

## **FINANCIAL INCLUSION AND CO2 EMISSIONS IN ASIA: IMPLICATIONS FOR ENVIRONMENTAL SUSTAINABILITY**

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### **ABSTRACT**

Financial inclusion and CO<sub>2</sub> emissions are two important factors in the context of environmental sustainability in Asia. Financial inclusion, which refers to public access and participation in formal financial services, can impact the ability of individuals and communities to invest in environmentally friendly technologies and sustainable business practices. On the other hand, CO<sub>2</sub> emissions, the relationship between financial inclusion and CO<sub>2</sub> emission levels in Asia, as well as their implications for environmental sustainability. This paper explores how increased access to financial services can affect the reduction of CO<sub>2</sub> emissions, both through changes in consumer behavior and innovation in the industrial sector. To achieve better environmental sustainability, it is important for policymakers and stakeholders to consider the synergies between the financial and environmental sectors, as well as design strategies that support the transition to a greener and more inclusive economy.

**Keywords:** Co<sub>2</sub>, Financial, Environmental, Sustainability

### **INTRODUCTION**

The catastrophic consequences of climate change for human life, health and environmental sustainability have received the world's attention. Notably, the increase in global warming is caused by anthropogenic greenhouse gas emissions due to massive consumption of fossil fuels and industrial dumping (Wawrzyniak and Doryń, 2020). It is widely considered that carbon dioxide is the main cause of environmental degradation among greenhouse gases (hereinafter referred to as GHGs) because it accounts for 70% of GHG emissions (Sarkodie et al., 2020). It is also claimed that the concentration of GHGs in the atmosphere could double from pre-industrial levels by 2035 (Charfeddine and Kahia, 2019). As a result, the rise in global temperature may exceed the threshold of 2°C, and if so, then the threat of environmental degradation is quite a matter of concern.

In the previous literature, there was a relationship between carbon emissions and economic growth (Le et al., 2019), energy consumption (Charfeddine and Kahia, 2019), foreign direct investment (Sarkodie et al., 2020), foreign finance (Alshubiri and Elhaddad, 2019), trade openness (Shahbaz et al., 2017), urbanization (Raghutla and Chittedi, 2020), population growth (Yeh and Liao, 2017) and financial development (Jiang and Ma, 2019; Kayani et al., 2020 ; Raghutla dan Chittedi, 2020). However, there are still very few empirical studies on the relationship between carbon emissions and the concept of financial inclusion.

Theoretically, there is an opposing view in the literature regarding the impact of financial inclusion on environmental sustainability (Le et al., 2020). On the one hand, financial inclusion allows individuals as well as businesses to take advantage of useful credit schemes at lower costs that make investing in green technology more affordable (Gök, 2020). In this way, an inclusive financial system contributes positively to environmental sustainability by encouraging individuals and businesses to use green technologies and adopt better environmental practices, which in turn will lower GHG emissions (Jiang and Ma, 2019).

On the other hand, an easily accessible financial system can damage the quality of the environment, thereby encouraging manufacturing and industrial activities through affordable financing, which in turn increases CO<sub>2</sub> emissions (Charfeddine and Kahia, 2019). Similarly, financial inclusion also motivates individual consumers to use energy-intensive electrical

appliances (Gök, 2020). The use of these energy-intensive goods is a serious threat to environmental sustainability. So far, two empirical studies, Le et al. (2020) and Renzhi and Baek (2020), establish a relationship between financial inclusion and CO<sub>2</sub> emissions.

## METHODS

Qualitative research is research that holistically intends to understand the phenomenon of what the research subject experiences, be it his behaviour, perceptions, motivations or actions, and in a description in the form of words and language, in a special natural context and by utilising various natural methods (Moleong, 2007). Literature study is a theoretical study, references and other scientific literature related to culture, values and norms that develop in the social situation under study (Sugiyono, 2012).

The type of research used is library research or literature study where researchers rely on various literatures to obtain research data and use a qualitative approach because the data produced is in the form of words or descriptions. Library research or literature research is research where the place of study is literature or literature (Purwanto, 2008). In this research, research is conducted by utilising studies which are similar or related. After collecting various literature related to the study under study, the researcher makes observations then the object of research is explored through various library information both from books, natural journals, digital data, documents and so on in order to analyse monetary, fiscal and green trade indicators in Indonesia.

## RESULTS AND DISCUSSION

### **The Relationship between Financial Inclusion and Financial Development**

Financial inclusion is an inseparable part of financial development (Le et al., 2020). Therefore, the theoretical and empirical foundations of financial development are discussed to establish a relationship between financial inclusion and carbon emissions. Theoretically, there are differences of opinion among researchers regarding the relationship between financial development and climate change (Jiang and Ma, 2019). On the one hand, experts argue that financial development mitigates GHG emissions by facilitating the energy supply sector to improve production technology and equipment through mitigating financial constraints with lower borrowing costs (Renzhi and Baek, 2020).

