substitute conventional resources. Simultaneously, investing in transforming the economy's energy consumption structure is crucial to enhancing the share of new and renewable energy in the country's overall energy demands. In addition, the government can establish appropriate legal frameworks that can effectively steer economic development towards environmentally sustainable growth. This issue can be achieved by implementing regulations that address unsustainable practices that have detrimental effects on the environment. The government can also establish minimum standards or completely prohibit various activities causing pollution and environmental degradation within enterprises, facilitated by providing credit from commercial banks. Furthermore, it is essential to use taxation as a market mechanism to incentivise environmentally sustainable investments from businesses and modify the conduct of affiliated entities. There is a need to implement income tax incentive schemes, mainly targeting firms producing environmentally friendly commodities and renewable energy products.

However, this research has not yet included data on the present condition of green finance, including metrics such as green investment and green investment percentage. Additionally, our study

only examines the effects of green financing and environmental taxation on achieving sustainable development objectives in Vietnam, a developing nation transitioning towards an ecologically conscious economy. Hence, this research only focuses on the economic aspects of Vietnam as a developing nation while disregarding other developed nations' cultural, geographical, and social disparities. Hence, future research might examine the impact of the financial green and environmental tax on a broader scale, such as in a region or many countries in the global market.

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References

- Abbas Z. 2020. Reassessing the contribution of energy consumption to GDP per capita: Evidence from developed and developing countries. *International Journal of Energy Economics and Policy*, 10, 6: 404–410.
- Barannik A.D. 2001. Providers of Financial Services and Environmental Risk Management. *Sustainable Banking*, 2001: 247–267.
- Bassino J., Van der Eng P. 2019. Asia's 'little divergence' in the twentieth century: Evidence from ppp-based direct estimates of GDP per capita, 1913–69. *The Economic History Review*, 73, 1: 185–208.
- Bukhari S.A., Hashim F., Amran A. 2021. Green banking: A conceptual framework. *International Journal of Green Economics*, 15, 1: 59–74.
- Chien F., Kamran H.W., Nawaz M.A., Thach N.N., Long P.D., Baloch Z.A. 2021. Assessing the prioritisation of barriers toward Green Innovation: Small and Medium Enterprises Nexus. *Environment, Development and Sustainability*, 24, 2: 1897–1927.
- Chien FengSheng, Sadiq M., Kamran H.W., Nawaz M.A., Hussain M.S., Raza M. 2021. Co-movement of energy prices and stock market return: Environmental Wavelet Nexus of COVID-19 pandemic from the USA, Europe, and China. *Environmental Science and Pollution Research*, 28, 25: 32359–32373.
- Cui Y., Geobey S., Weber O., Lin H. 2018. The impact of green lending on credit risk in China. *Sustainability*, 10, 6: 2008.
- D'Adamo I., Gastaldi M., Morone P. 2020. The post-Covid-19 green recovery in practice: Assessing the profitability of a policy proposal on residential photovoltaic plants. *Energy Policy*, 147: 111910.
- Doś A., Pattarin F. 2024. Is sustainability a cost, an obligation, or an opportunity? Evidence on sustainable entrepreneurship orientation from Poland. *Entrepreneurial Business and Economics Review*, 12, 1: 17–33.
- Ehsanullah S., Tran Q.H., Sadiq M., Bashir S., Mohsin M., Iram R. 2021. How energy insecurity leads to energy poverty? Do environmental consideration and climate change concerns matters? *Environmental Science and Pollution Research*, 28, 39: 55041–55052.
- Gajjar Y. 2020. Exploring the scope of green investment in the coal sector of India and its efficacy on Indian economy. *Environmental Claims Journal*, 33, 4: 279–303.
- Geddes A. 2020. 13 The role of Green State investment banks in financing low-carbon projects. *Green Banking: Realizing Renewable Energy Projects*, 2020: 349–358.
- Kim J.H., Kang K.H. 2021. The interaction effect of tourism and foreign direct investment on urban-rural income disparity in China: A comparison between autonomous regions and other provinces. *Current Issues in Asian Tourism: Volume II*, 2021: 204–217.
- Li Z., Liao G., Wang Z., Huang Z. 2018. Green loan and subsidy for Promoting Clean Production Innovation. *Journal of Cleaner Production*, 187: 421–431.
- Liao X., Shi X. (Roc). 2018. Public appeal, environmental regulation, and green investment: Evidence from China. *Energy Policy*, 119: 554–562.
- Mallick D., Rahman A. 2020. Inclusive economic growth and climate-resilient development in Bangladesh. *Bangladesh's Economic and Social Progress*, 2020: 89–114.
- Marjit S., Sasmal R., Sasmal J. 2020. Composition of public expenditure and growth of per capita income in Indian states: A political perspective. *Journal of Social and Economic Development*, 22, 1: 1–17.
- Nawaz M.A., Hussain M.S., Kamran H.W., Ehsanullah S., Maheen R., Shair F. 2020. Trilemma Association of energy consumption, carbon emission, and Economic Growth of BRICS and OECD regions: Quantile Regression Estimation. *Environmental Science and Pollution Research*, 28, 13: 16014–16028.
- Ngo T.Q., Doan P.N., Vo L.T., Tran H.T., Nguyen D.N. 2021. The influence of Green Finance on economic growth: A Covid-19 pandemic effects on Vietnam economy. *Cogent Business & Management*, 8, 1–19.
- Nguyen C.T., Nguyen C.D., Bui V.D. 2023. Index of financial development with foreign direct investment: Case of Vietnam. *Contemporary Economics*, 17, 3: 323–332.
- Nguyen T.T.N. 2016. Overview of the 2030 agenda for sustainable development of the United Nations. *Institute of Statistical Science*, special issue on sustainable development goals (SDGs): Monitoring the implementation of SDGs in Vietnam: 3–5. <https://vienthongke.vn/wp-content/uploads/2021/05/Bai2.-CS-SDG2017.pdf>.
- Othman Z., Nordin M.F., Sadiq M. 2020. GST fraud prevention to ensure business sustainability: A Malaysian case study. *Journal of Asian Business and Economic Studies*, 27, 3: 245–265.
- Ozili P.K. 2022. Green Finance Research around the world: A literature review. *International Journal of Green Economics*, 16, 1: 56–75.
- Quy N.H. 2017. The role of Public Expenditures in economic growth at provincial level: Empirical study in Vietnam. *Journal of Politics and Law*, 10, 2: 88–96.
- Sadiq M., Le-Dinh T., Tran T.K., Chien F., Phan T.T., Quang Huy P. 2023. The role of Green Finance, eco-innovation, and creativity in the sustainable development goals of ASEAN countries. *Economic Research-Ekonomska Istraživanja*, 36, 2: 2175010.
- Sadiq M., Singh J., Raza M., Mohamad S. 2020. The impact of environmental, social and governance index on firm value: Evidence from Malaysia. *International Journal of Energy Economics and Policy*, 10, 5: 555–562.

