How Does Financial Inclusion Support a Green Economy in Asia?

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Abstract :

The purpose of this research is to investigate financial inclusion with green economy development performance. To achieve this goal, this study uses data envelopment analysis (DEA) to assess the productive feasibility of green and complex basic designs in increasing green profitability. This study uses CO2 emissions as an indicator for measuring green economy development management. The results of this research are expected to provide an overview and suggestions on how to develop financial inclusion while maintaining environmental sustainability. This study uses quantitative non-parametric data envelopment analysis (DEA) methods using robust analysis. We found that economic development does not ignore environmental sustainability. Economic development must also be able to minimize the impact of environmental damage. Infrastructure development surprisingly has a negative impact on green economy development as well as credit. However, financial inclusion provides optimistic results that have the potential to drive Green economic development in Asia. The industrial structure that is affected by green financial inclusion also positively encourages an increase in environmentally friendly economic growth.

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Introduction

The United Nations Environment Program (UNEP) defines a green economy as one that results in increased human well-being and social equity, significantly reduces environmental risk and ecological scarcity. In addition, the green economy achieves economic development and efficient consumption of resources (Chalil, 2020).

A green economy seeks to promote the development and responsible use of resources, minimize environmental impacts and promote climate and social justice based on equality and inclusion of vulnerable people. In addition, it aims to promote the creation of green jobs, i.e. jobs that directly contribute to the preservation or restoration of the environment (Khoshnava, Rostami, Zin, Štreimikienė, Yousefpour, Strielkowski, & Mardani, 2019).

The green economy is one of the axes of Asian countries' environmental strategies, along with risk mitigation, analysis and mitigation, adaptation to climate change, capacity building, and political advocacy. Environmental degradation and climate change pose a new threat, and it is one of the big (if not the biggest) concerns of the new generation (Dhyani, Murthy, Kadaverugu, Dasgupta, Kumar, & Adesh Gadpayle, 2021).

According to Lee & Woo (2020), the green economy, sometimes also known as the ecological economy, emerged as a response to the fight against climate change, the reduction of greenhouse gas emissions, and the promotion of sustainable development. Green jobs, also known as resource efficiency, are at the heart of green economy efforts to balance the creation of new jobs and economic expansion. Green companies, on the other hand, are companies that take care of nature and the environment while emitting less carbon dioxide. Moreover, many green businesses not only create green jobs or green jobs, but also incorporate an environmental mindset into their production, produce products that are better for the environment, and use green marketing to emphasize their sustainability (Bilgaev, Sadykova, Mikheeva, Bardakhanova, Ayusheeva, Li, & Dong, 2022).

A green economy is a type of economic model that aims to improve human well-being from a transition to an economic system that takes into account a set of factors transcendental to the planet: social justice, resource consumption efficiency and current (and future) factors that generate problems environment (Ossewaarde & Ossewaarde-Lowtoo, 2020).

Environmentally friendly energy is a need for sustainable development in Asia and governments in Asian countries are committed to developing sustainable energy (Liu, Kong, & Zhang, 2021). Globally developed financial inclusion is financial inclusion that is inexpensive and reaches all levels of society. Groups of people who are underserved financially are things that need to be handled efficiently. Limitations of financial accessibility by considering the risks of financial services need to be continuously developed. Financial services are a necessity for society in today's modern era. The economic cycle is always related to the time series period of the macro economy. Financial inclusion is a vital factor in driving economic development (Liu, Luan, Wu, Zhang, & Hsu, 2021).

A green economy is a necessary proposal to address the many challenges facing society today that highlight the current needs of the planet at a financial level, but also at a climate, energy, food and social level. Of course, for a green economy to be definitively implemented in each country, there needs to be an optimal set of circumstances and the institutions involved (D'amato & Korhonen, 2021). Undoubtedly, individual contributions will be important, but we know that new regulations that support this type of economy will be necessary. This can achieve increased public investment in the green sector and assistance to promote it. In the same way, public administration policies that encourage private companies to bet on a green economy are needed (Mohsin, Taghizadeh-Hesary, Iqbal, & Saydaliev, 2022).

Financial inclusion is very important in providing financial access to everyone in society. The challenge is the considerable risk in providing financial access to economically weak groups. The health of the financial industry is highly dependent on the current economic cycle (Omar & Inaba, 2020). The banking sector is always influenced by macroeconomic performance. Poor macroeconomic performance has an impact on increasing banking risk and increasing the potential for default on parties who borrow money from banks or non-bank financial services. The banking and financial services sector is closely related to the provision of capital in the real sector (Omodero & Mlanga, 2019).