Therefore, it is evident that the development of the financial sector that shows the availability of capital and real funding channels through banks and the stock market can contribute positively to environmental sustainability through the reduction of GHG emissions (Gök, 2020). From this perspective, financial development reduces environmental damage (Koshta et al., 2020). Several empirical studies recognize the positive role of financial development in combating climate change (Charfeddine and Kahia, 2019; Omri et al., 2015; Shahbaz et al., 2013; Tamazian and Rao, 2010).

### **The Impact of Financial Development on CO<sub>2</sub> Emissions**

Saidi and Mbarek (2017) investigated the impact of financial development on CO<sub>2</sub> emissions in a dynamic panel framework using time series data in 19 developing countries during the period 1990-2013. The empirical results show the negative influence of financial system development on CO<sub>2</sub> emissions, which shows that financial development makes a positive contribution to environmental sustainability. Using data from the top 23 renewable energy user countries from 1985 to 2011, Dogan and Seker (2016) analyzed the impact of financial development on CO<sub>2</sub> emissions based on dynamic ordinary least square (DOLS) and fully modified ordinary least square (FMOLS). The study reveals that financial development and CO<sub>2</sub> emissions are cointegrated in the long term and financial development reduces GHG emissions.

However, other research says that financial development exacerbates environmental damage through increased CO<sub>2</sub> emissions for the following reasons. First, a well-

functioning financial system lowers borrowing costs, which encourages businesses to acquire the capital needed to expand production, which in turn increases CO<sub>2</sub> emissions (Raghutla and Chittedi, 2020). Second, financial developments dramatically boost social consumption thereby providing better utilization of credit, which can facilitate individual consumers to purchase more energy-intensive items such as electrical appliances (Gök, 2020), cars and many others, which in turn increases CO<sub>2</sub> emissions (Koshta et al., 2020). Third, the capital market is considered an important indicator of economic development. Good stock market performance will attract individual and institutional investors and stimulate production and consumption activities, which will ultimately increase CO<sub>2</sub> emissions through massive fossil fuel consumption (Rajpurohit and Sharma, 2020). From this perspective, environmental damage increases along with financial development. This is also supported by several empirical studies such as Al-Mulali et al. (2015), Kayani et al. (2020), Jiang and Ma (2019) and Pata (2018).

Several studies have found an inverted U-shaped relationship between financial development and GHG emissions (Omri et al., 2015; Salahuddin et al., 2018; Shahbaz et al., 2013). Hung et al. (2018) examined the impact of financial system development on CO<sub>2</sub> emissions in 25 OECD countries from 1971 to 2007. Empirical results show the in-linearity between financial development and CO<sub>2</sub> emissions. Renzhi and Baek (2020) examined the impact of financial inclusion on CO<sub>2</sub> emissions in the framework of the environmental Kuznets curve (EKC) based on 103 countries, and supported an inverted U-shaped relationship.

## CONCLUSION

Large-scale development that is not properly moderated can create several challenges including environmental damage and climate change. Global warming is a serious threat to human existence. This is supported by several literatures both theoretically and empirically regarding the main macroeconomic determinants of climate change, namely economic growth variables, energy consumption variables, population variables and financial development. Financial inclusion has recently attracted the world's attention in mitigating climate change. There is a positive relationship between financial inclusion and CO<sub>2</sub> emissions. Various ways can be done to massively reduce environmental impacts, including facilitating individuals and businesses in obtaining easy access to environmentally based financial services, motivating businesses to expand production scales and increasing individual consumer power to purchase environmentally friendly energy-based intensive electrical equipment. This is one of the efforts to reduce energy use from fossil fuels, so that CO<sub>2</sub> emissions can be reduced.

### Suggestions:

1. Financial inclusion can refer to the green credit guidelines carried out by the State of China, the State of China has carried out green credit financial services to reduce carbon emissions, and has been able to contribute to a sustainable green economy
2. Authorities can align initiatives for financial inclusion by implementing environmental protection policies, for example, the government can lift marginalized segments of society by expanding inclusive finance that can address environmental damage, in this case, for example, small and medium enterprises (SMEs) can be encouraged to adopt carbon mitigation practices through easy access to green financial services. The SME partnership pattern involves public-private partnerships that have concepts and goals towards environmental sustainability in accordance with the concept of sustainable development (SDGs).
3. Businesses tend to expand their production through financial loans based on investment in green technology projects.

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