- SBV. 2022. Annual Report 2021, State Bank of Vietnam. https://www.sbv.gov.vn/webcenter/portal/en/home/rm/public/nreport?_afLoop=47947209888385466#%40%3F_afLoop%3D47947209888385466%26centerWidth%3D80%2525%26leftWidth%3D20%2525%26rightWidth%3D0%2525%26showFooter%3Dfalse%26showHeader%3Dfalse%26_adf.ctrl-state%3D119jbk29v1_50.
- Setyawan Y., Bektı R.D., Isarlin F. 2020. Application of skater and Ward's methods in grouping Indonesian provinces based on monthly expenditure per capita of food commodity groups. *IOP Conference Series: Materials Science and Engineering*, 807, 1: 012017.
- Shair F., Shaorong S., Kamran H.W., Hussain M.S., Nawaz M.A., Nguyen V.C. 2021. Assessing the efficiency and total factor productivity growth of the banking industry: Do environmental concerns matters? *Environmental Science and Pollution Research*, 28, 16: 20822–20838.
- Ssekibaala D.S., Ariffin M.I., Duasa J. 2022. Economic growth, international trade, and environmental degradation in Sub-Saharan Africa. *Journal of Economics and Development*, 24, 4: 293–308.
- Touat O., Tebani A. 2022. Green taxation: An evaluation of the Algerian experience. *International Journal of Green Economics*, 15, 4: 359–377.
- Tran T.T., Do H.N., Vu T.H., Do N.N. 2020. The factors affecting green investment for Sustainable Development. *Decision Science Letters*, 9: 365–386.
- Tu C.A., Chien F., Hussein M.A., Ramli MM Y., S. Psi M.S., Iqbal S., Bilal A.R. 2021. Estimating the role of Green Financing on Energy Security and economic and environmental integration of BRI member countries. *The Singapore Economic Review*, 2021: 1–19.
- United Nation. 2022. UN climate change global innovation hub COP26 eventreport. *UN climate change conference UK 2021*. https://unfccc.int/sites/default/files/resource/UGIH_COP26_Report.pdf.
- United Nations. 2015. Transforming our world: the 2030 Agenda for Sustainable Development. *General Assembly*, 1–35. <https://documents.un.org/doc/undoc/gen/n15/291/89/pdf/n1529189.pdf?token=GG0kGIcaQ60gVTAiEr&fe=true>.
- Weeks W.B., Huynh G.H., Weinstein J.N. 2020. A decade of modest convergence in geographic variation in per capita Medicare fee-for-service expenditures: Taxation without representation is not sustainable; is it time for taxpayer and consumer engagement? *Journal of General Internal Medicine*, 35, 12: 3736–3739.
- Xu X., Li J. 2020. Asymmetric impacts of the policy and development of green credit on the debt financing cost and maturity of different types of enterprises in China. *Journal of Cleaner Production*, 264: 121574.
- Xueying W., Sadiq M., Chien F., Ngo T.Q., Nguyen A.-T., Trinh T.-T. 2021. Assessing Long-Run Dynamics of Financial Hedging, a New Determinants of Green Financing in E7 and G7 Countries.
- Yuan Y., Wang M., Zhu Y., Huang X., Xiong X. 2020. Urbanisation's effects on the urban-rural income gap in China: A meta-regression analysis. *Land Use Policy*, 99: 104995.
- Zhao L., Zhao L., Chen B.-F. 2015. The Interrelationship between defence spending, public expenditures, and economic growth: Evidence from China. *Defence and Peace Economics*, 28, 6: 703–718.
- Zhuang Y., Yang S., Chupradit S., Nawaz M. A., Xiong R., Koksall C. 2021. A nexus between macroeconomic dynamics and trade openness: Moderating role of Institutional Quality. *Business Process Management Journal*, 27, 6: 1703–1719.