Another challenge of economic development aside from the macroeconomic environment is the environment. The environment is important in building human life (Koren, Bondarenko, & Pustovarov, 2020). Economic development is often paid for by environmental damage. But it is getting attention at this time. Where economic development must also maintain environmental sustainability. The challenge of environmental sustainability is closely related to capital. Where capital in the banking sector can be carried out with a green capital scheme which of course

requires in-depth study (Fan & Hao, 2020). Research findings on financial inclusion and a green economy are debatable. According to Xuan, Jiang, & Fang (2023), research on green economy development has yielded mixed results. This study aims to investigate the relationship between green economy development performance and financial inclusion. This study uses data envelopment analysis (DEA) to evaluate the productive feasibility of basic green and complex designs in increasing green profitability to achieve this goal. CO2 emission is used as an indicator in this study to measure green economy development management. The results of this examination are intended to provide outlines and ideas on how best to encourage monetary considerations while retaining natural maintenance.

Literature review and hypothesis development

Modern economic development that is supported by industrialization and the use of fossil energy has an impact on environmental sustainability. Current financial inclusion also contributes to environmental damage, especially motor vehicle credit services which increase environmental pollution from the production process of motorized vehicles to the use of motorized vehicles that produce carbon dioxide (Raihan & Tuspekova, 2022). Financial services such as banking encourage increased efficiency because with an increase in real sector capital it can increase economies of scale. The financial services sector encourages environmental pollution by increasing capital in industries that produce carbon dioxide in their production processes (Qu, Shao, & Shi, 2020).

Green financial inclusion can use carbon dioxide emissions as an indicator in determining the delivery of capital services to the real sector. Financial inclusion is a vital component in driving real sector performance. But it also has a big impact on the environment. On the other hand, financial inclusion can also be used as a tool in developing green economic performance by increasing paperless transactions, green financing and so on (Zheng & Li, 2022).

Financial services can assist in realizing a green economy by providing capital support services to industries that are energy efficient or that use renewable energy. Financial inclusion can be a vital tool in green economy development. Environmental impact is an important indicator in modern economic development (Zhao, Mahendru, Ma, Rao, & Shang, 2022). Financial inclusion can help support green economy development. Support for eco-friendly industries can be provided by the financial industry to encourage the promotion of green economy development for sustainable economic development. Increasing funding is important in the real sector, where financial service support for green industries can motivate business people to develop environmentally friendly industries (Saleem, Nasreen, & Azam, 2022).

To support green economic growth, financial services ought to concentrate on the development of environmentally friendly and energy efficient technologies. Capital support for green industries also has an impact on environmentally friendly business strategies for obtaining green finance funding (Mahmood, Zhao, Lou, & Geng, 2022). As a direct consequence of the expansion of green financial services, there is a corresponding increase in the demand for eco-friendly technologies. Naturally, this can encourage expansion and a business climate that is friendly to the environment. According to Ulucak (2020), the likelihood that other sectors will participate in the process of developing a green economy and gaining access to green finance increases with the level of green financial inclusion.

Hypothesis 1: Increasing green financial inclusion can promote green economy development.

The increase in green financial inclusion is accompanied by an increase in the use of environmentally friendly energy. The use of environmentally friendly energy has an impact on increasing natural sustainability (Fareed, Rehman, Adebayo, Wang, Ahmad, & Shahzad, 2022).

Increasing the green economic climate has an impact on increasing consumption of renewable and environmentally friendly energy among the public. Banking with increased support for environmentally friendly industries can actively promote the use of environmentally friendly energy or energy efficient industries (Khan, Zhang, Kumar, Zavadskas, & Streimikiene, 2020).
Hypothesis 2: Green financial inclusion has an impact on increasing environmentally friendly energy and increasing the efficiency of energy use which in turn has an impact on green economic development.
Economic efficiency can be achieved by improving technology and economies of scale as well as efficient production methods (Rehman Khan, Yu, Sarwat, Godil, Amin, & Shujaat, 2022). Financial inclusion can encourage efficiency by increasing technology financing and increasing economies of scale (Mhlanga, 2020). Fossil energy and energy that is not environmentally friendly can damage the environment and endanger human life. Financial services by providing financing limits to industries that are not environmentally friendly can hinder the growth of these industries (Adebayo, 2022).
Limiting the growth of industries that are less environmentally friendly can reduce the increase in carbon emissions. The use of energy that is less environmentally friendly also has an impact on soil, water and air pollution. Restrictions on financing in industrial sectors that are less environmentally friendly have an impact on increasing the motivation of business actors in developing environmentally friendly industries and ultimately encouraging the development of a green economy (Shen, Su, Malik, Umar, Khan, & Khan, 2021).
Hypothesis 3: An increase in financing restrictions on industries that are less environmentally friendly can encourage an increase in green economy performance.

Data And Methodology

This study uses quantitative non-parametric data envelopment analysis (DEA) methods using robust analysis. We use the following equation:

$$GEE\ it = a_0 + B_1Fit_{it} + B_2Ins_{it} + B_3Eg_{it} + B_4Cr_{it} + B_5Fe_{it} + B_6TO_{it} + B_7M_{it} + B_8IS_{it} + e_{it}$$

GEP = Green Economics Performance
Fit = Total financial inclusion
Ins = Insurance
Eg = Environmental Governance
cr = Credits
Fe = Fiscal Expenditure
TO = Trade Openness
M = Marketing
Is = Industrial Structure
e = term error
i = region 1...to i
t = time series
B = Coefficient
a = autonomus

We conducted research on 48 Asian nations and analyzed data from the World Bank and the Organization for Economic Co-operation and Development (OECD). This study takes into account the environment, fiscal spending, the connection between economic growth and corporatization, corporate competitiveness, industry structure, financing, and insurance. Green economy performance is measured by the OECD index of the effective use of natural resources

and green economy expansion. The significance of insurance is evaluated using OECD trends in the insurance market. To measure total financial inclusion, we use data from the World Bank. To gauge environmental governance, we use the World Bank's CO2 emissions (metric tons per capita). We measure financial inclusion in terms of credit using data from the World Bank and credit as a percentage of GDP from the domestic financial sector. As the government's strategy for fostering economic expansion, we employ the final consumption expenditure (percent of GDP) figure. To assess trade openness, we make use of World Bank trade data. To comprehend aggregate demand, we make use of the World Bank's final consumption spending (percent annual growth). Industry Structure is measured by utilizing the World Bank's value added (percentage of GDP) for construction-related industries. The variables are described in detail in Table 1.

Table 1. Description of Variable

Variables	Description	Source
Green Economics Performance	Efficient use of natural resources and green economy improvement	OECD
Total financial inclusion	The total number of financial inclusion	World Bank
Insurance	insurance market trends	OECD
Environmental Governance	CO2 emissions (metric tons per capita)	World Bank
Credits	Financial sector domestic credit (percent of GDP)	World Bank
Fiscal Expenditure	Spending on final consumption by the government (as a percentage of GDP)	World Bank
Trade Openness	Trade (% of GDP)	World Bank
Marketing	Final consumption	World Bank

	expenditure (annual % growth)	
Industrial Structure	Industry (including construction), value added (% of GDP)	World Bank

Result and Discussion

In the estimation process, stationary data is needed so that it is necessary to test the stationarity of the data presented in table 2.

Table 2. Test The Stationarity Of The Data In First Different

Variable	PP – Fisher stat.	Prob.	Description
Green Economics Performance	69.1221	0.0000	Stationer
Total financial inclusion	53.1121	0.0000	Stationer
Insurance	33.0112	0.0007	Stationer
Environmental Governance	54.1233	0.0000	Stationer
Credits	16.3351	0.0000	Stationer
Fiscal Expenditure	29.2113	0.0000	Stationer
Trade Openness	21.2232	0.0000	Stationer
Marketing	13.1231	0.0007	Stationer
Industrial Structure	14.2111	0.0000	Stationer

The test results conclude that all data is stationary on the first difference. We estimate the impact of the variables Total financial inclusion, Insurance, Environmental Governance, Fiscal Expenditure, Trade Openness, Marketing, Industrial Structure on Green Economic Performance which is presented in table 3.

Table 3. Financial Inclusion Impact On Green Economic Performance

Indicators	**Coefficient**
Total financial inclusion	0.006 (0.001)
Insurance	0.005 (0.001)
Environmental Governance	0.278 (0.009)
Credits	- 0.049 (0.001)
Fiscal Expenditure	-0.038 (0.002)

Trade Openness	0.006 (0.001)
Marketing	0.005 (0.001)
Industrial Structure	0.016 (0.009)
N	98
Wald Chi2	18.21

Financial inclusion has the potential to boost green economic growth by 0.006% for every percent increase in financial inclusion. Likewise insurance. The surprising thing is that credit and fiscal expenditure actually suppress the green economy performance in Asia. The most important and key things in developing a green economy are environmental governance and industrial structure.

Conclusion

Economic development does not ignore environmental sustainability. Economic development must also be able to minimize the impact of environmental damage. Infrastructure development surprisingly has a negative impact on green economy development as well as credit. However, financial inclusion provides optimistic results that have the potential to drive Green economic development in Asia. The industrial structure that is affected by green financial inclusion also positively encourages an increase in environmentally friendly economic growth.

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